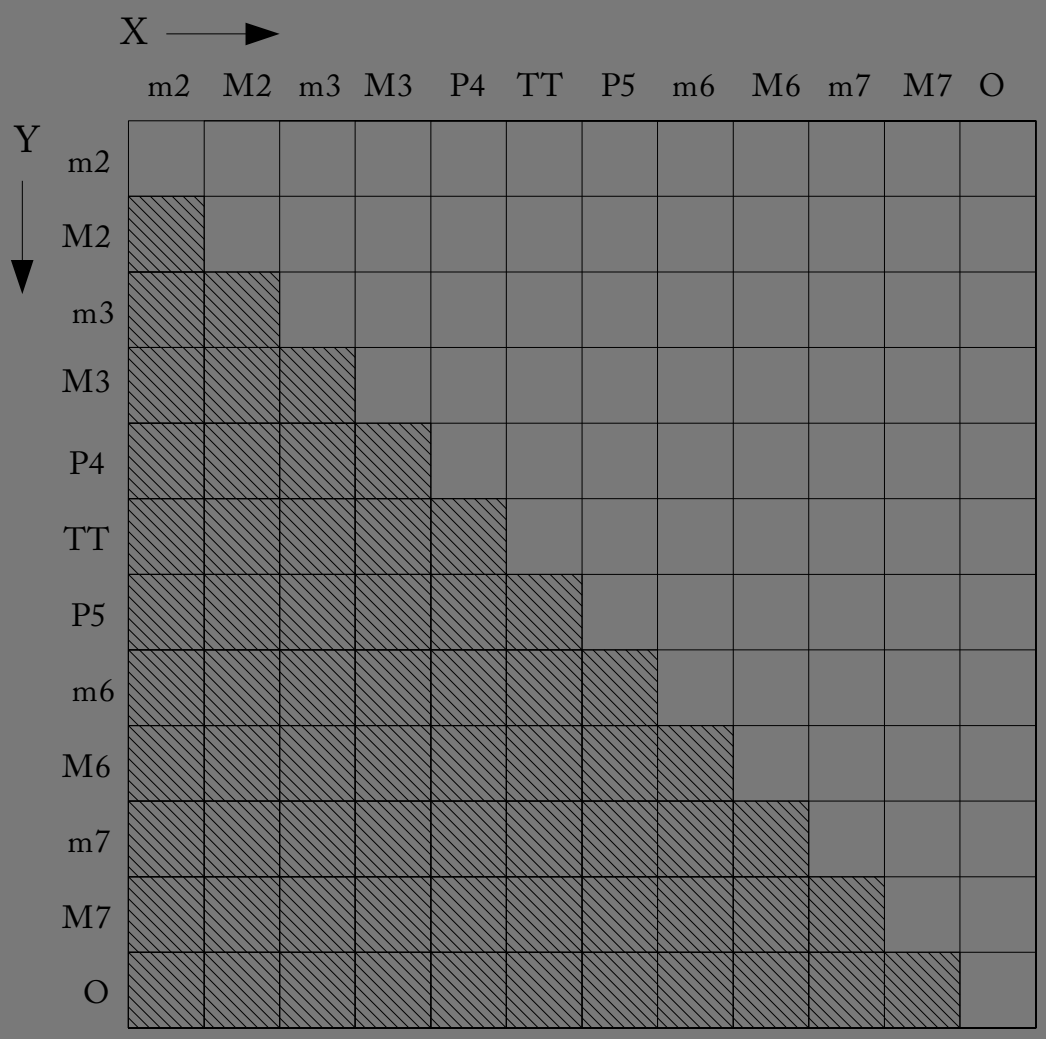
INTERVAL MATRIX

By

JAMES MAHONE



1st Edition

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INTRODUCTION

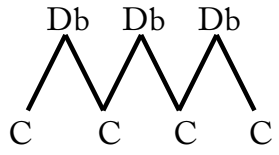
The concept of the INTERVAL MATRIX materialized because of a simple question: how can intervallic relationships be studied in a comprehensive and systematic way? The INTERVAL MATRIX is a logical solution.

I began by sketching a 2 dimensional (xy) grid* with 12 points along each axis representing every interval within an octave** from the smallest (Minor 2nd) to the largest (Perfect Octave). Each coordinate represents an intersection of 2 intervals, x and y. Both x and y intervals may move up or down. There are 4 resulting interval sequences at each coordinate:

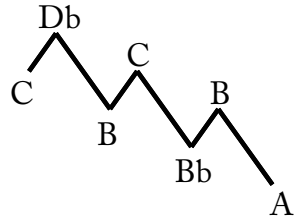
x moves up, y moves down
x moves down, y moves up
x and y move up
x and y move down

312 unique interval sequences are available within this framework***. Using this data, I built 4 patterns at each coordinate based on a repeating intervallic sequence. With this method, examining intervallic relationships is simple and straightforward.

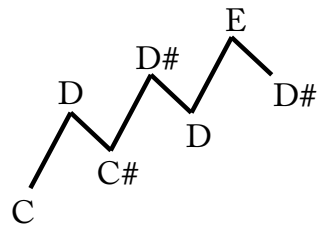
For example, on the coordinate at the top left of the grid, x and y are both represented by a Minor 2nd interval. When using C as a starting note, moving up a Minor 2nd goes to Db. Moving down a Minor 2nd returns to C. Repeating this two note sequence creates a balanced or static intervallic pattern, in other words, a trill. A visual representation of this two note sequence repeating through time (a pattern) looks like this:



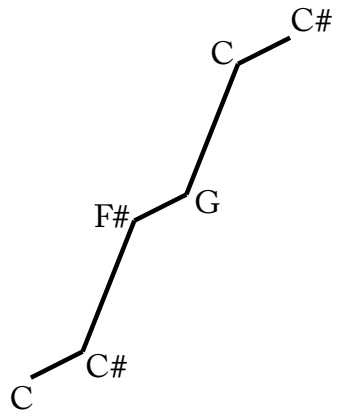
Any unequal interval relationship on a coordinate creates an unbalanced or dynamic intervallic pattern. If x is a Minor 2nd moving upward and y is a Major 2nd moving downward, and C is again the starting point, moving up a Minor 2nd goes to Db. Moving down a Major 2nd takes the sequence up to B (Cb). Repeating the sequence produces this pattern: C, Db, B, C, Bb, B, A, etc.



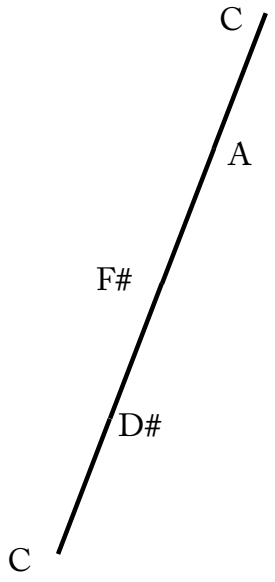
Conversely, if x is the larger interval, the pattern moves upward. For example, if x is a Major 2nd moving upward and y is a Minor 2nd moving downward, the pattern is this: C, D, C#, D#, D, E, D#, E# (F), etc.



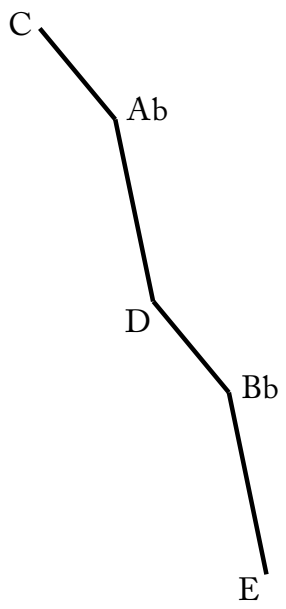
If both x and y are designated as moving in the same direction, up or down, a repeating sequence results in an ascending or descending pattern whose incline is determined by the size of intervals x and y. For example, if x is a Minor 2nd and y is a Perfect 4th, and both intervals move upward, this pattern is produced: C, C#, F#, C, C#, etc.



If both x and y are Minor 3rd intervals and move upward, the resulting pattern is this: C, D#, F#, A, C, etc.



If x is a Major 3rd and y is a Tritone and both intervals move downward, the pattern will be: C, Ab, D, Bb, E, etc.



All patterns created using an xy grid are essentially repeating sequences of a constant relationship, whose shape and direction is determined by the interval values and directions given to x and y.

Chapters in this book are arranged in order from the smallest to the largest intervals along the x axis of the matrix. Each x interval is paired with an interval along the y axis of the matrix, also arranged from the smallest to the largest. At each coordinate I built a pattern based on each of the four xy pairs. In cases where an xy pair has been previously addressed, I have excluded the pattern. Because of range considerations for wind instruments, as a general rule I have limited each exercise to a range of approximately 2½ octaves situated between the upper and lower extremes of the treble clef staff. Because each pattern moves through all 12 keys, transposition is not necessary. I have allowed for adjustments of time signature, octave jumps, etc. to facilitate ease of playing. Patterns are generally written out in 4/4 or 3/4 with no references to articulation. To benefit fully from practicing these exercises, it is recommended that students modify these sequences by using different tempos, time signatures and a variety of articulations.

The following abbreviations are used to represent intervals:

m2	**Minor 2nd**	**P5**	**Perfect 5th**
M2	**Major 2nd**	**m6**	**Minor 6th**
m3	**Minor 3rd**	**M6**	**Major 6th**
P4	**Perfect 4th**	**M7**	**Major7th**
TT	**Tritone**	**O**	**Octave**

In summary, I created the **INTERVAL MATRIX** for use as a practical tool. Intervallic patterns can be used to increase technical proficiency, sight singing and ear training purposes, or perhaps even as a means of developing simple melodic motifs for use in improvisation and composition. Using the **INTERVAL MATRIX** as a template, a great variety of sequences can be generated for personal application.

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* Pictured on the book cover.

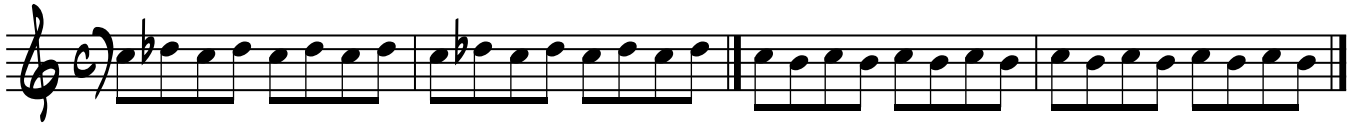
** I purposely omitted unisons as an interval choice because any xy sequence that contains a unison as a variable will produce a pattern of repeating notes. Using unisons in sequences of 3 or more variables however, will produce some interesting patterns.

*** Any repeated xy sequence is omitted

MINOR 2nds

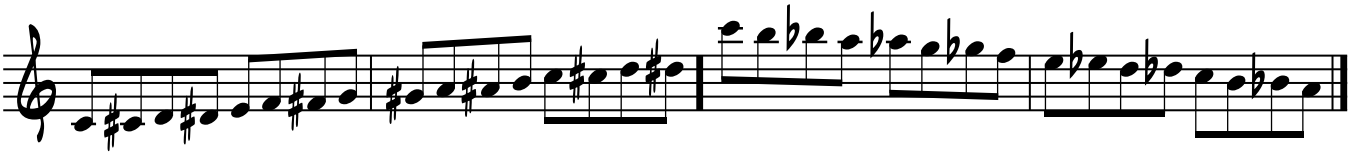
x=m2 up, y=m2 down

x=m2 down, y=m2 up

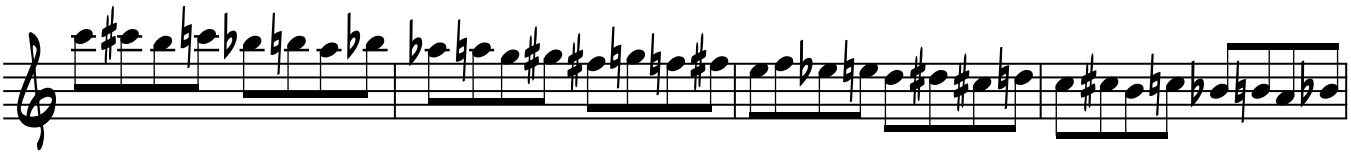


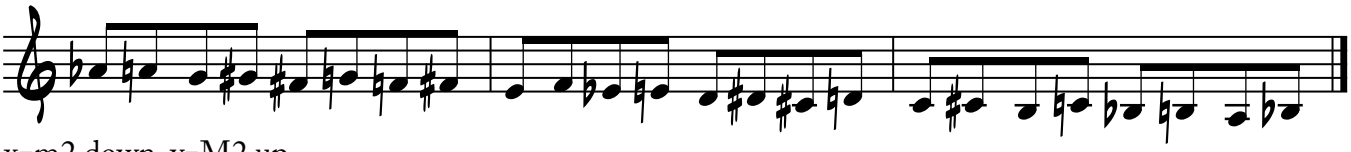
x=m2 up, y=m2 up

x=m2 down, y=m2 down

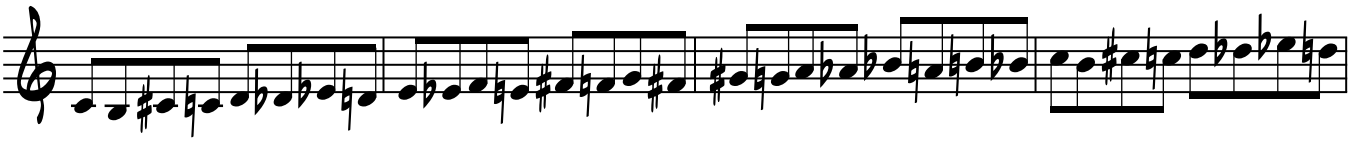


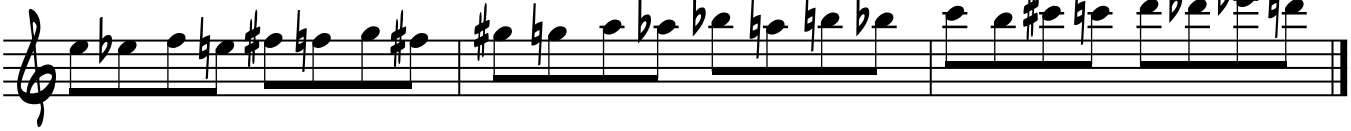
x=m2 up, y=M2 down



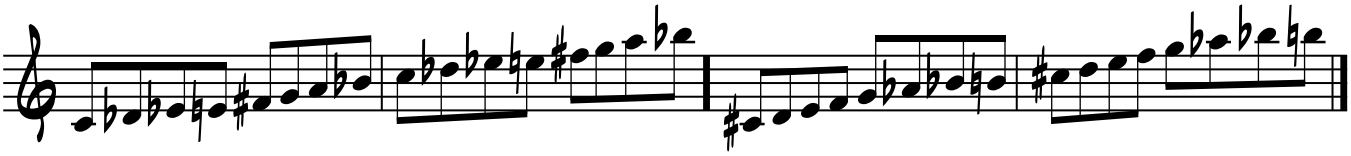


x=m2 down, y=M2 up

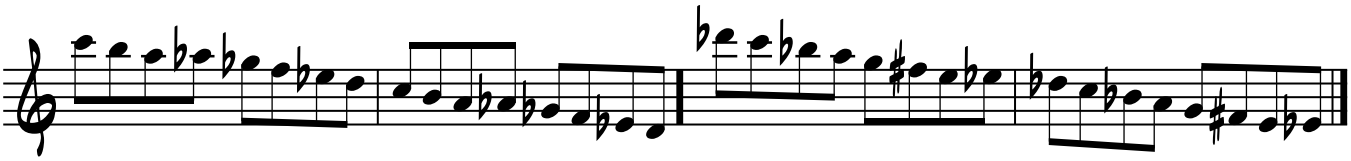




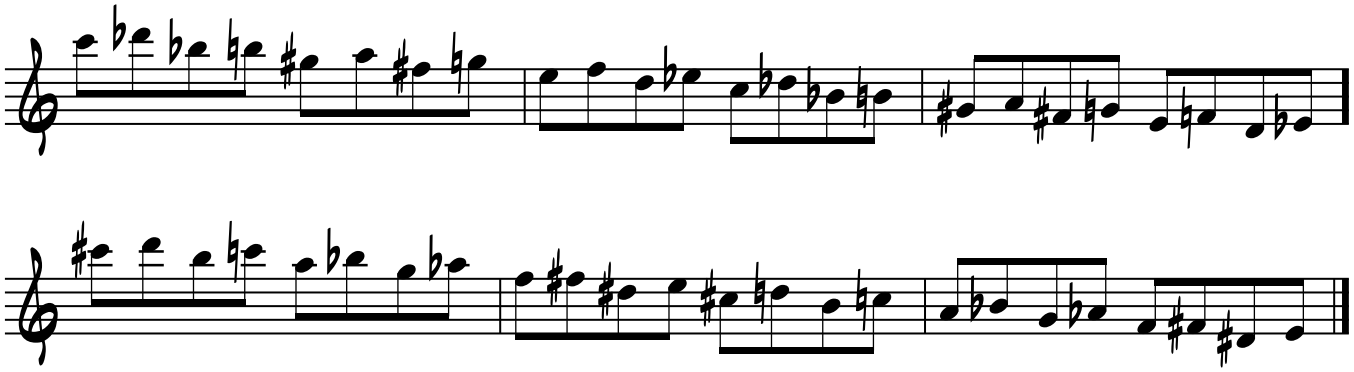
x=m2 up, y=M2 up



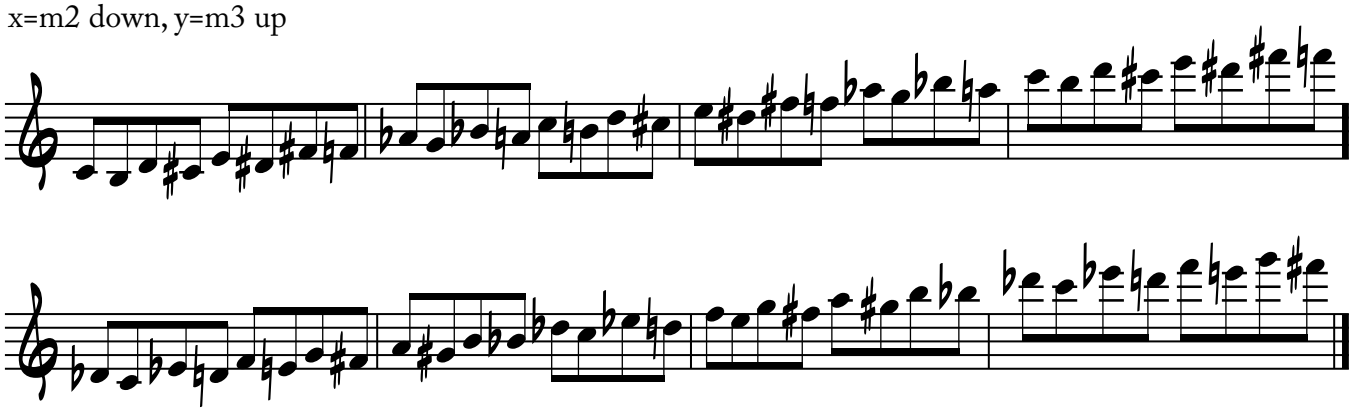
x=m2 down, y=M2 down



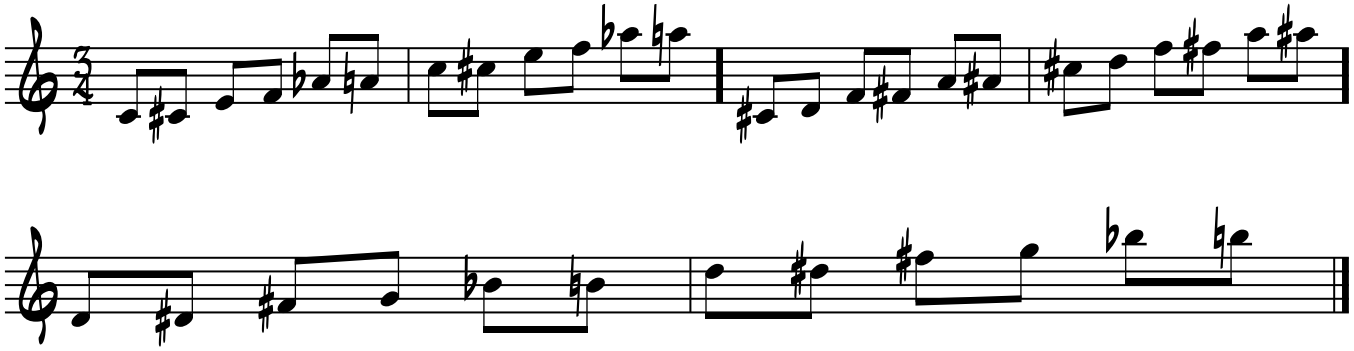
x=m2 down, y=m3 down



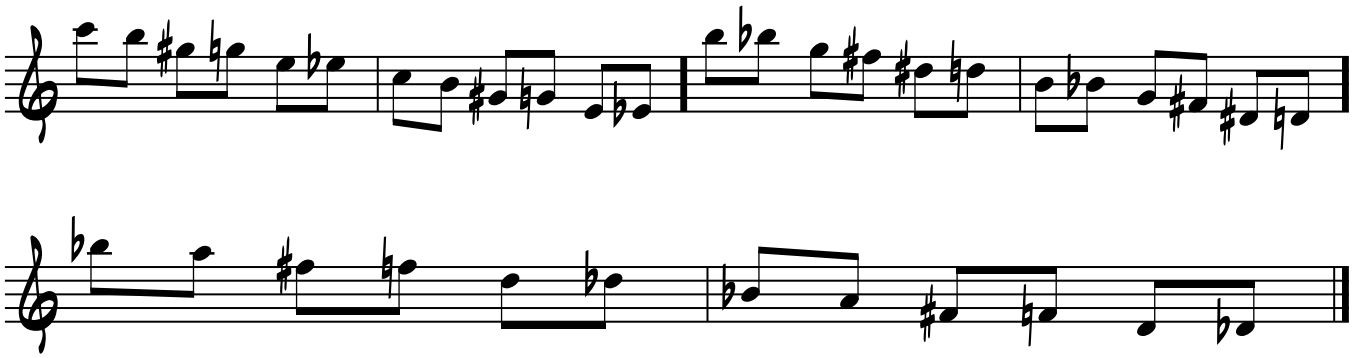
x=m2 down, y=m3 up



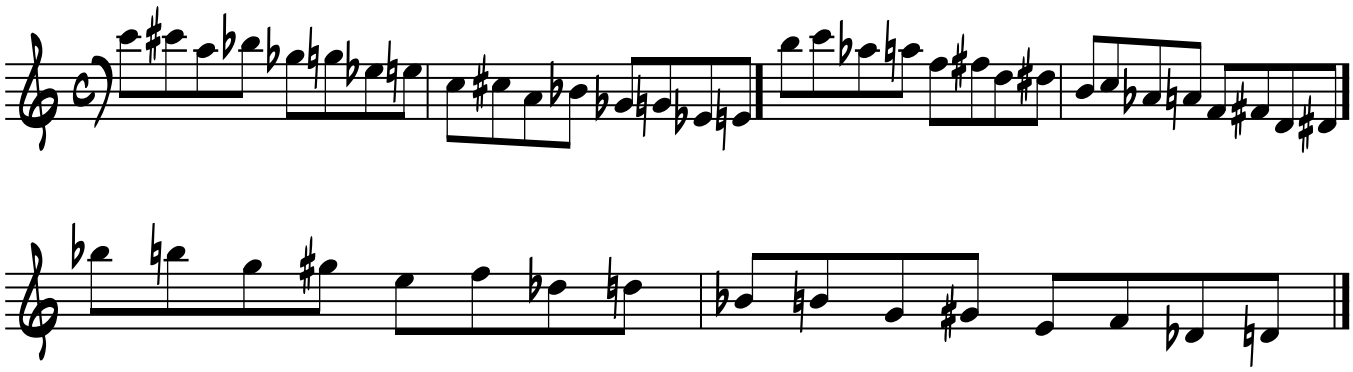
x=m2 up, y=m3 up



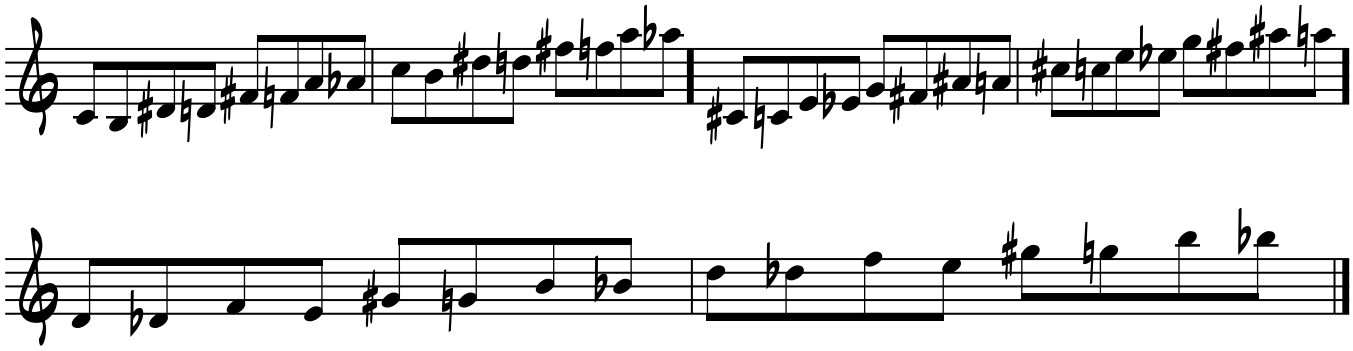
x=m2 down, y=m3 down



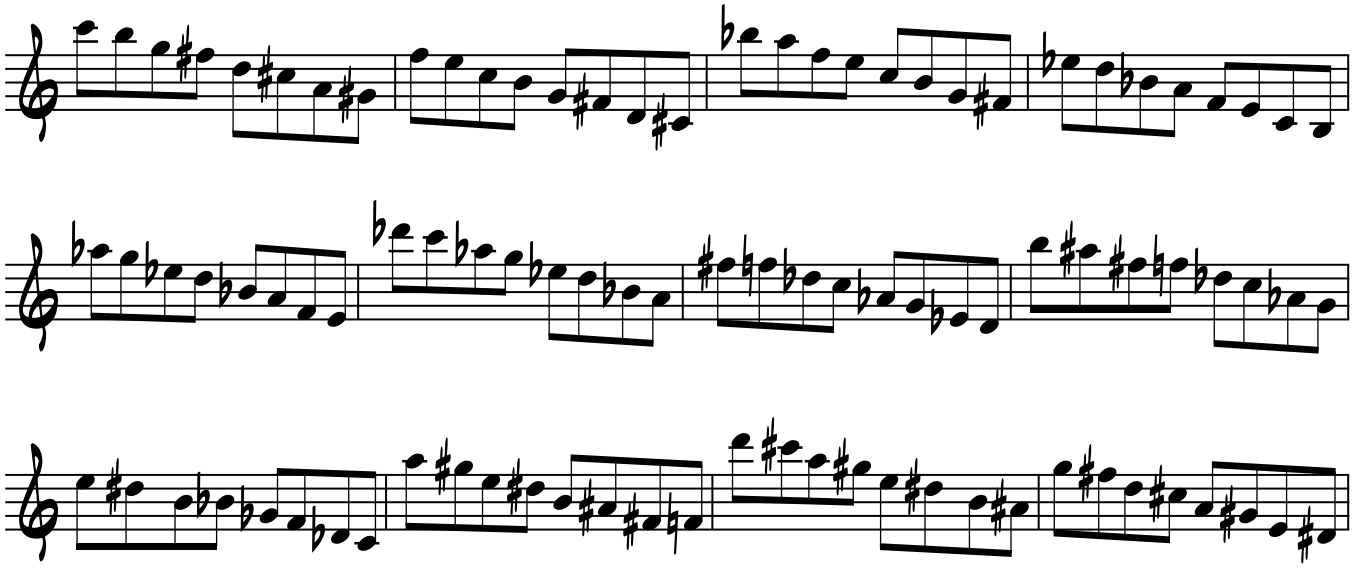
x=m2 up, y=M3 down



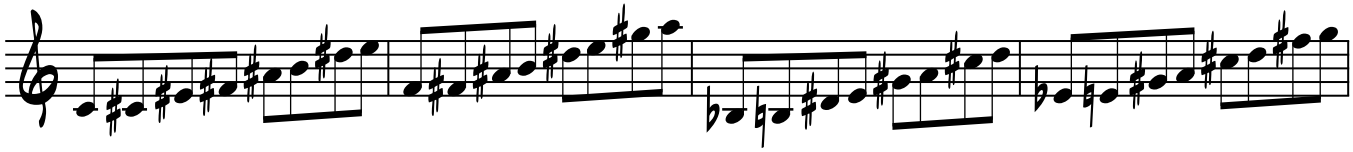
x=m2 down, y=M3 up

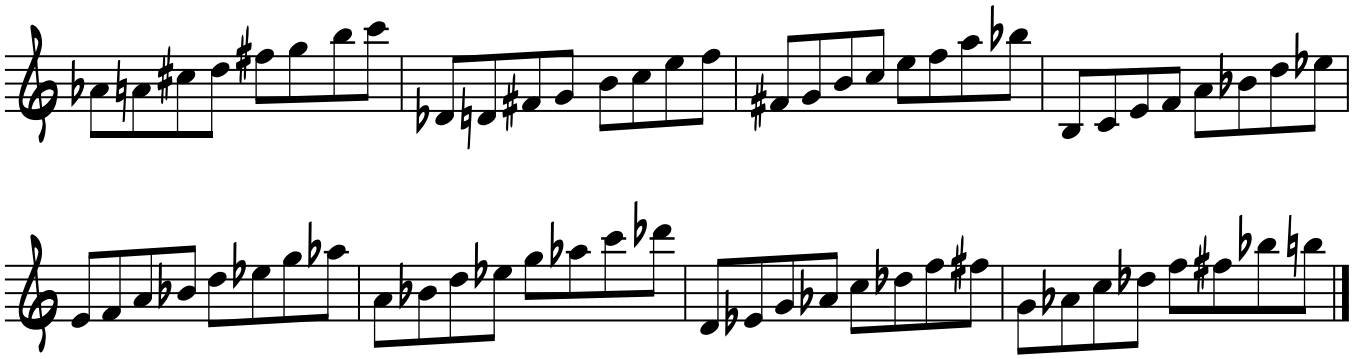


x=m2 down, y=M3 down

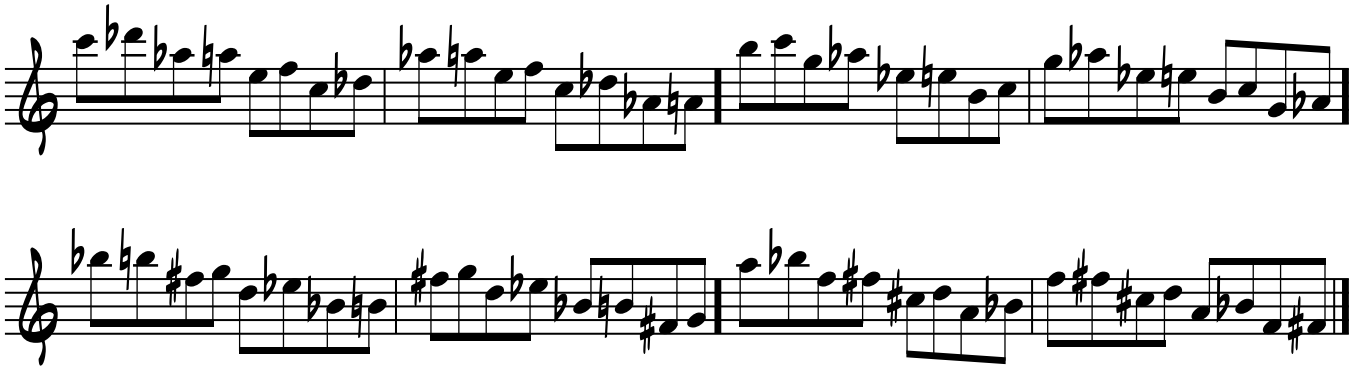


x=m2 up, y=M3 up

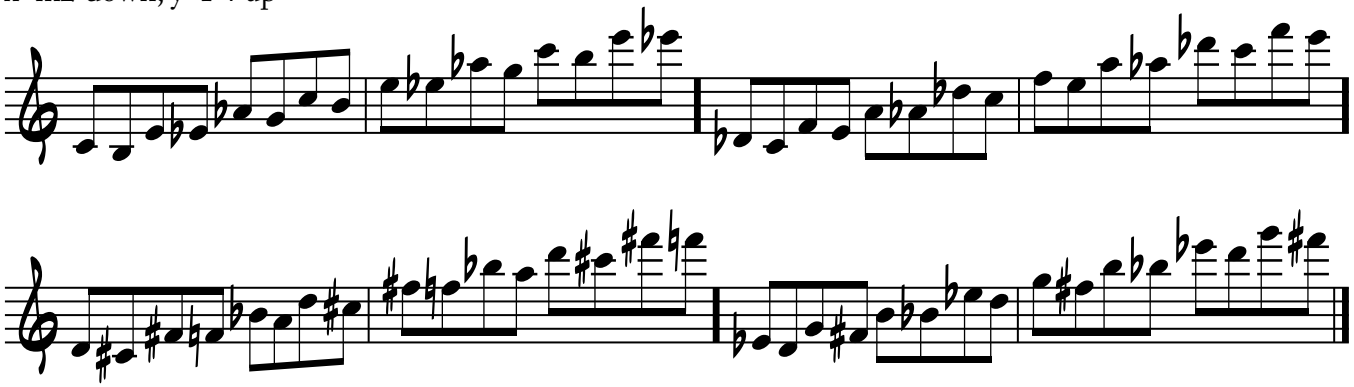




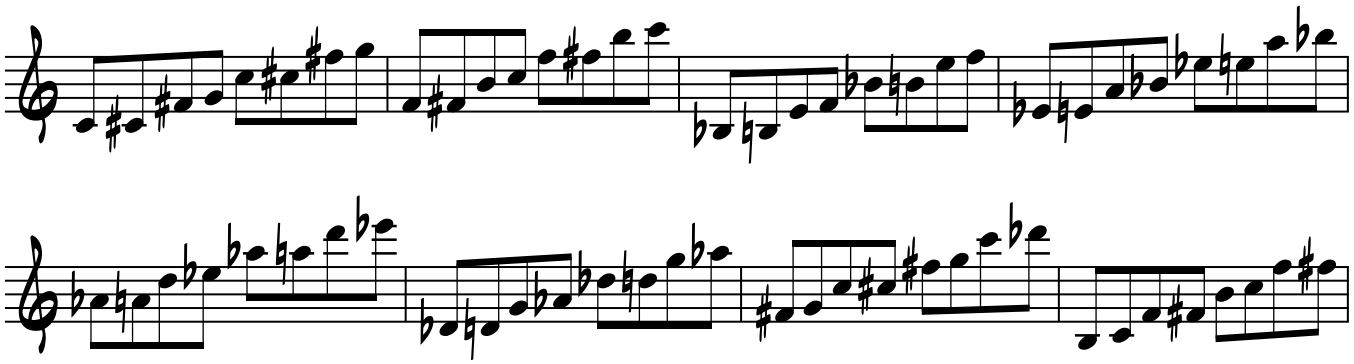
x=m2 up, y=P4 down

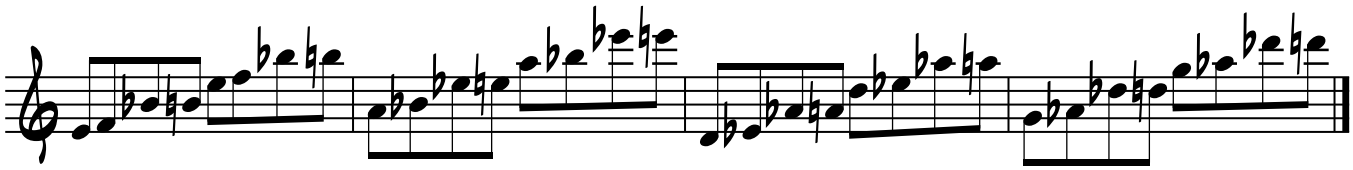


x=m2 down, y=P4 up

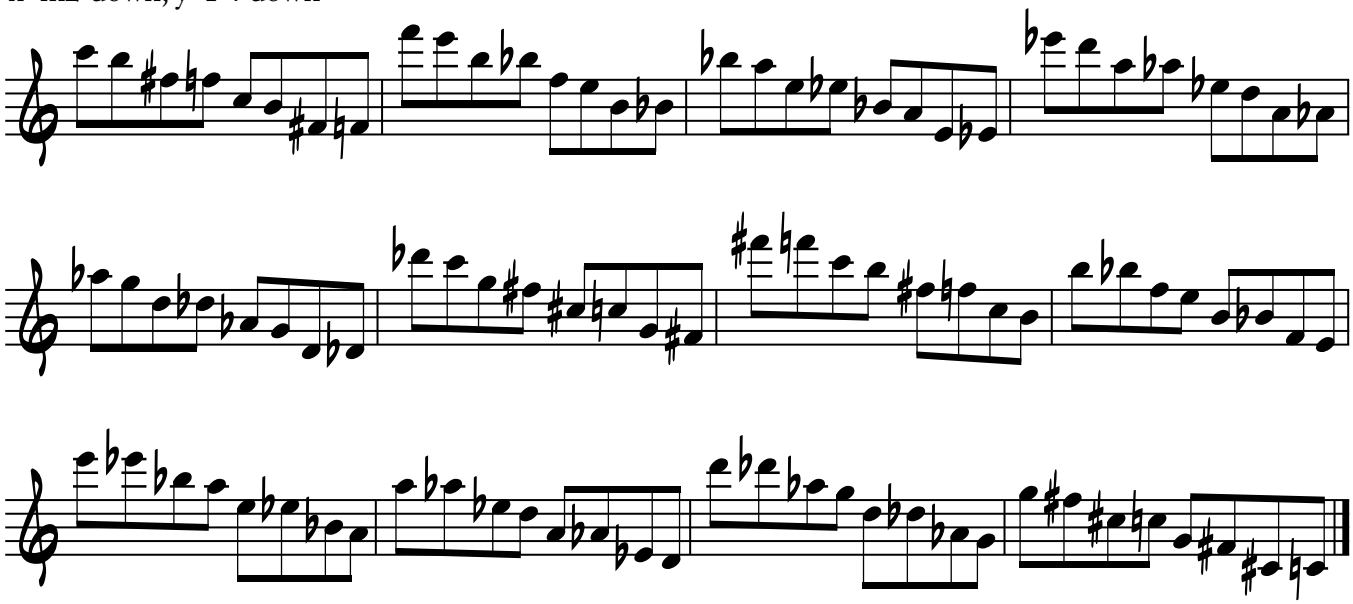


x=m2 up, y= P4 up

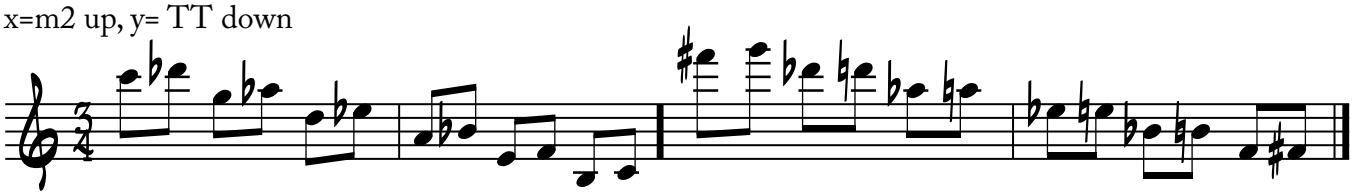




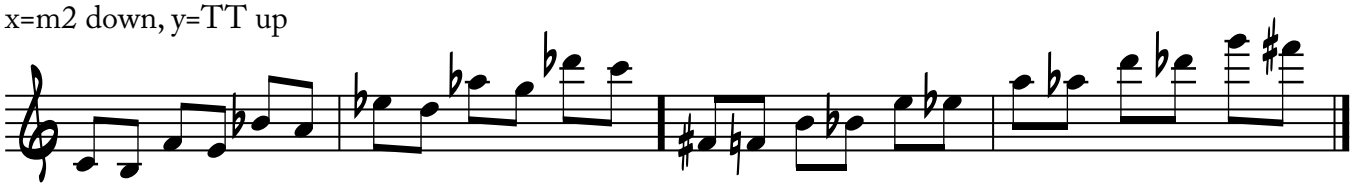
x=m2 down, y=P4 down



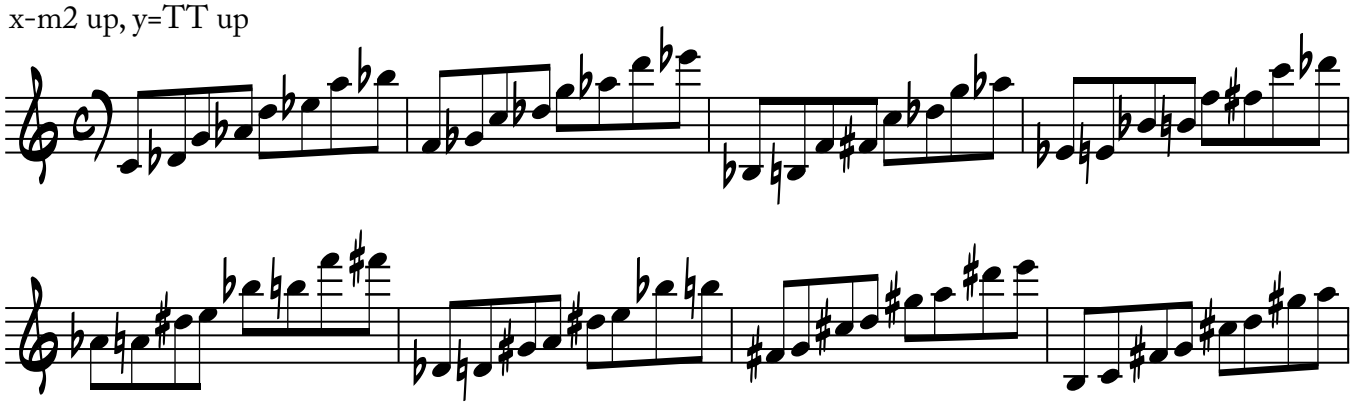
x=m2 up, y= TT down

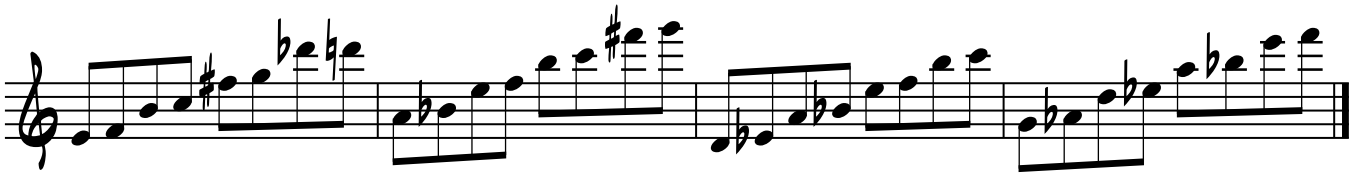


x=m2 down, y=TT up

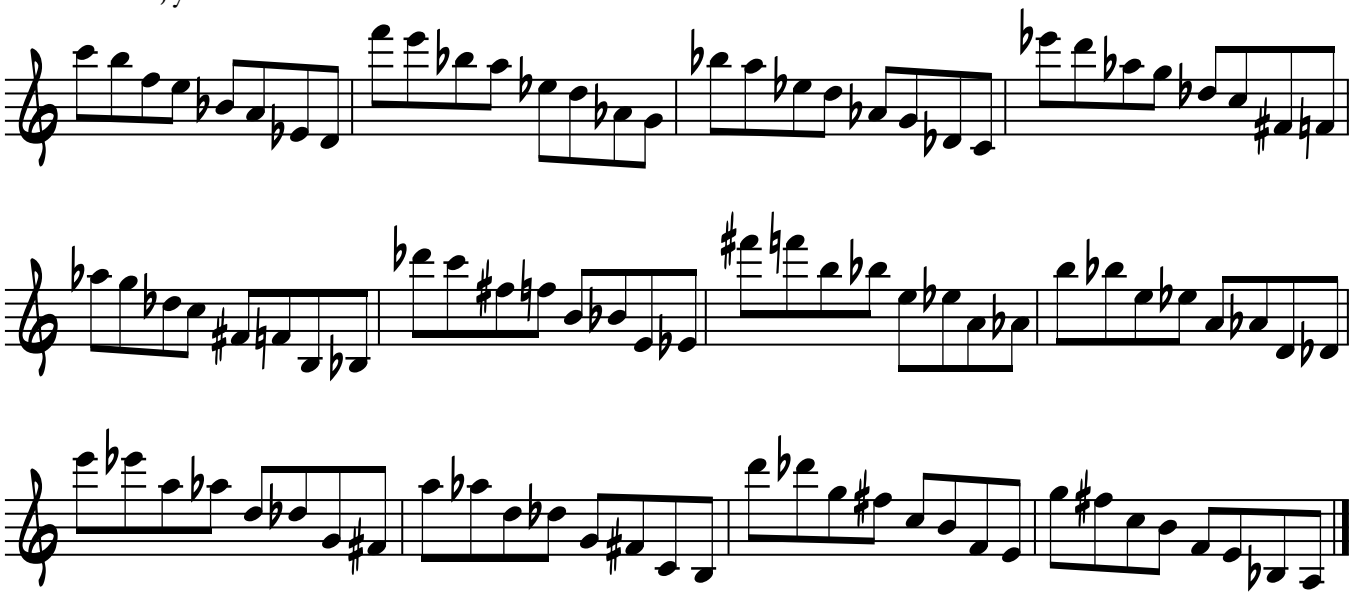


x-m2 up, y=TT up

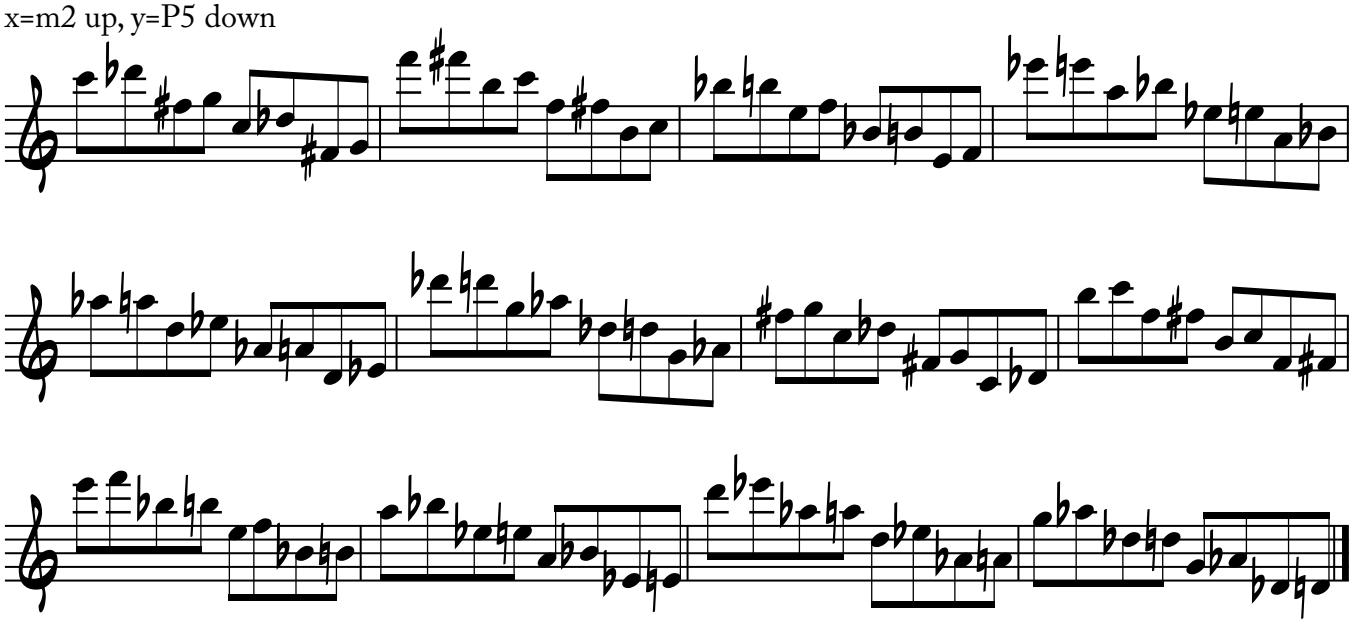




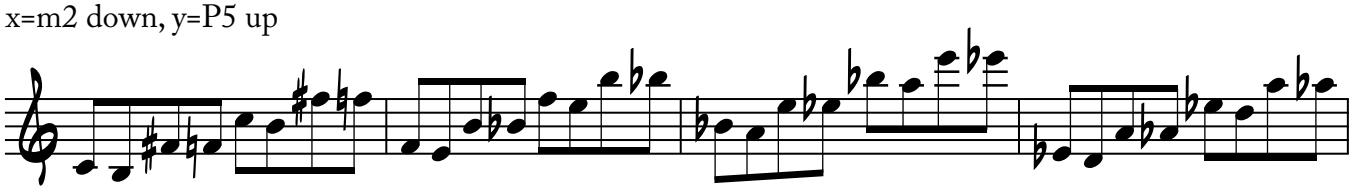
x=m2 down, y=TT down

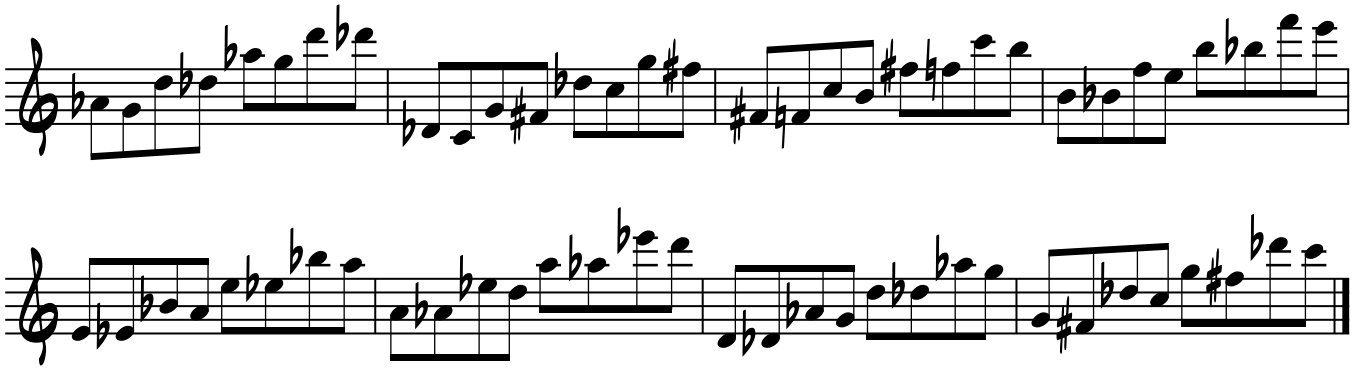


x=m2 up, y=P5 down

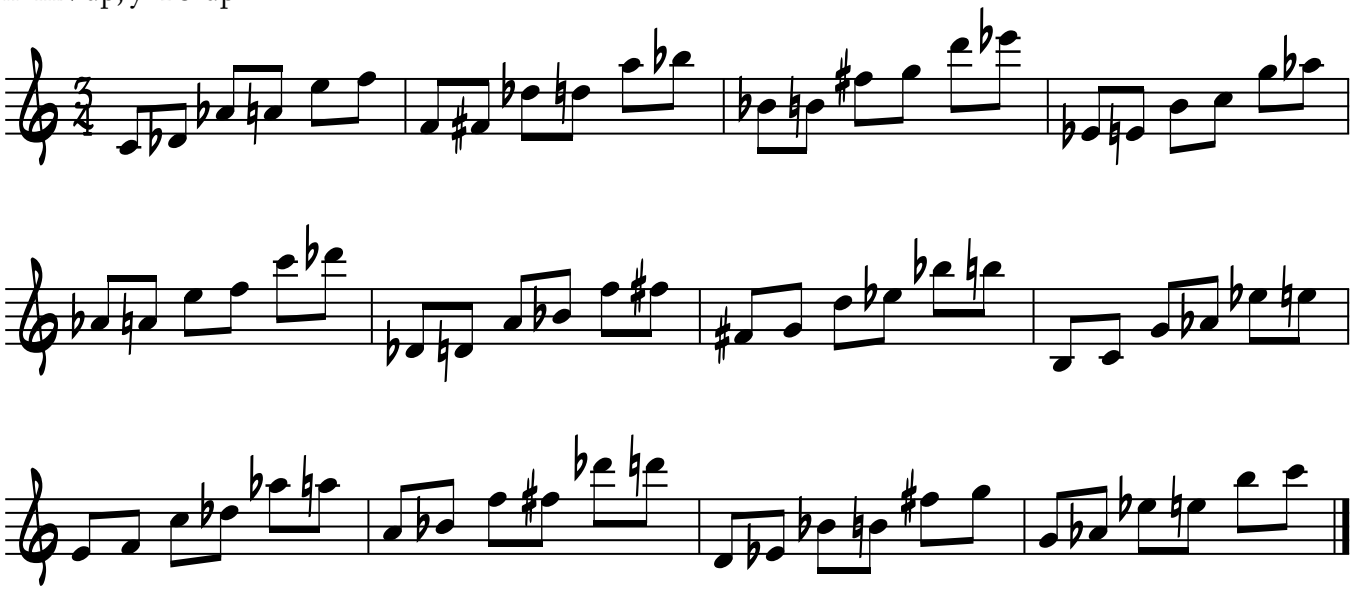


x=m2 down, y=P5 up





x=m2 up, y=P5 up



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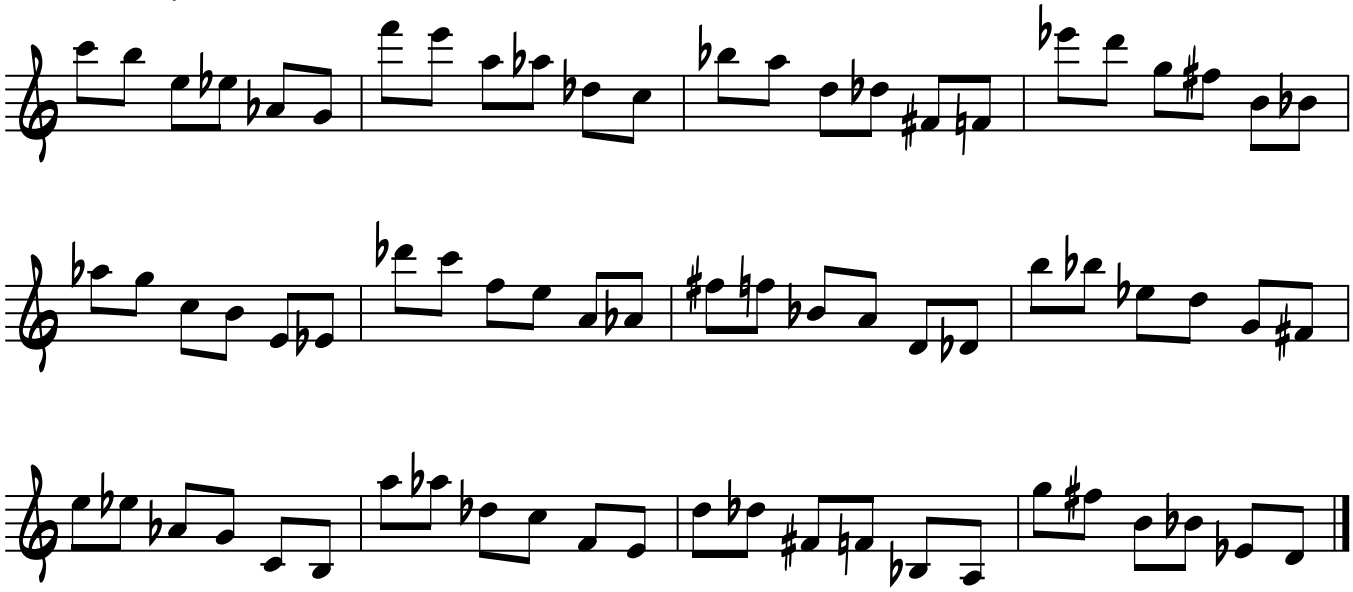
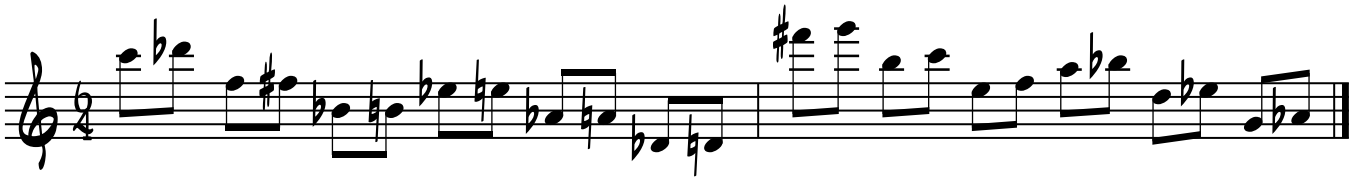
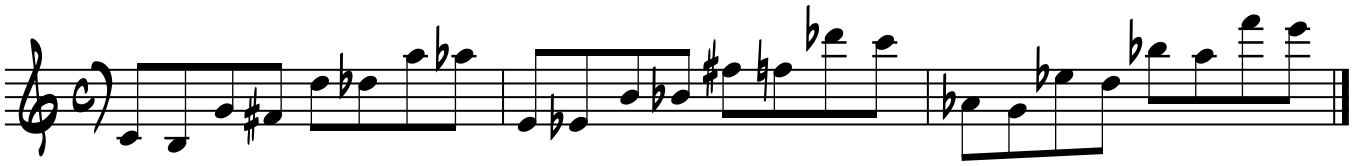


x=m2 up, y=m6 down



x=m2 down, y=m6 up



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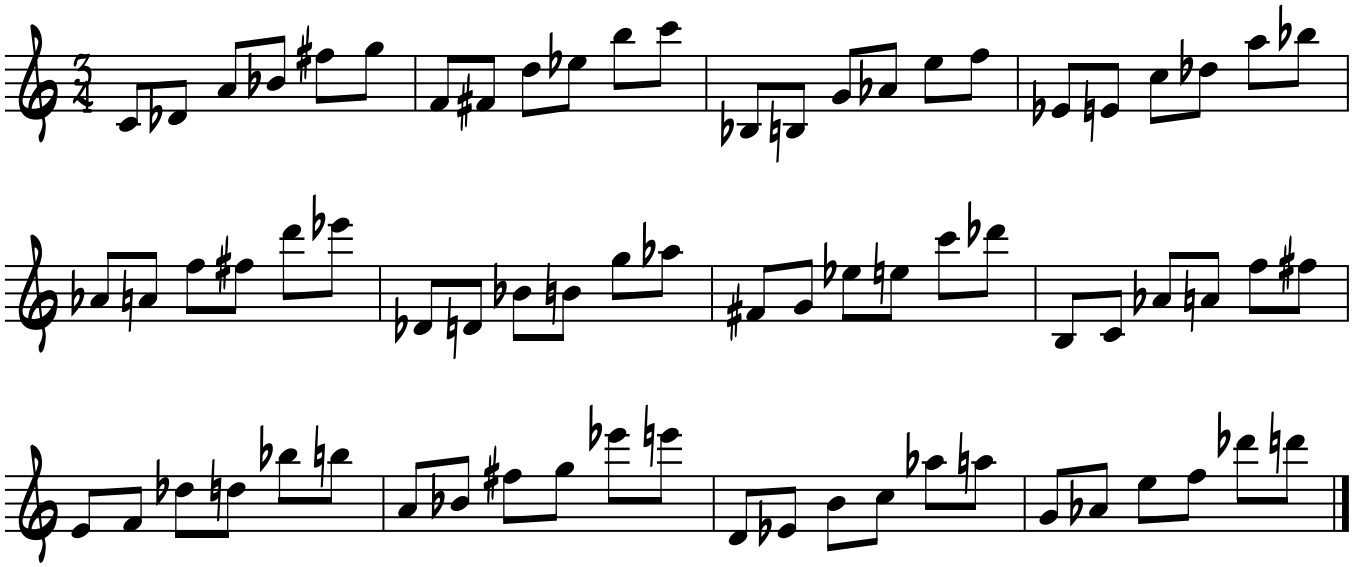
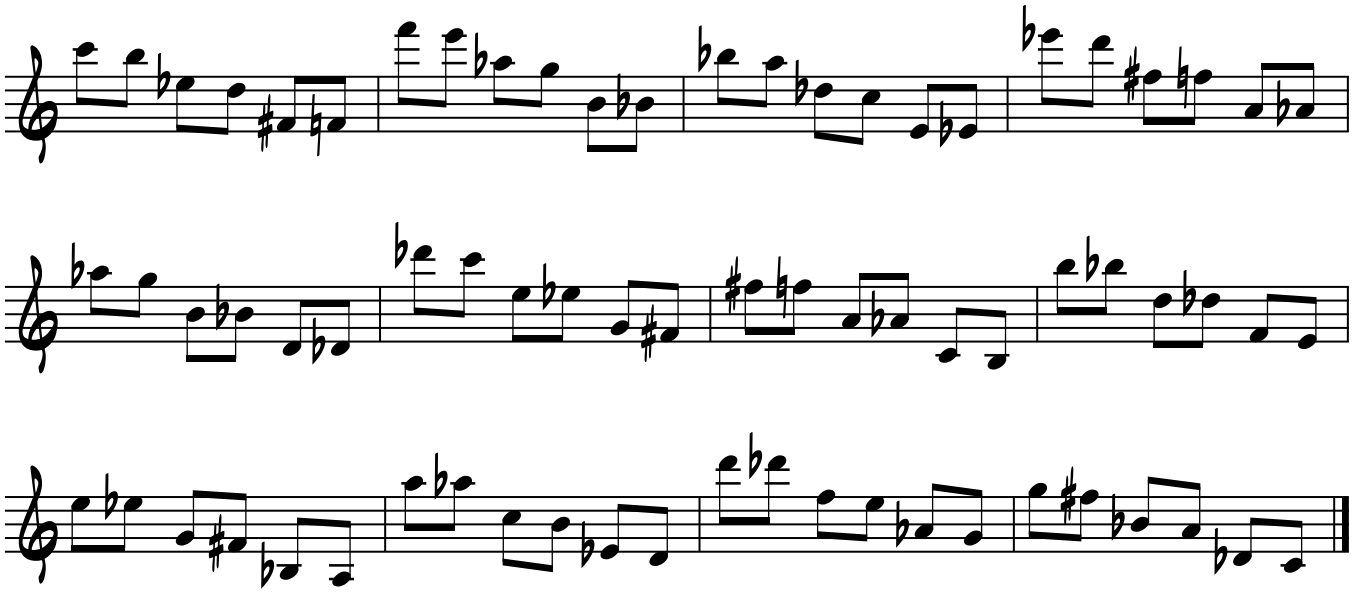
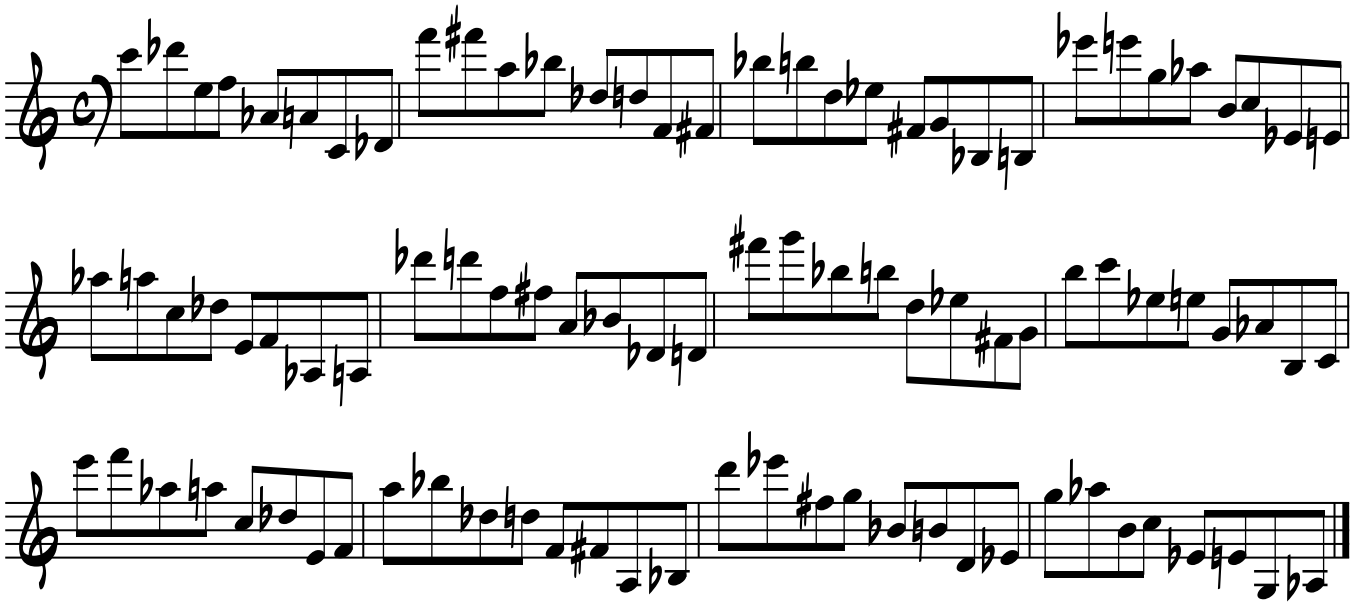


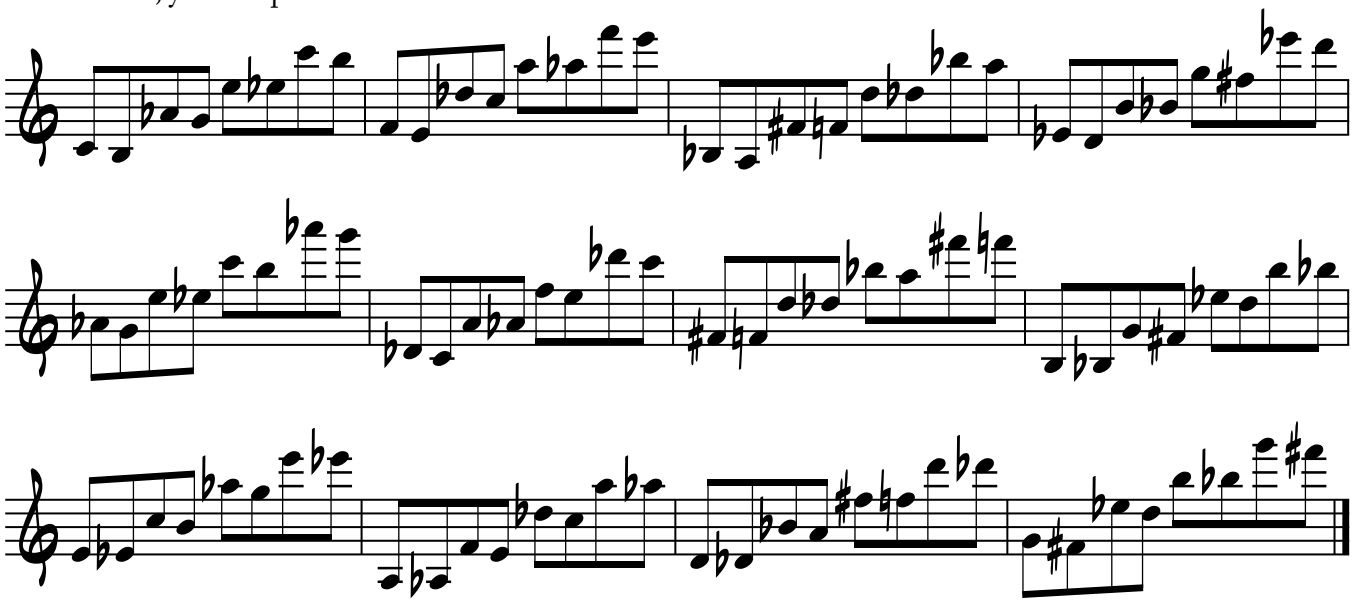
x=m2 down, y=m6 down



x=m2 up, y=M6 down



x=m2 down, y=M6 up



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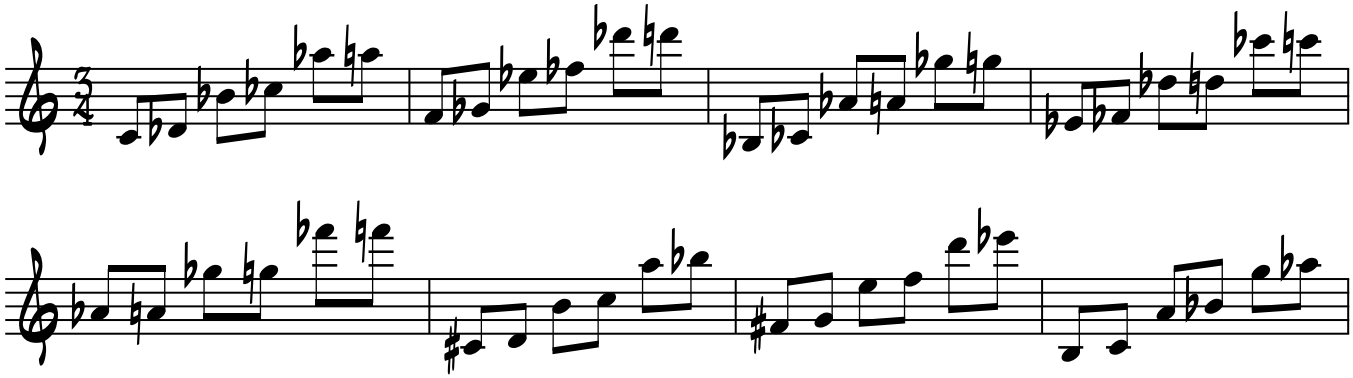

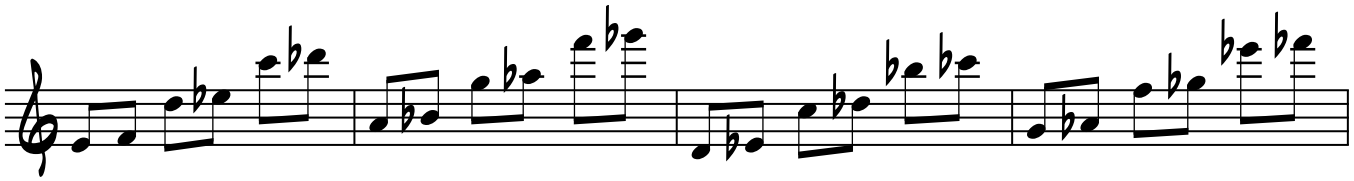

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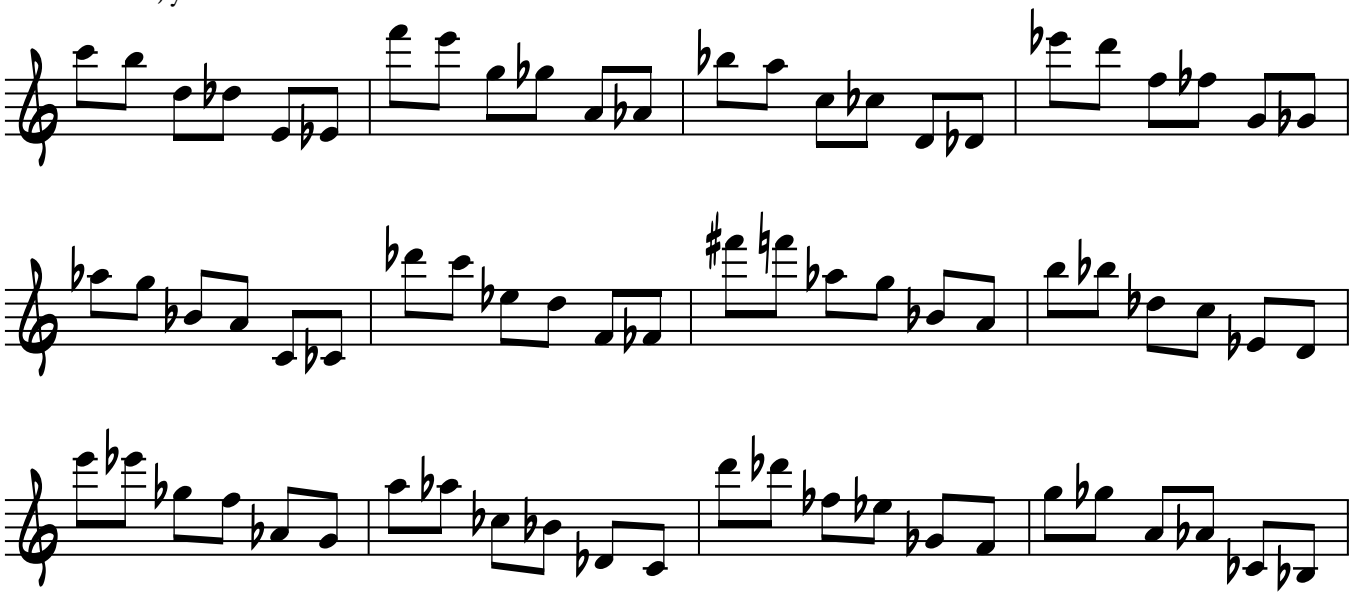

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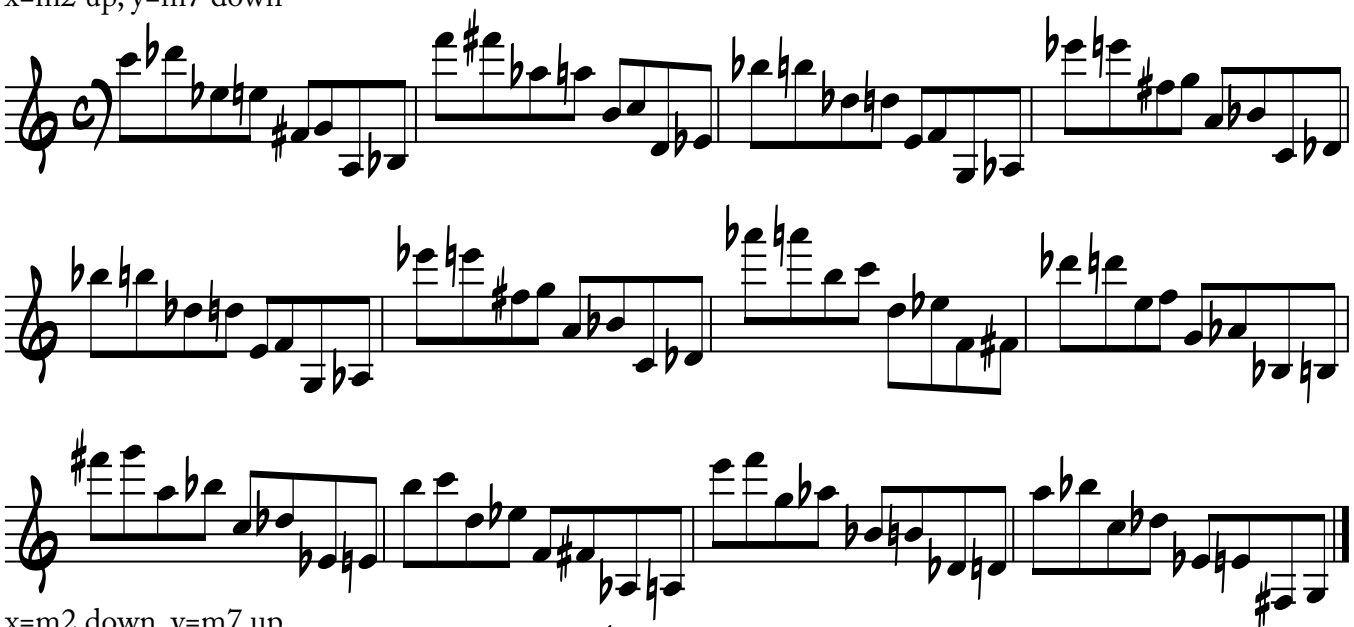

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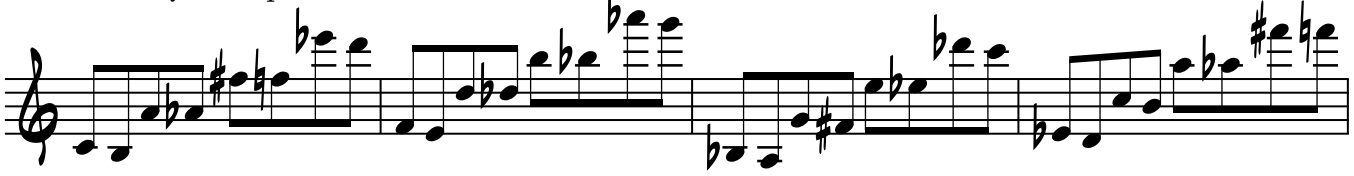

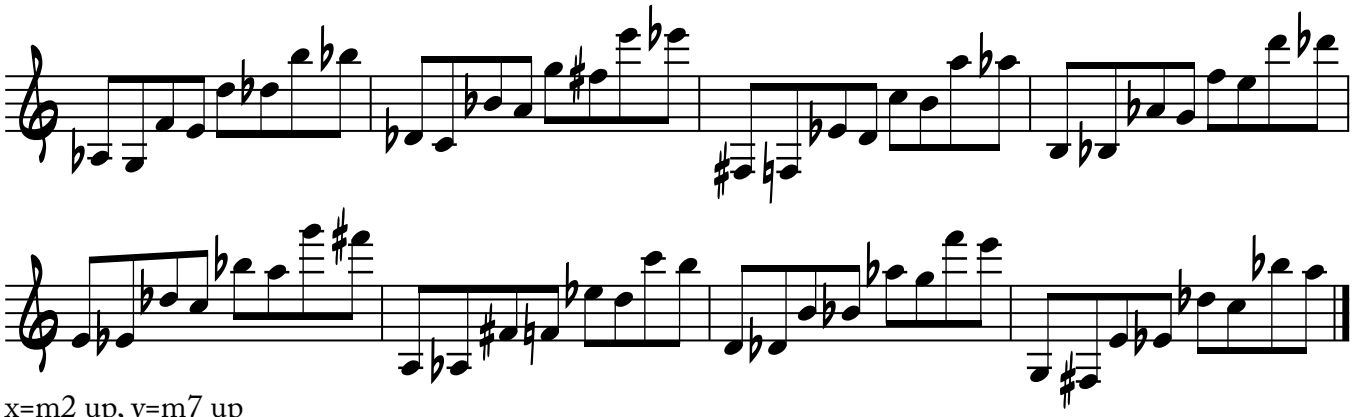

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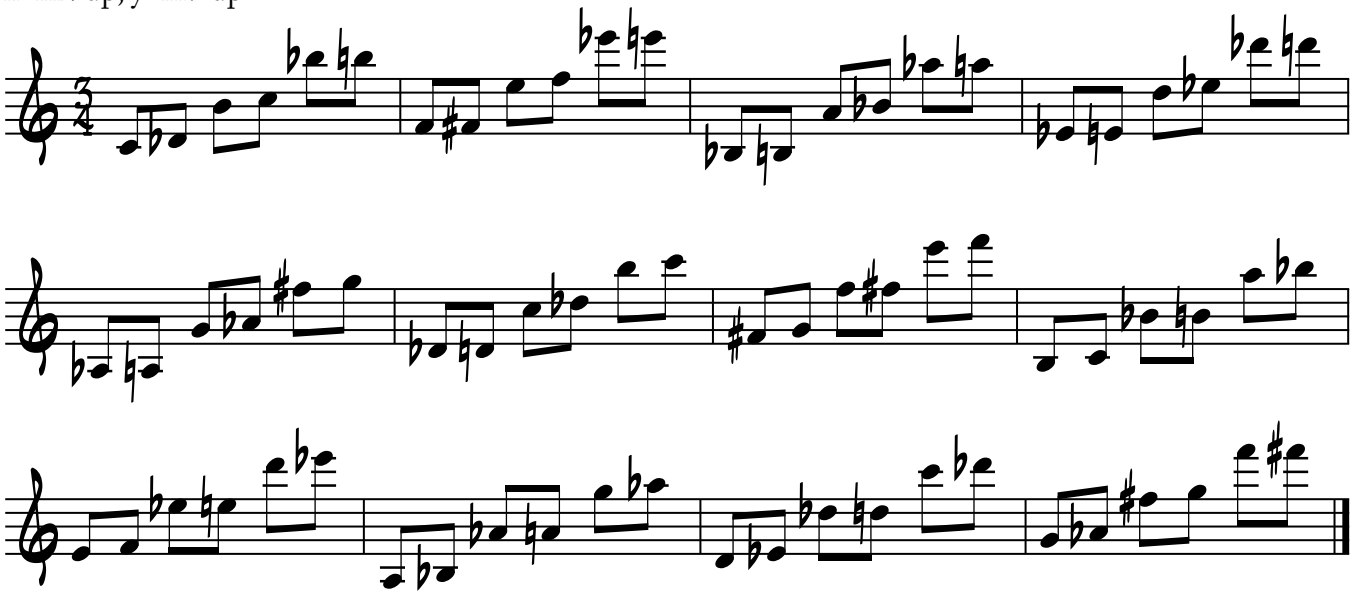

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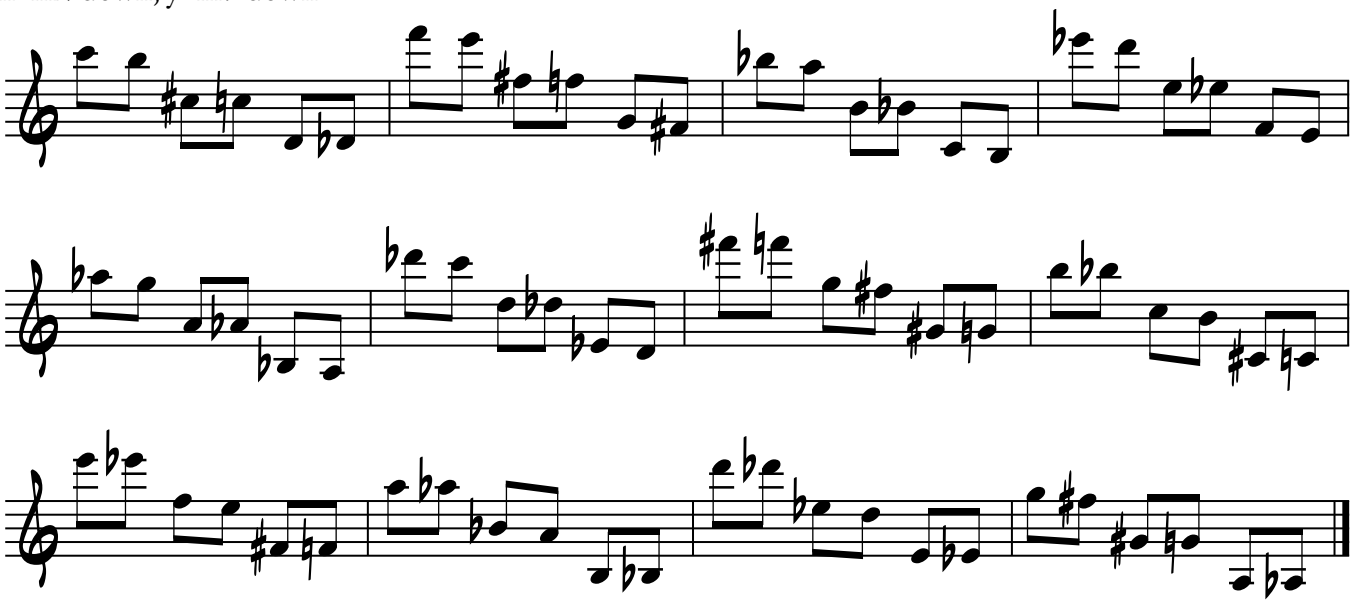

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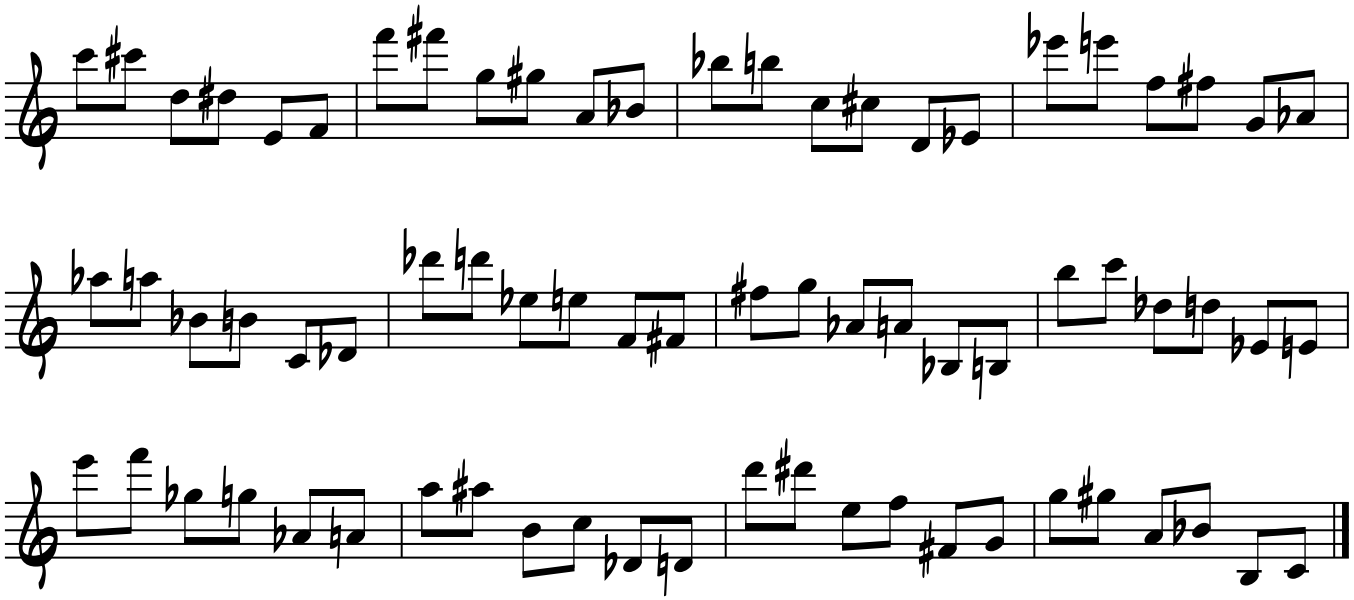

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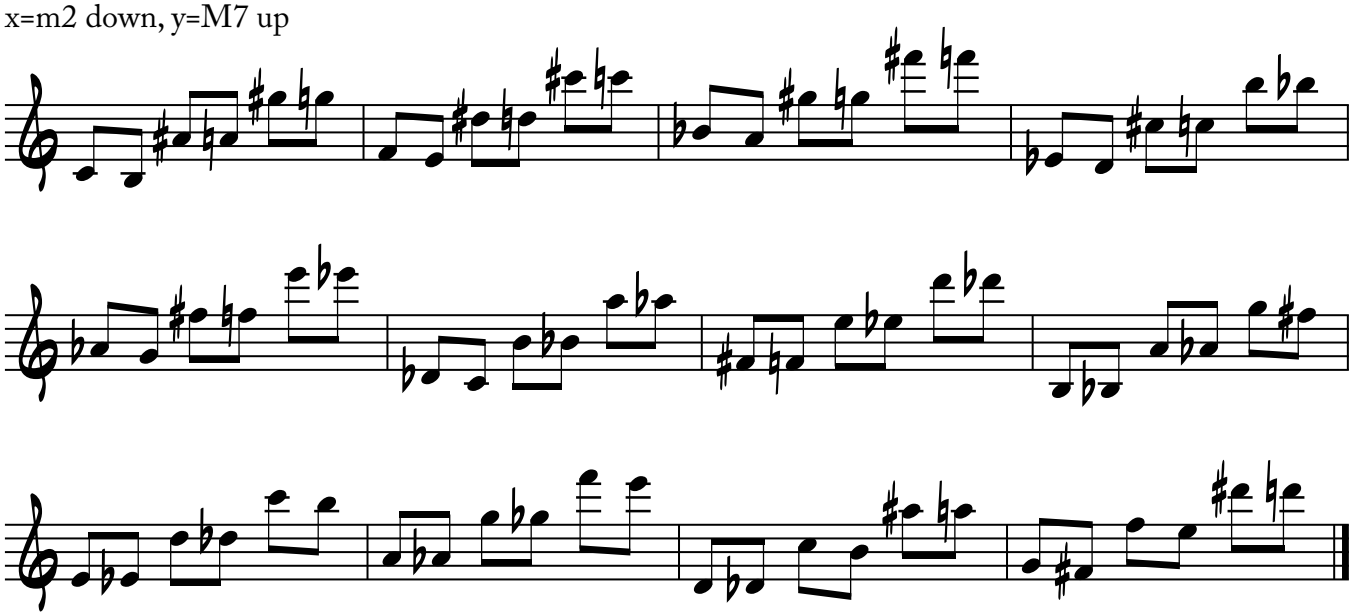

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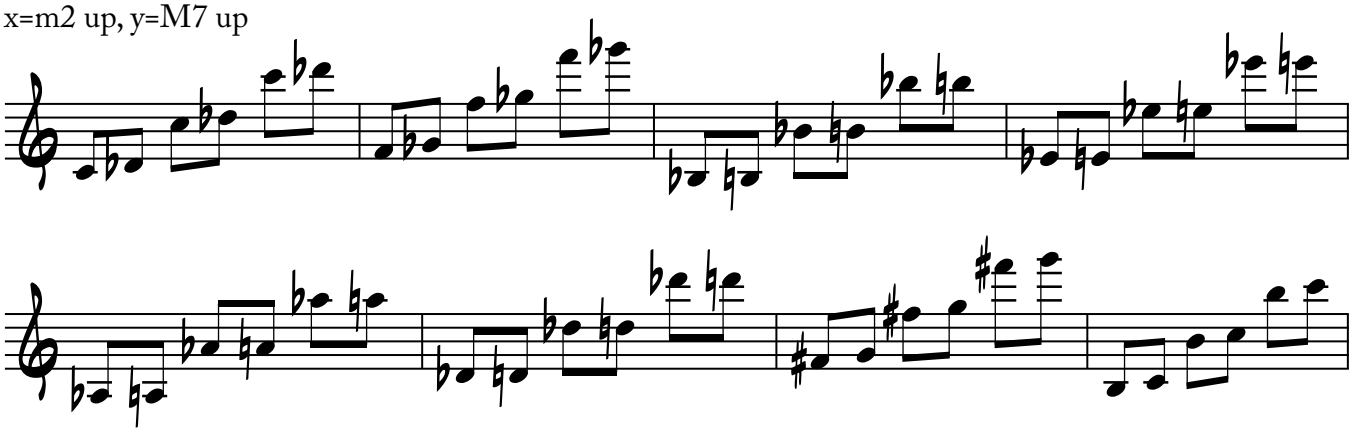

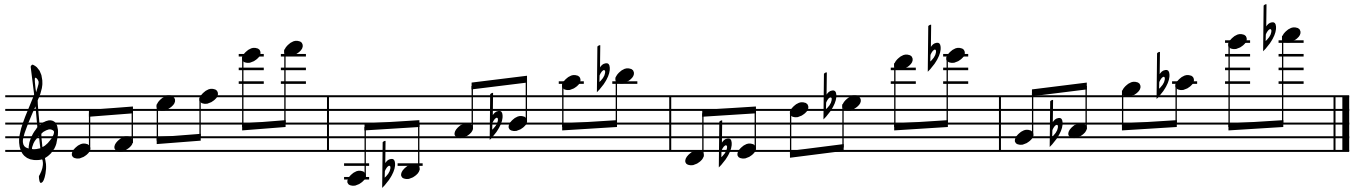

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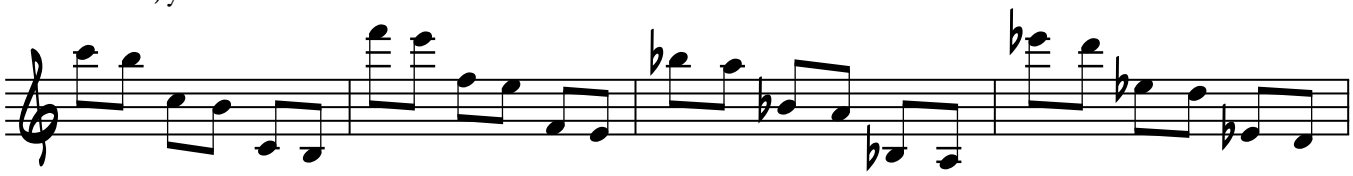

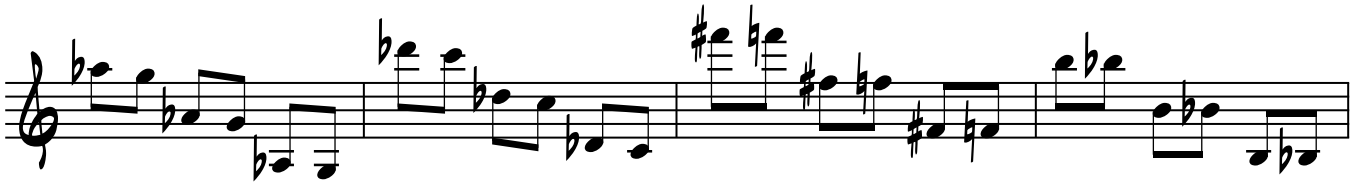

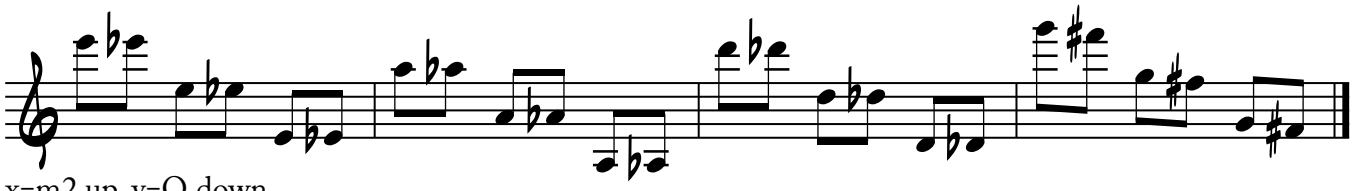

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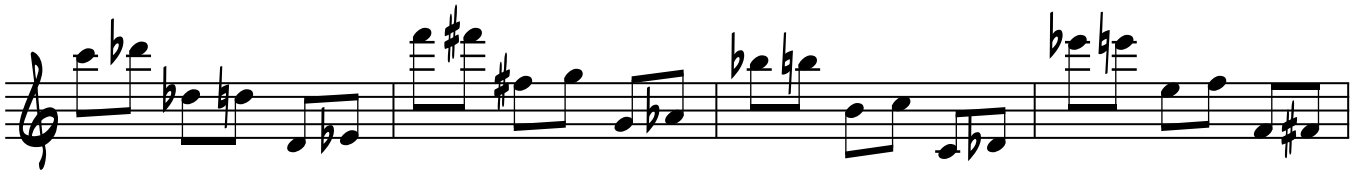

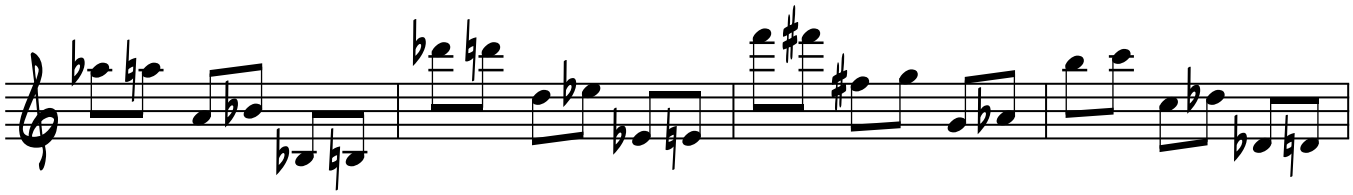

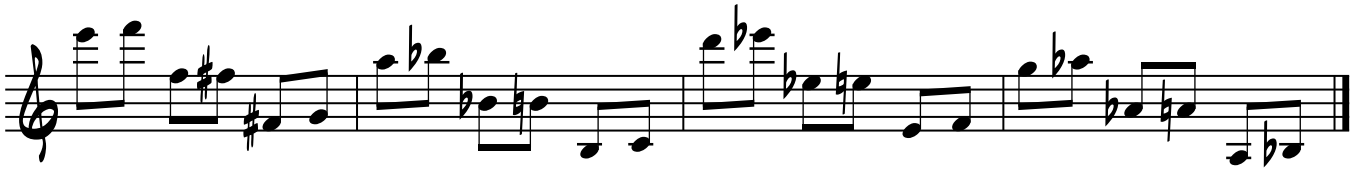

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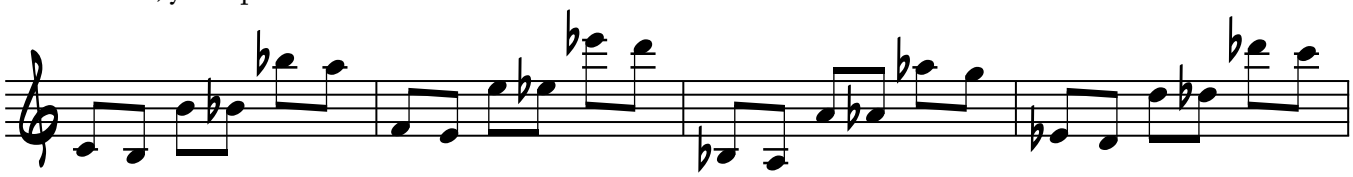

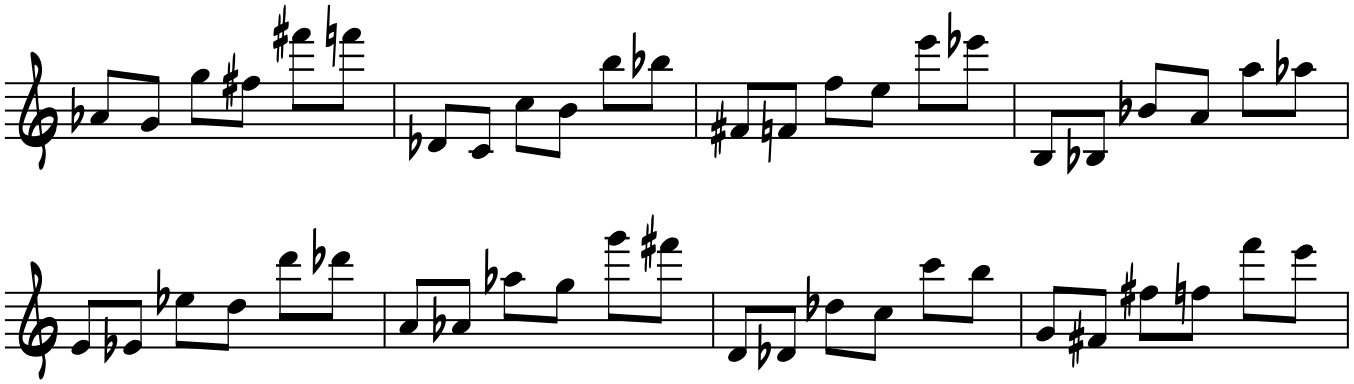

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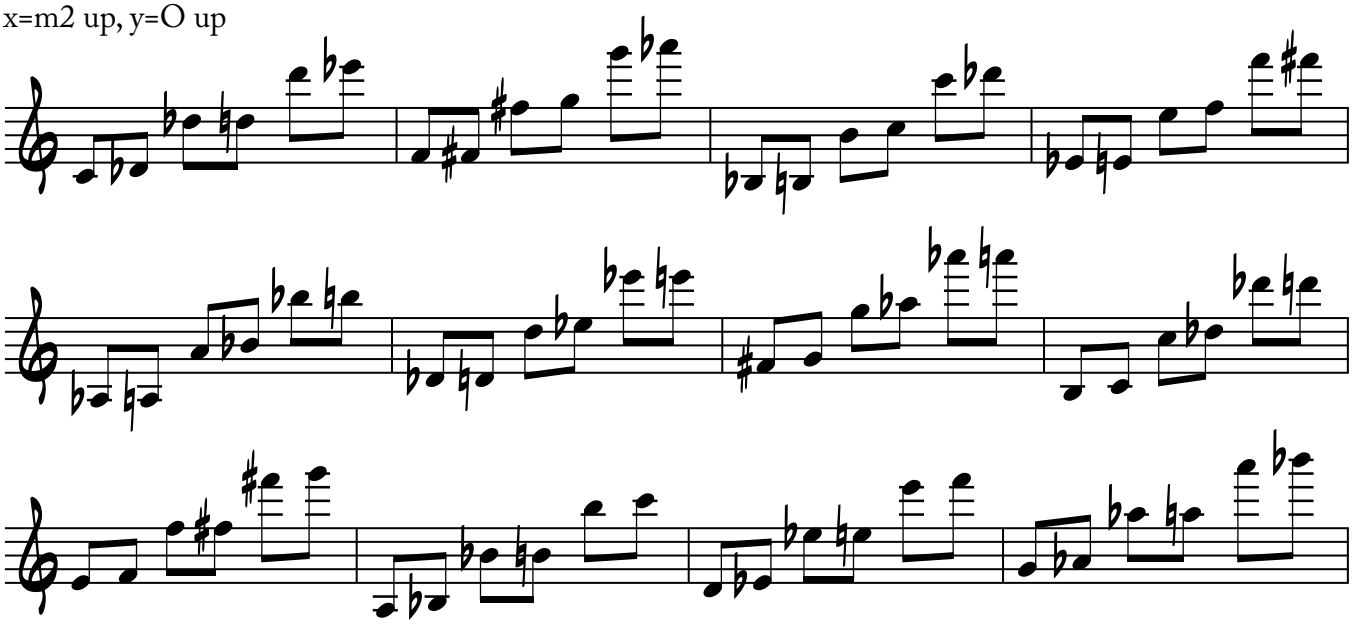

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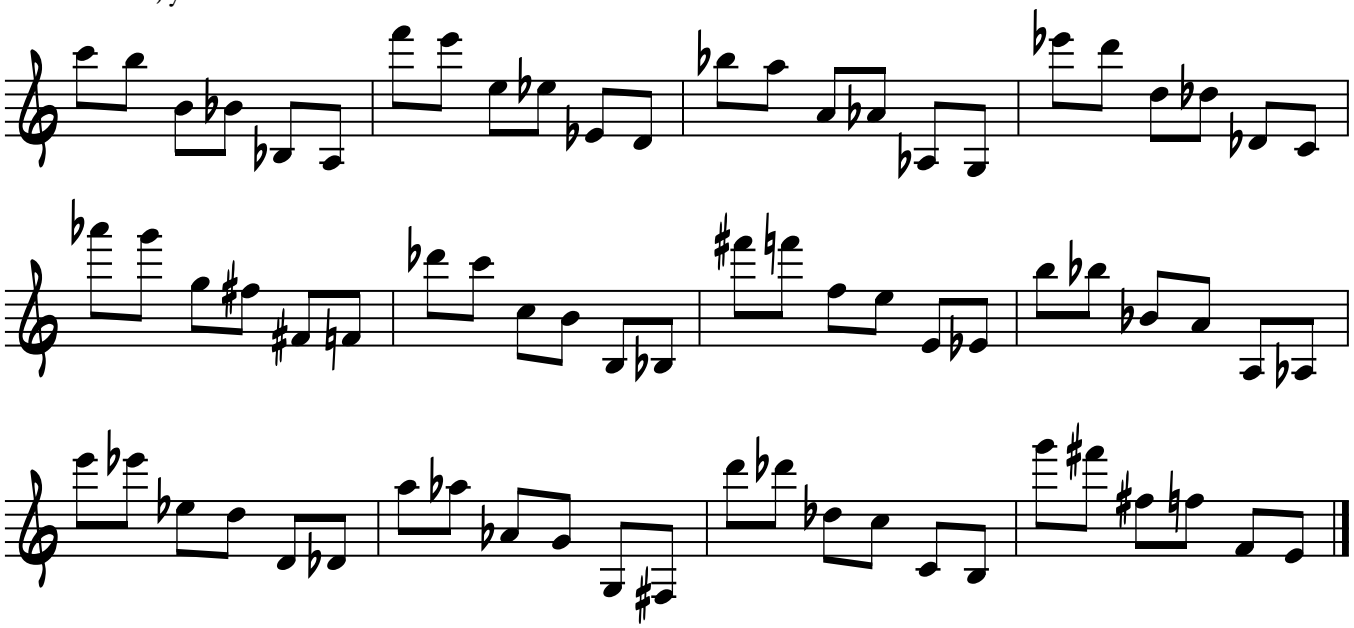
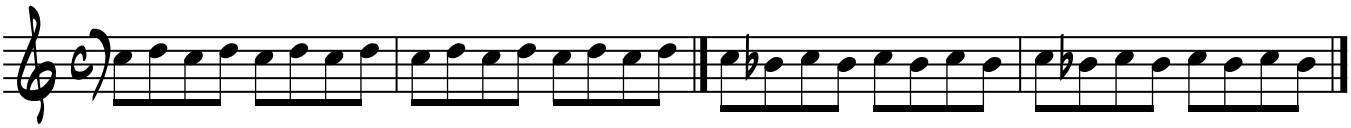


MAJOR 2nds

x=M2 up, y=M2 down

x=M2 down, y=M2 up



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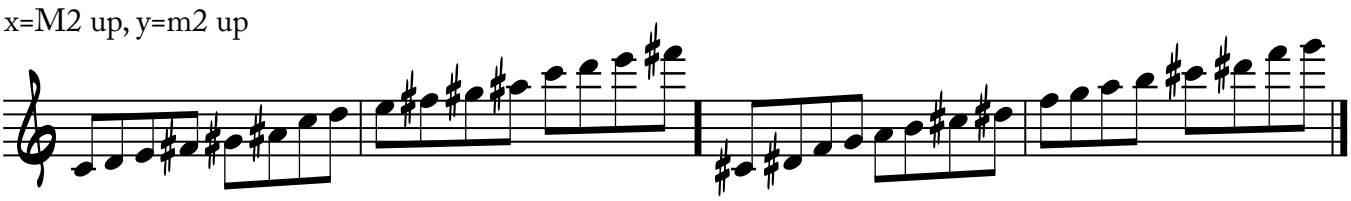

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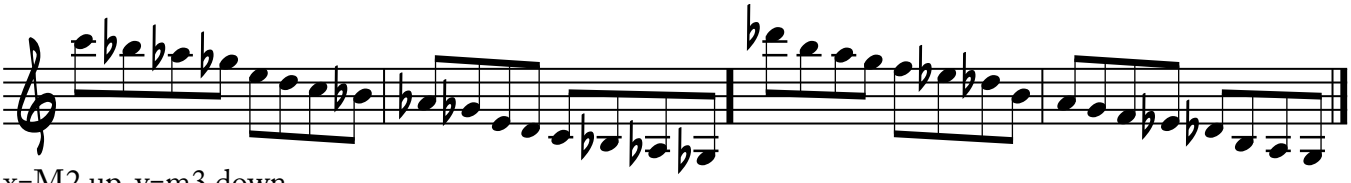

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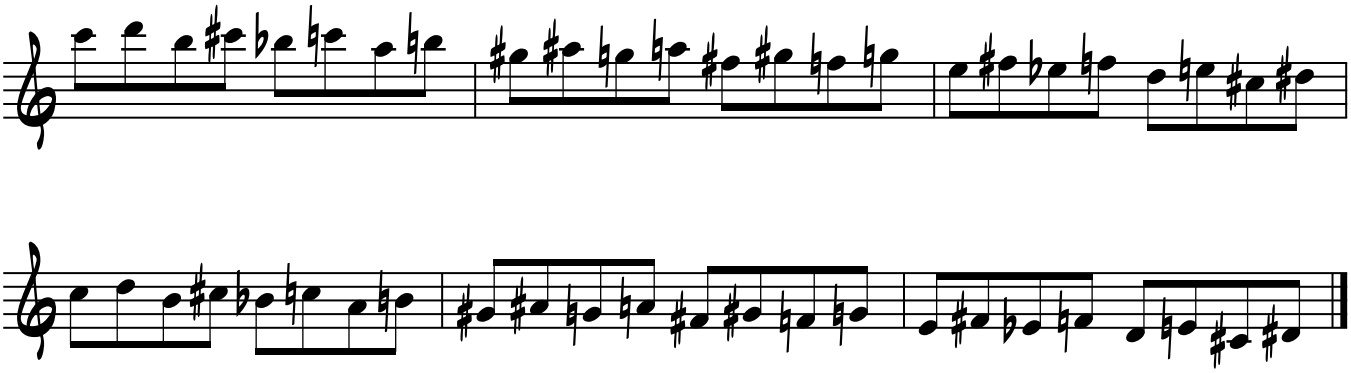

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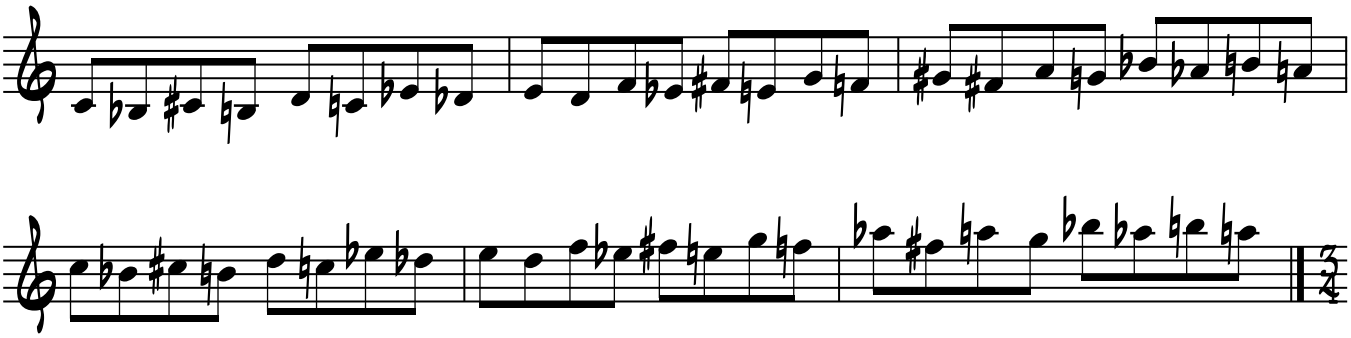

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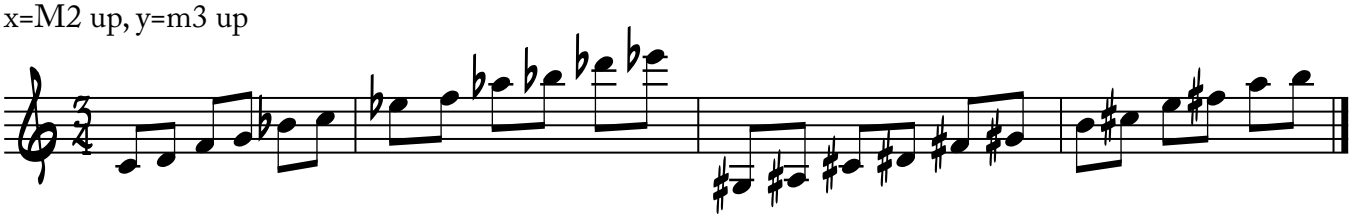

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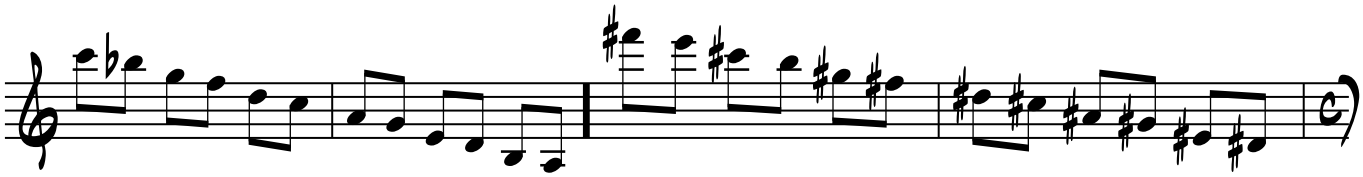

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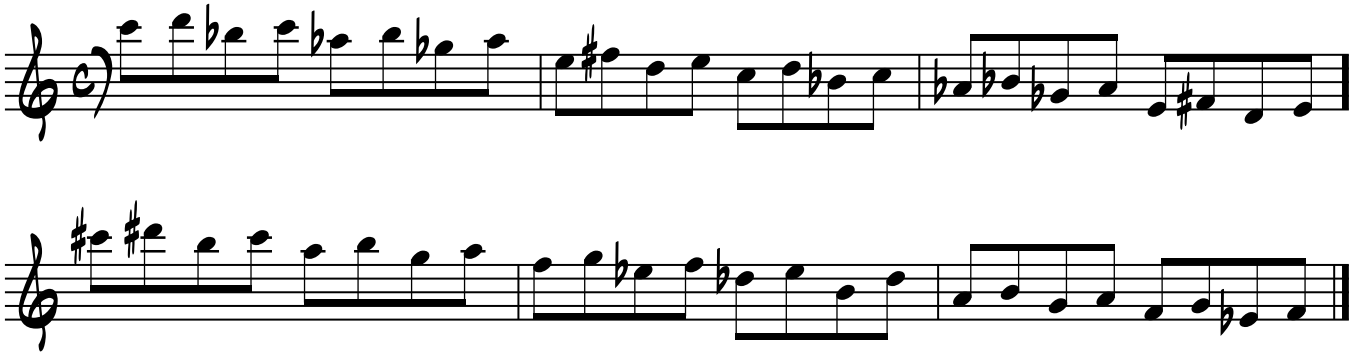

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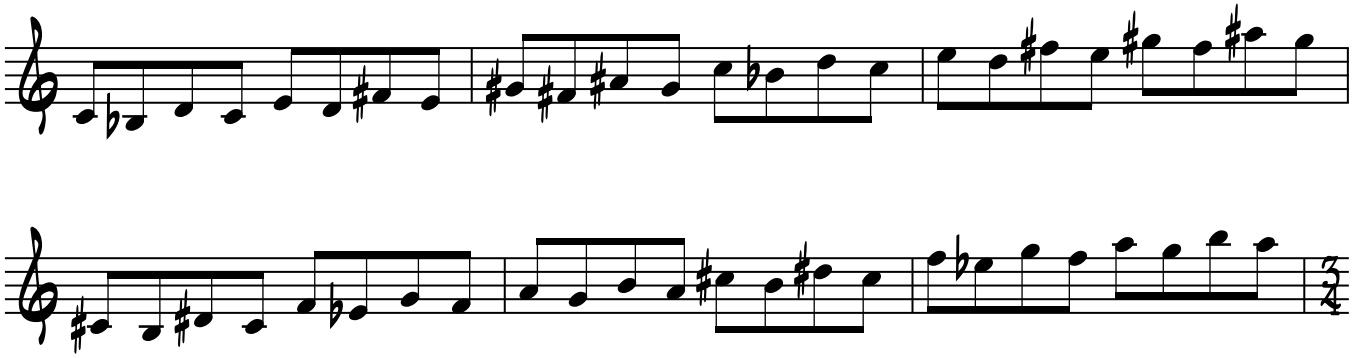

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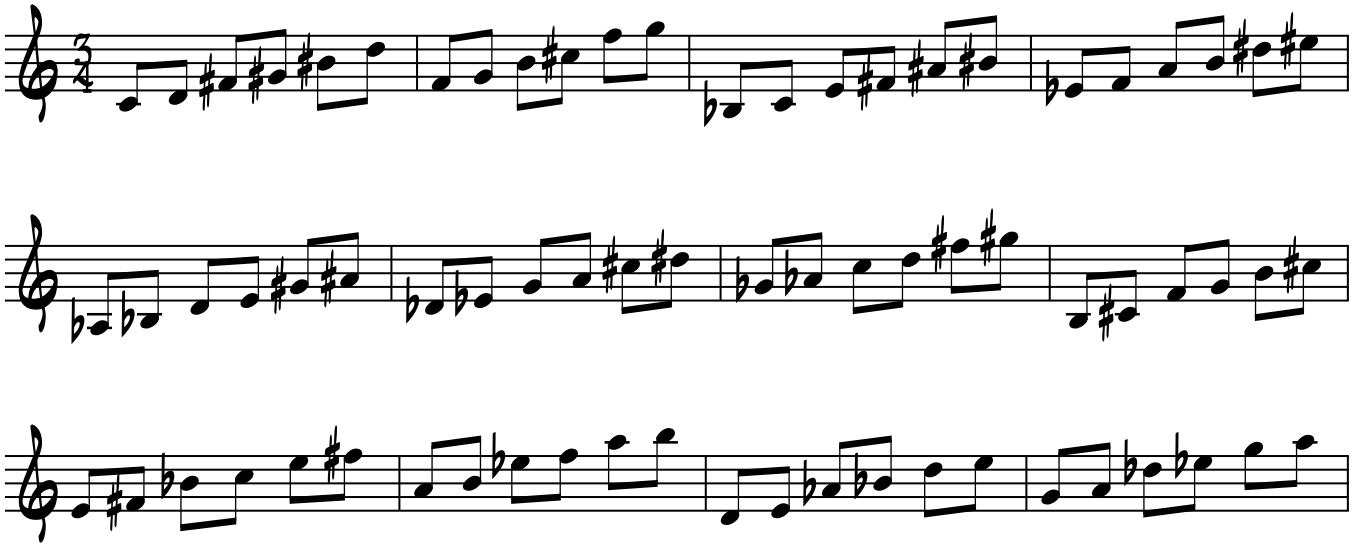

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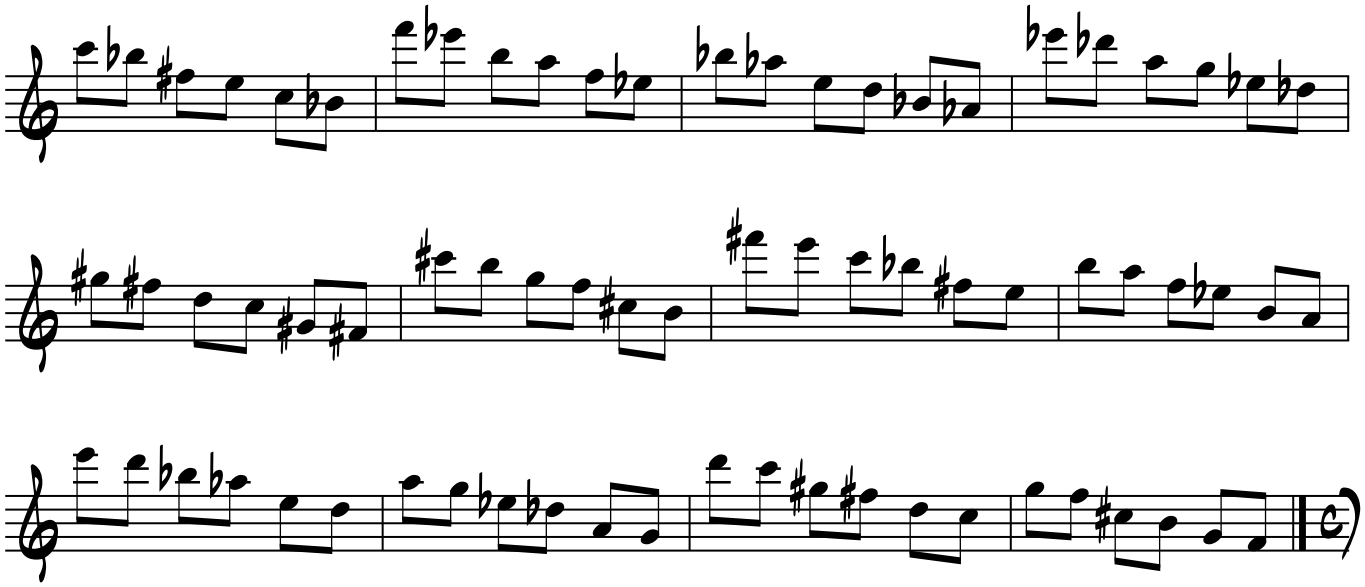

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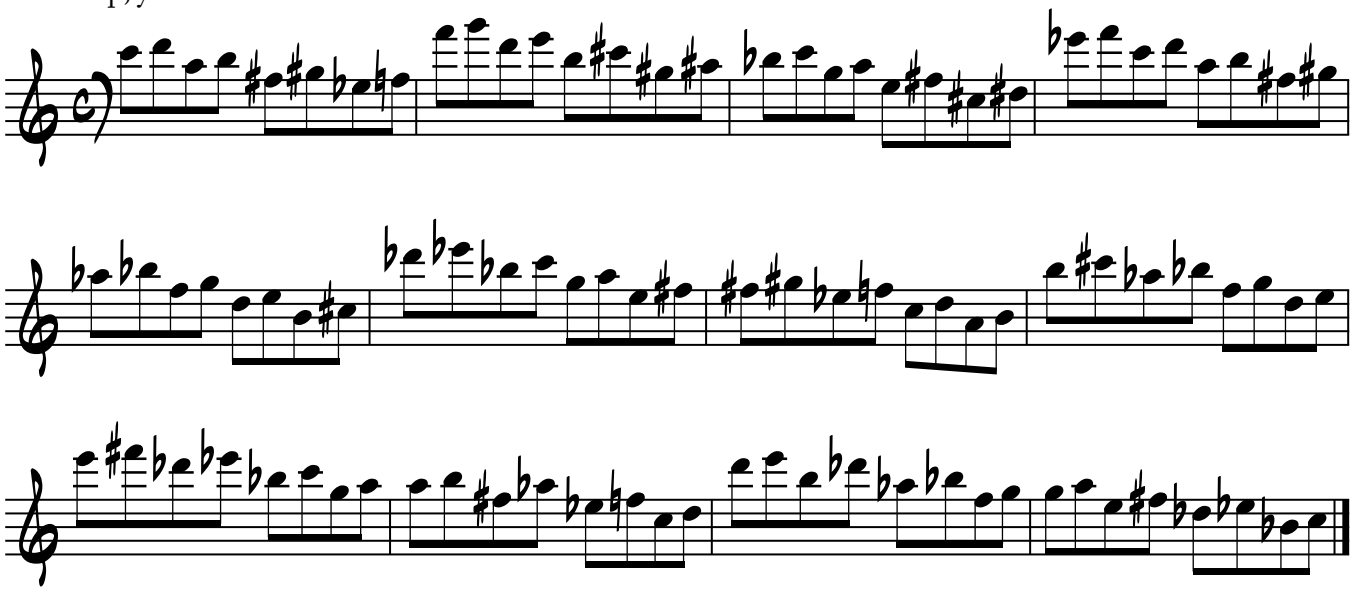

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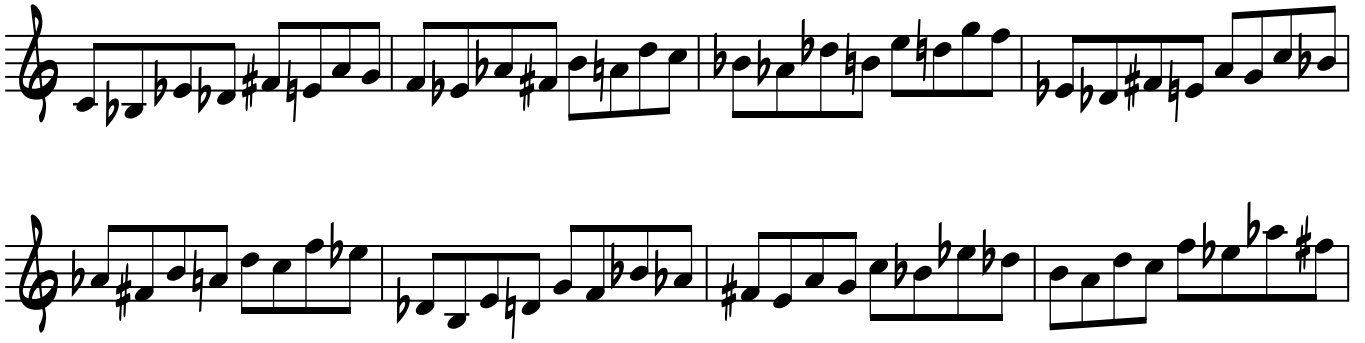

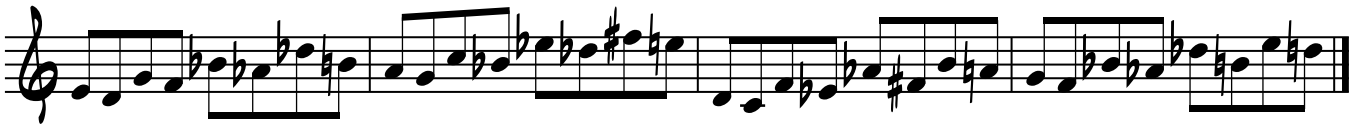

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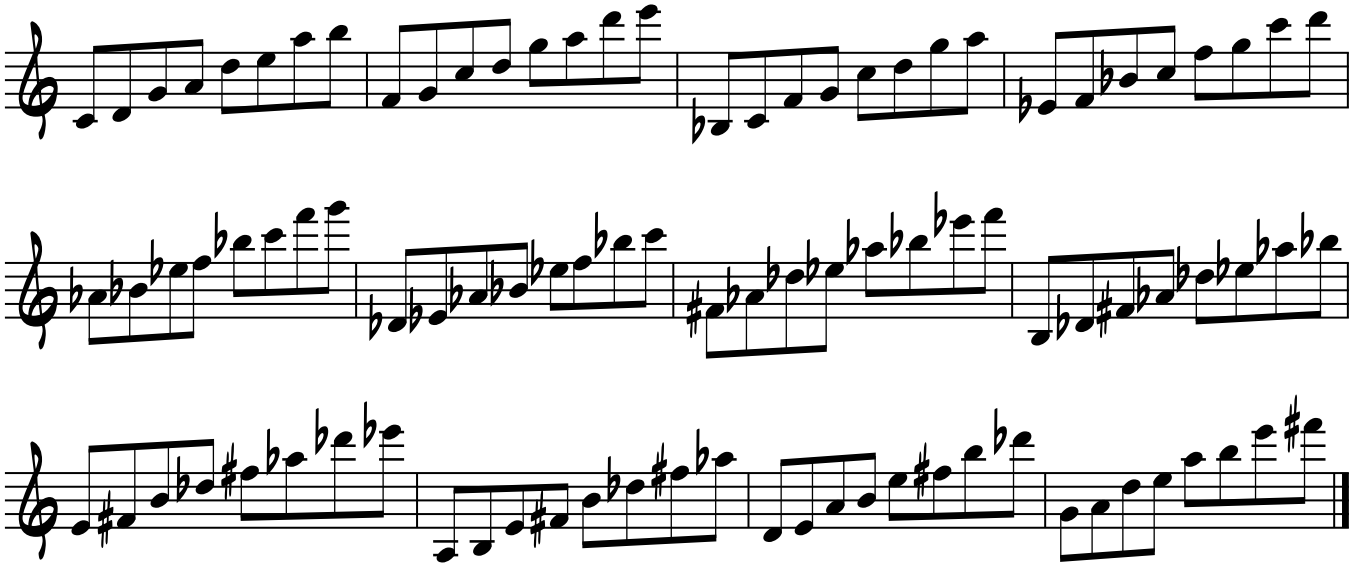

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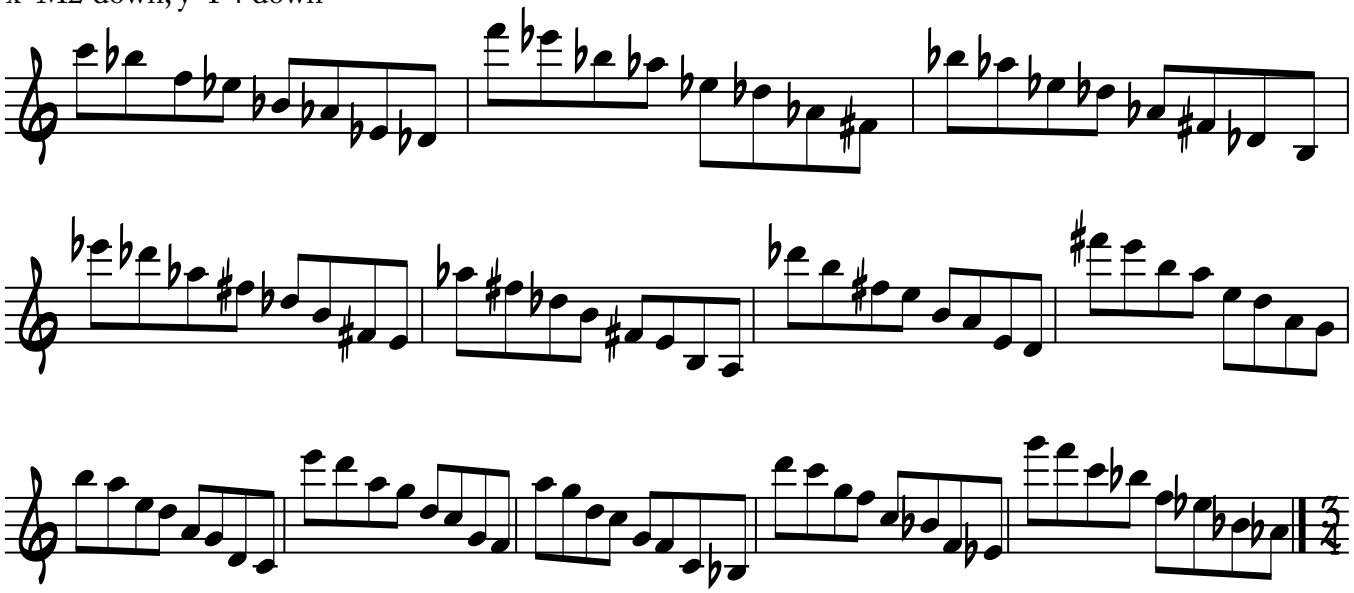

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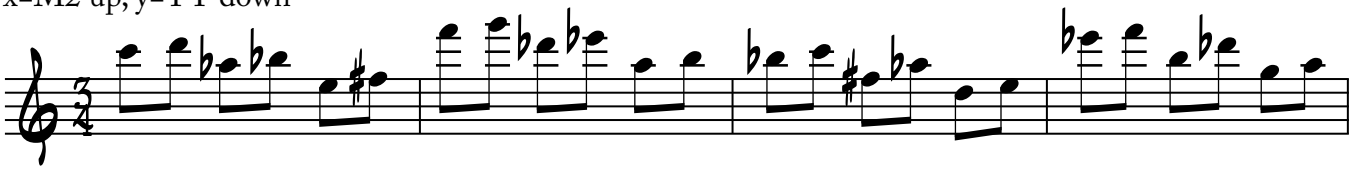

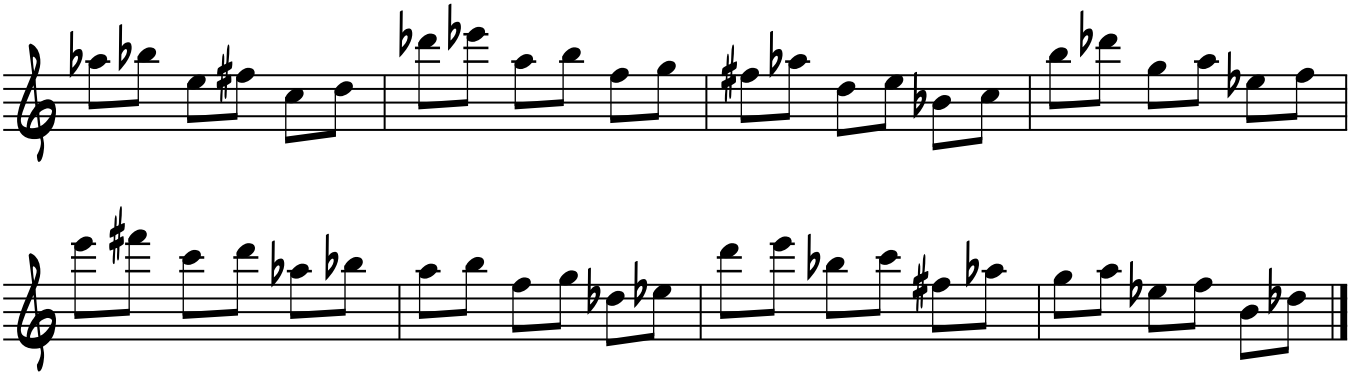

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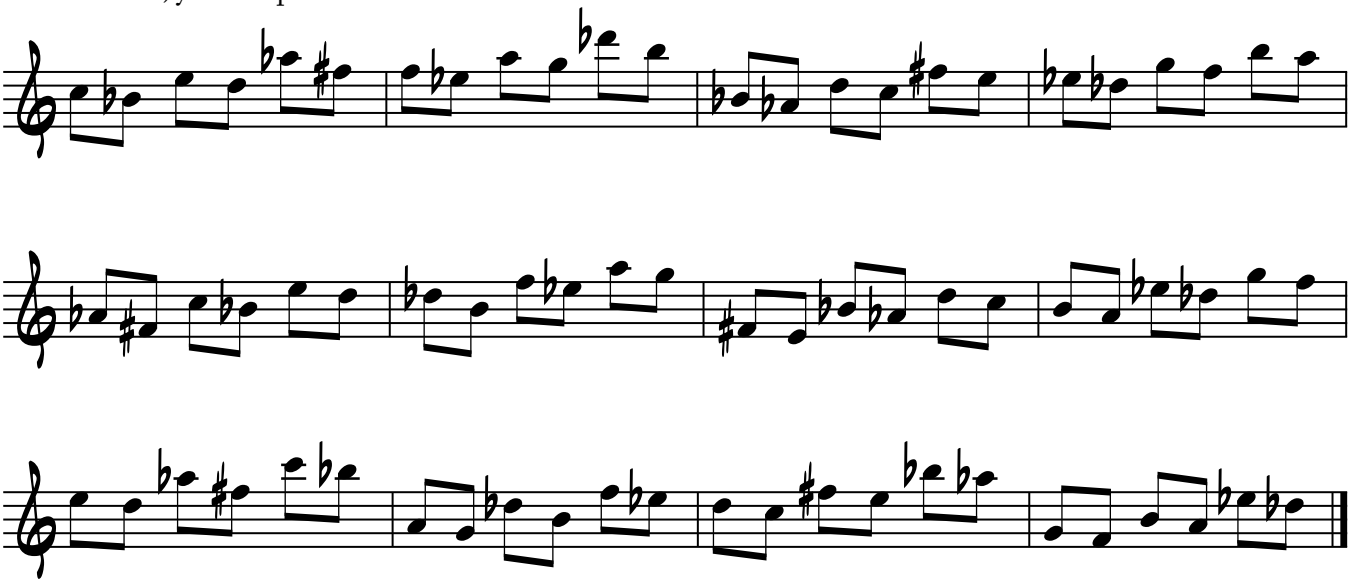

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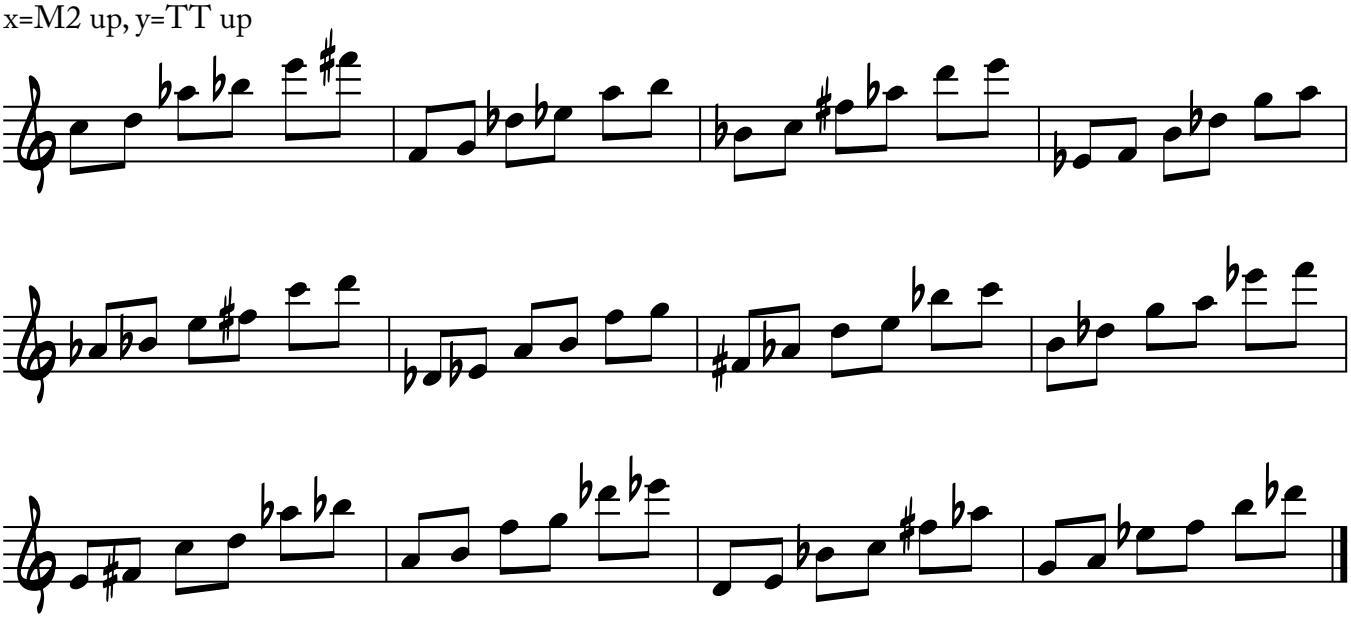

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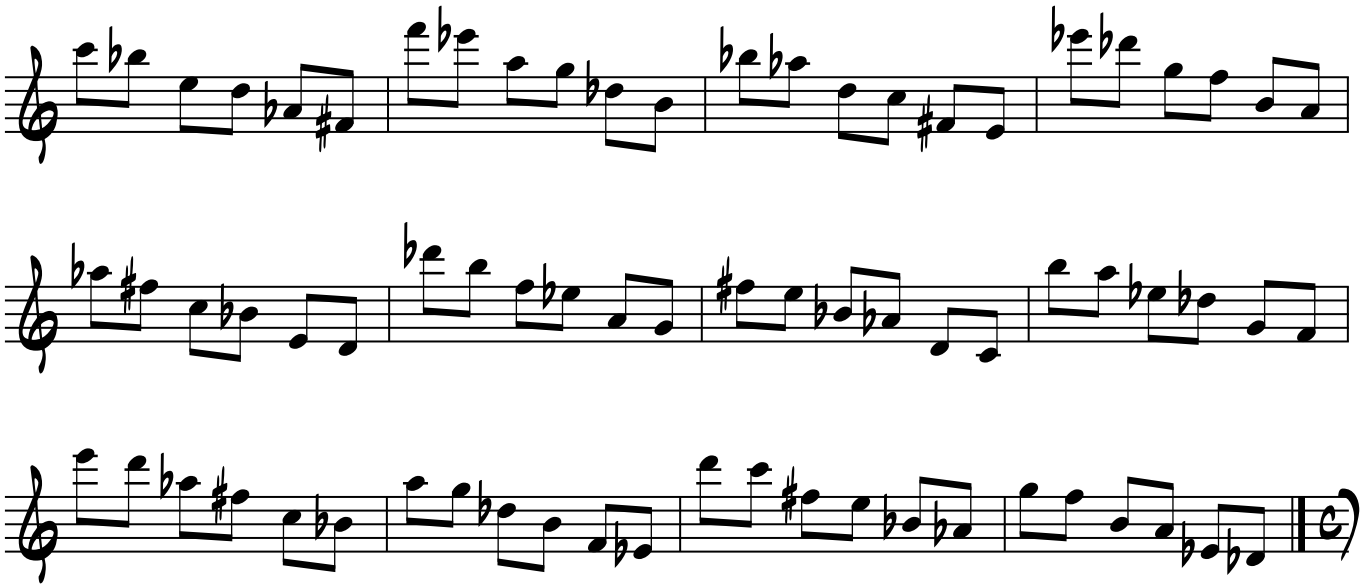

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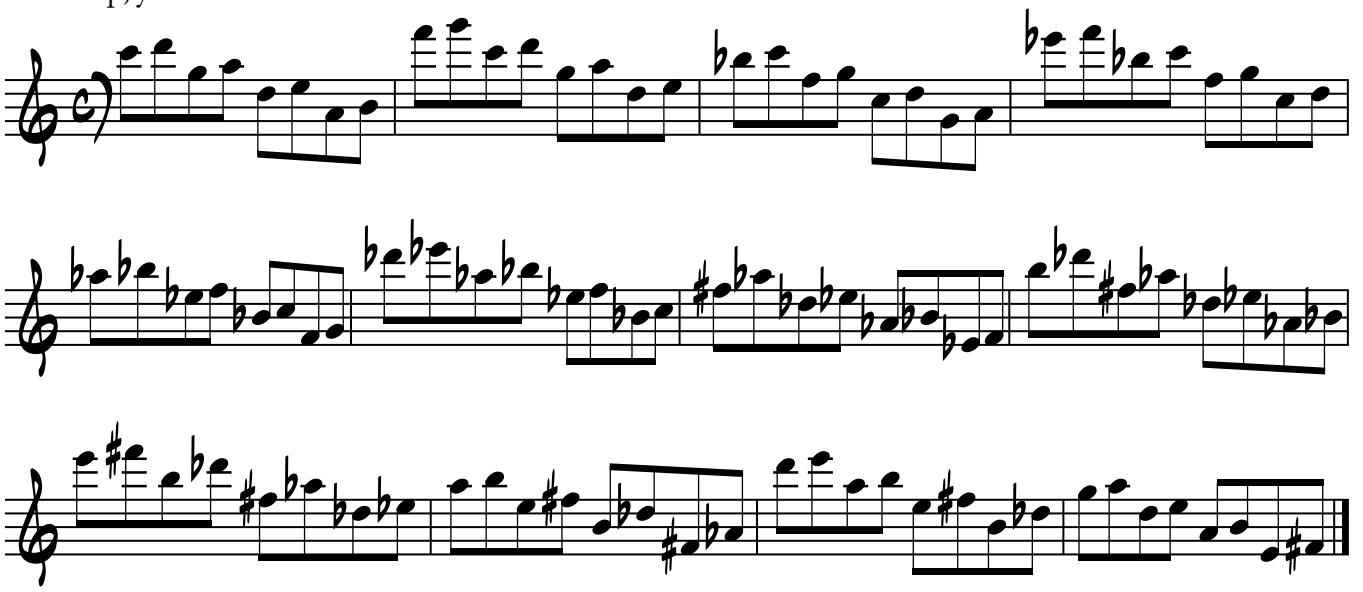

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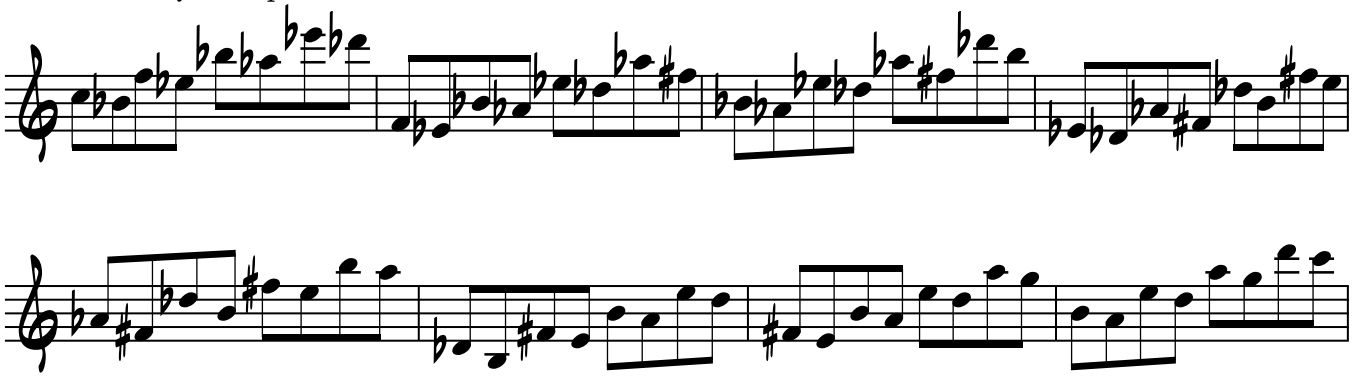

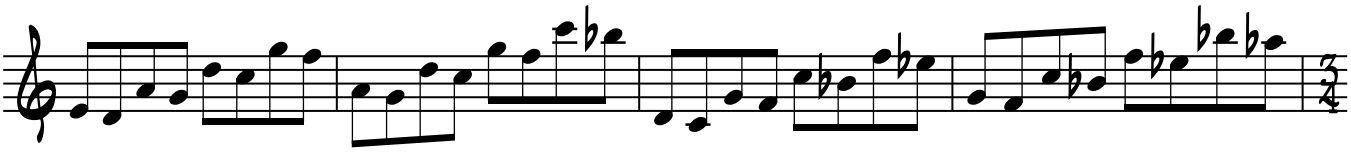

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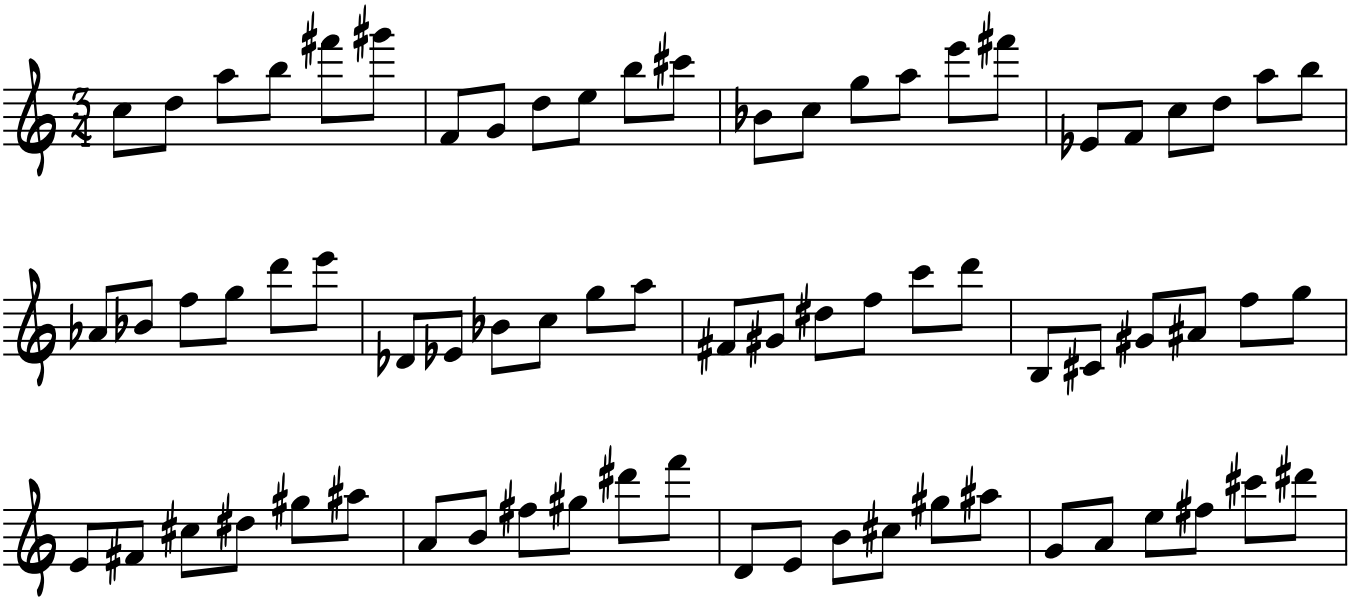

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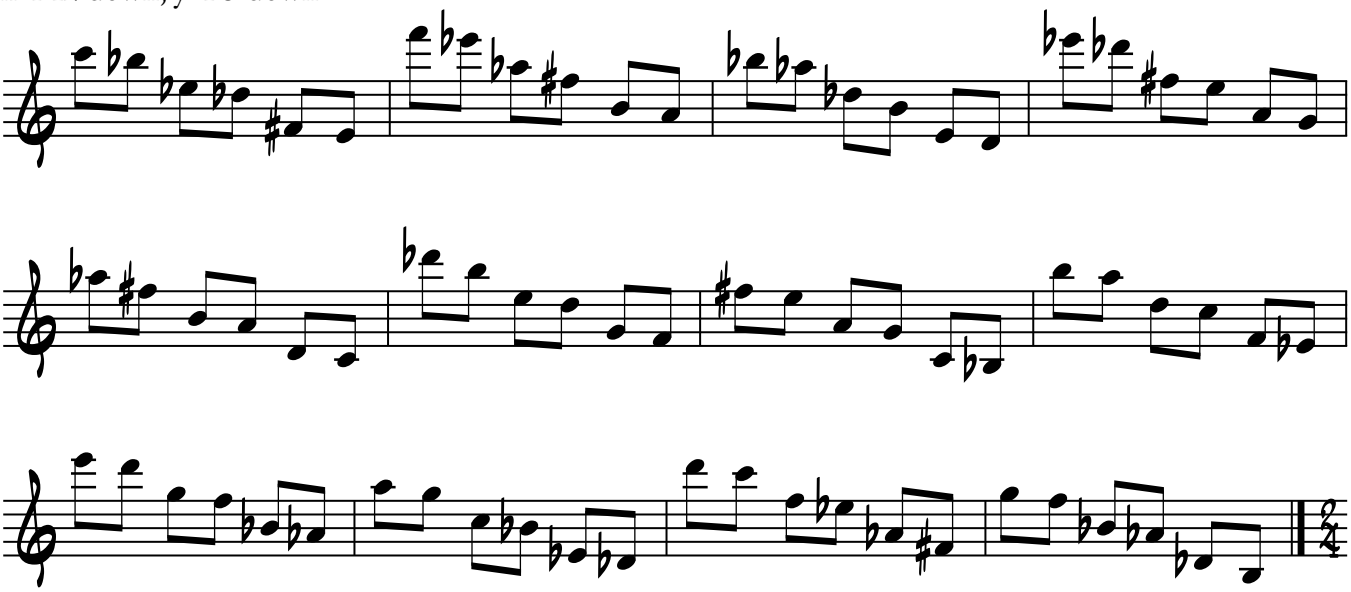

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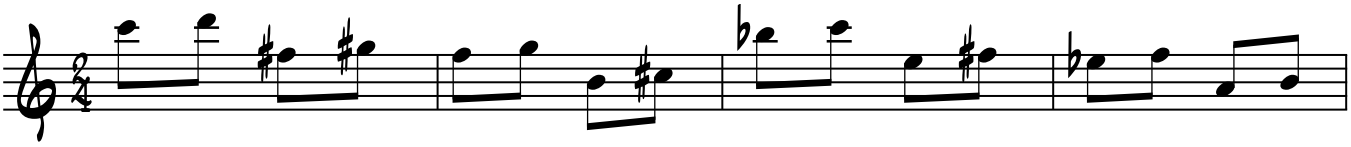

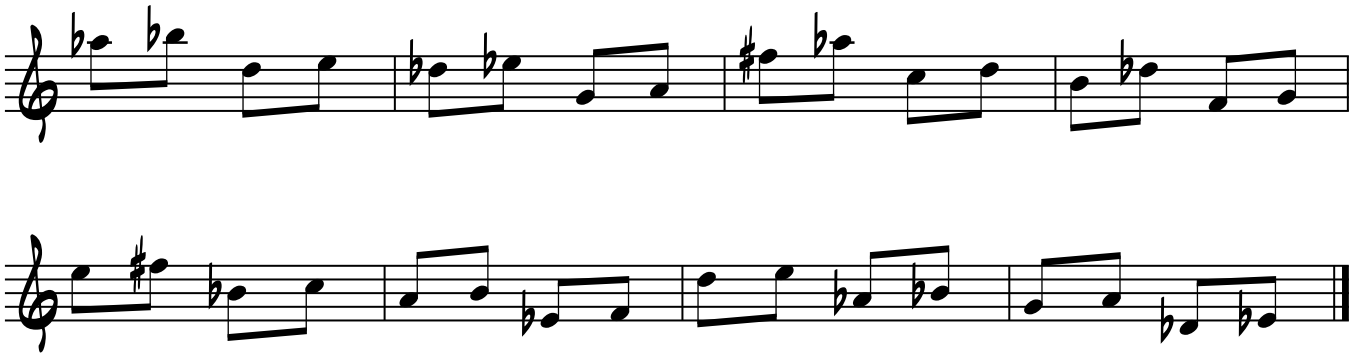

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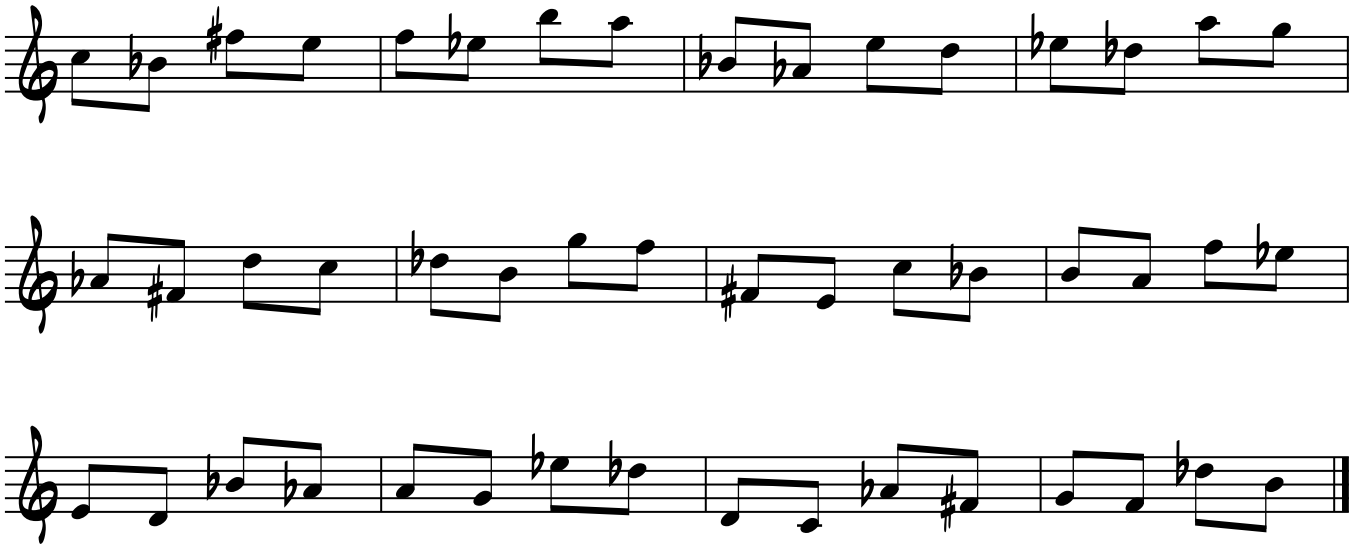

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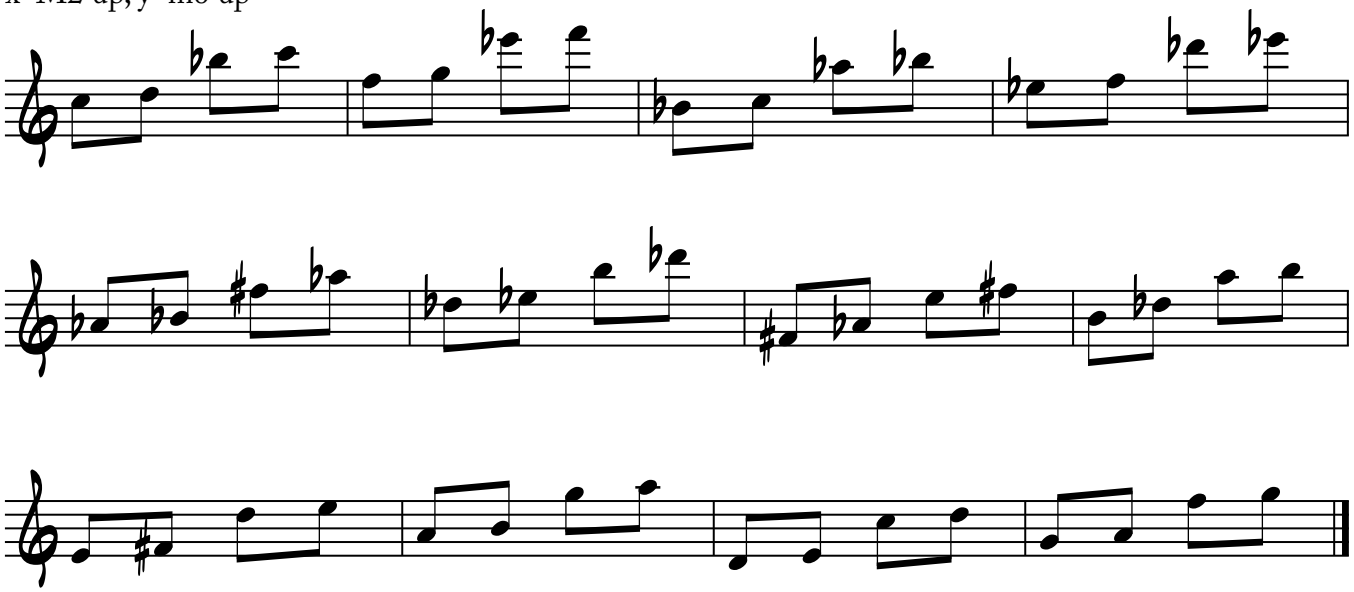

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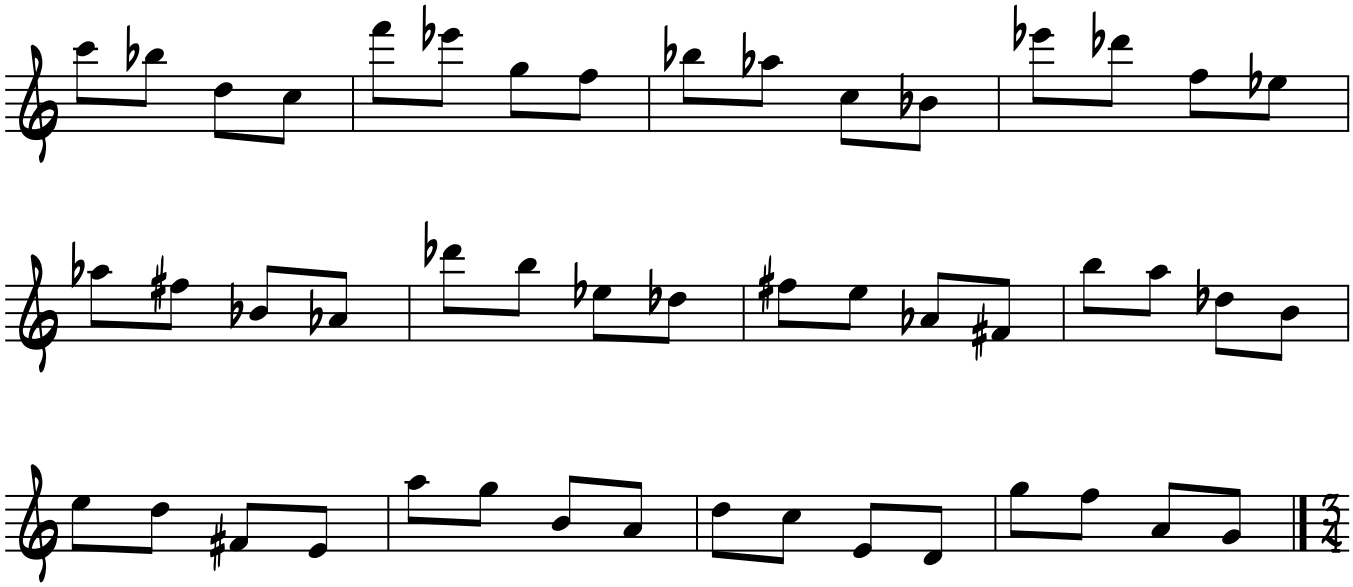

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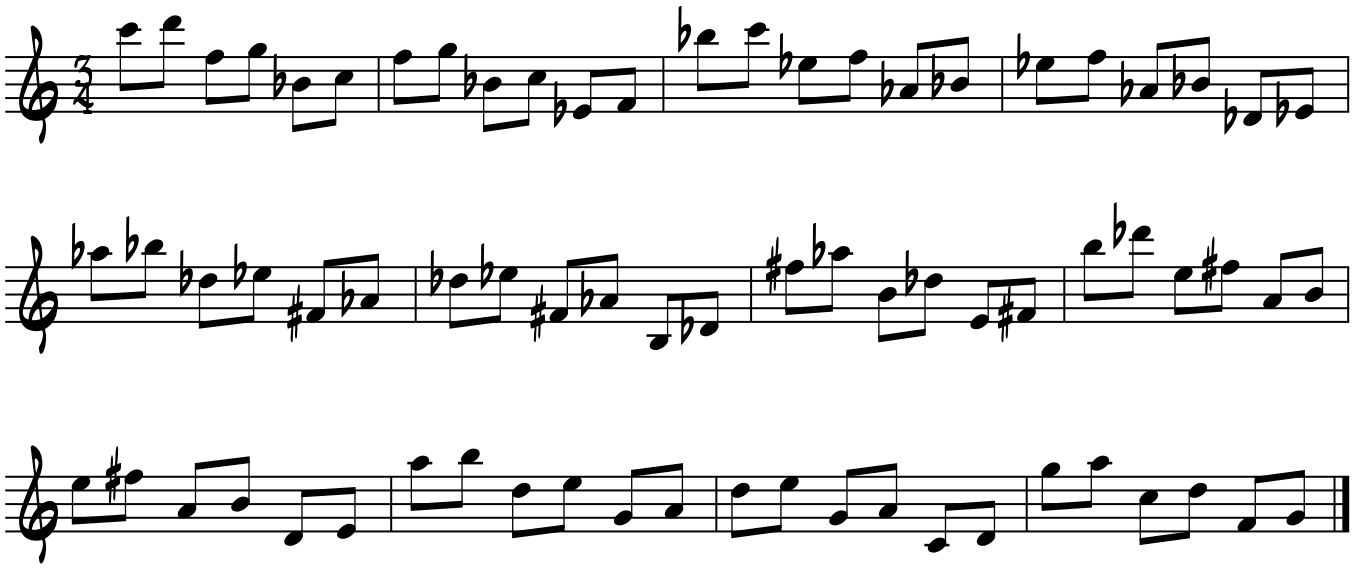

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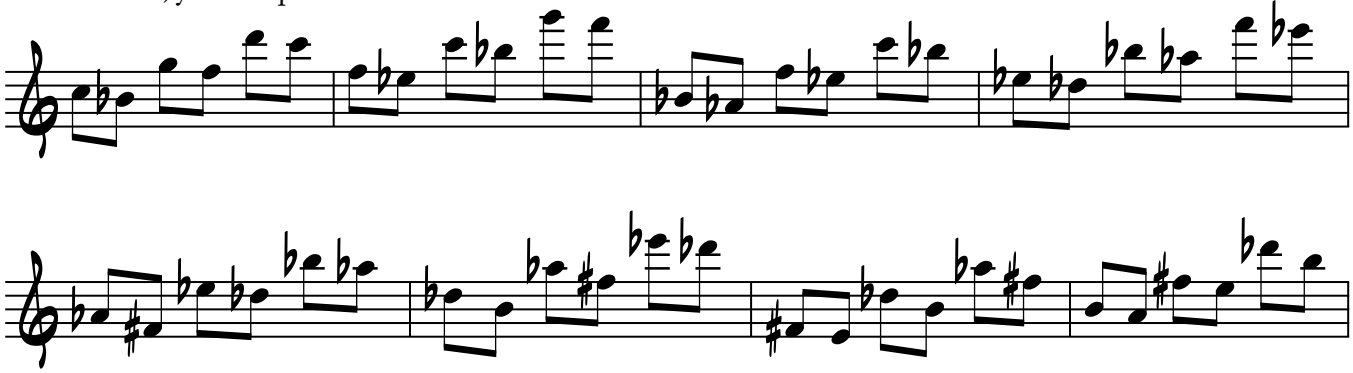

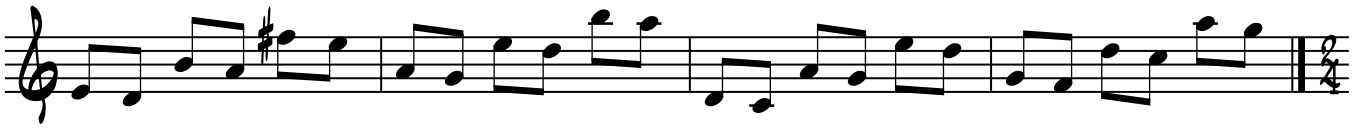

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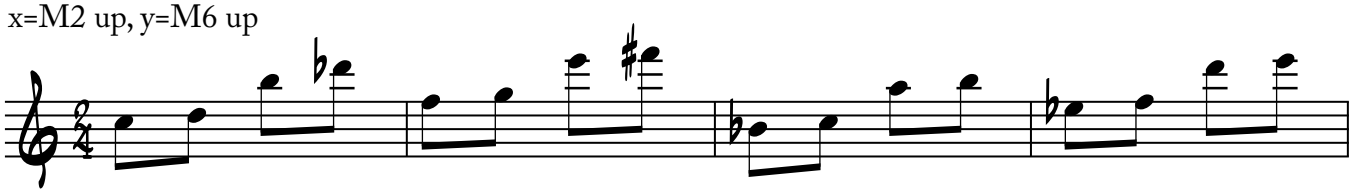

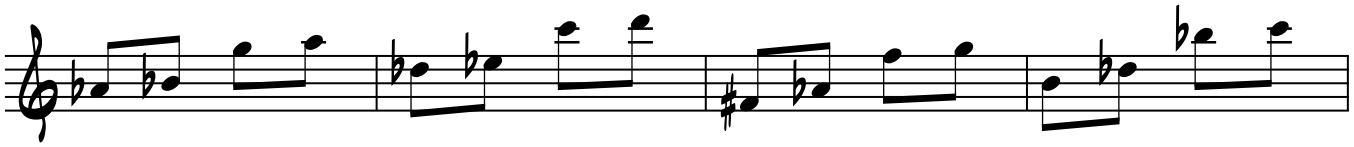

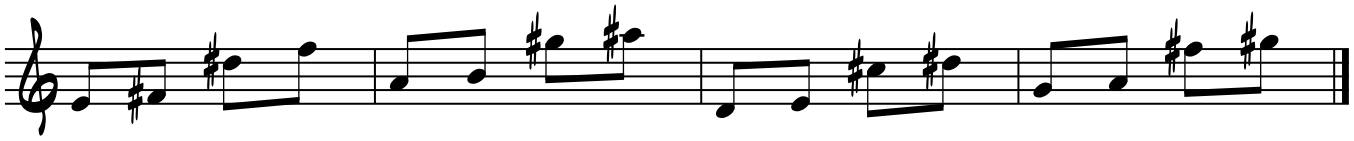

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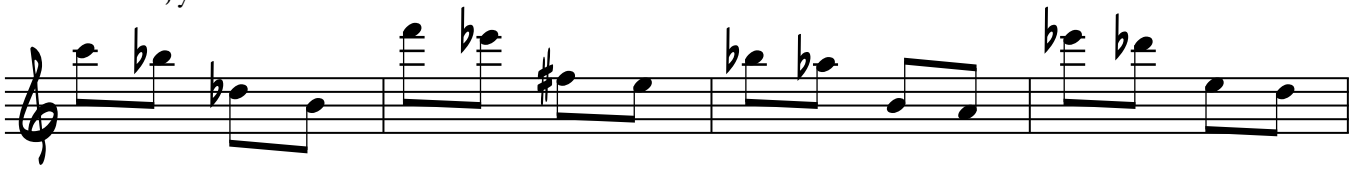

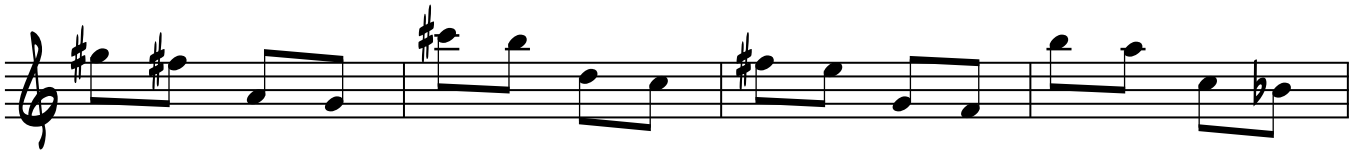

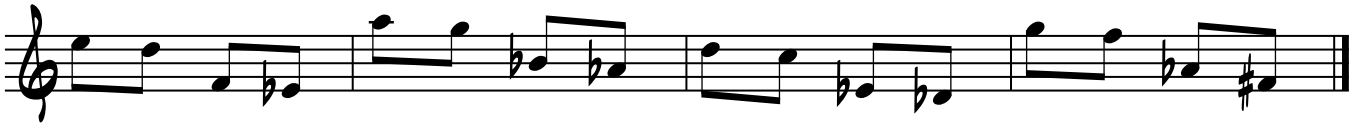

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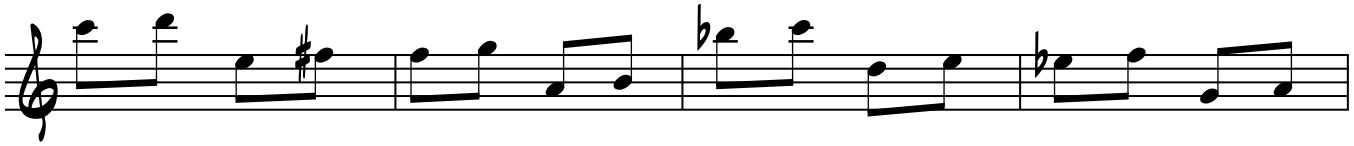

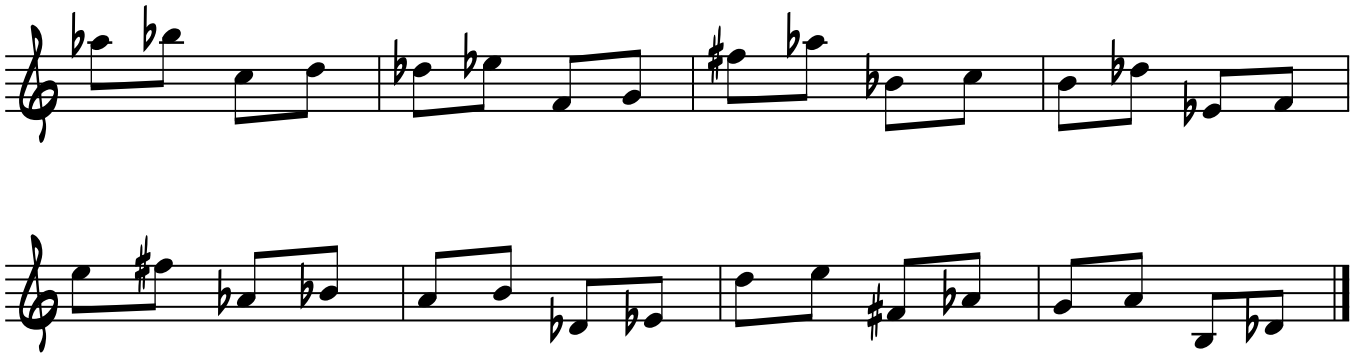

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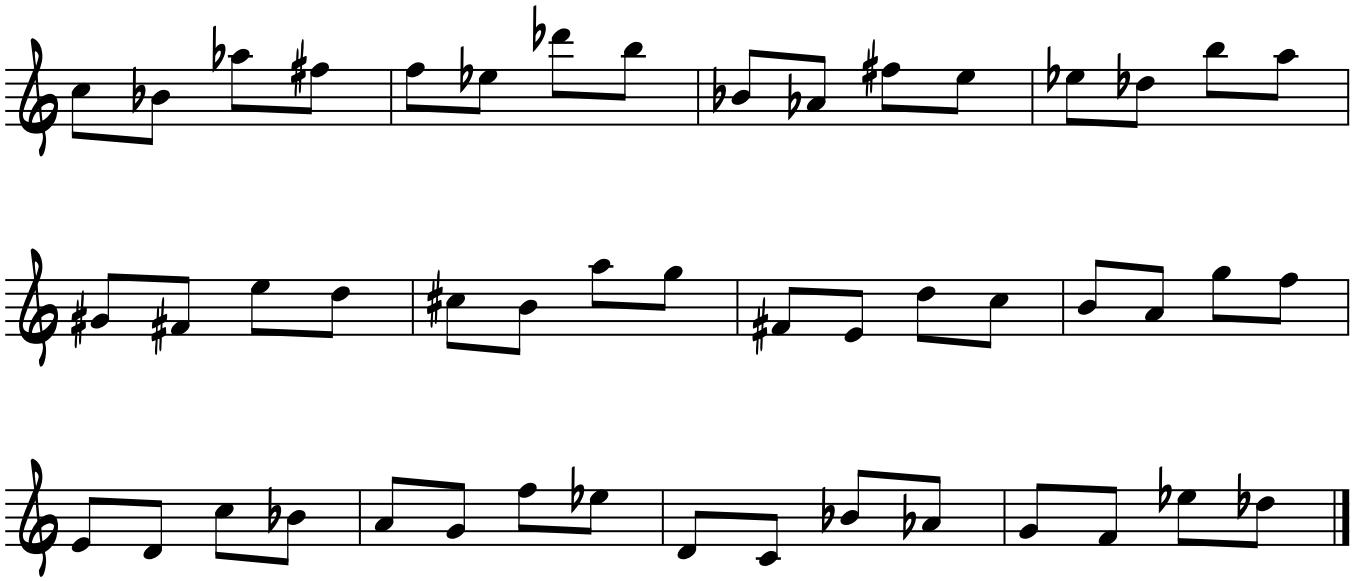

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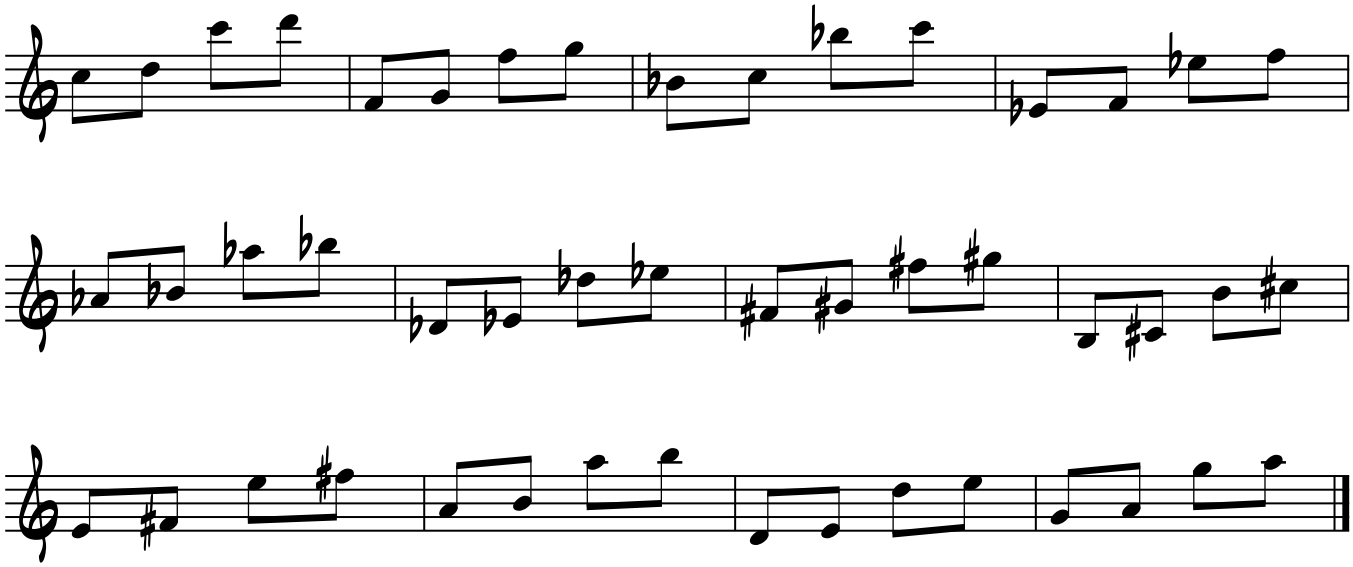

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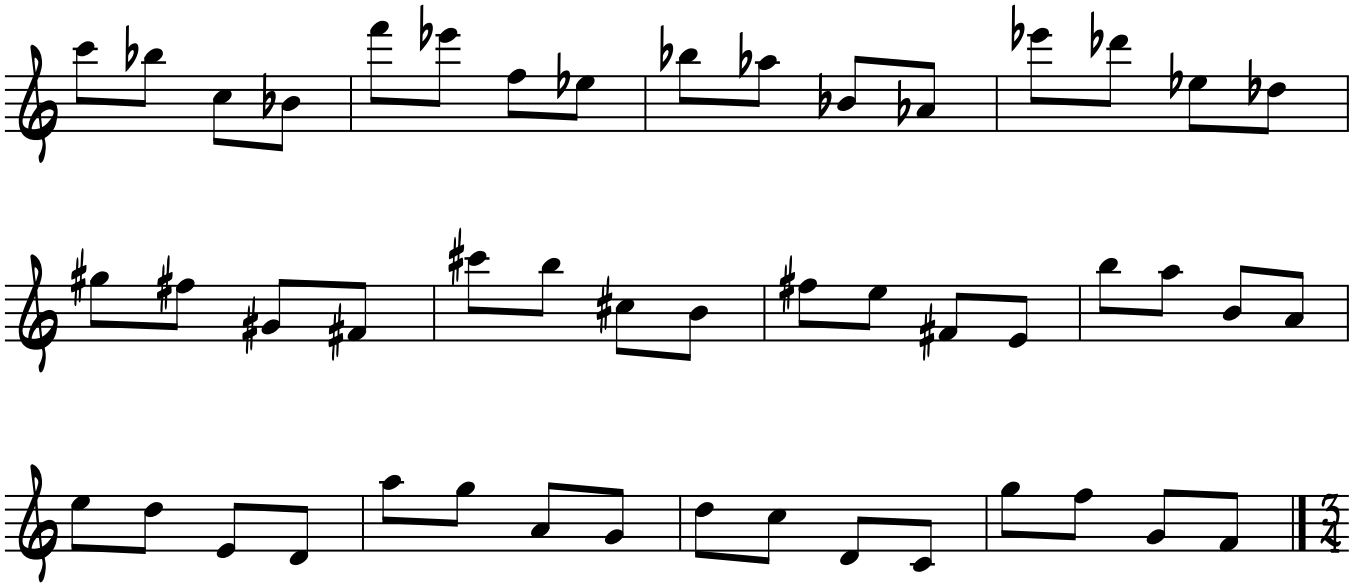

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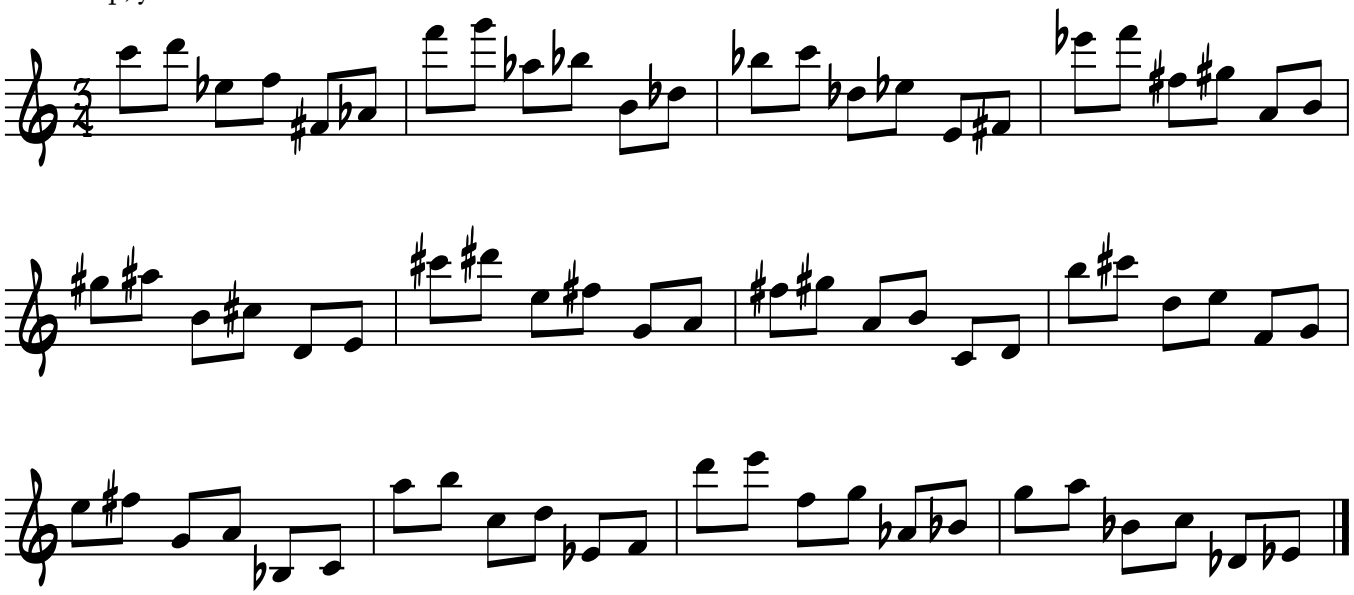

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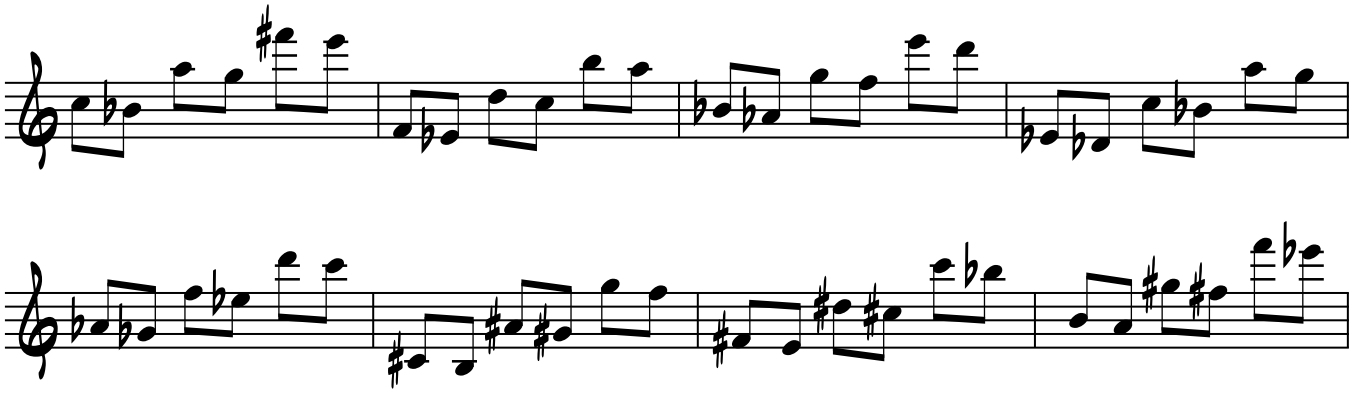

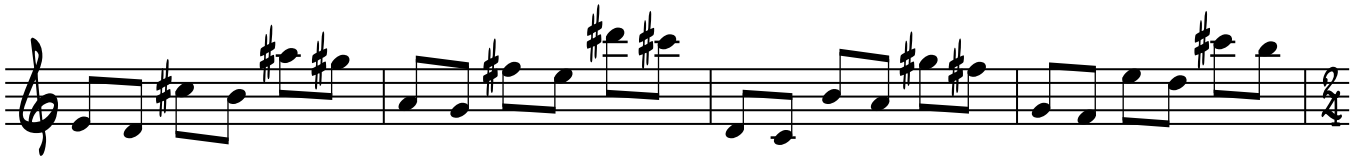

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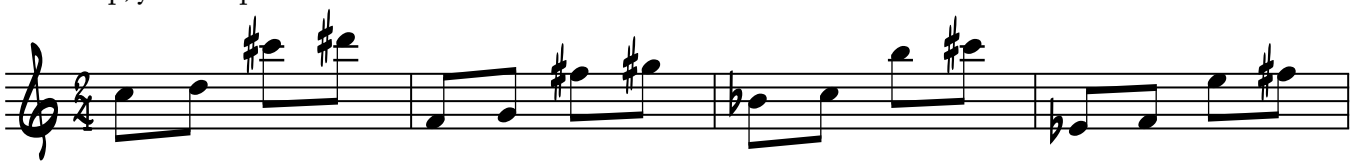
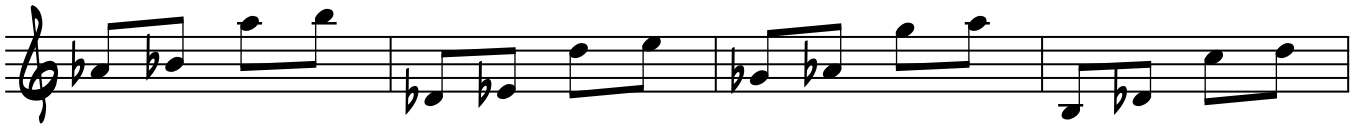
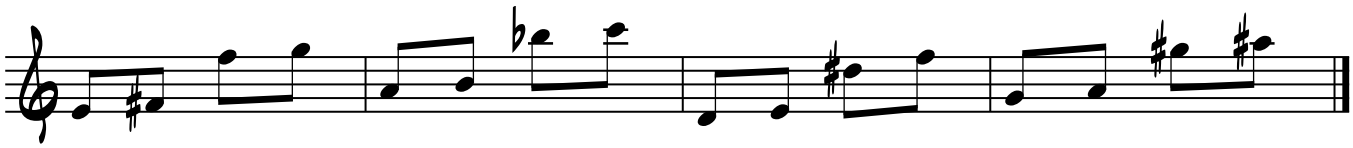
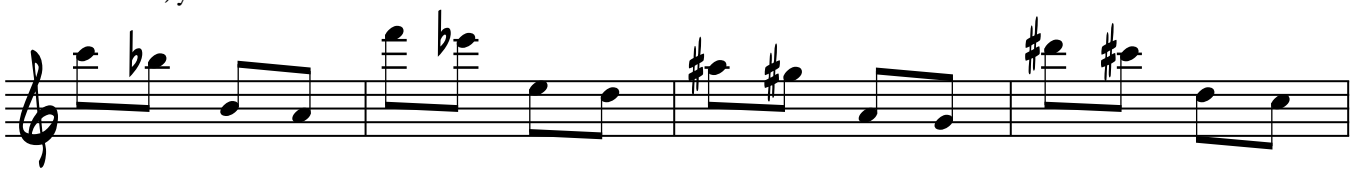
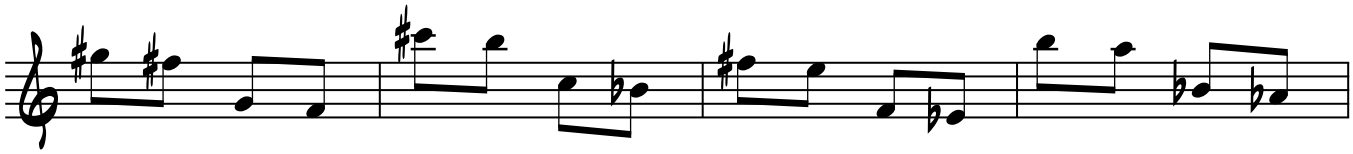


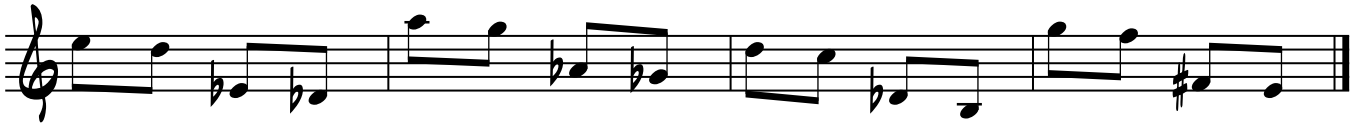




x=M2 down, y= M7 down







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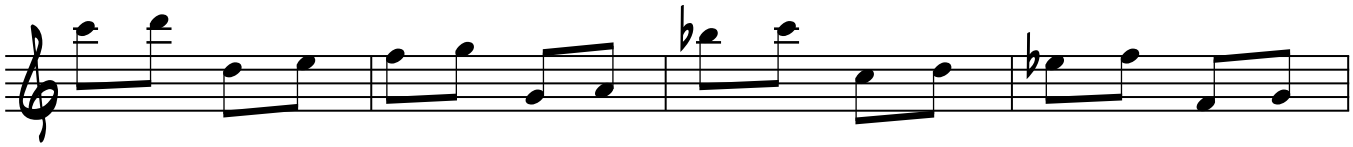

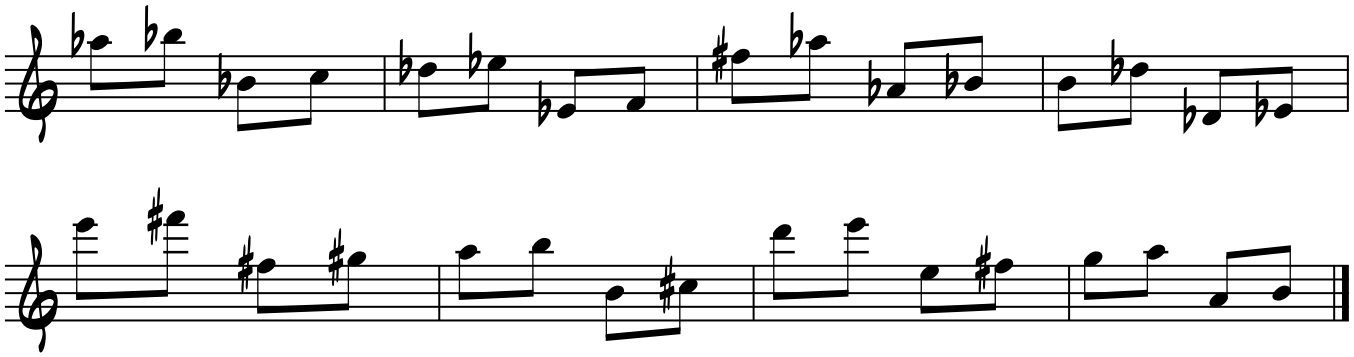

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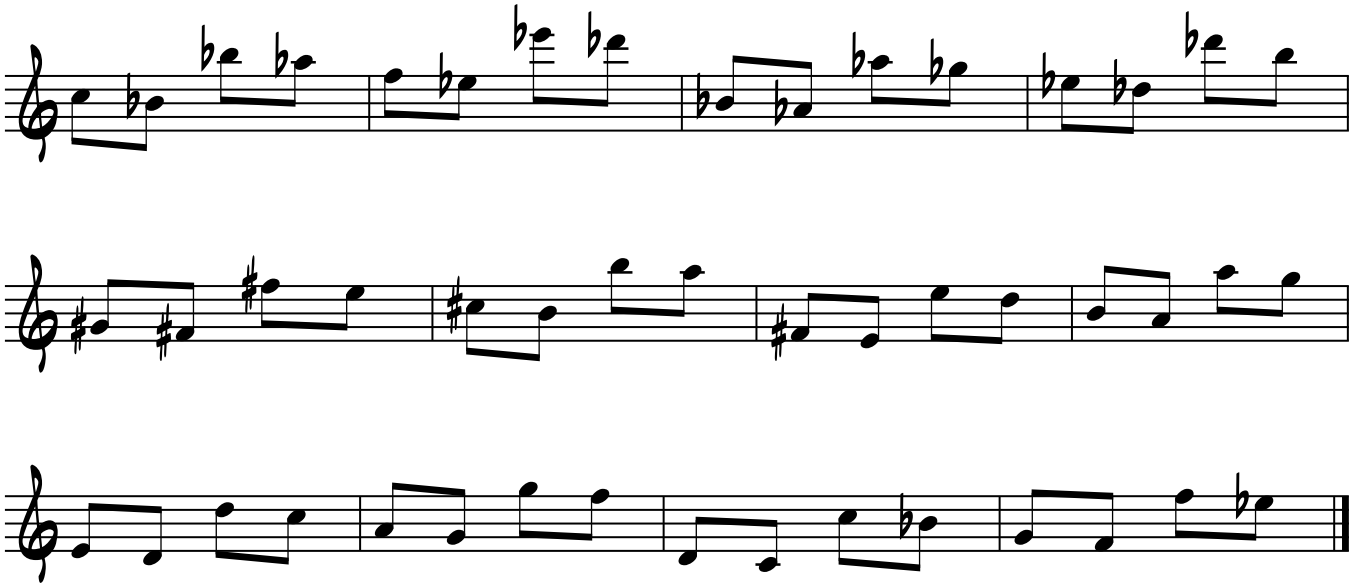

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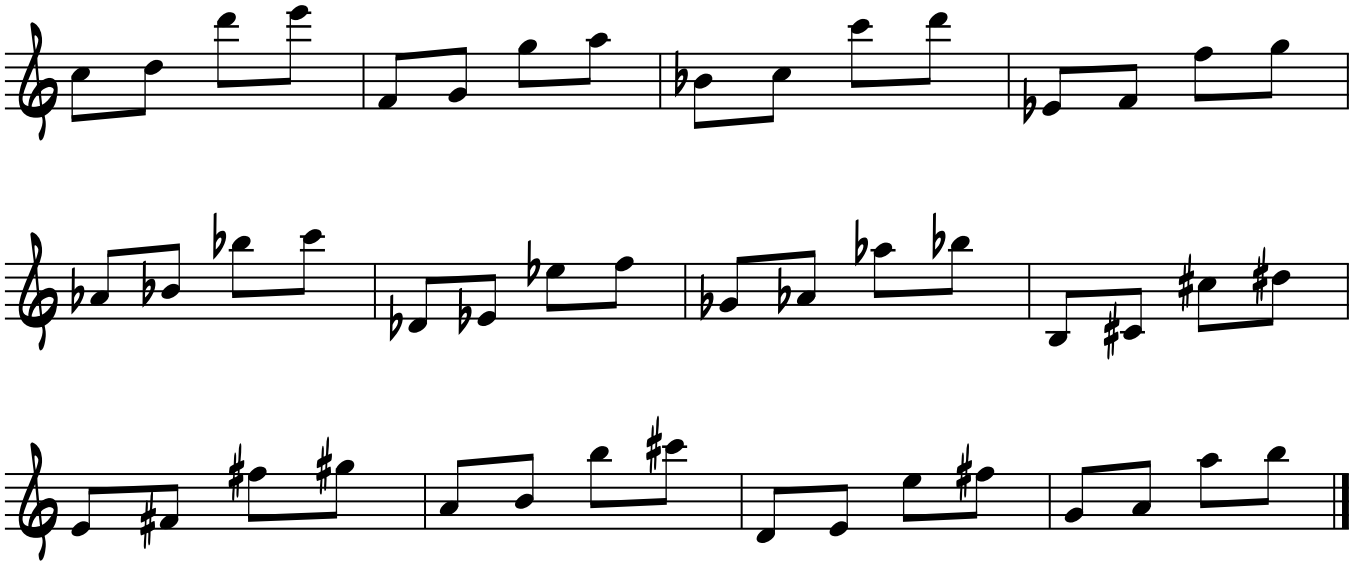

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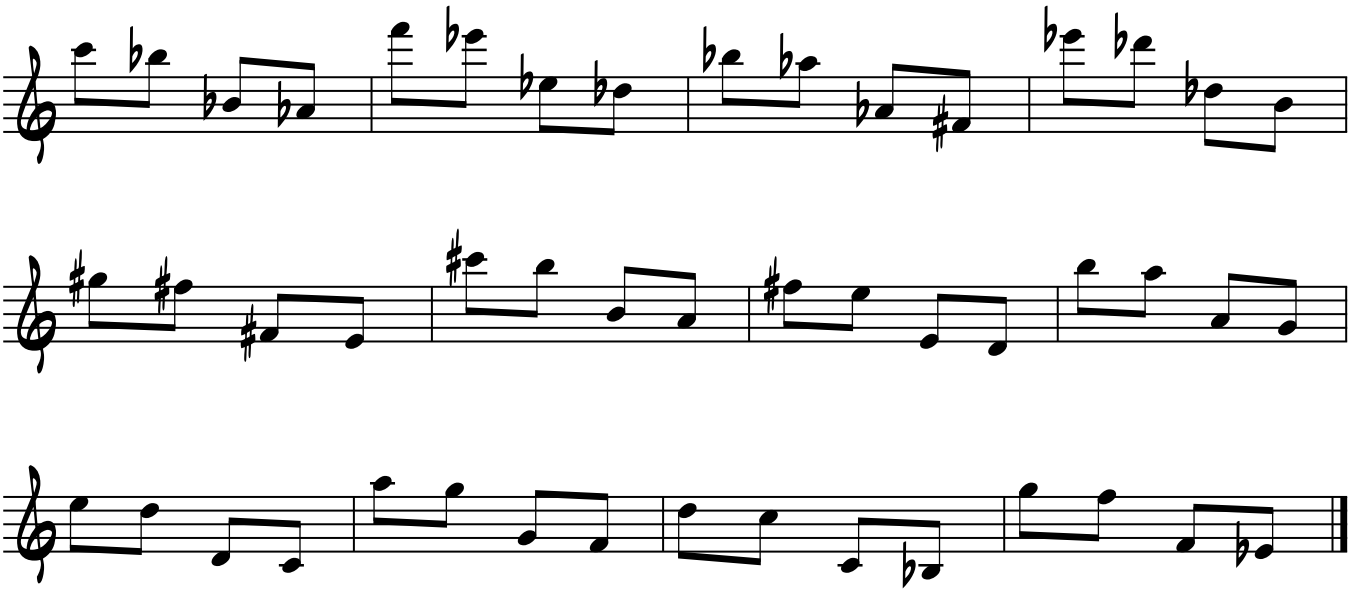
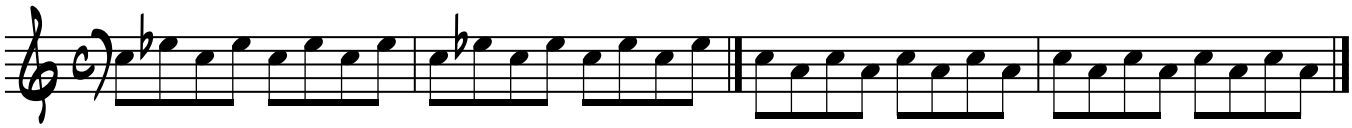


Minor 3rds

x=m3 up, y=m3 down

x=m3 down, y=m3 up



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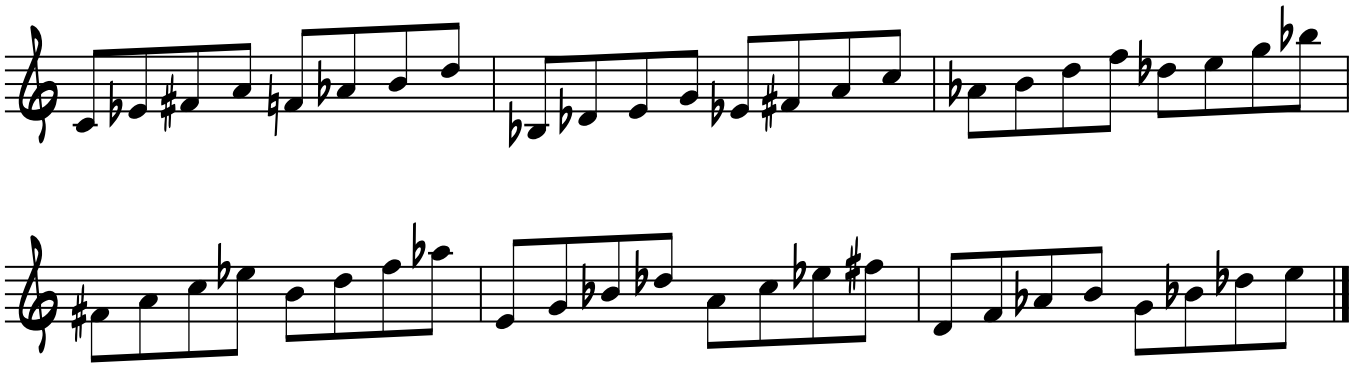

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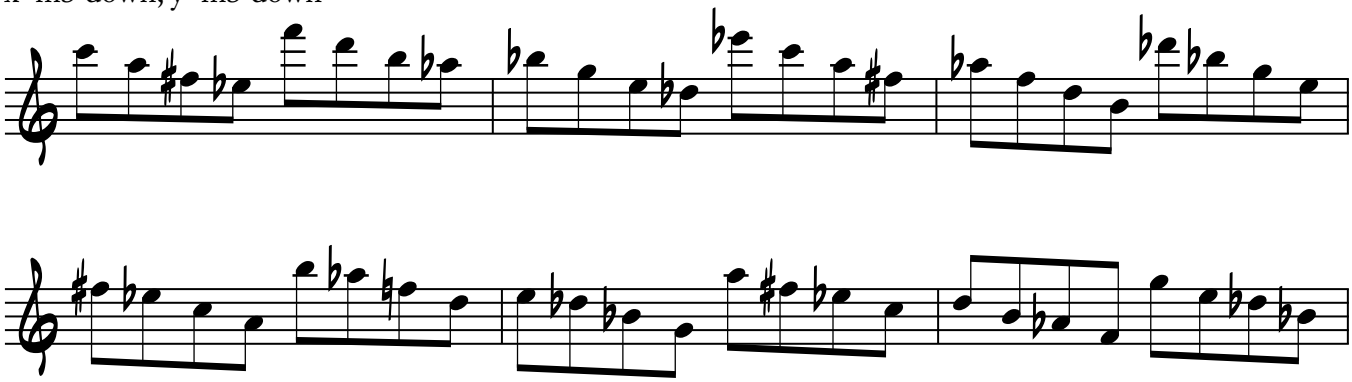

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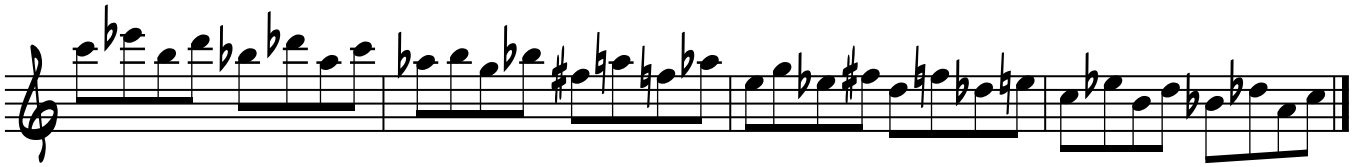

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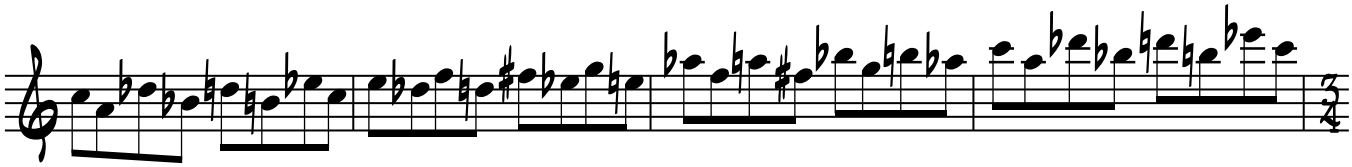

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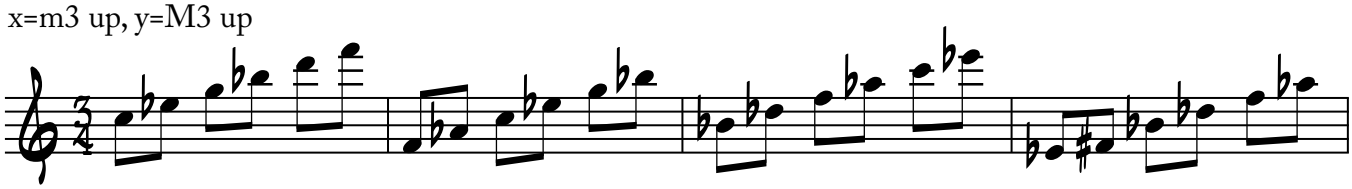

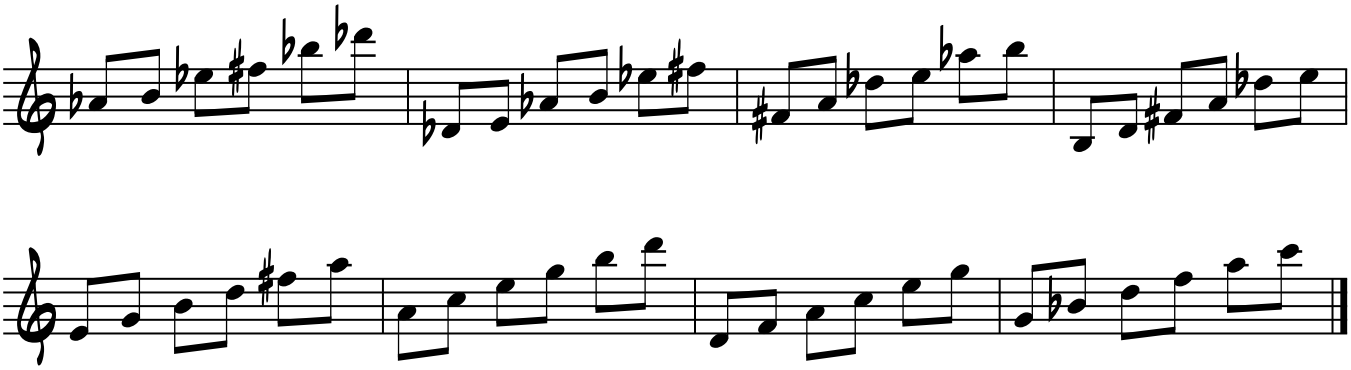

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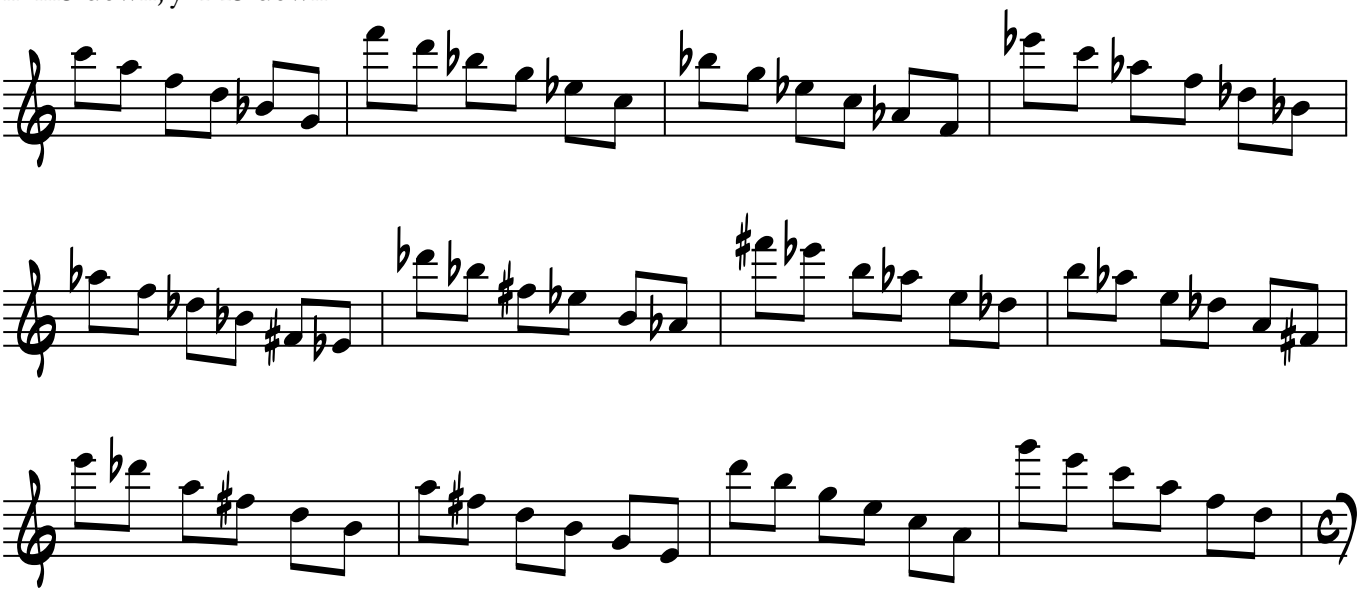
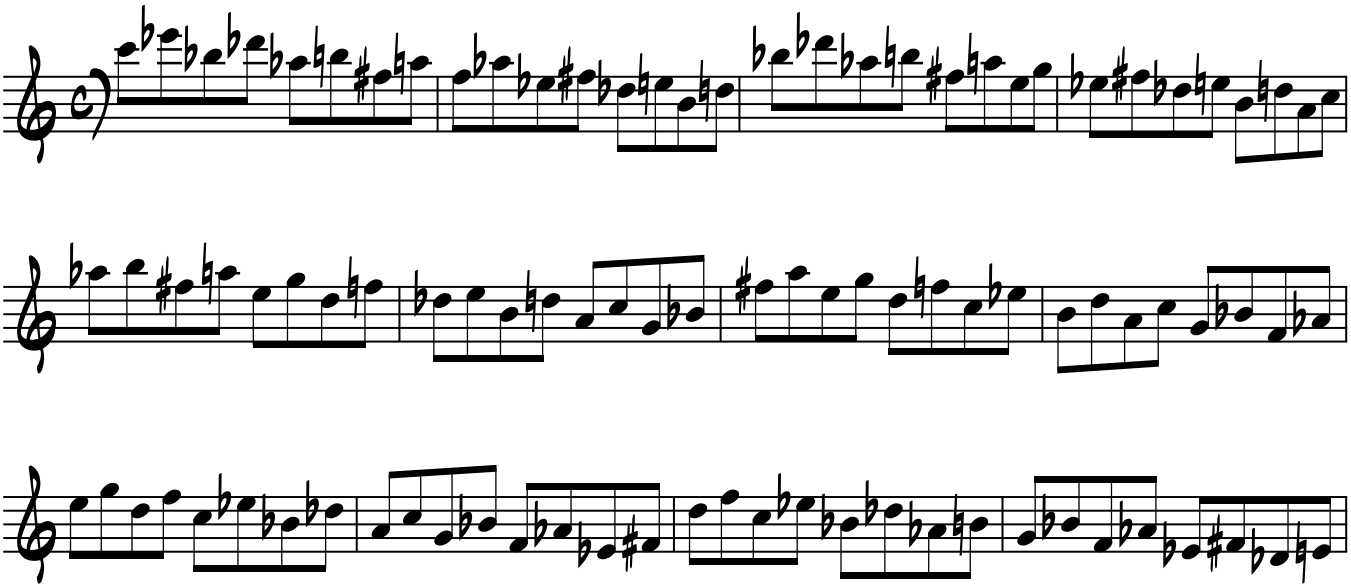
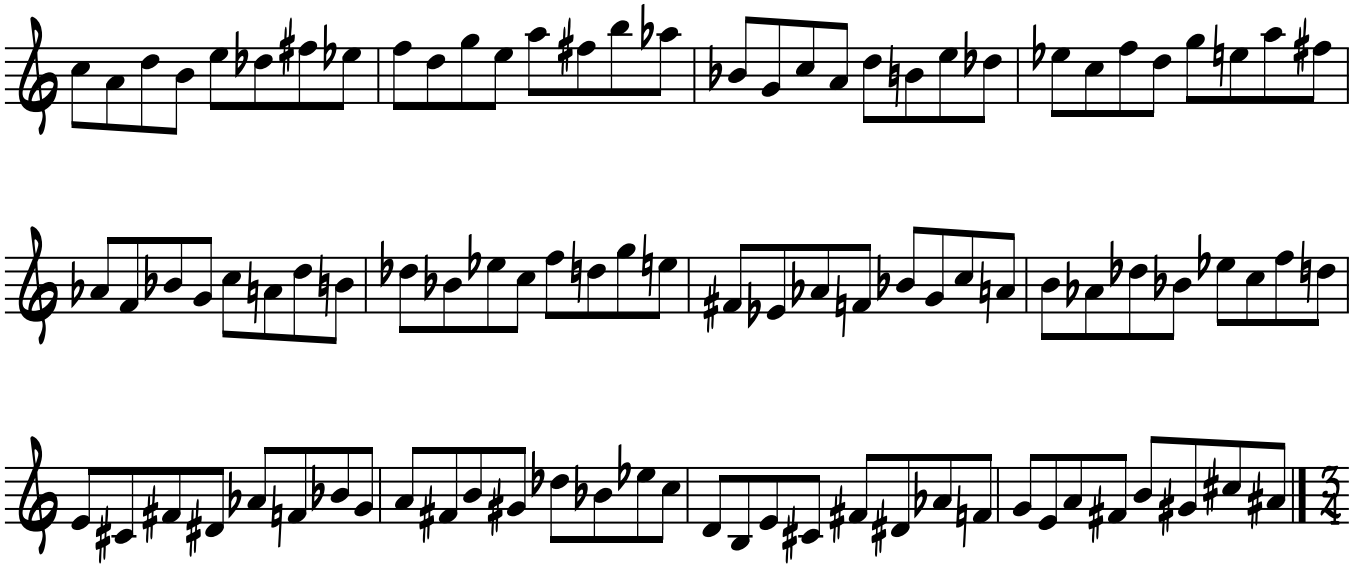


x=m3 up, y=P4 down



x=m3 down, y=P4 up



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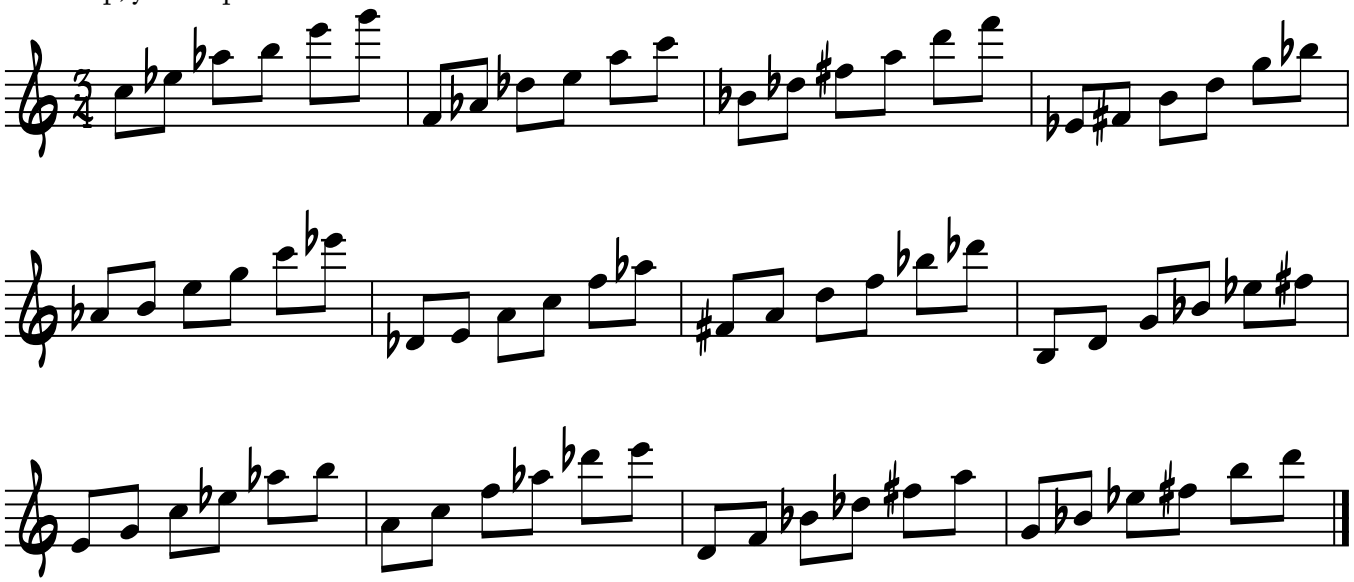

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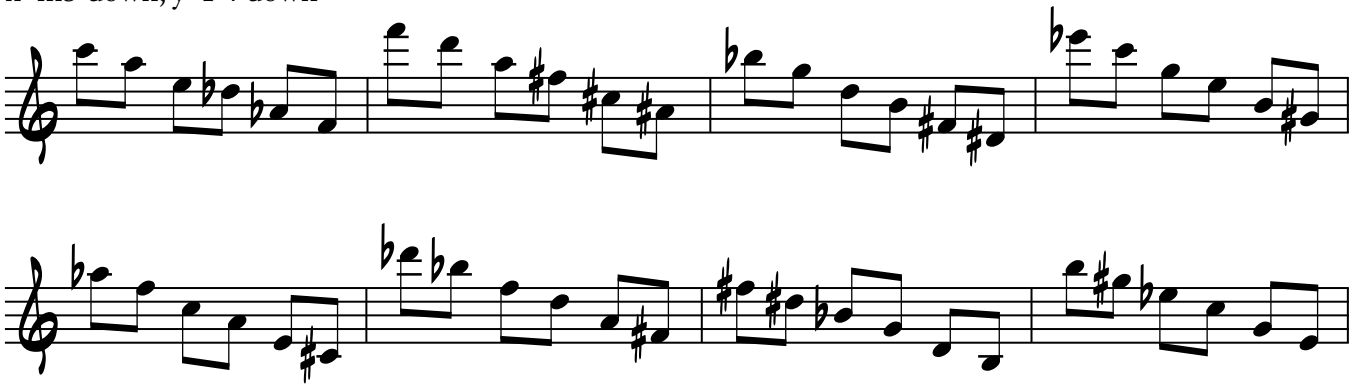

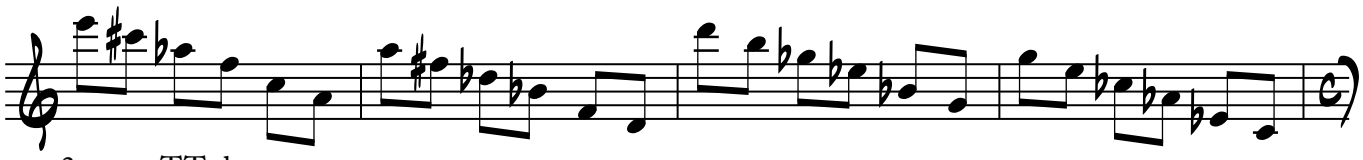

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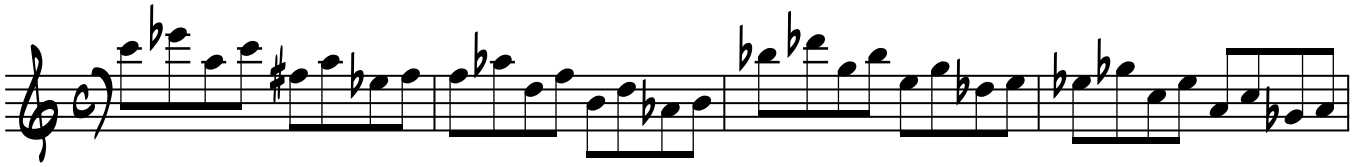

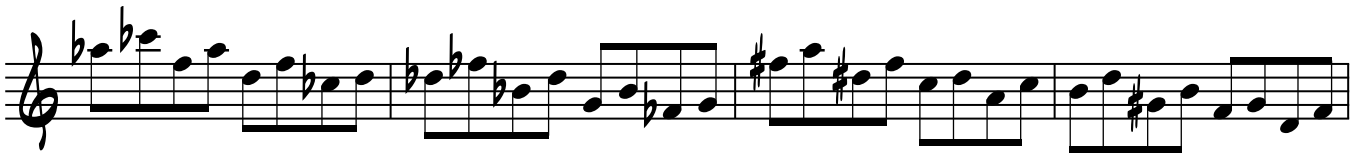

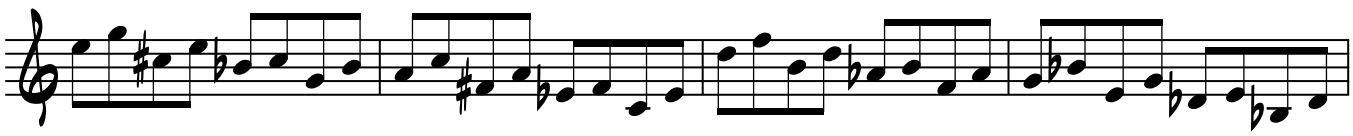

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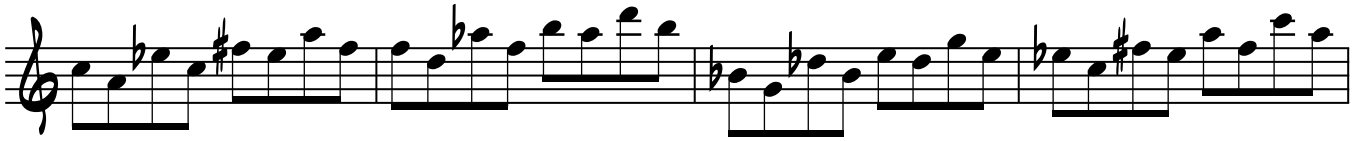

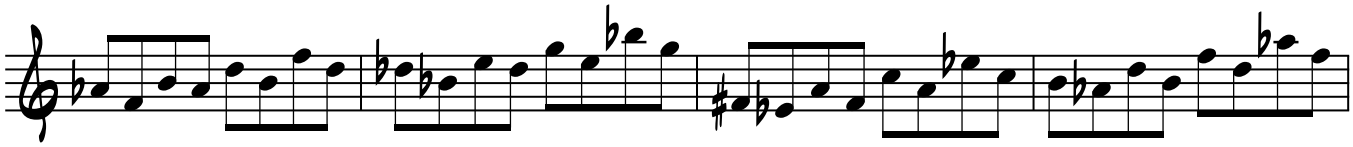

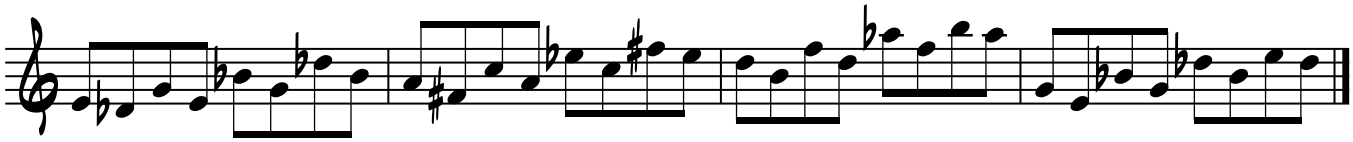

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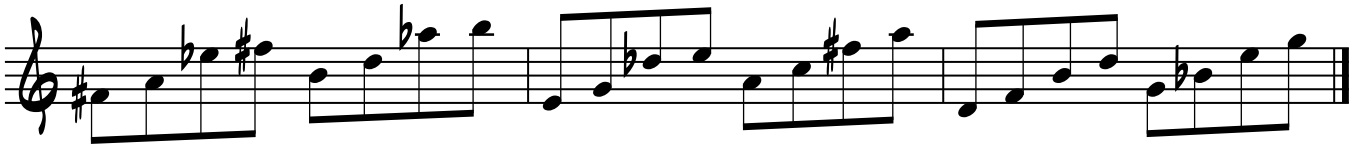

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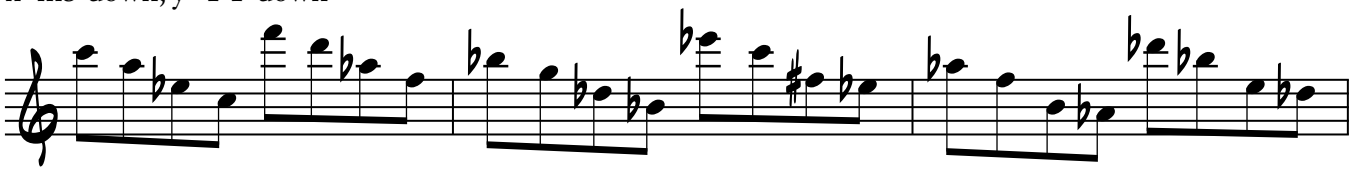

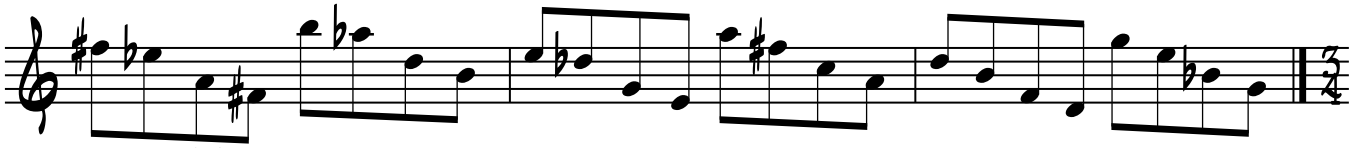

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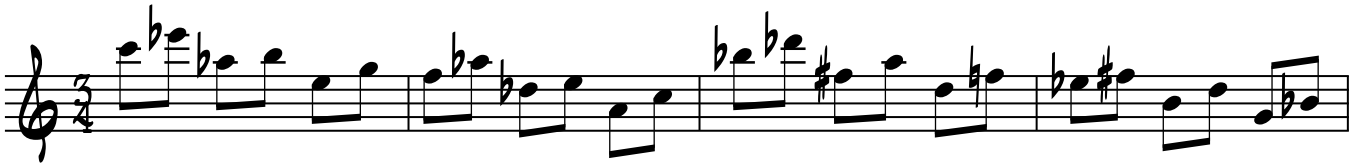

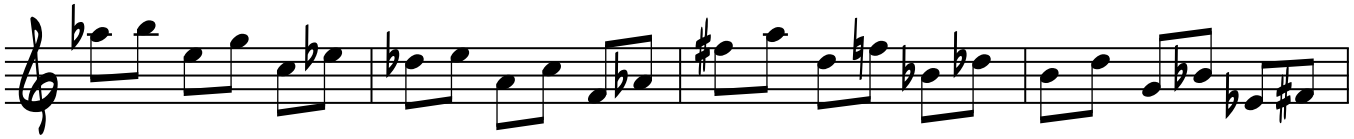

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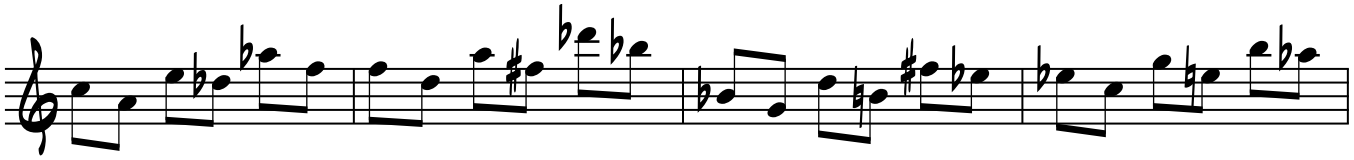

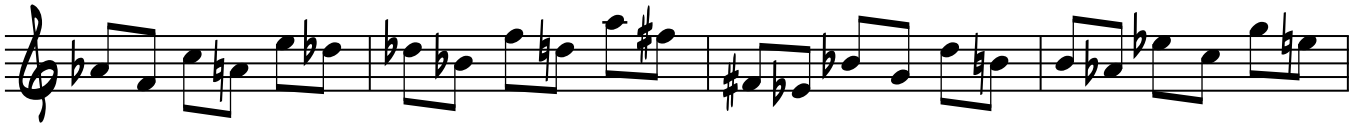

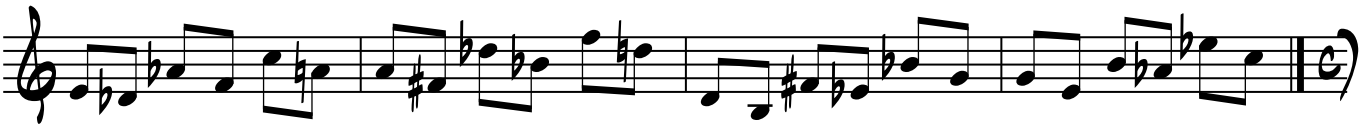

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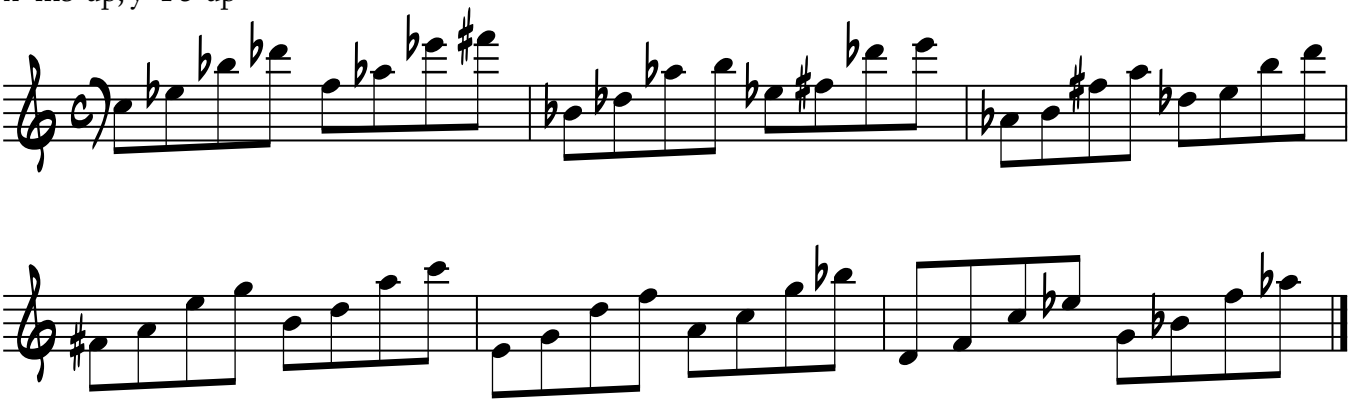

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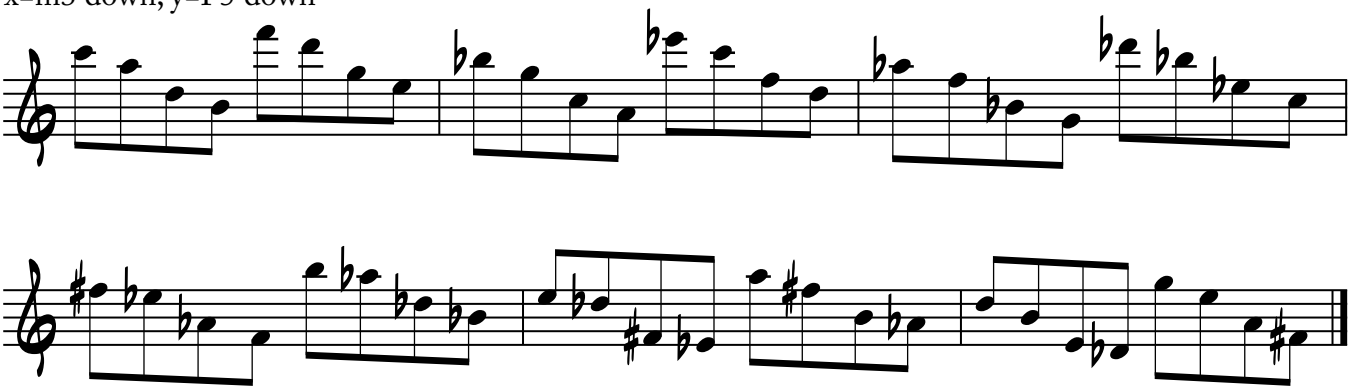

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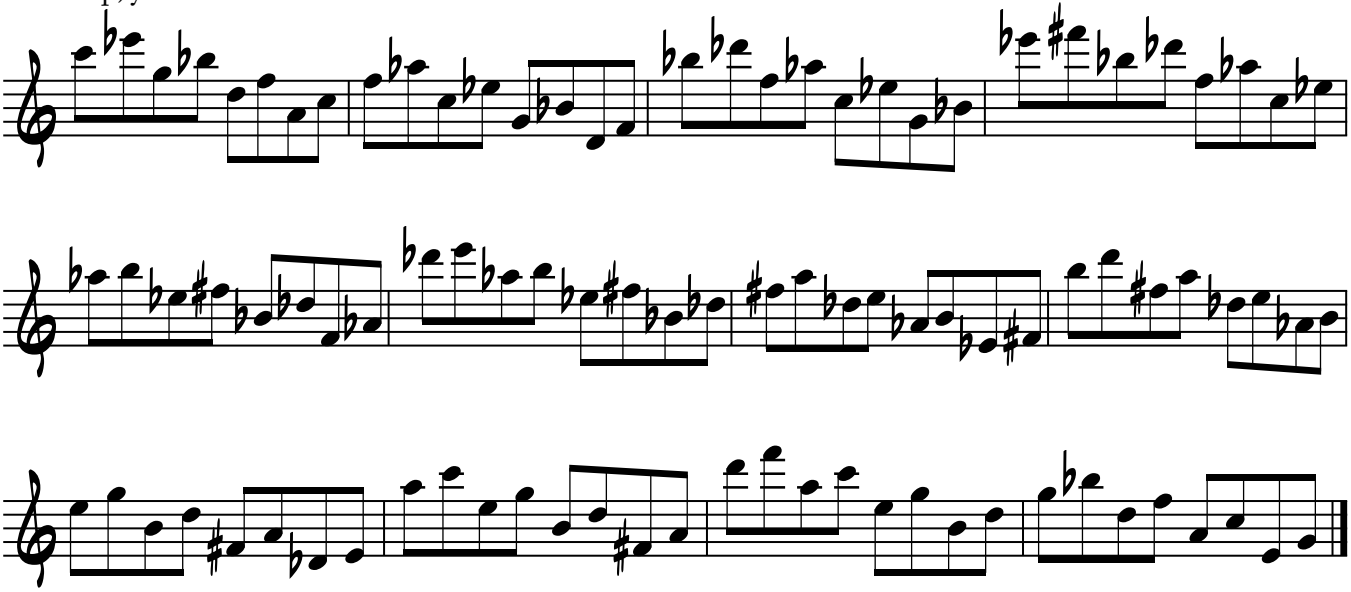

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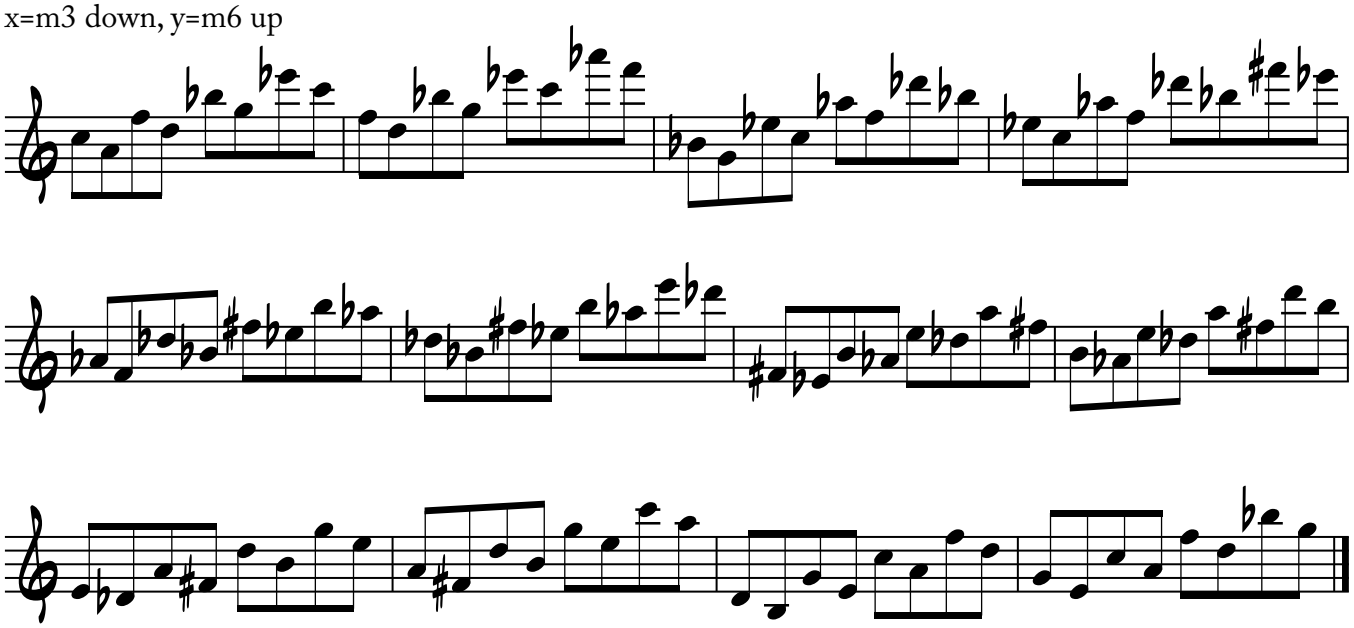

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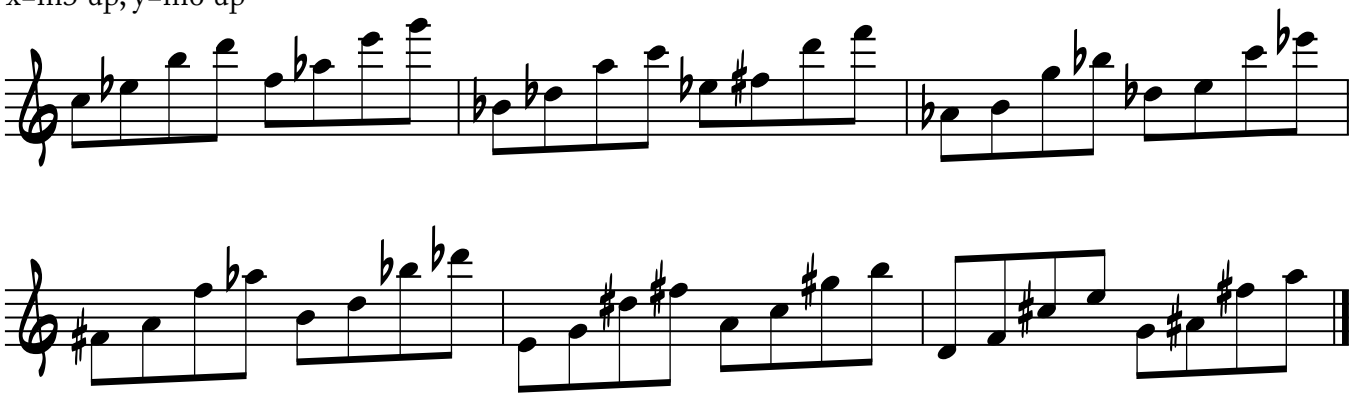

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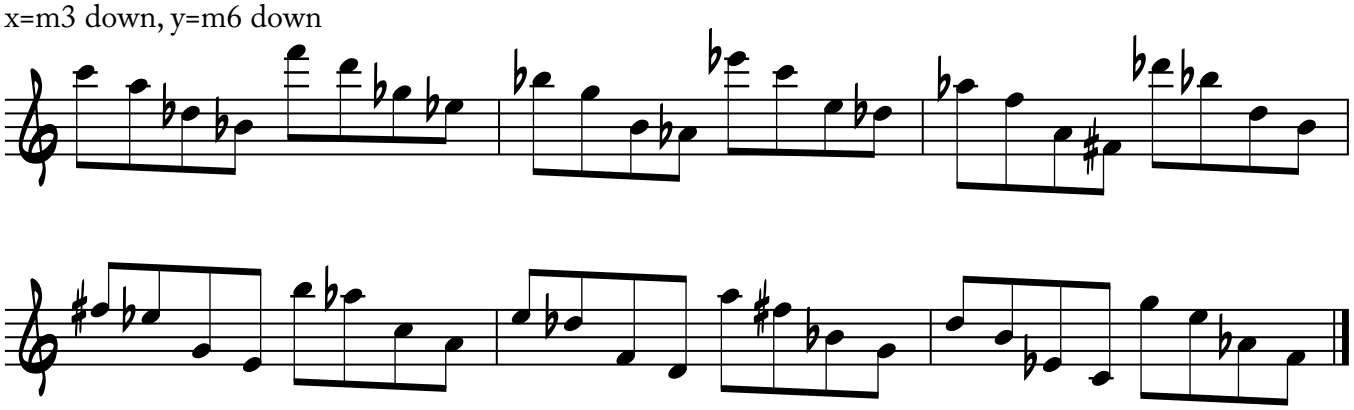

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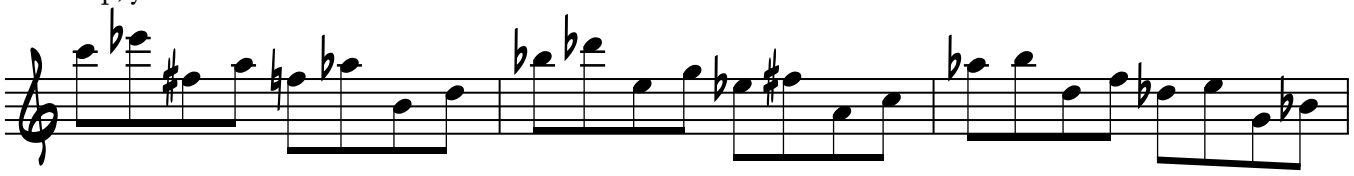

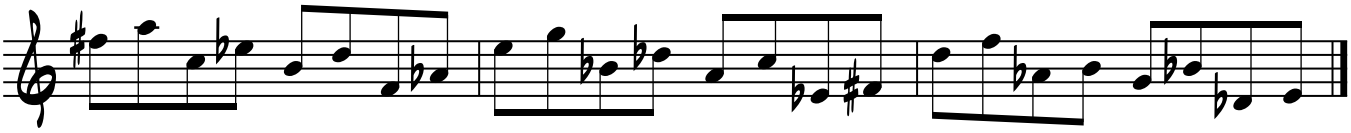

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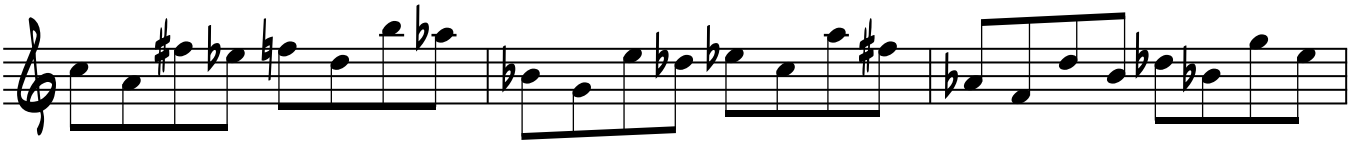

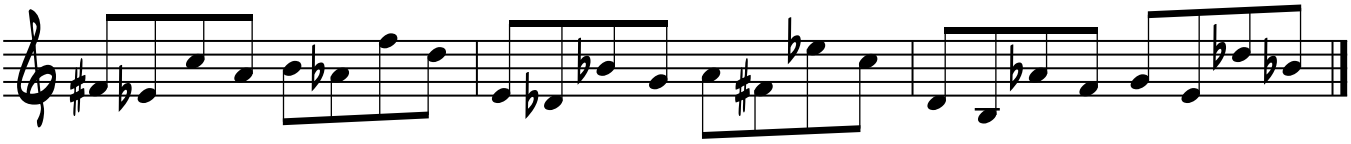

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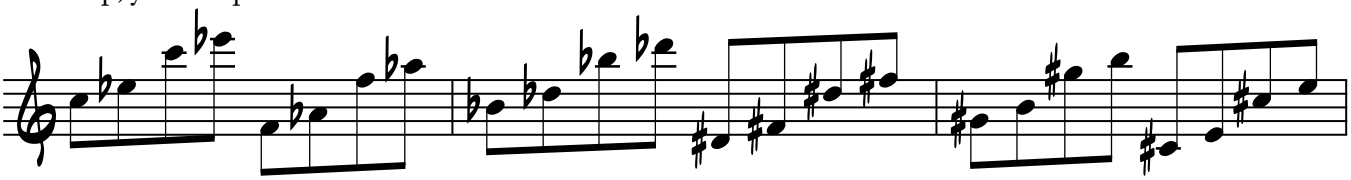

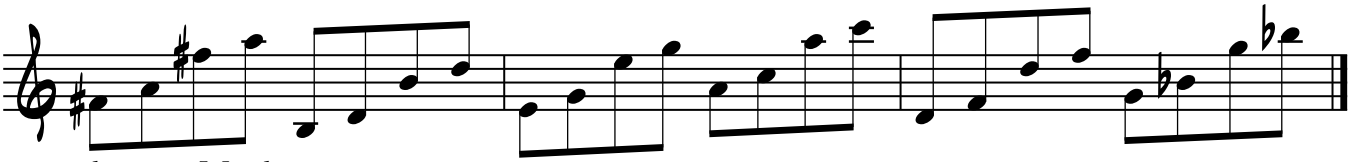

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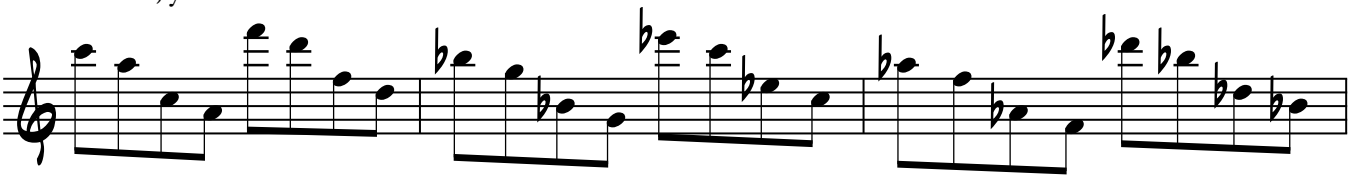

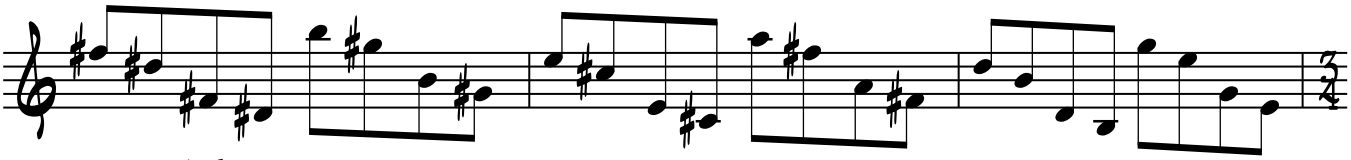

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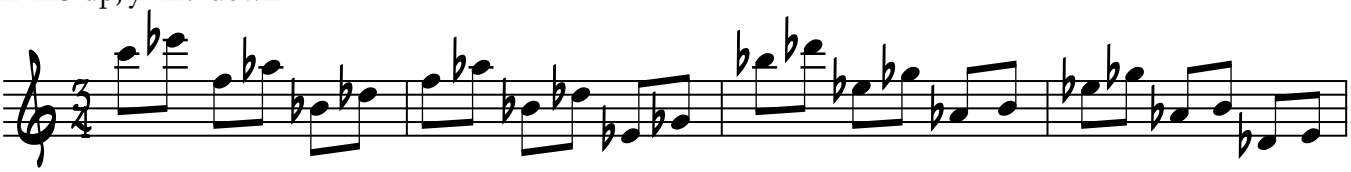

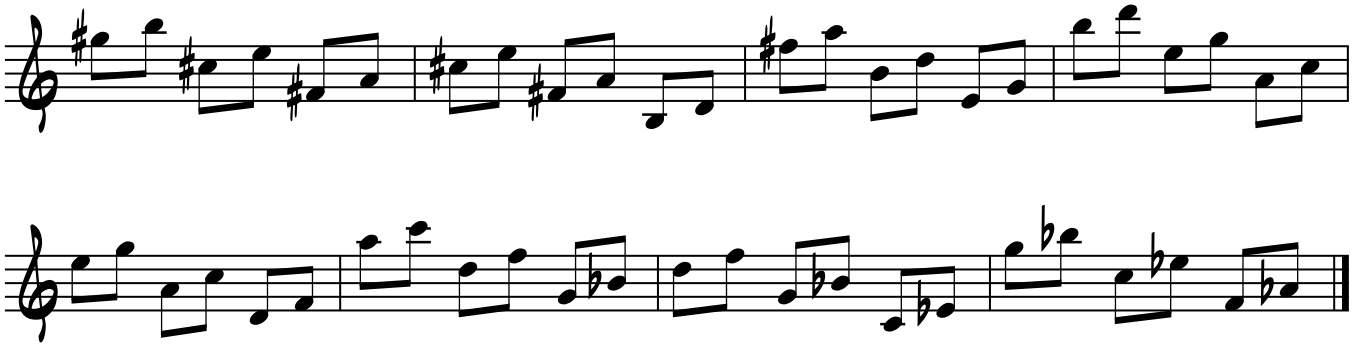

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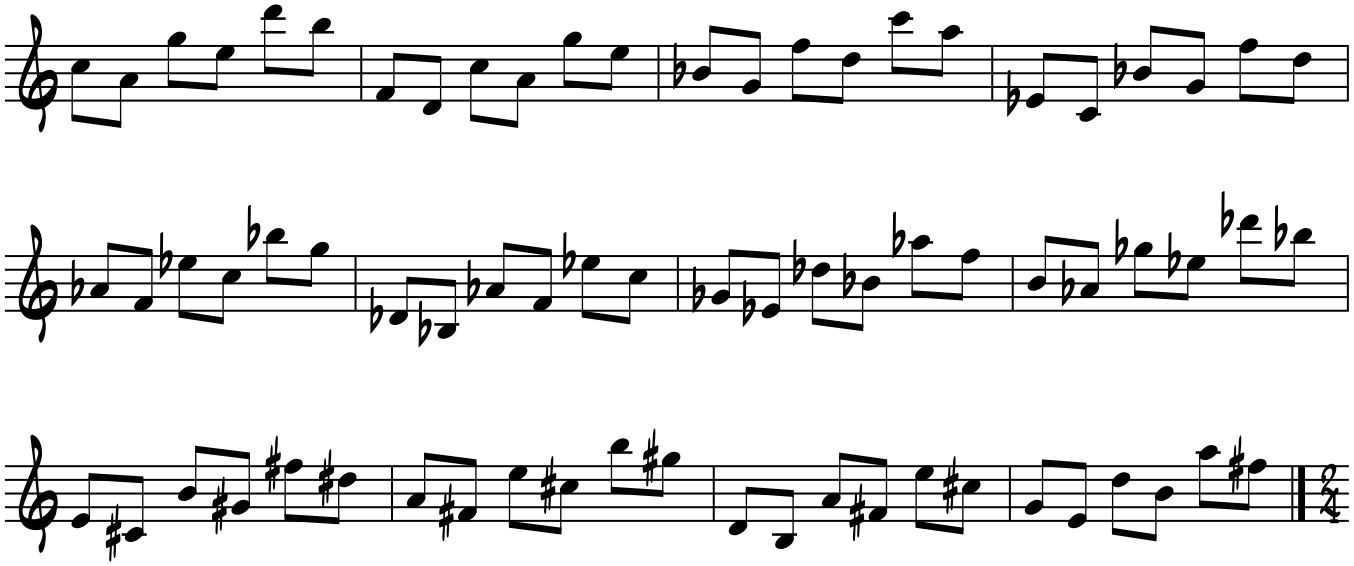

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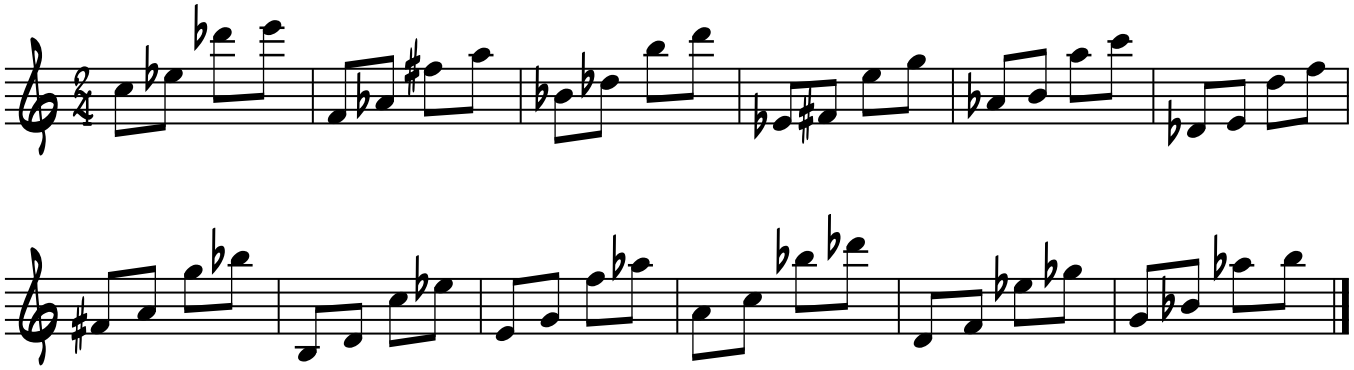

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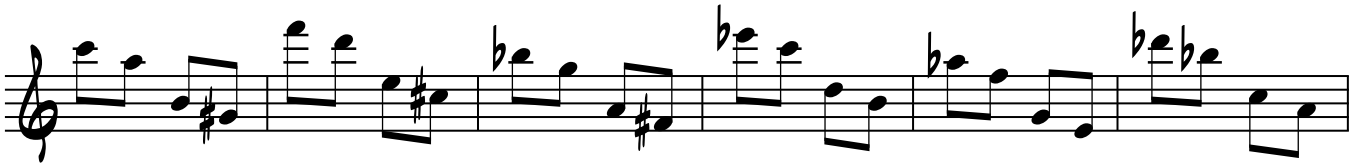

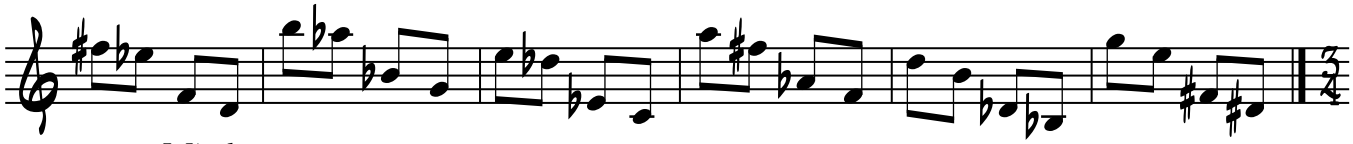

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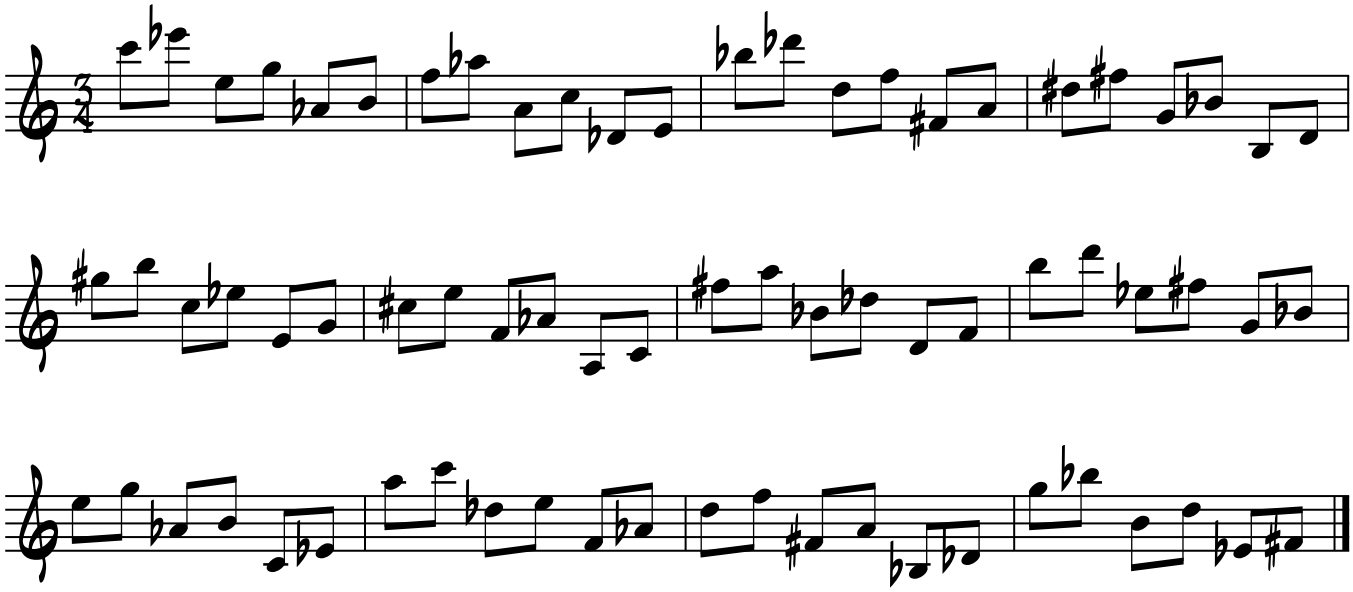

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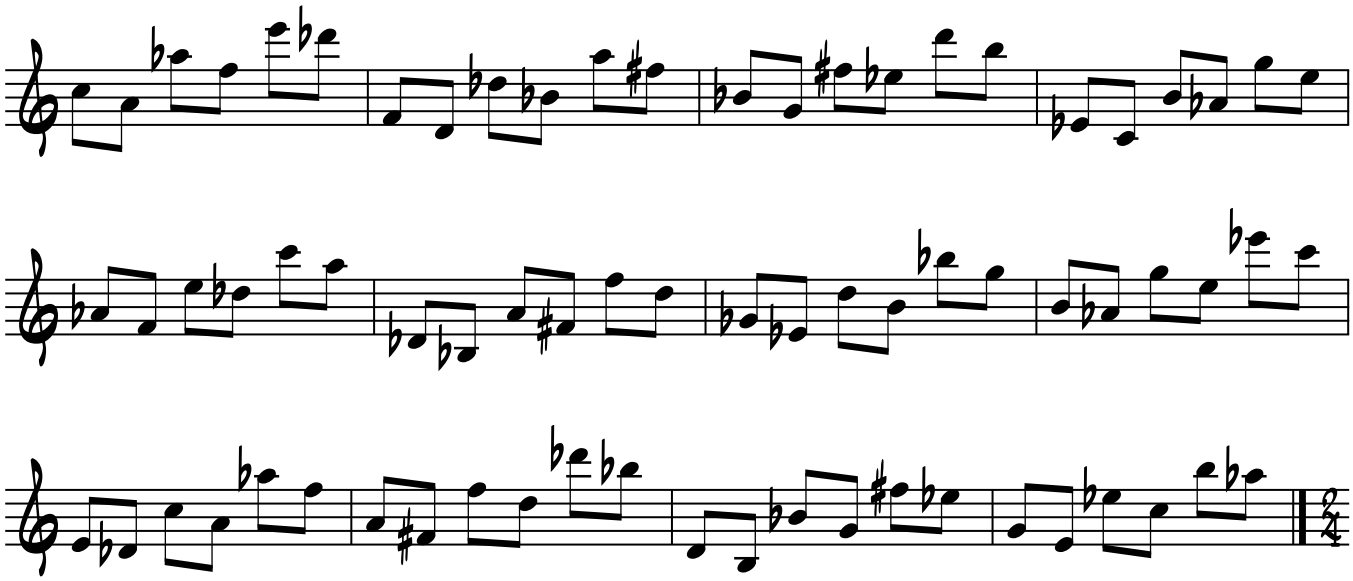

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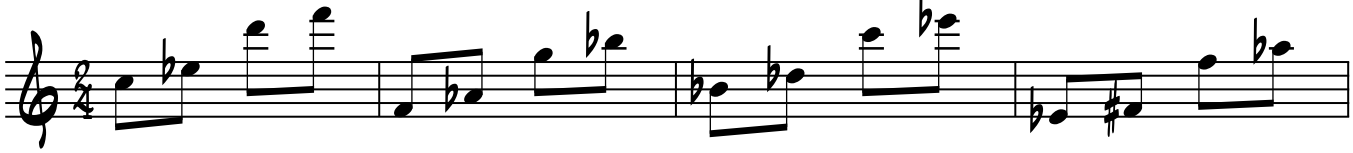

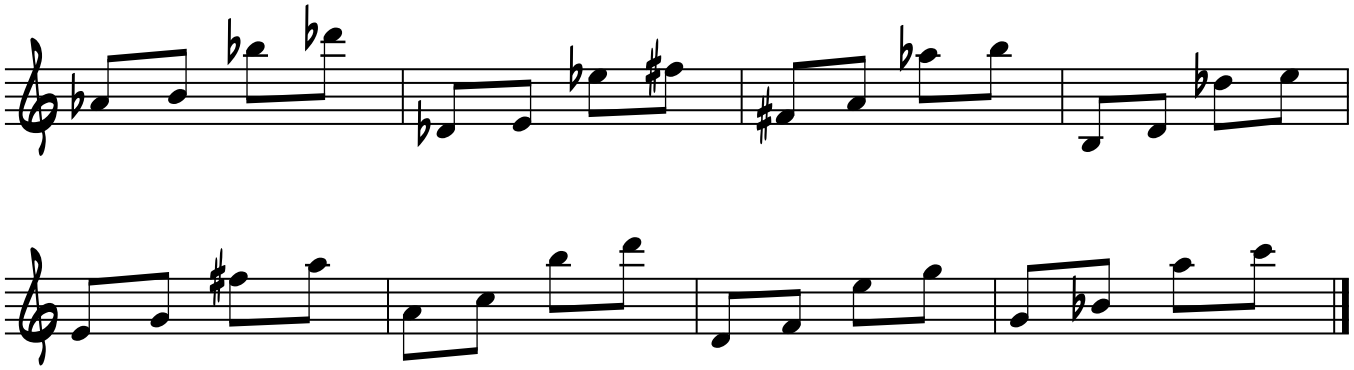

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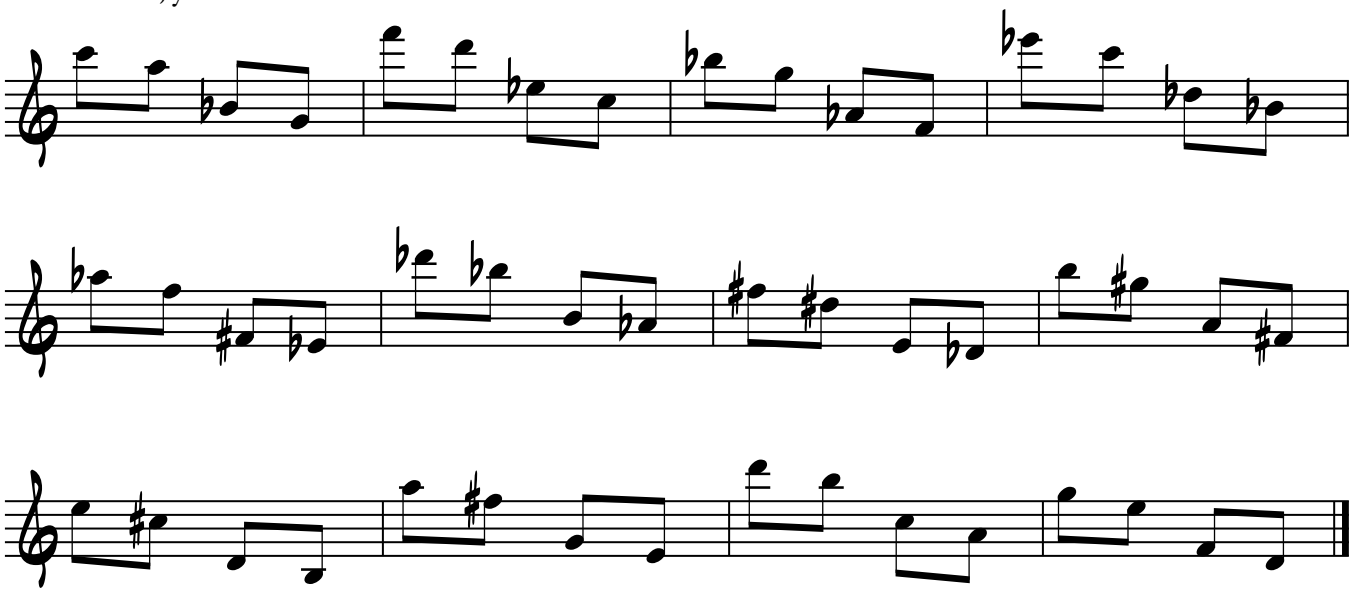

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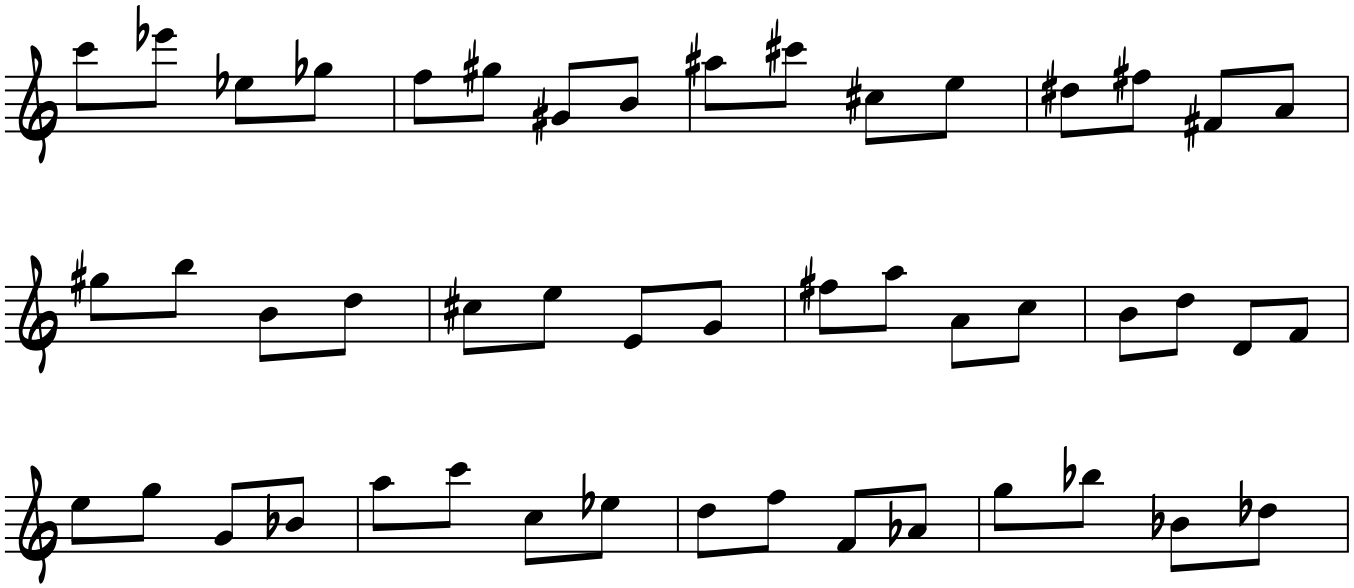

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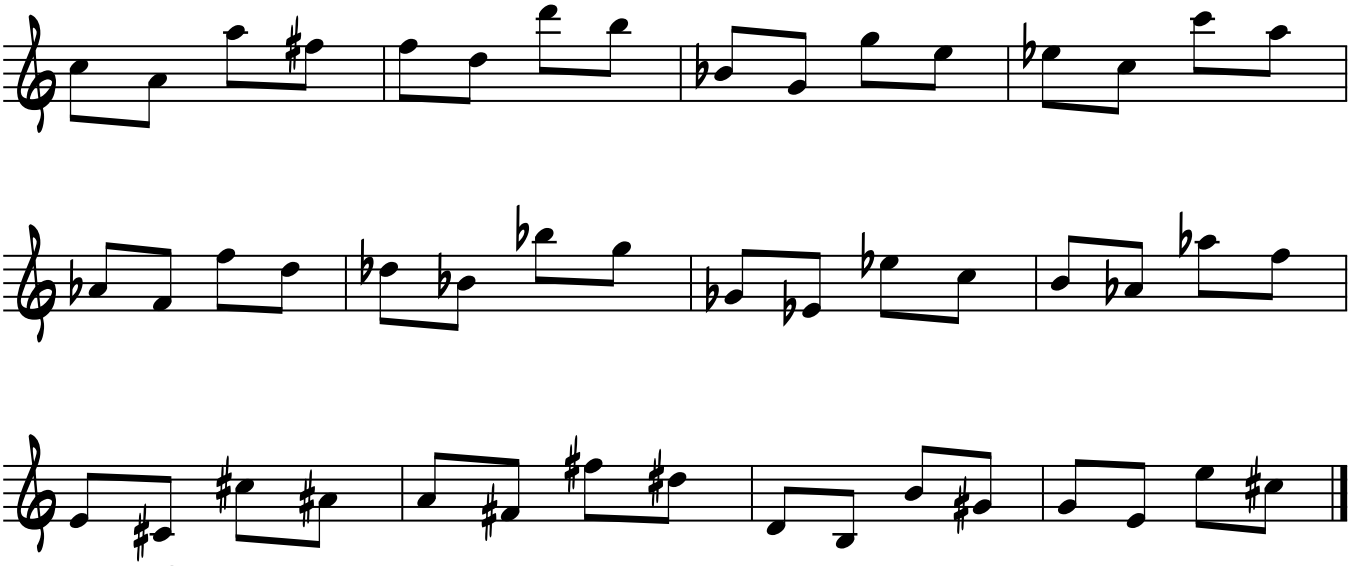

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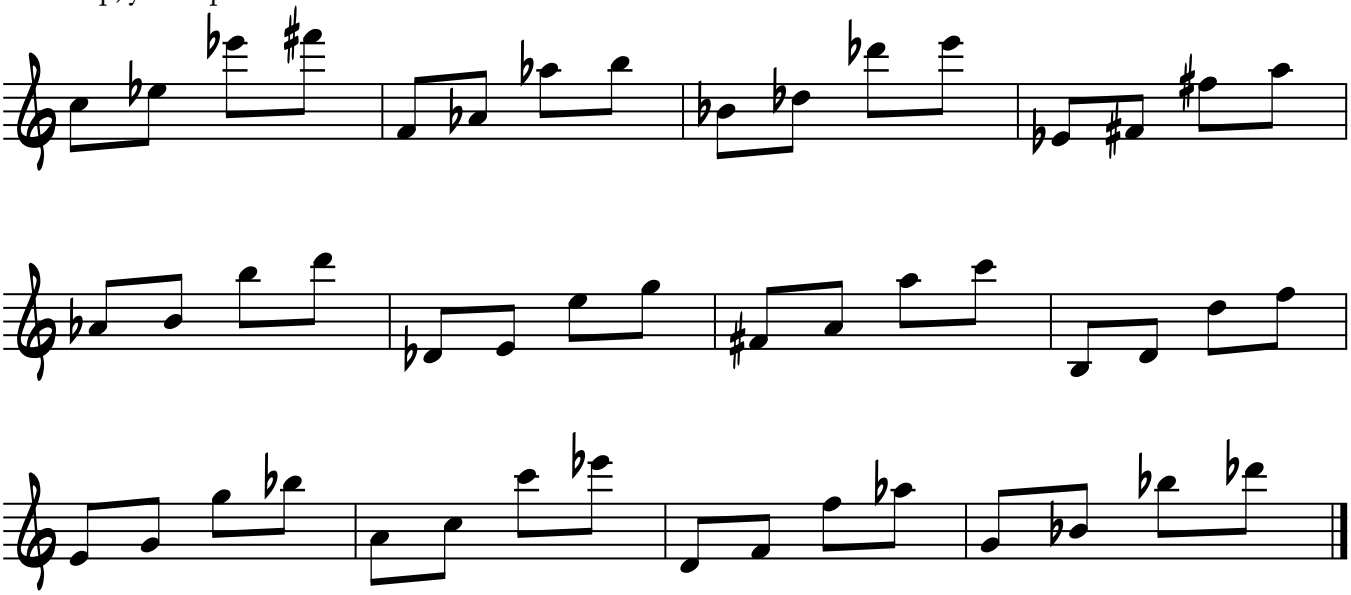

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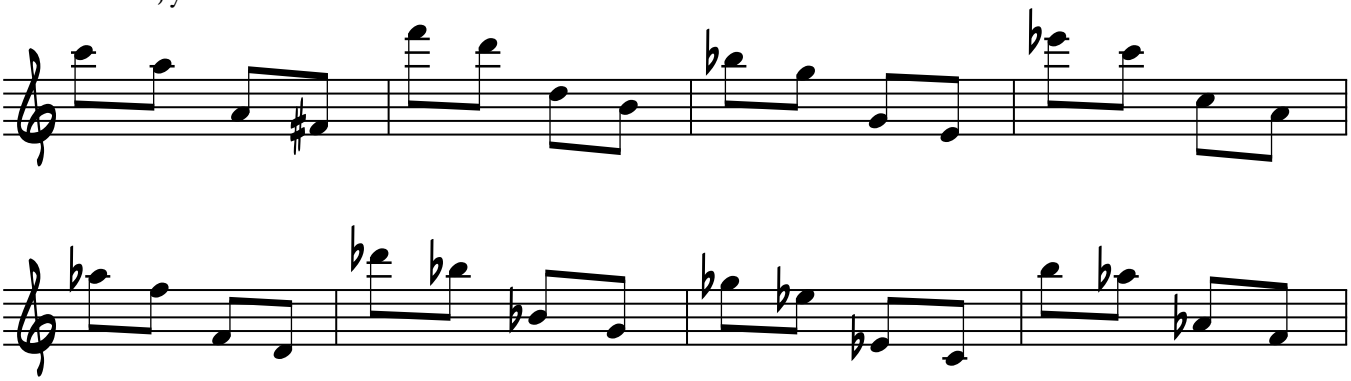

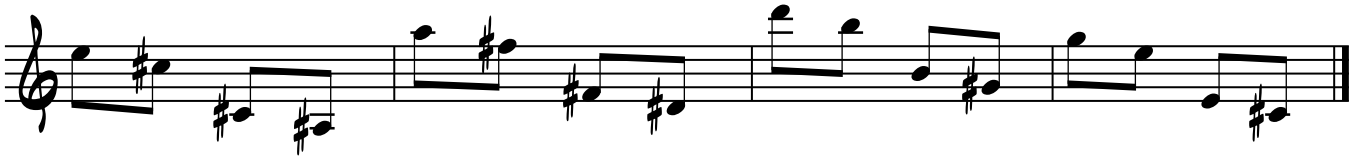

MAJOR 3rds

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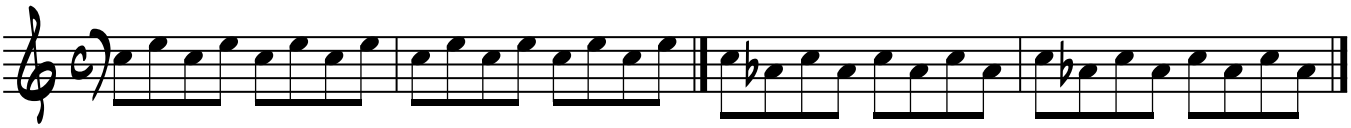
x=M3 down, y=M3 up



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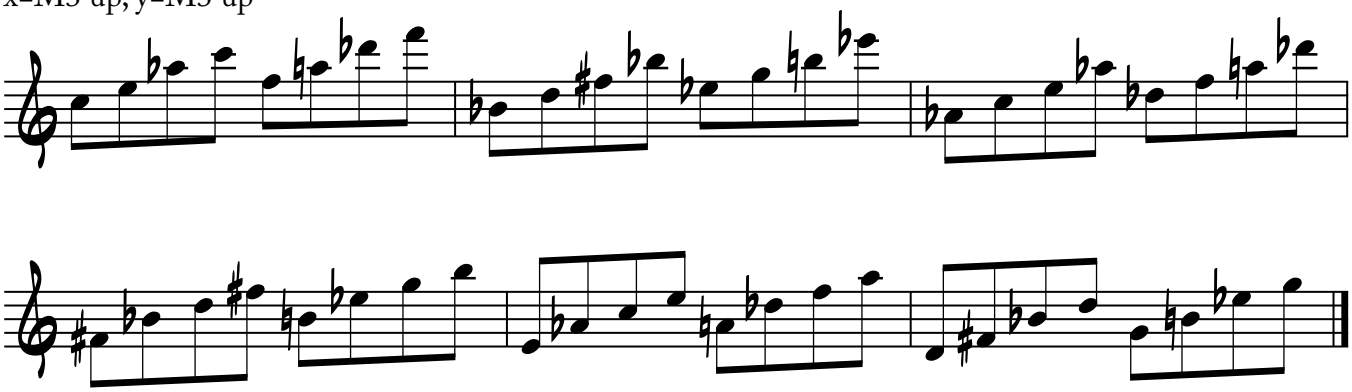

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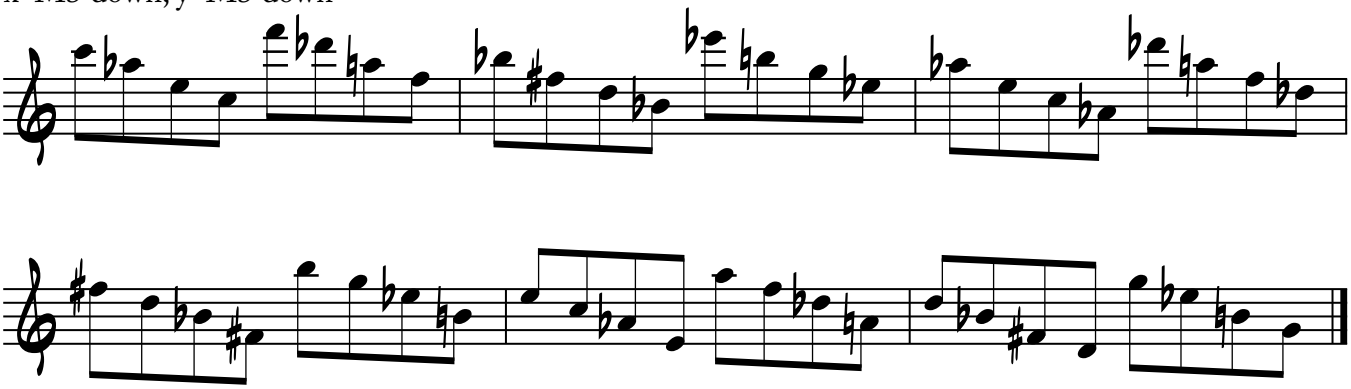

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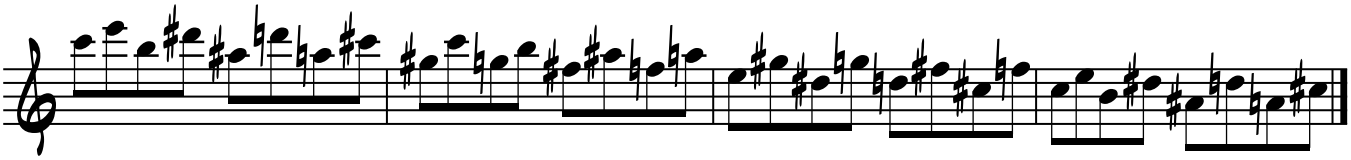

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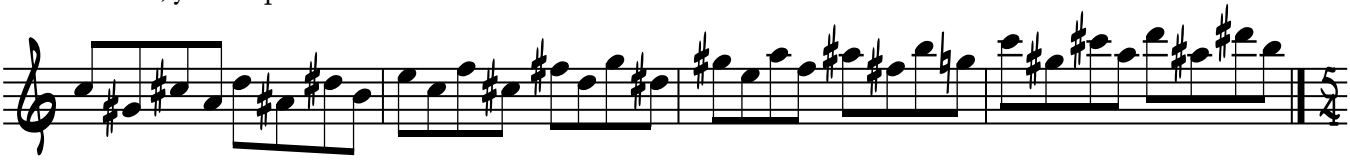

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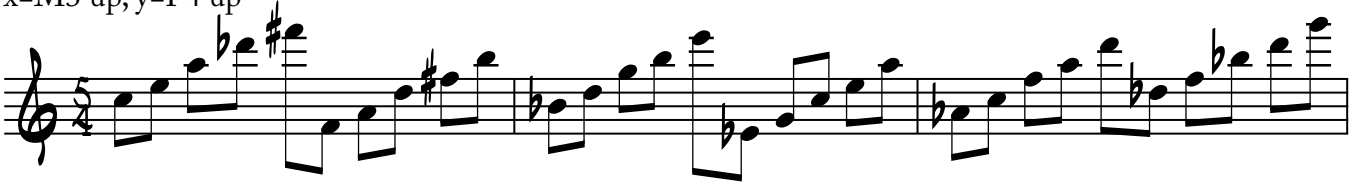

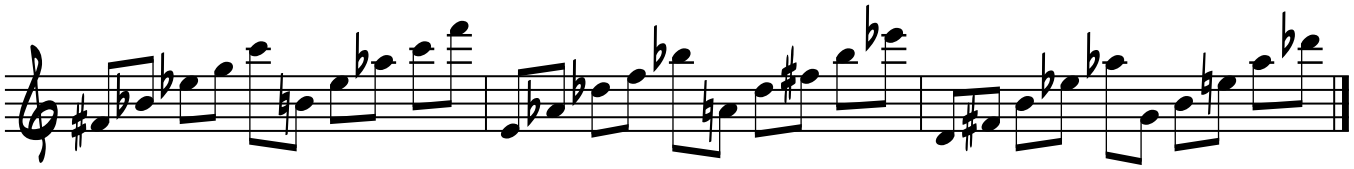

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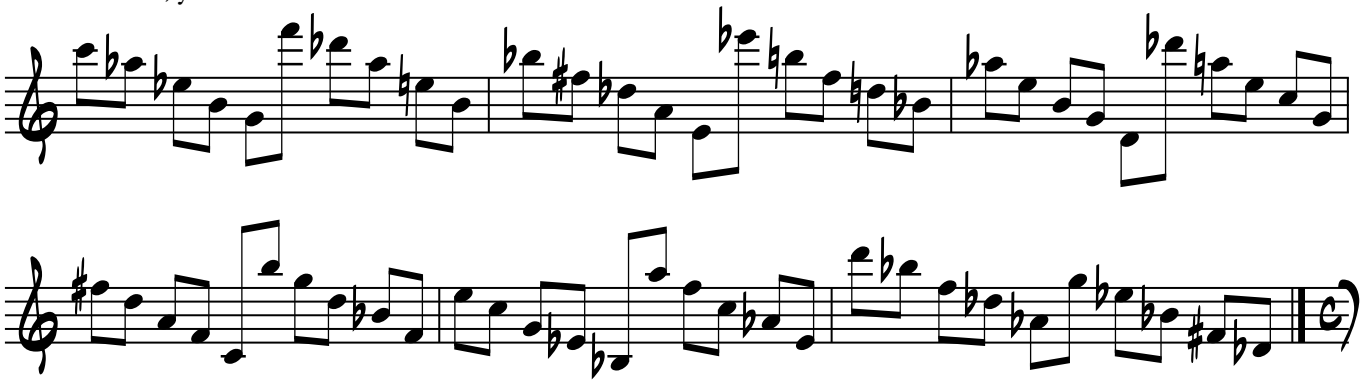

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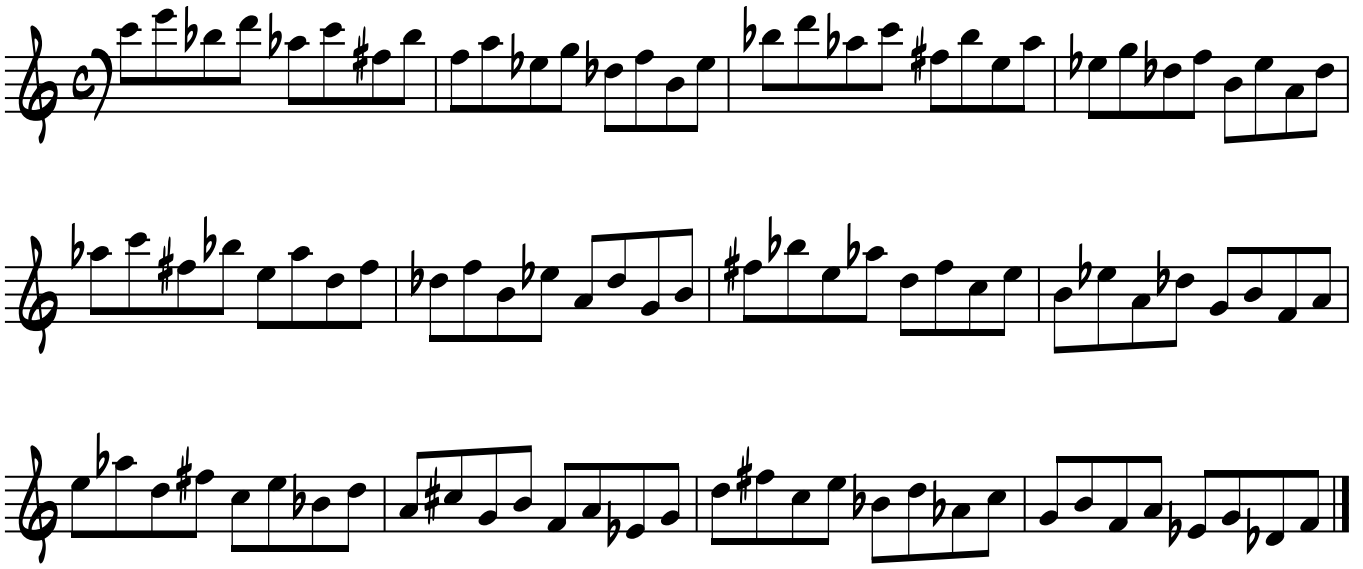

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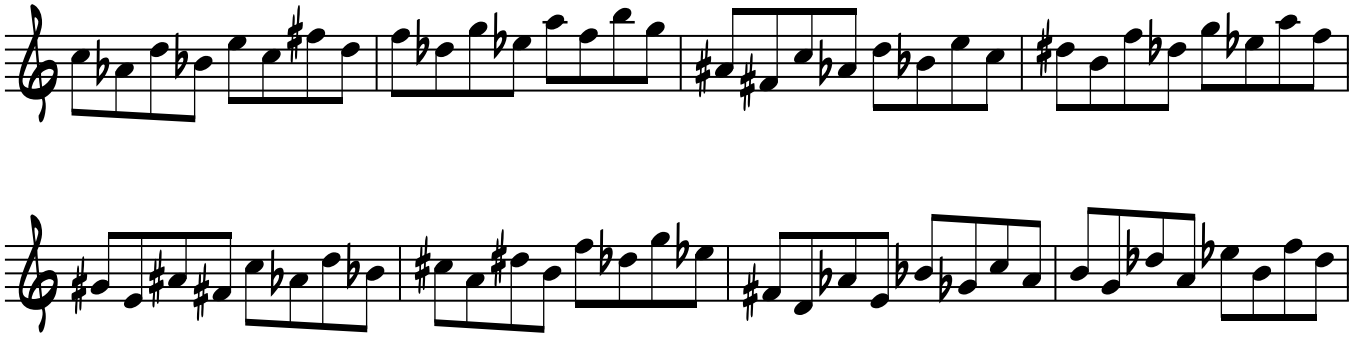

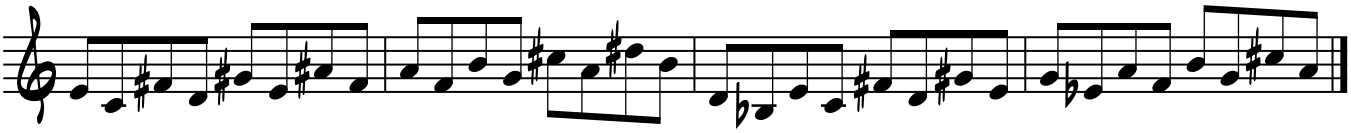

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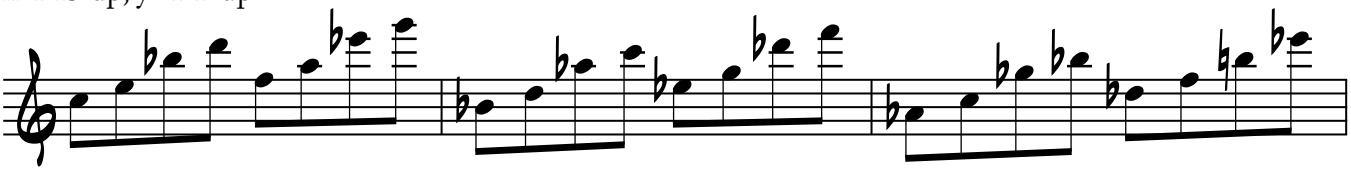

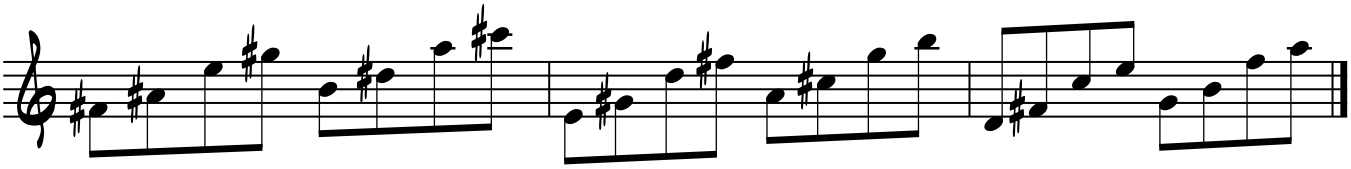

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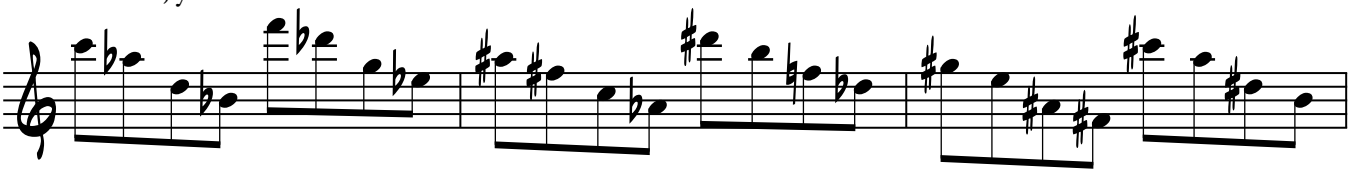

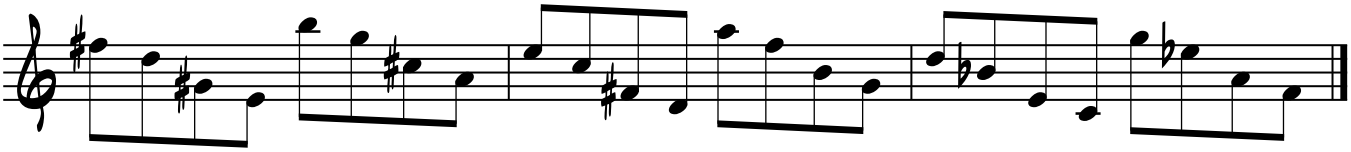

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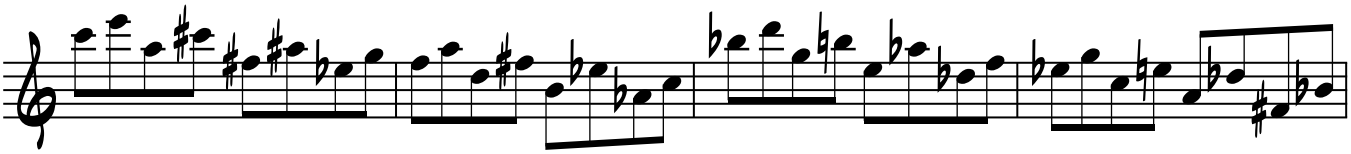

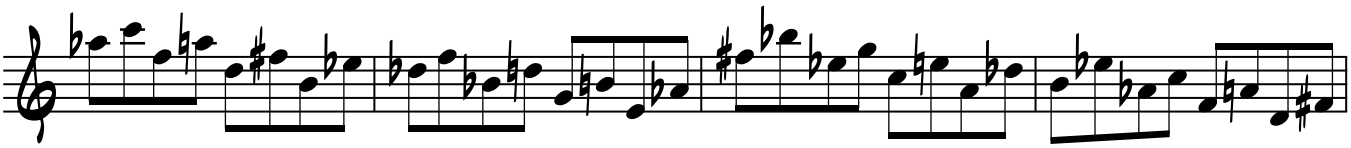

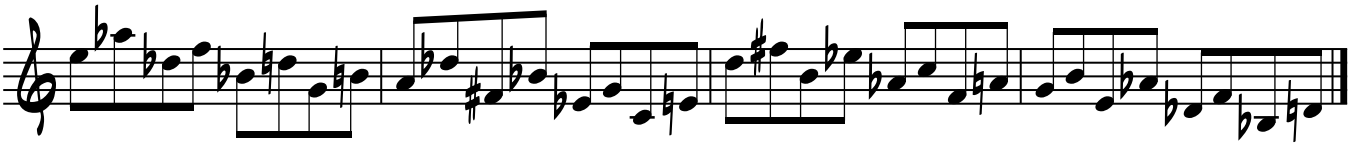

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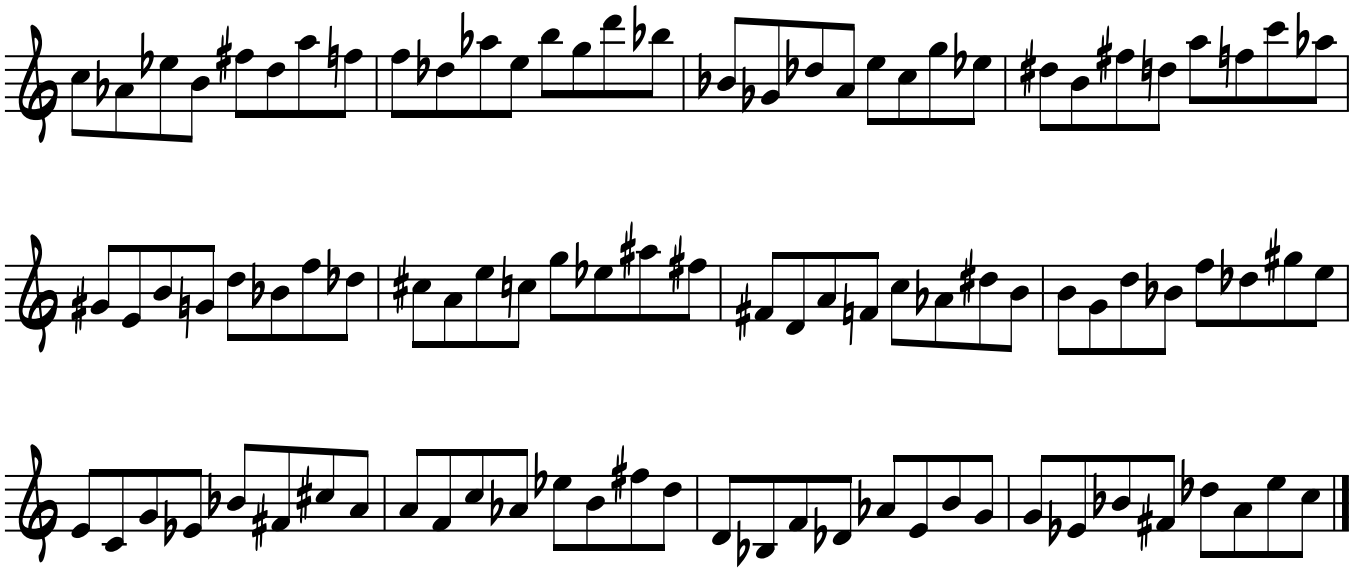

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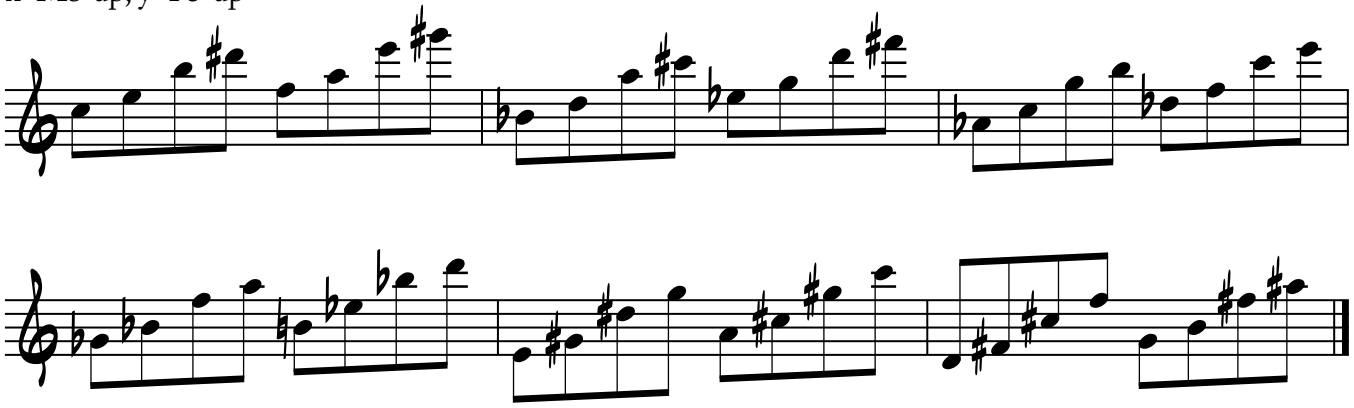

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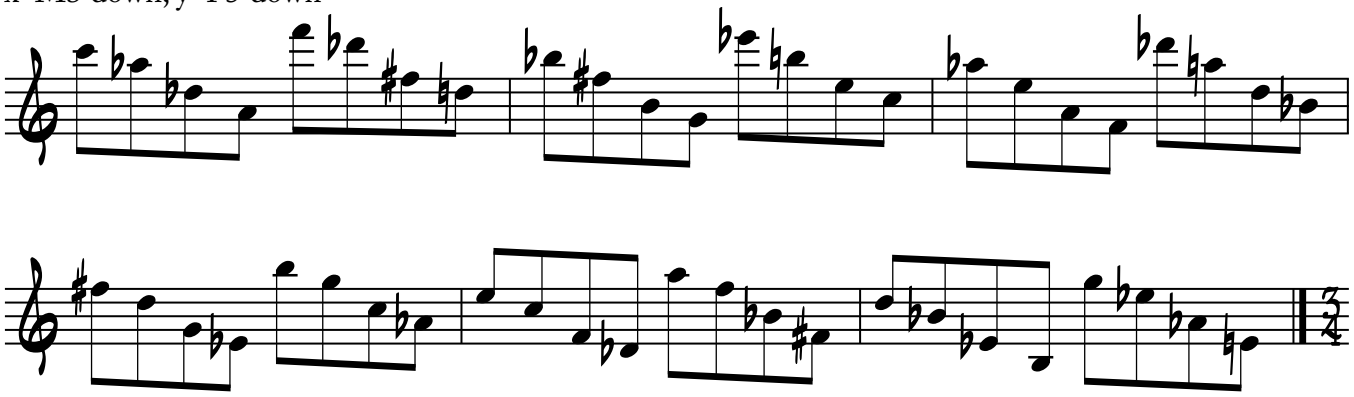

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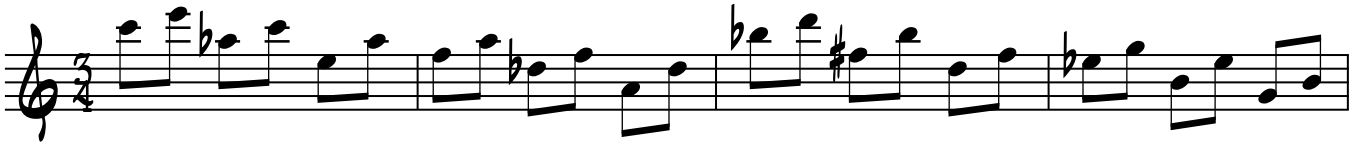

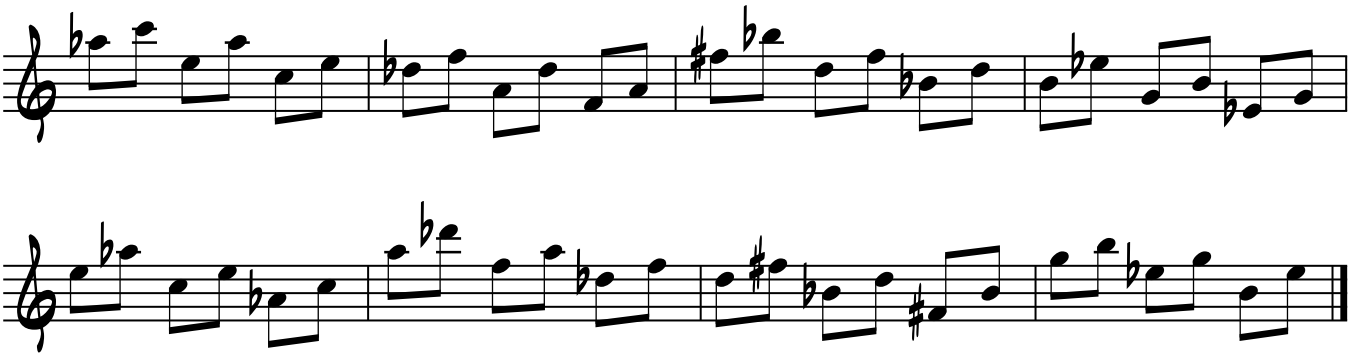

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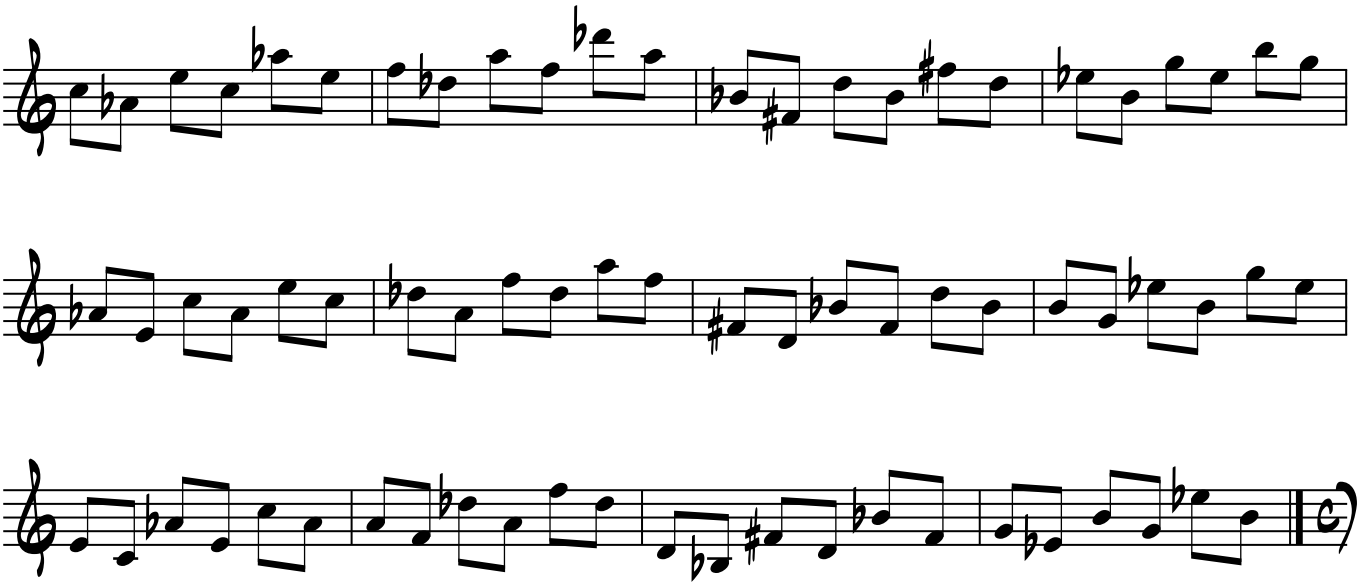

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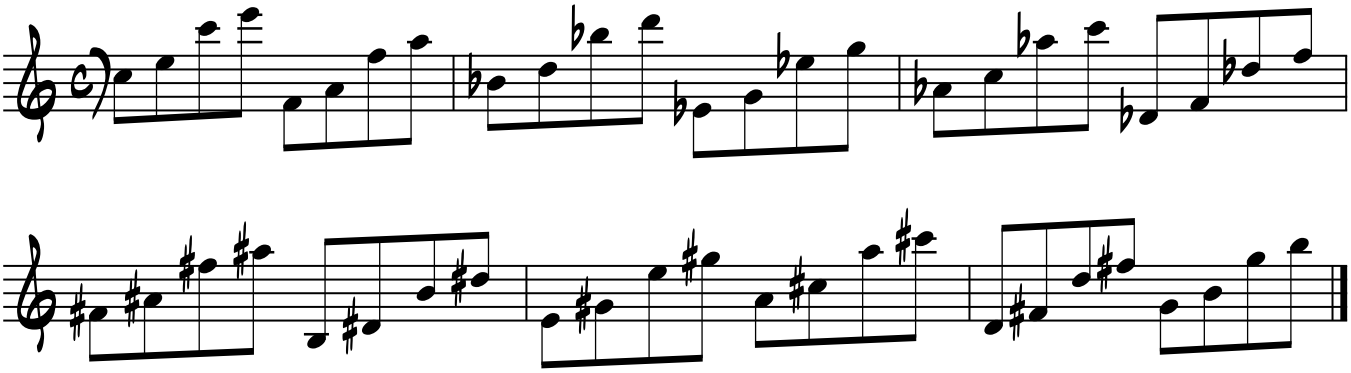

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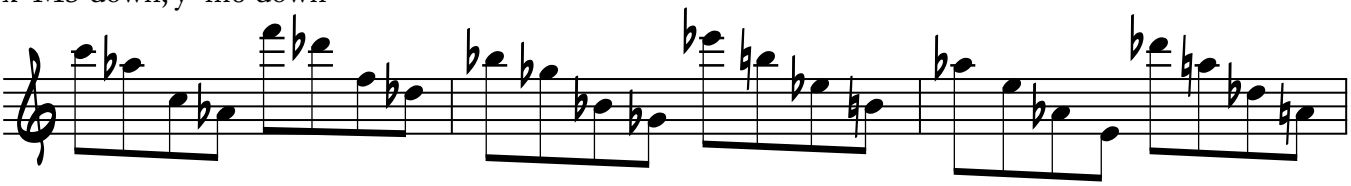

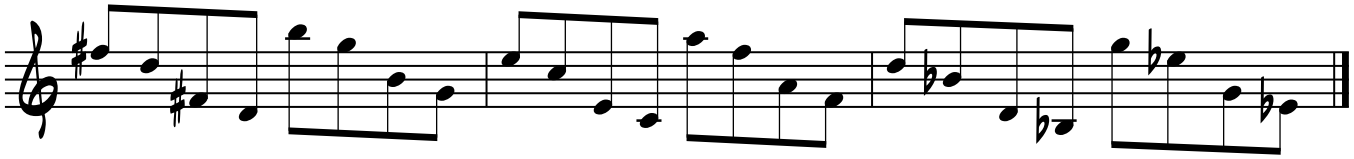

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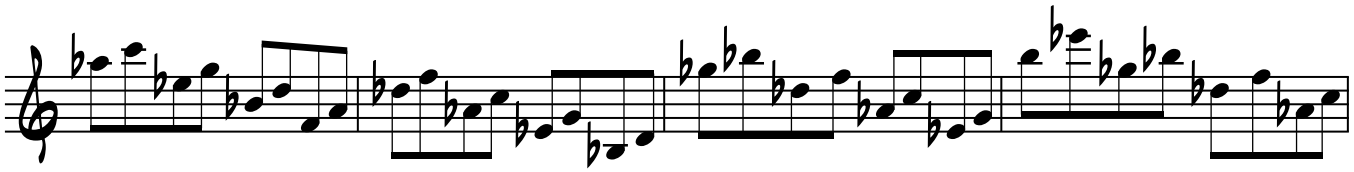

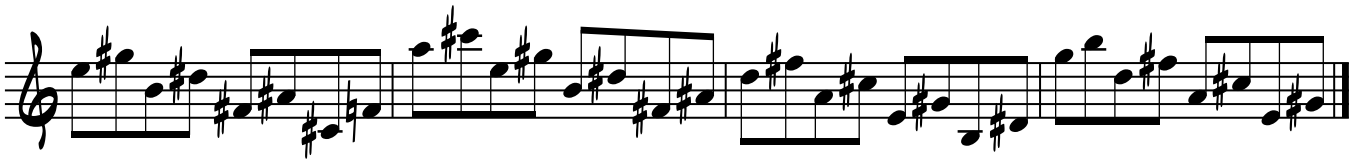

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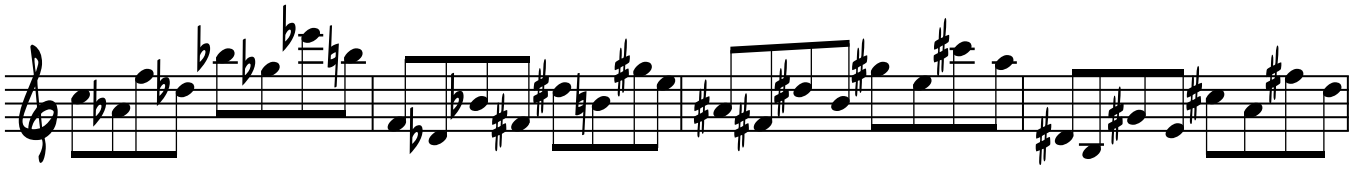

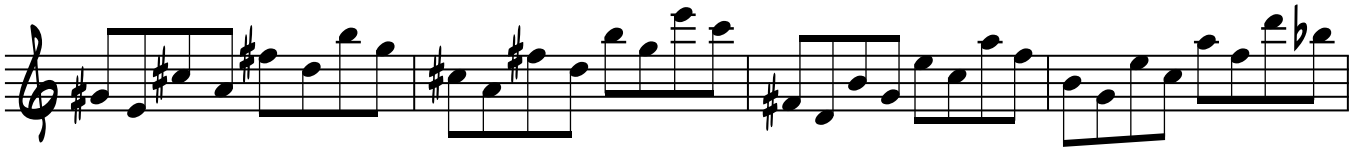

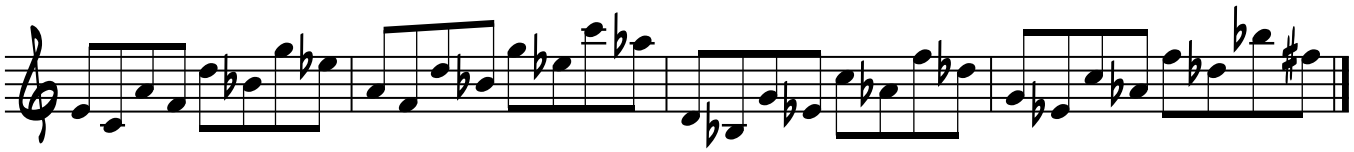

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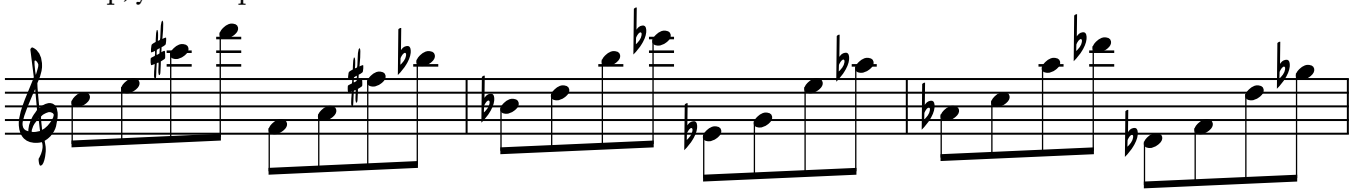

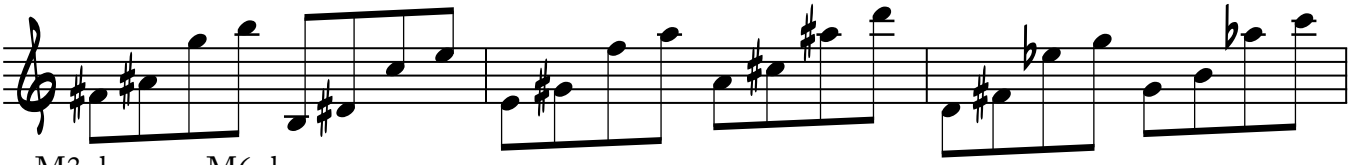

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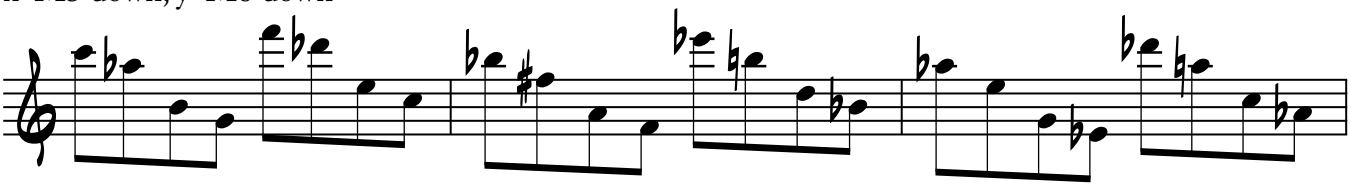

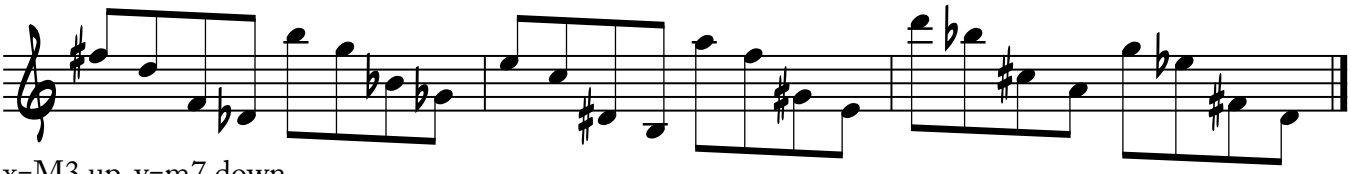

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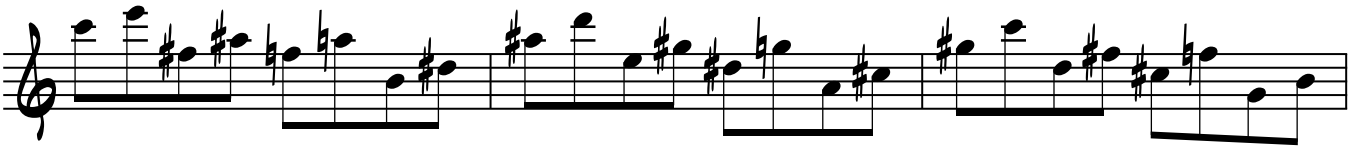

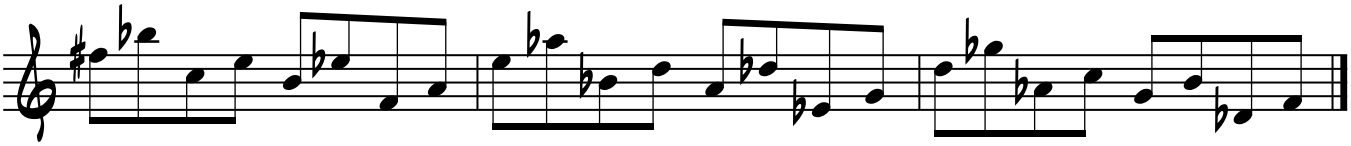

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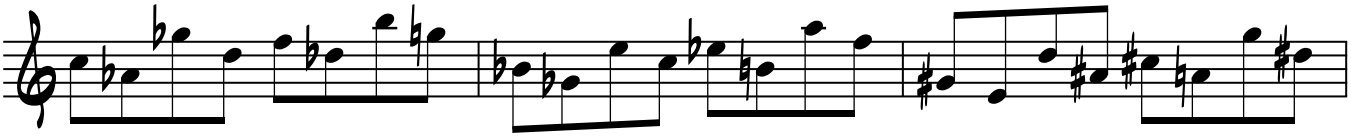

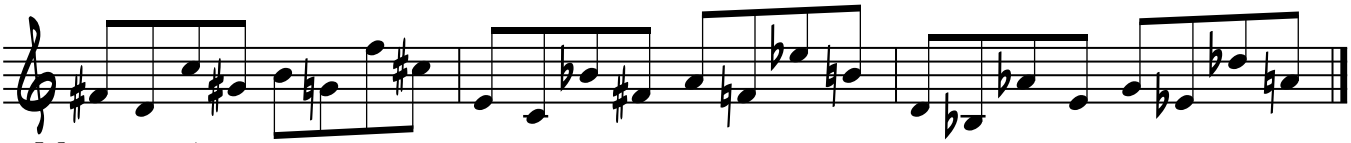

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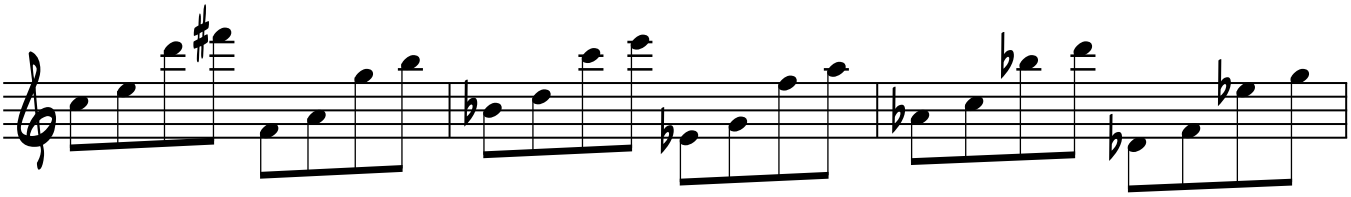

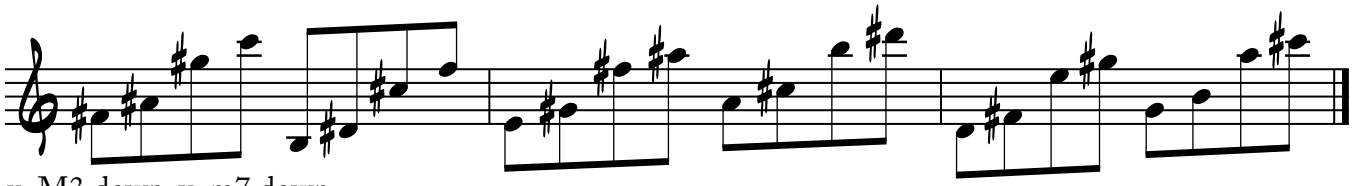

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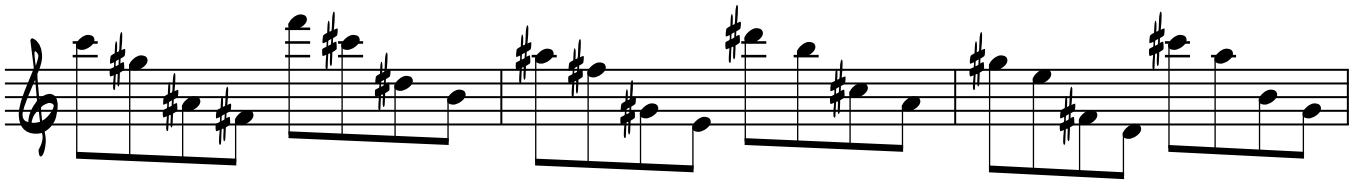

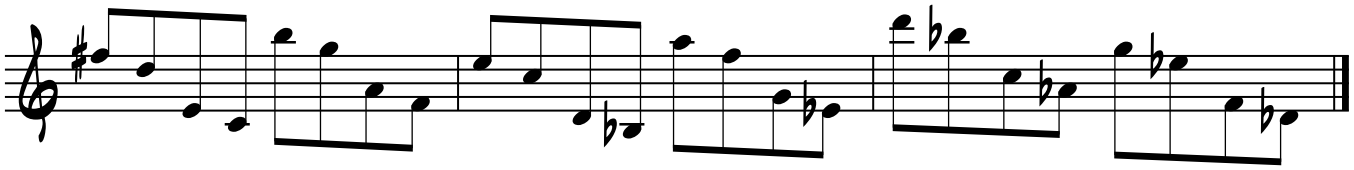

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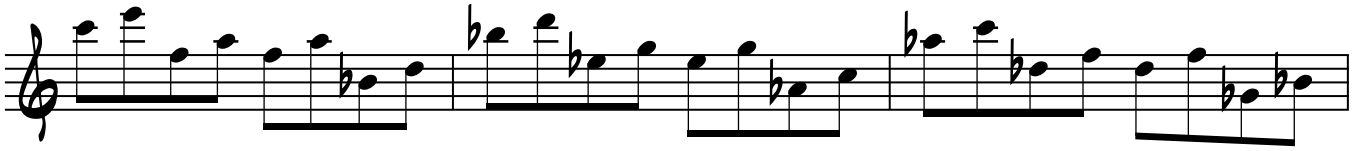

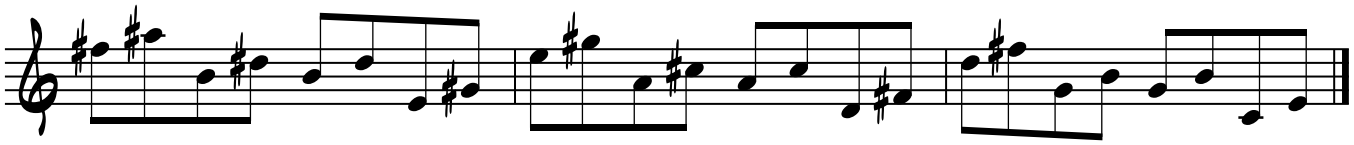

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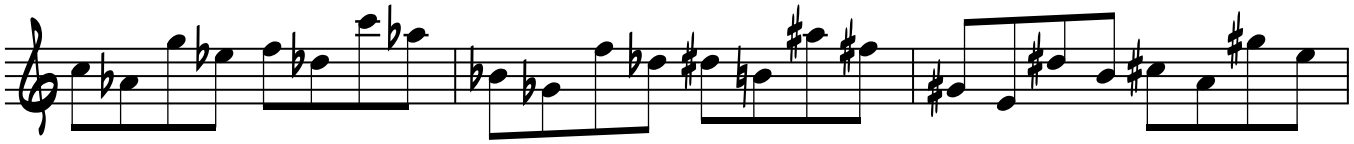

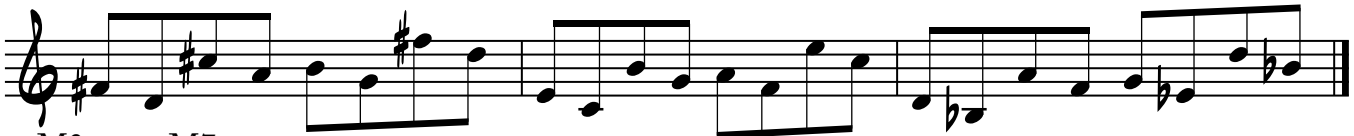

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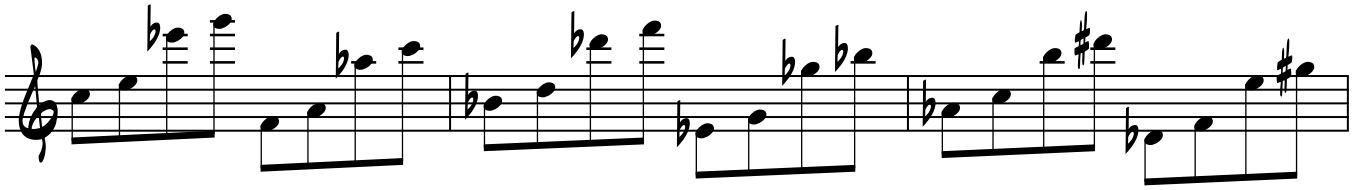

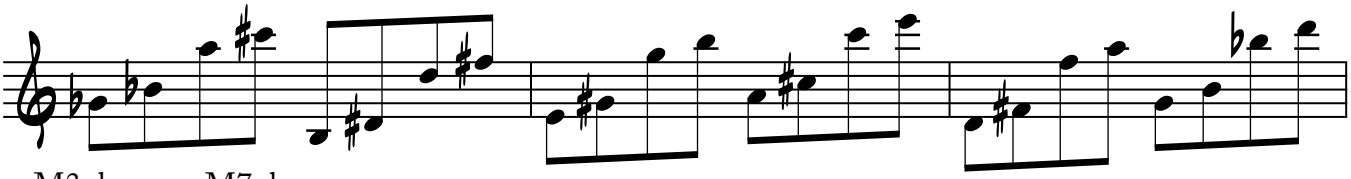

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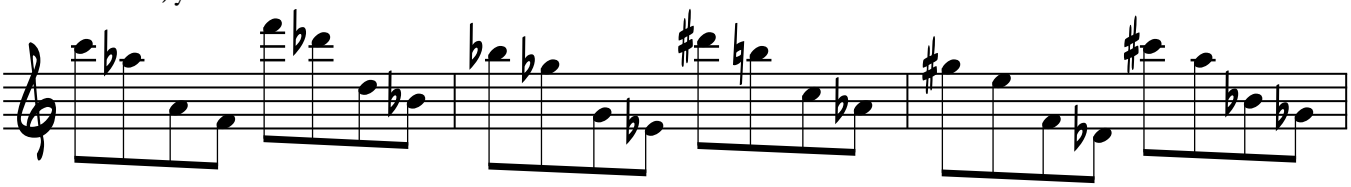

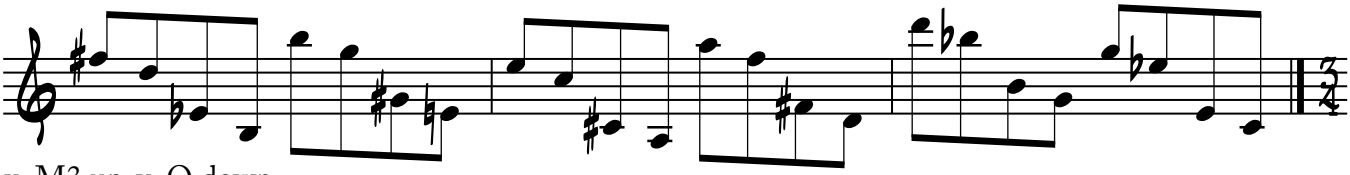

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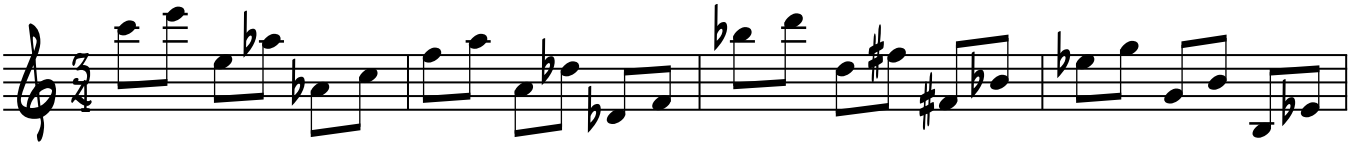

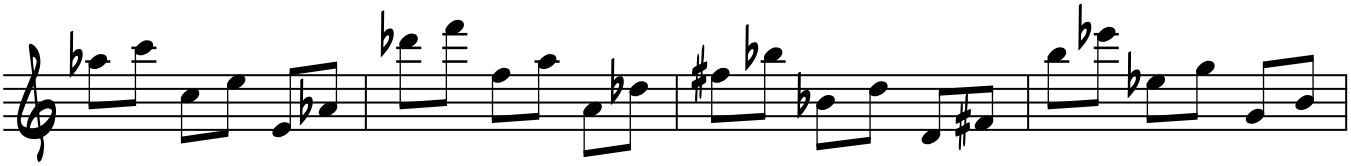

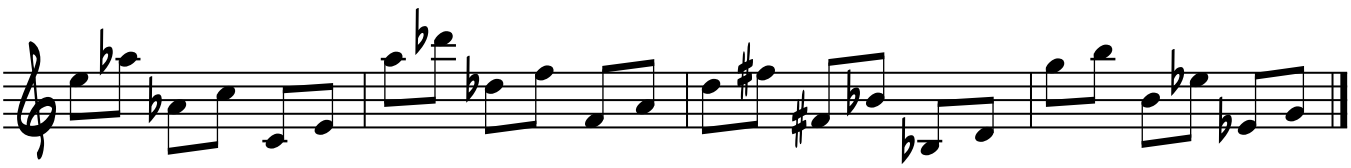

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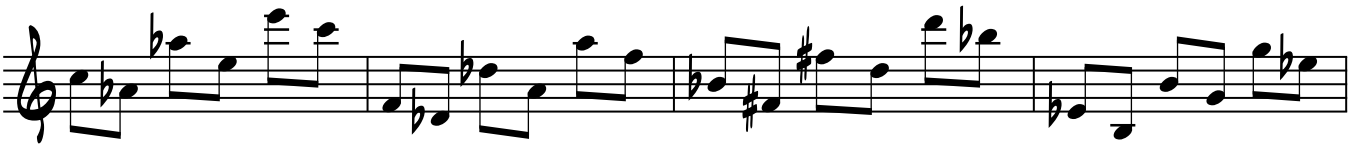

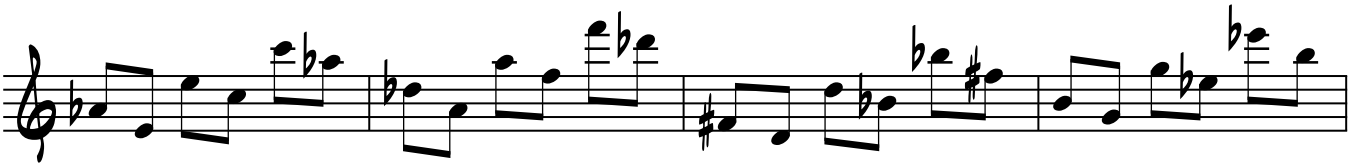

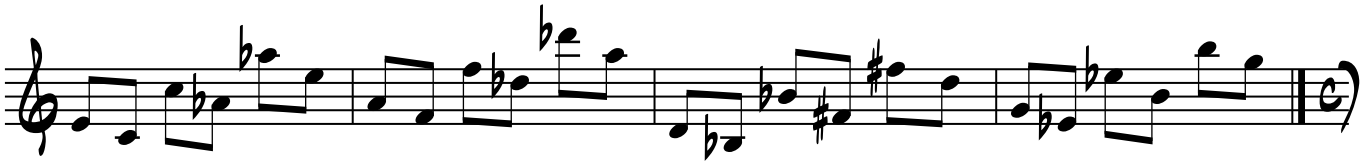

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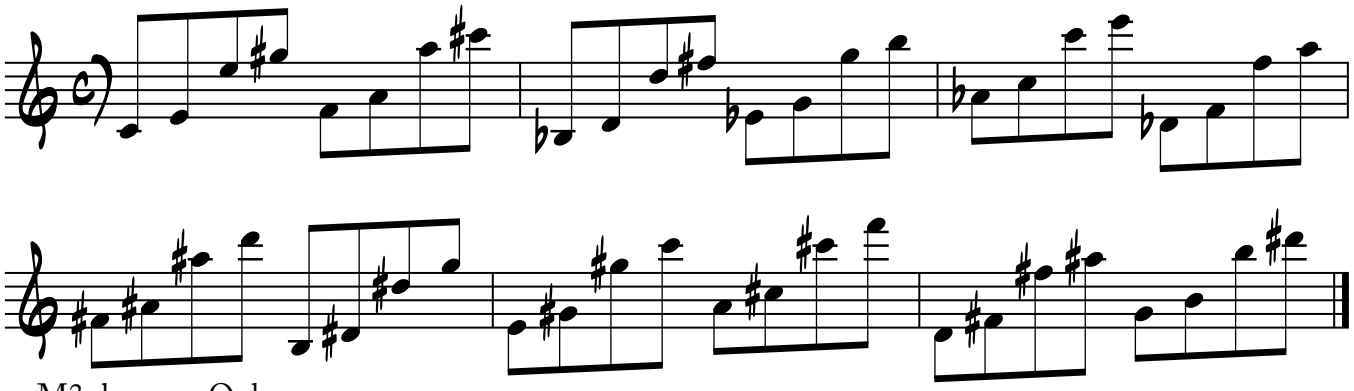
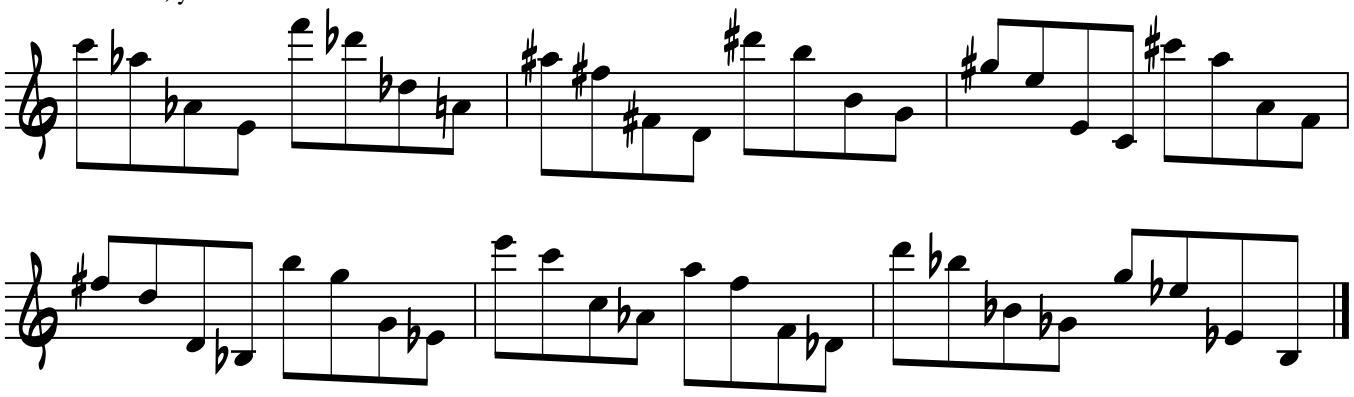


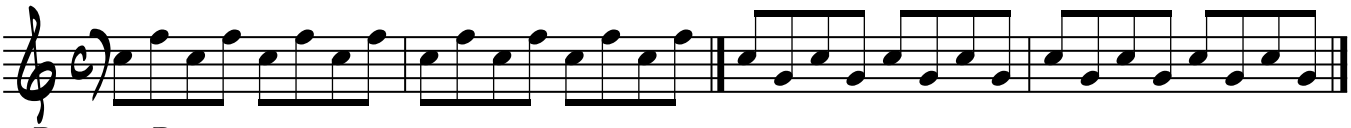
x=M3 down, y=O down



PERFECT 4ths

x=P4 up, y=P4 down

x=P4 down, y=P4 up



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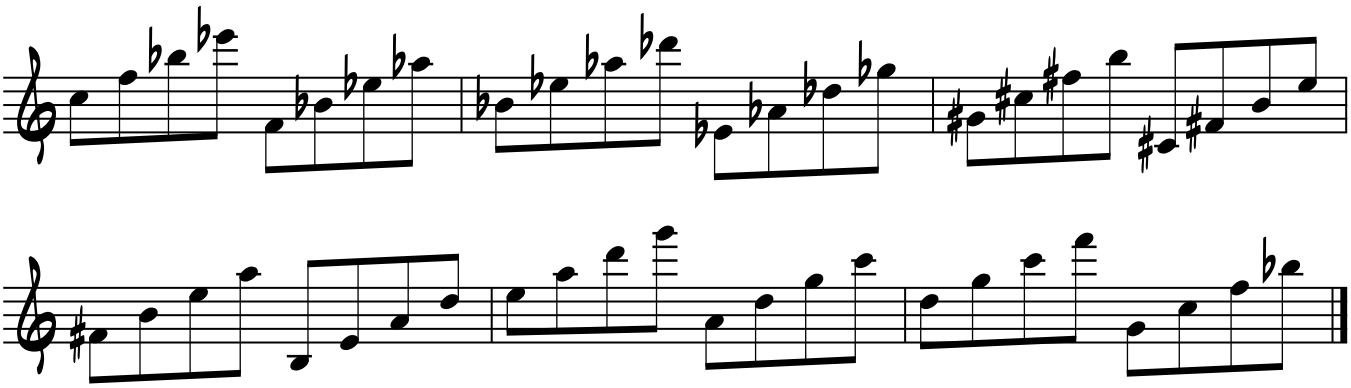
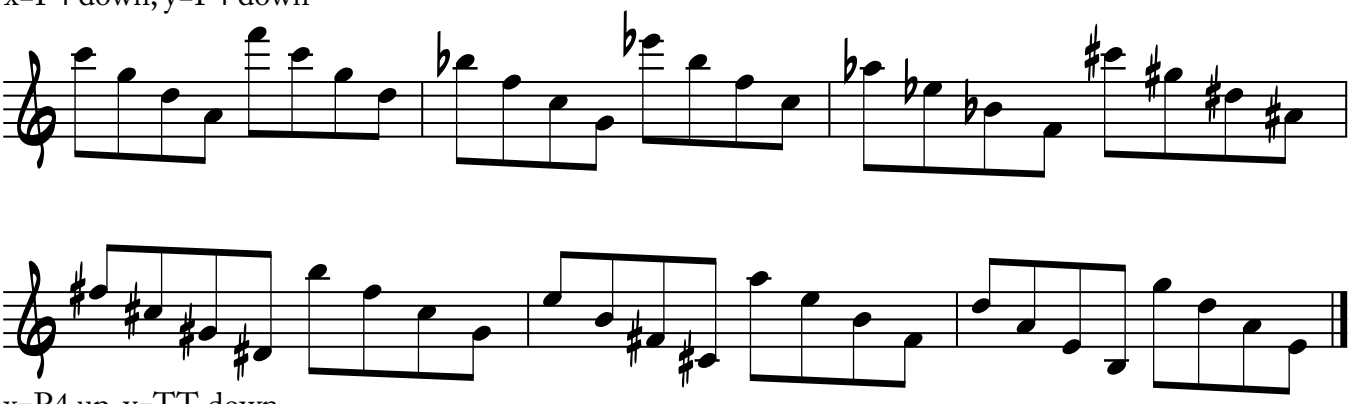
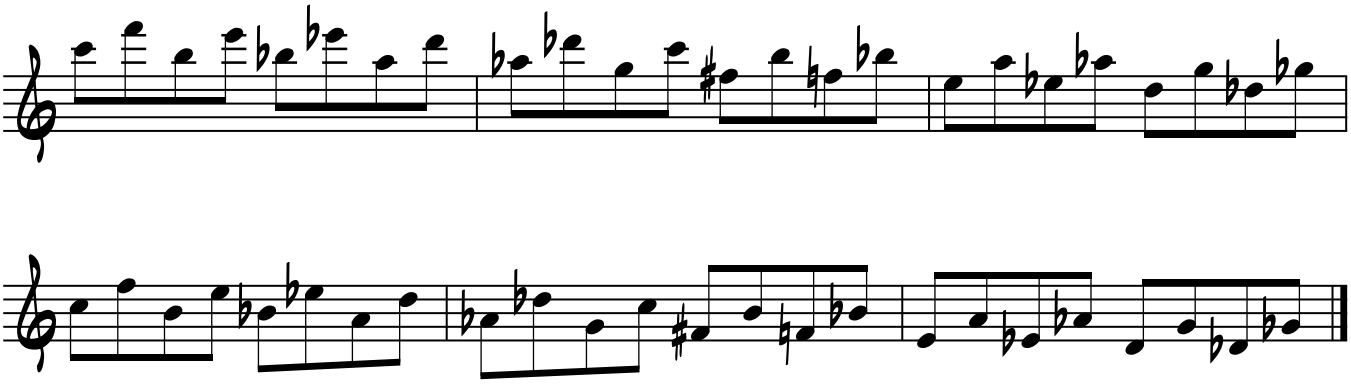


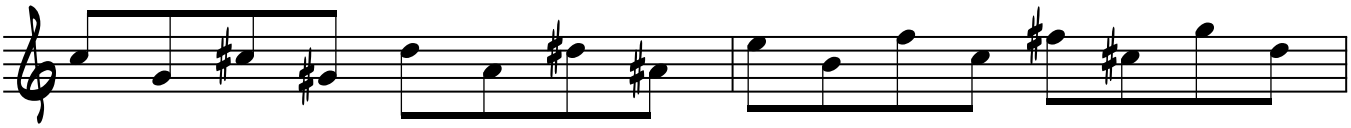
x=P4 down, y=P4 down

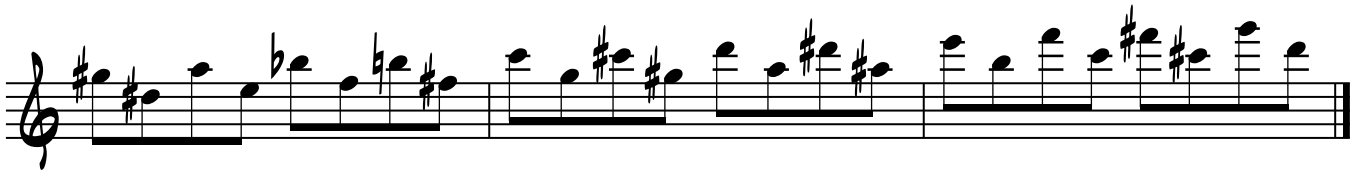


x=P4 up, y=TT down

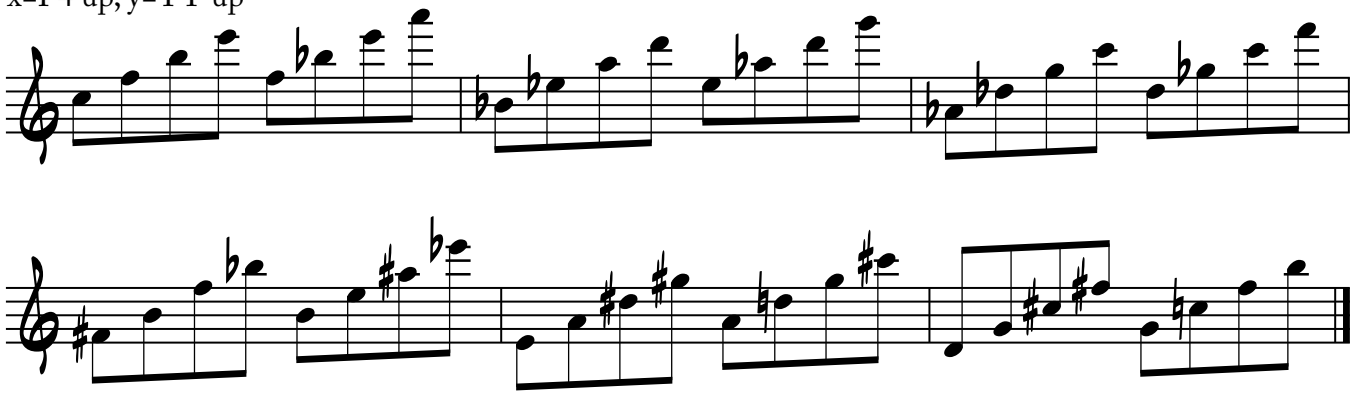


x=P4 down, y=TT up

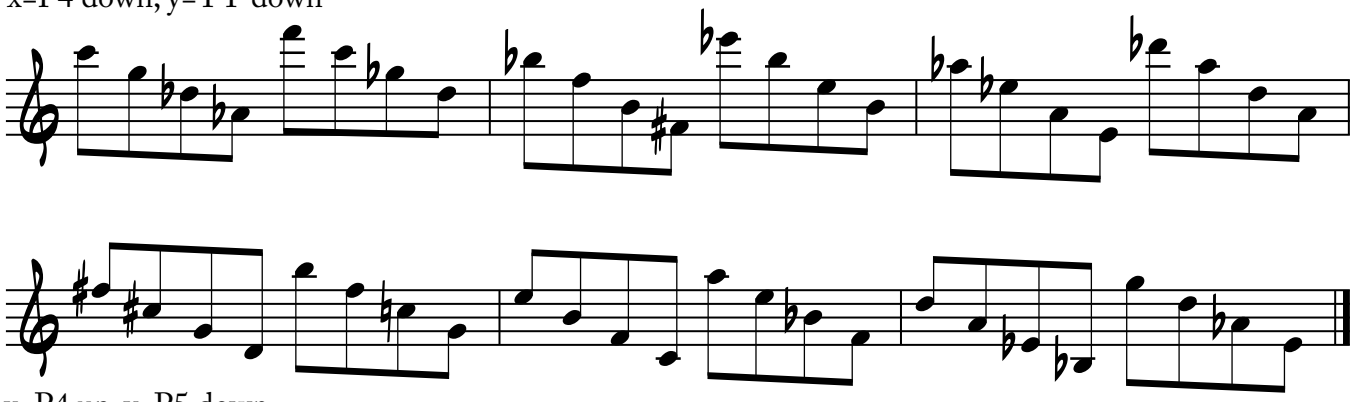




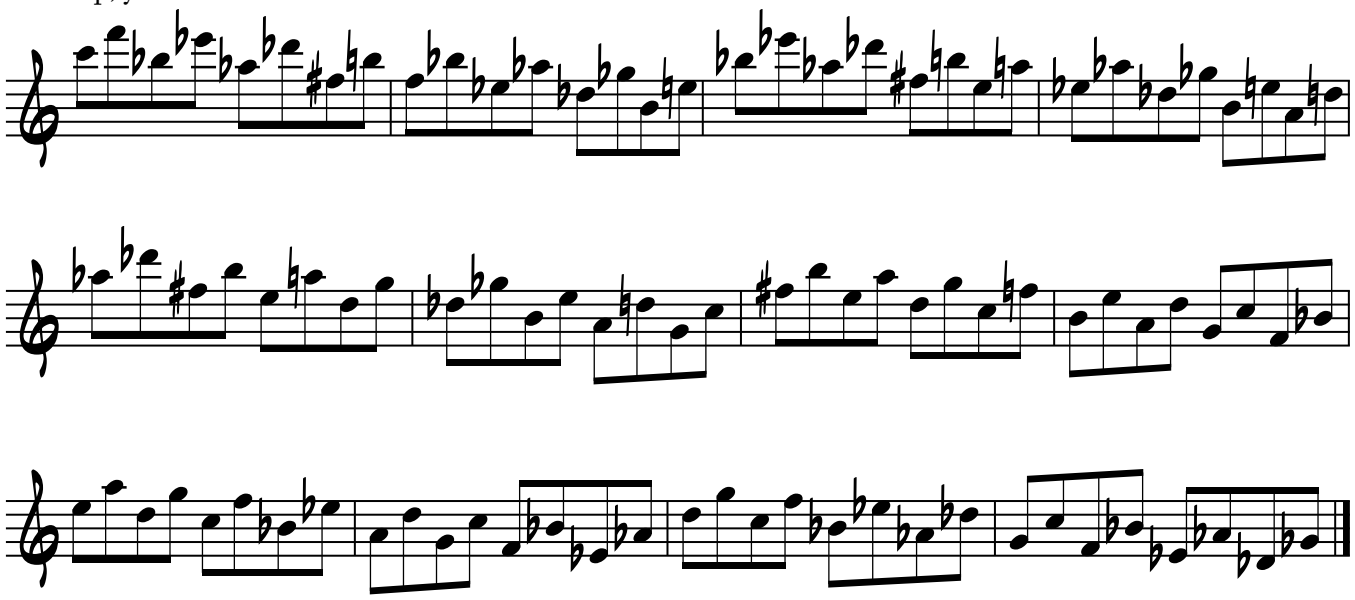
x=P4 up, y=TT up



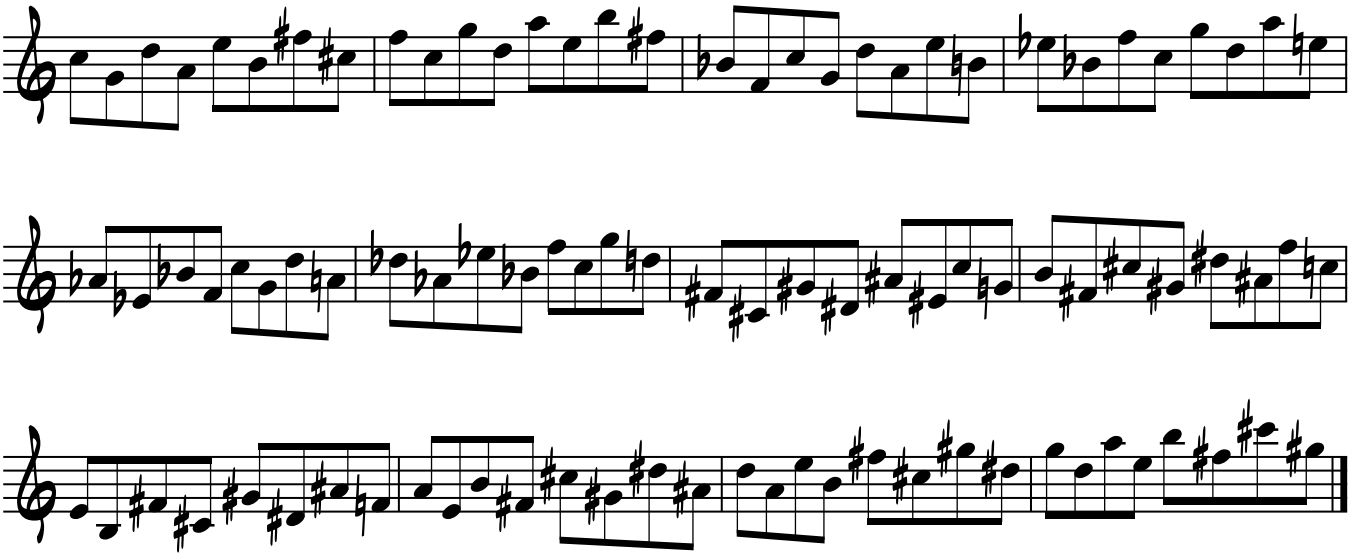
x=P4 down, y=TT down



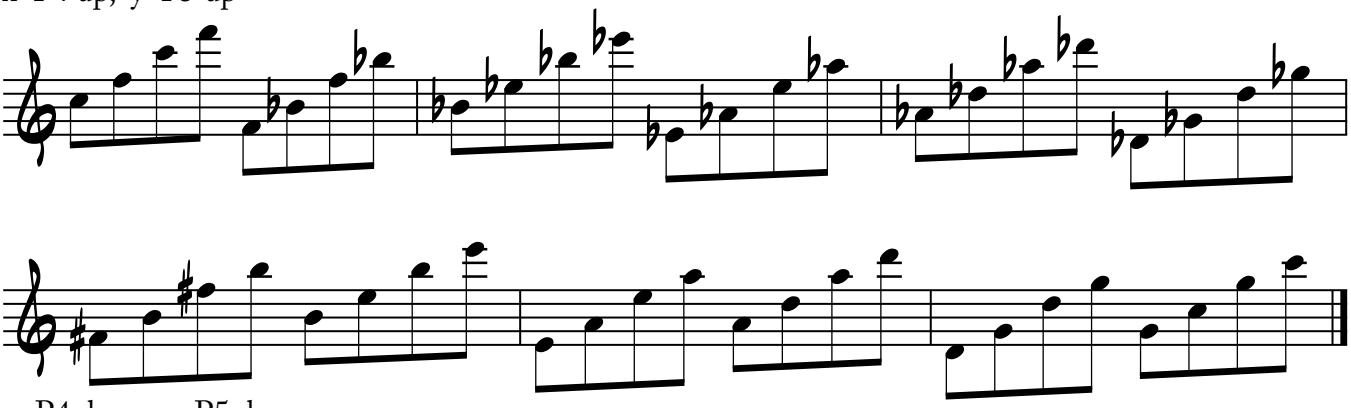
x=P4 up, y=P5 down



x=P4 down, y=P5 up



x=P4 up, y=P5 up



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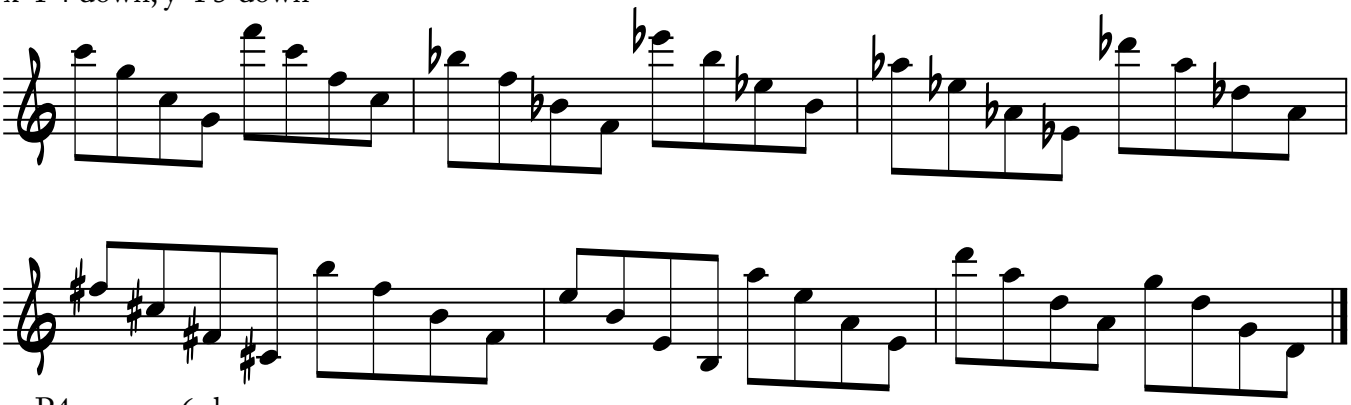

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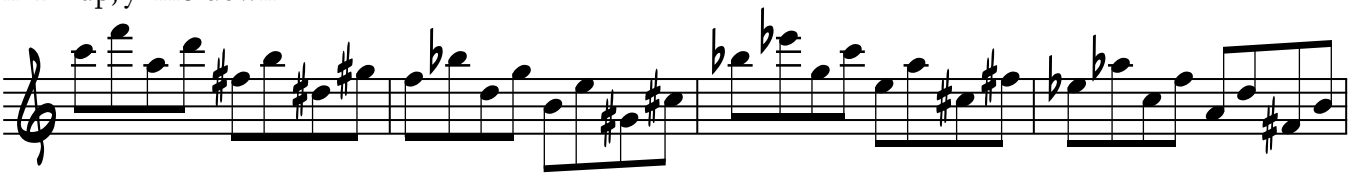

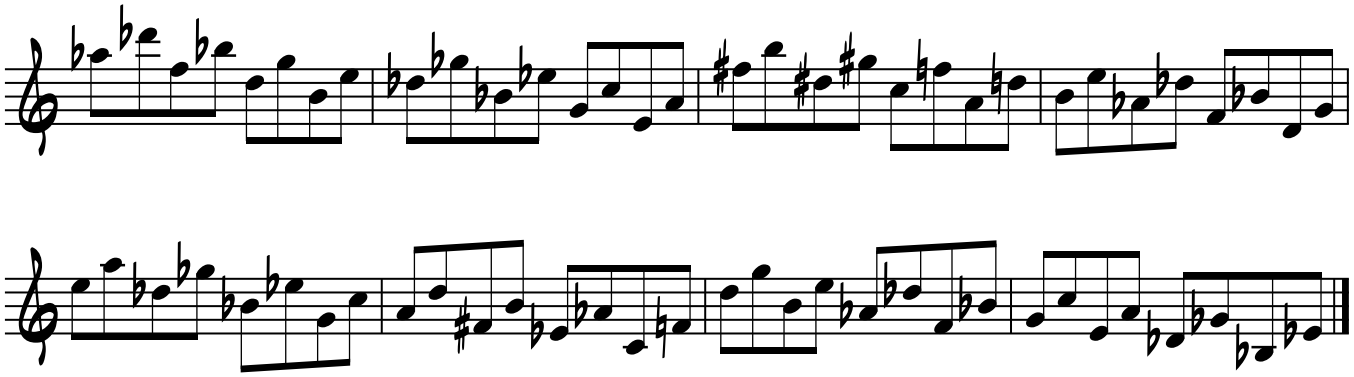

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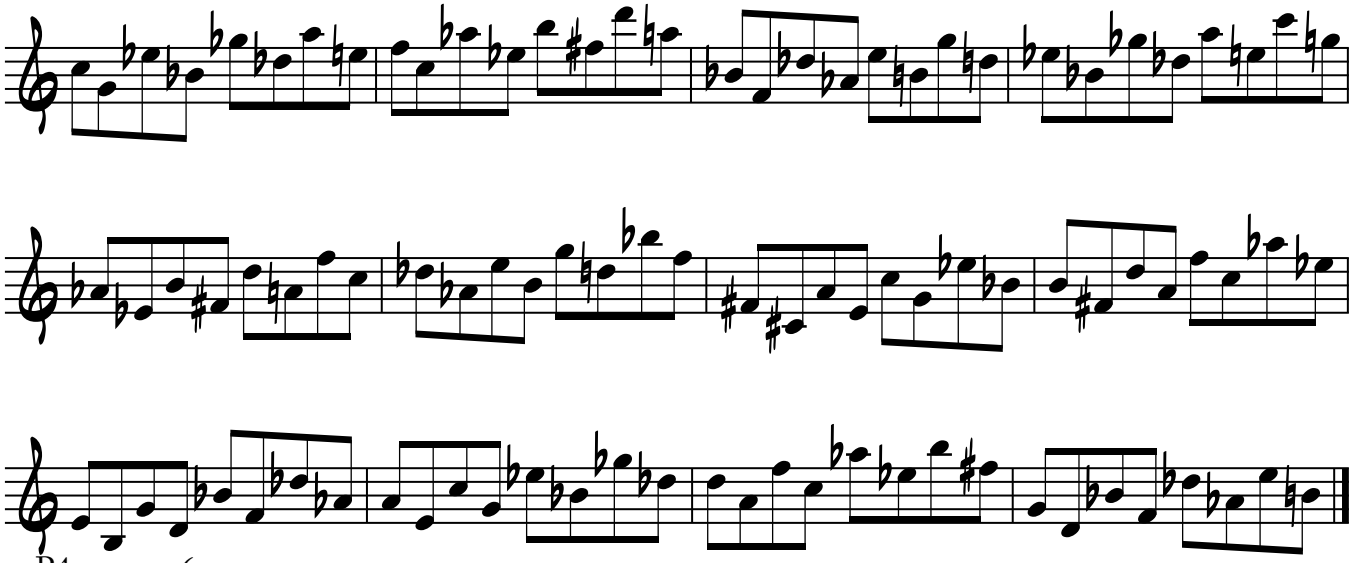

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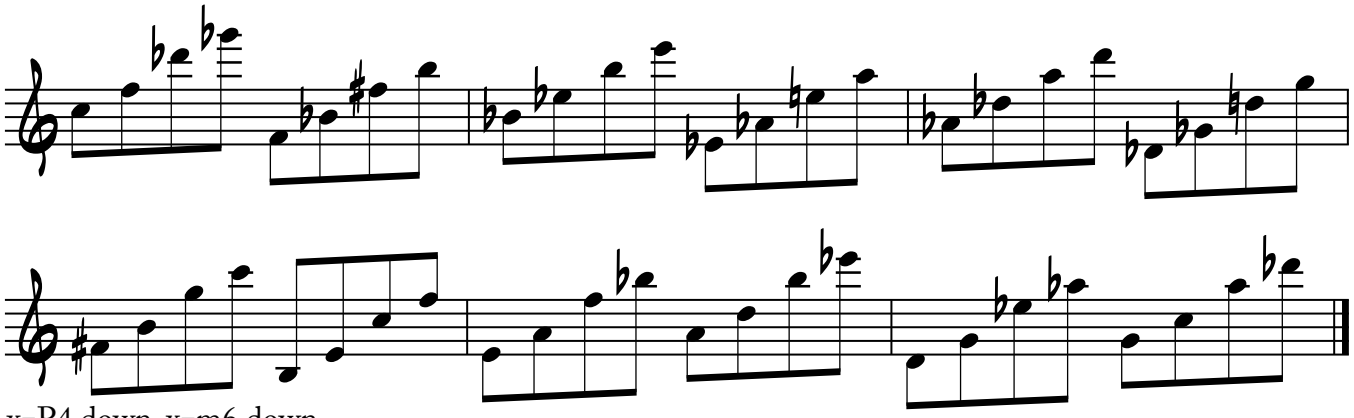

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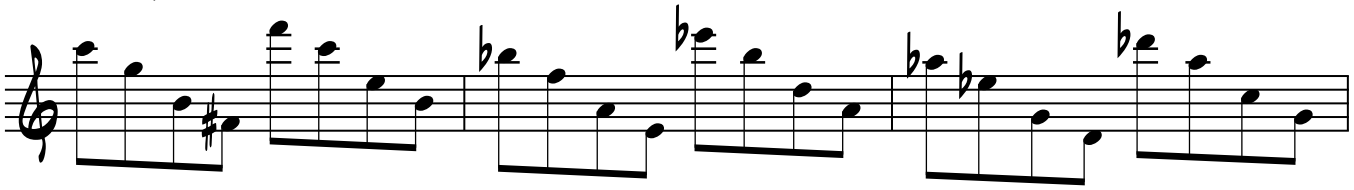

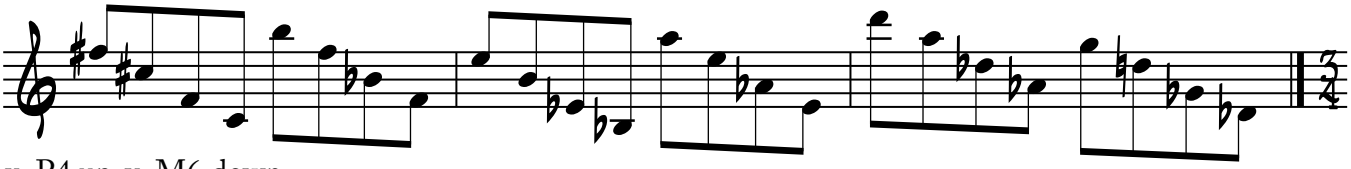

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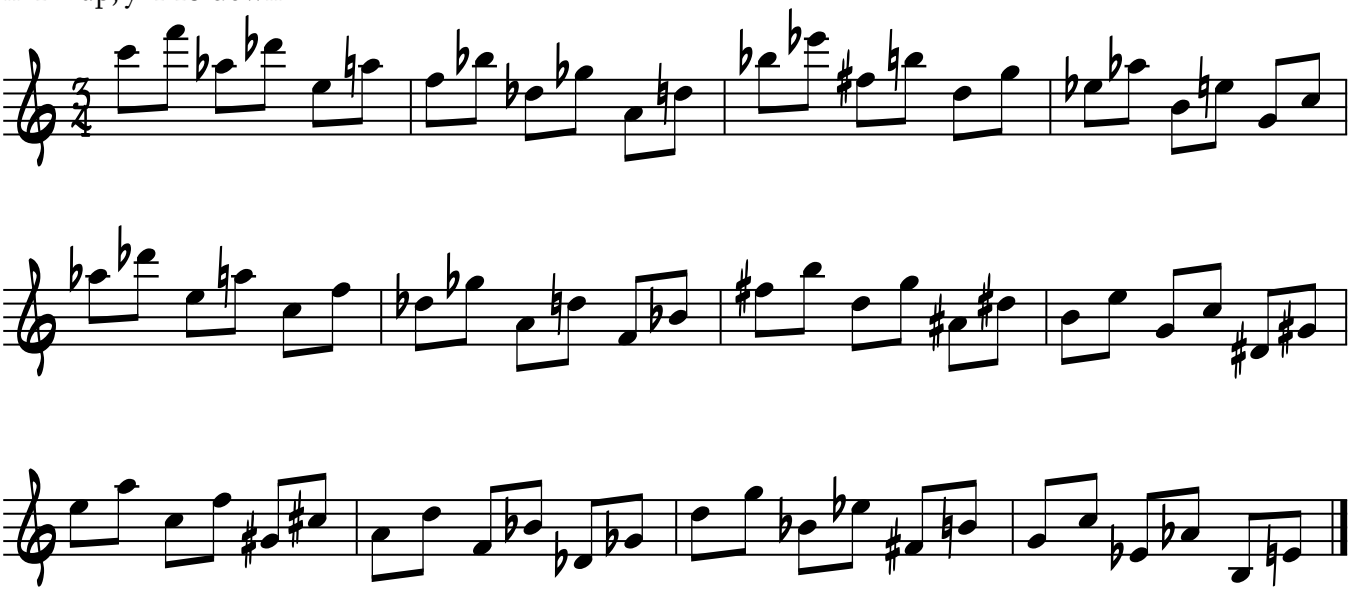

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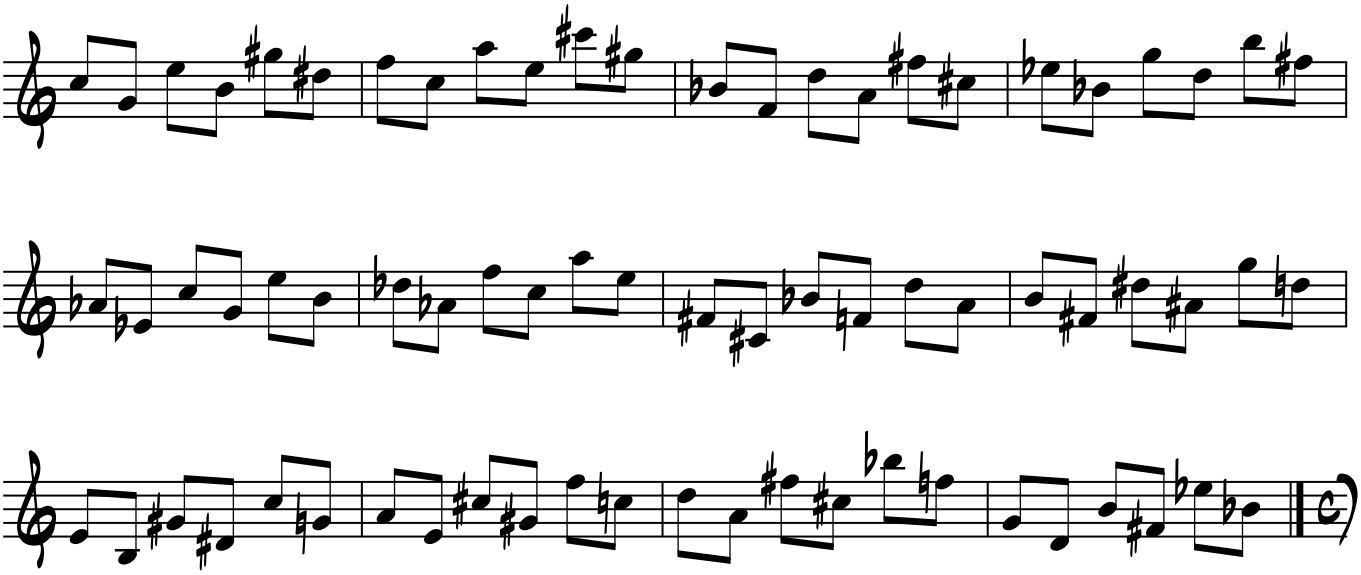

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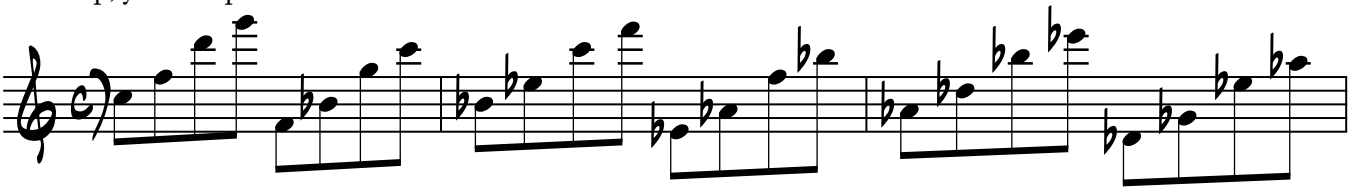

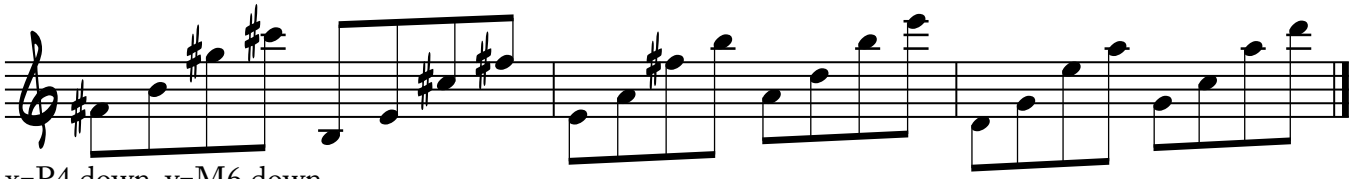

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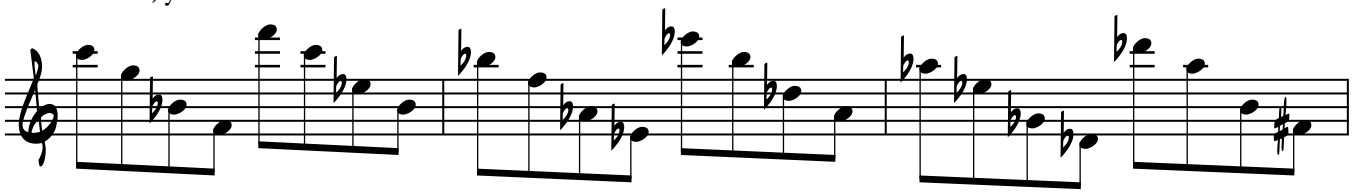

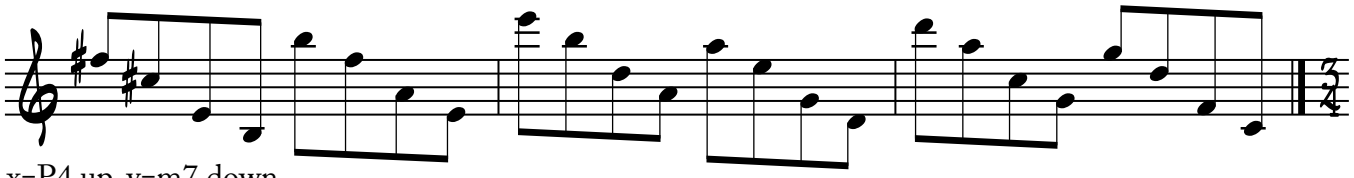

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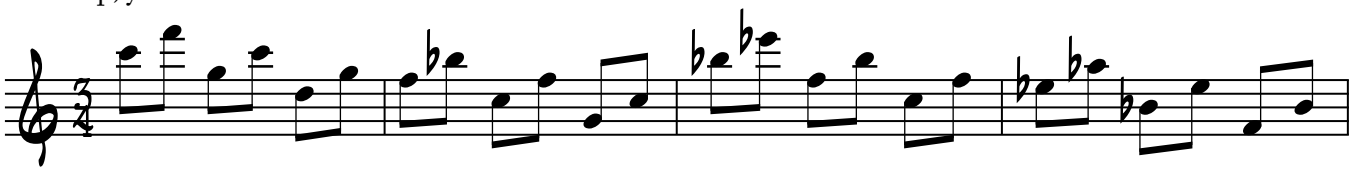

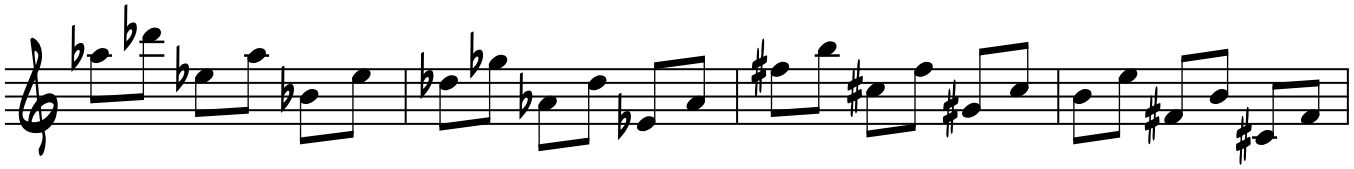

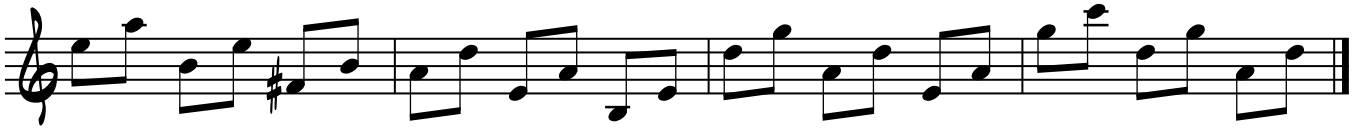

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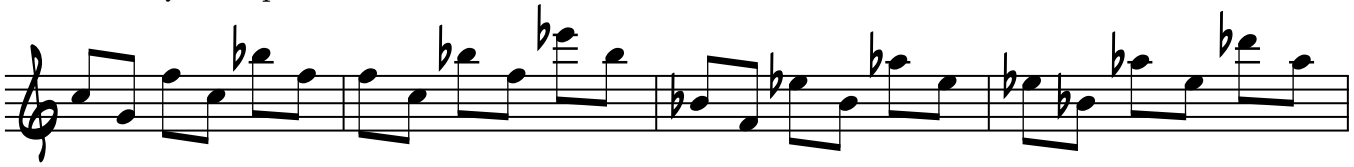

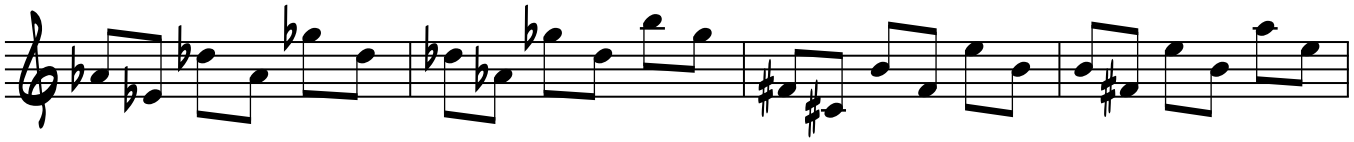

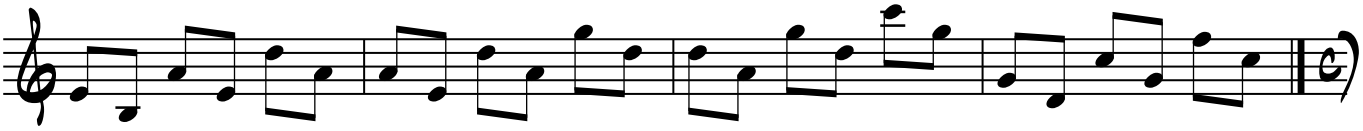

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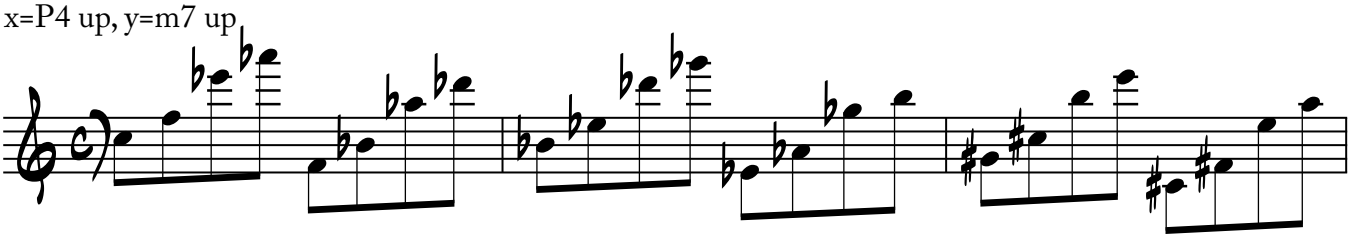

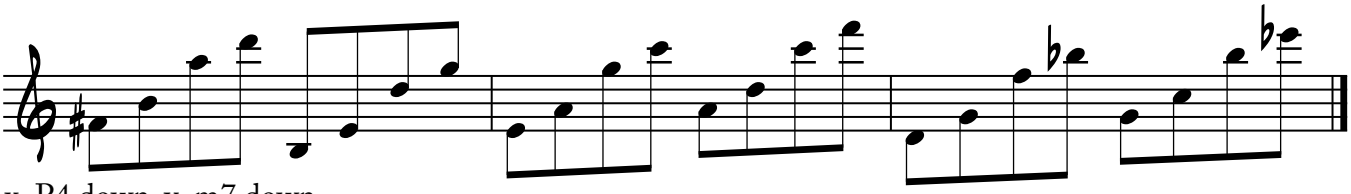

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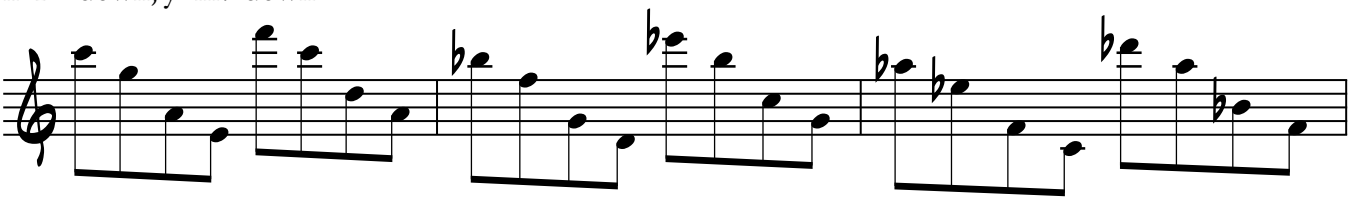

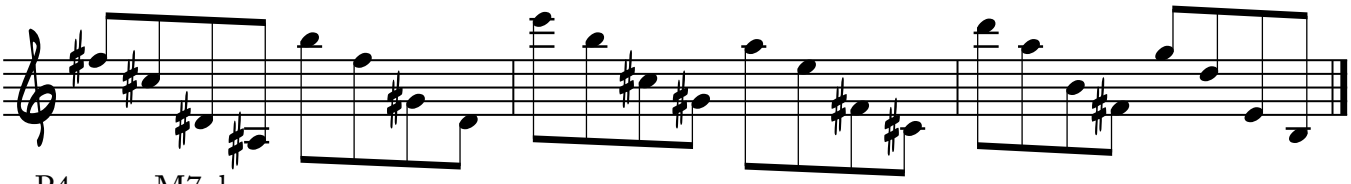

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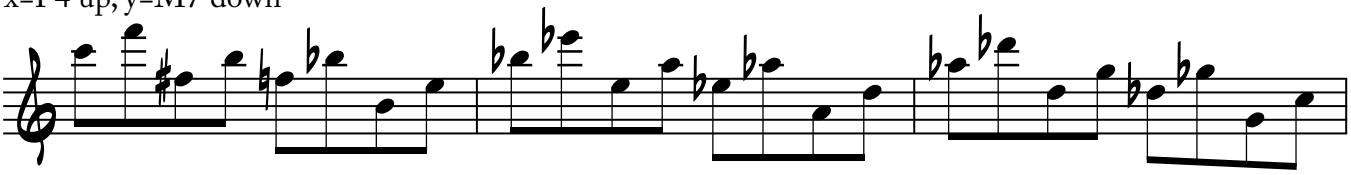

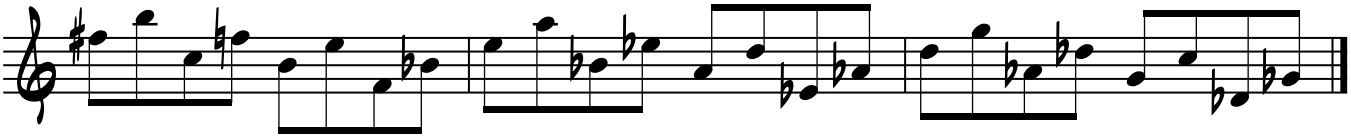

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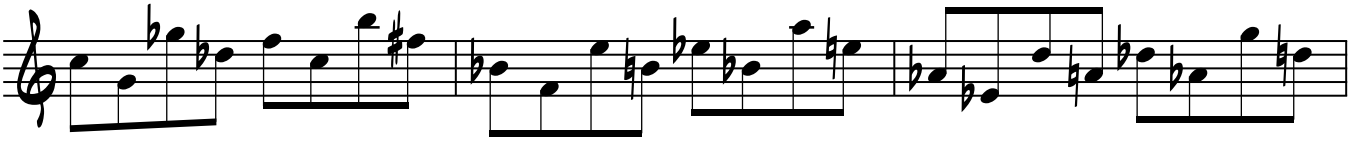

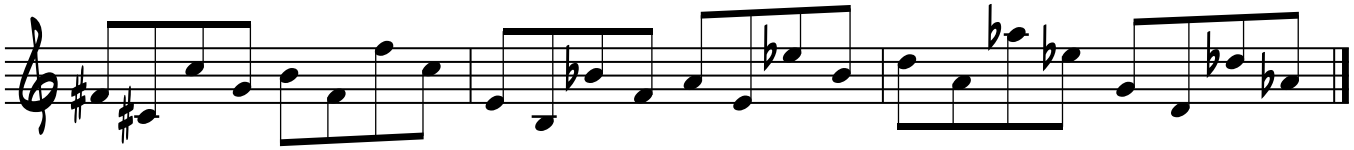

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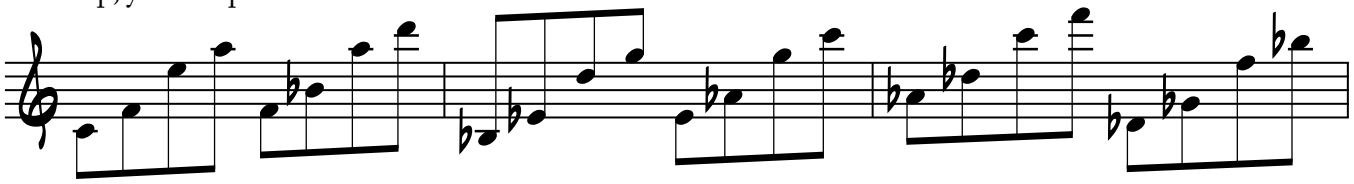

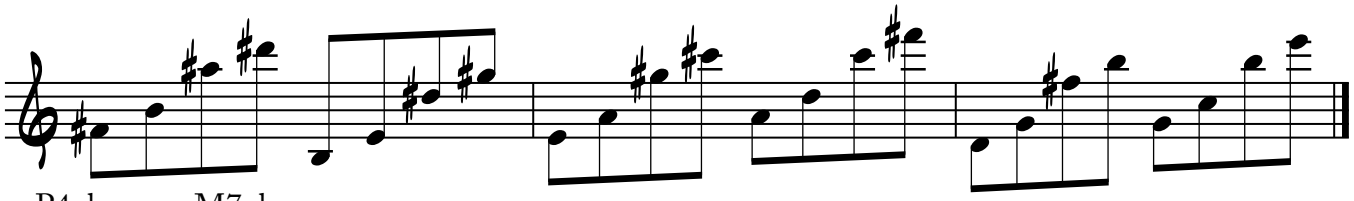

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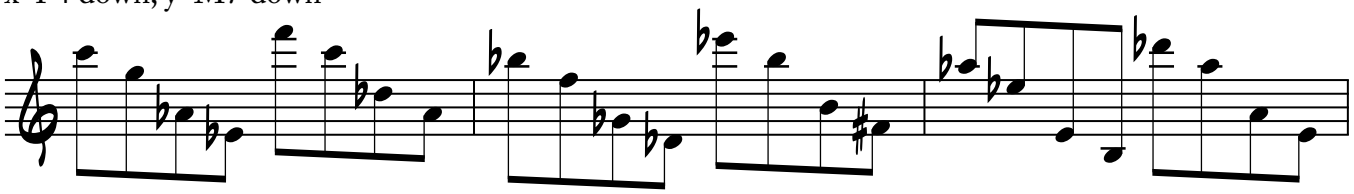

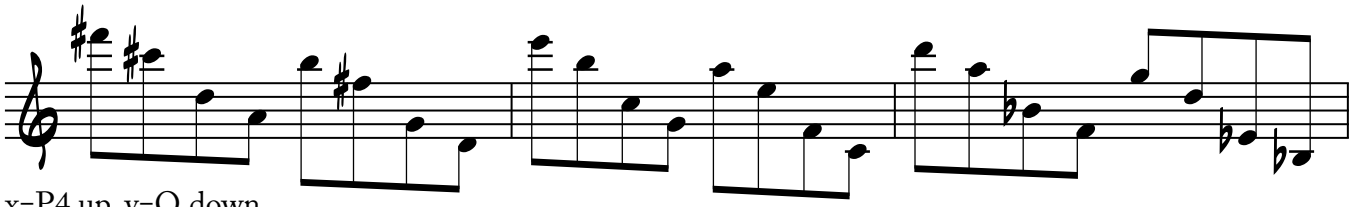

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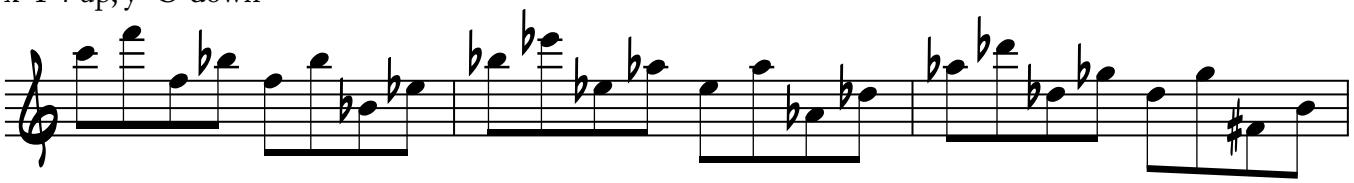

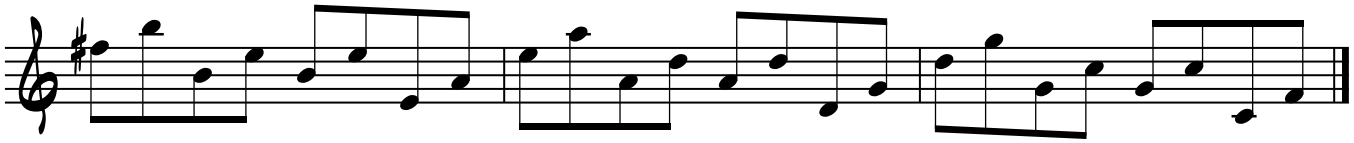

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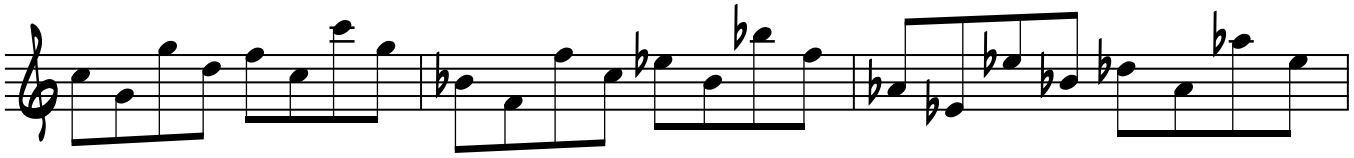

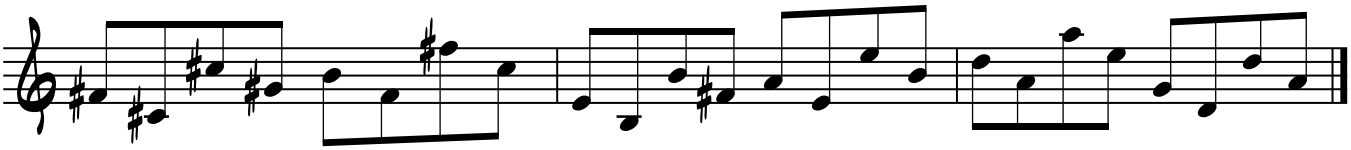

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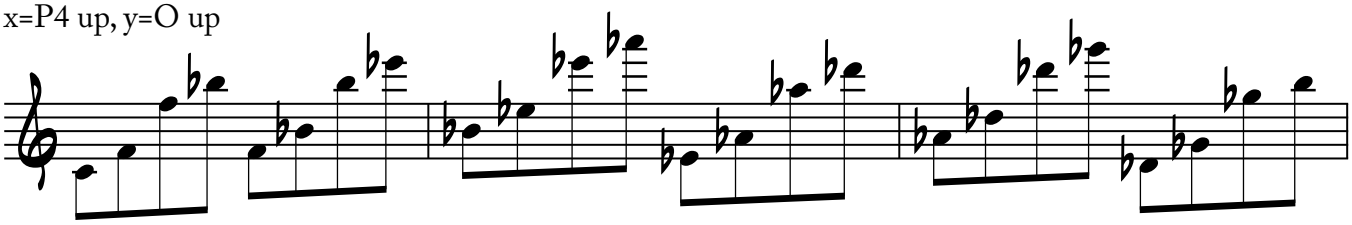

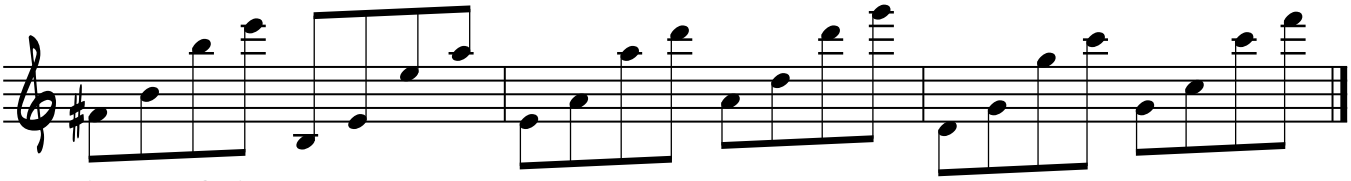

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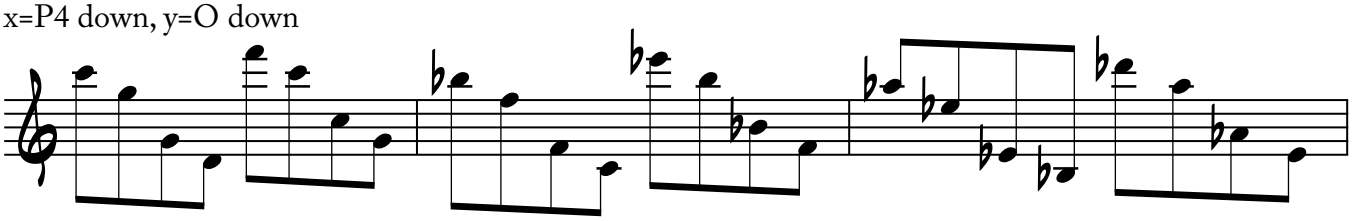

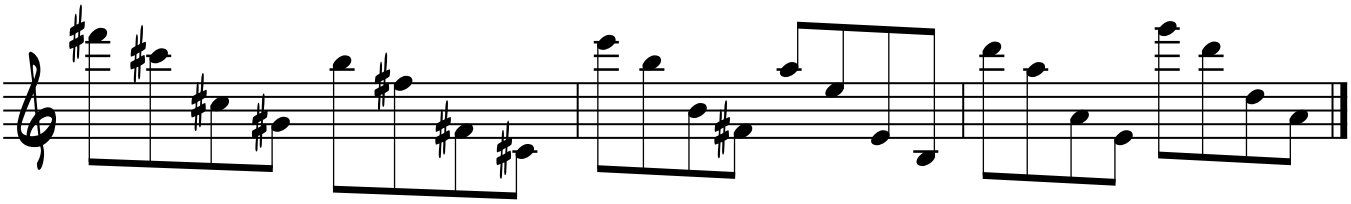

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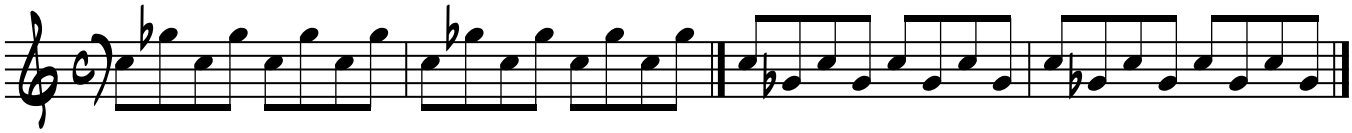
x=TT up, y=TT down

x=TT down, y=TT up



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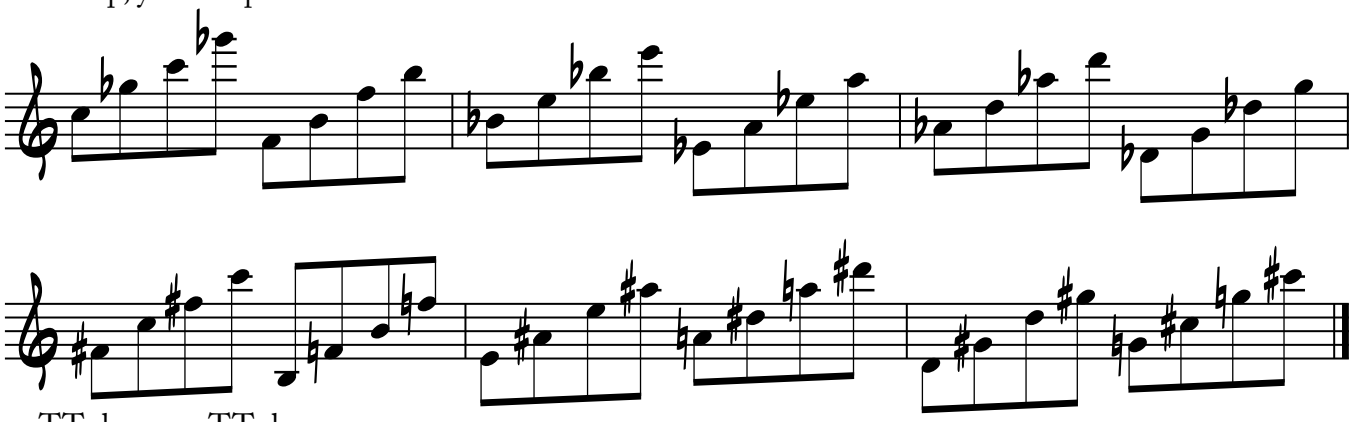

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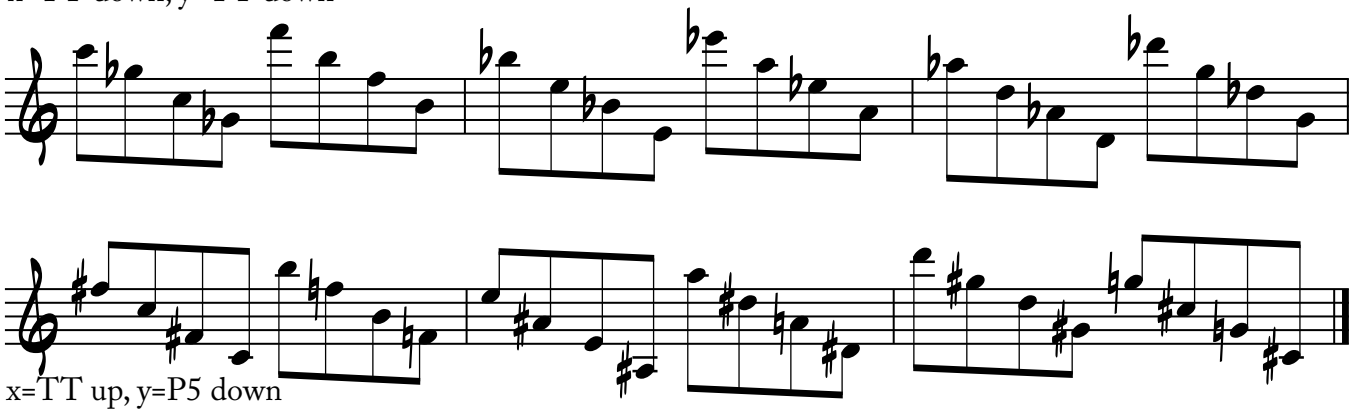

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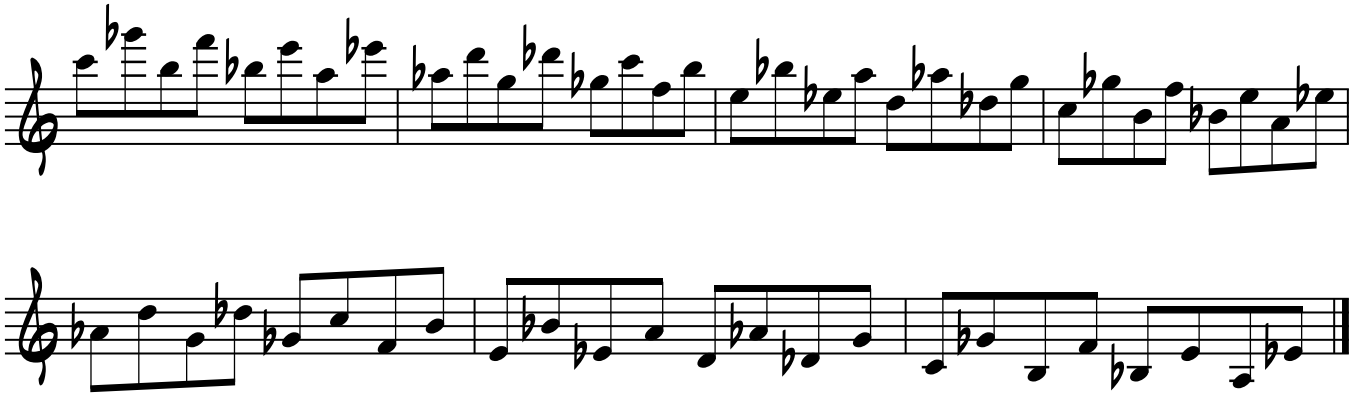

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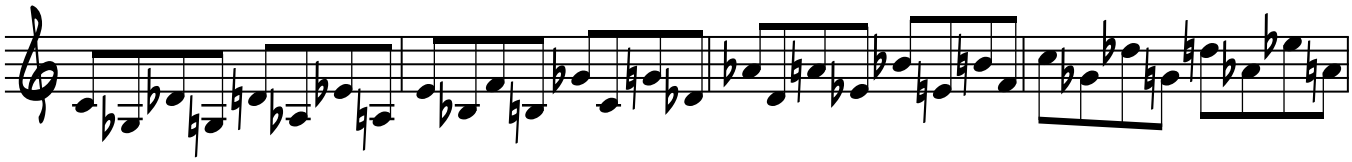

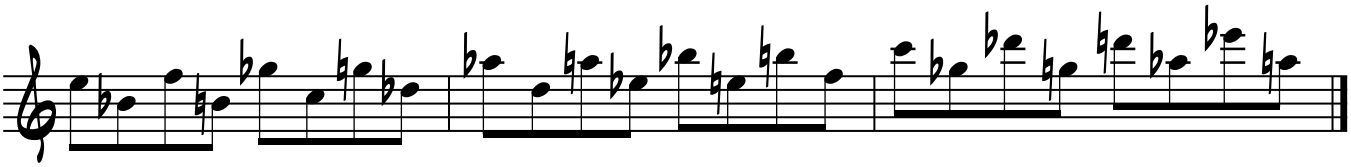

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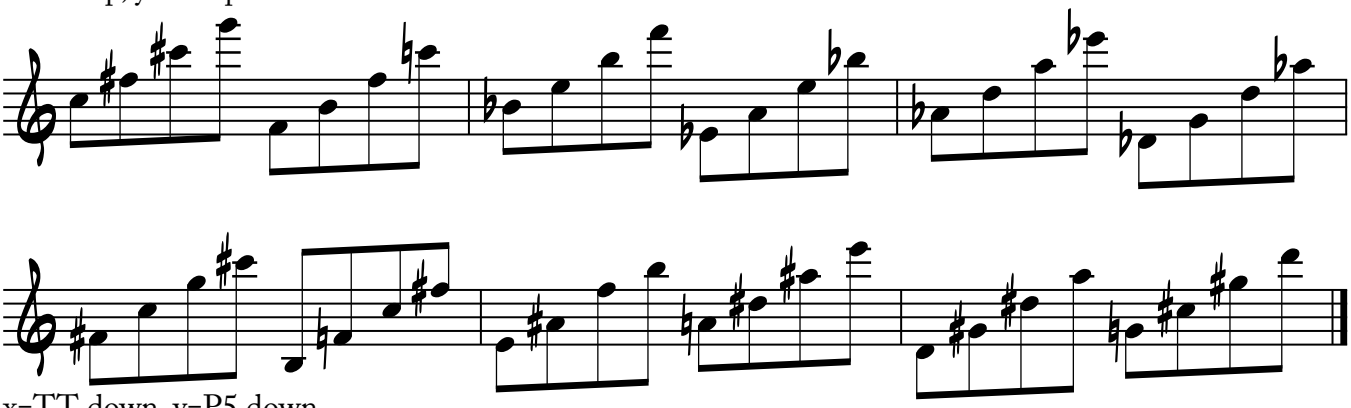

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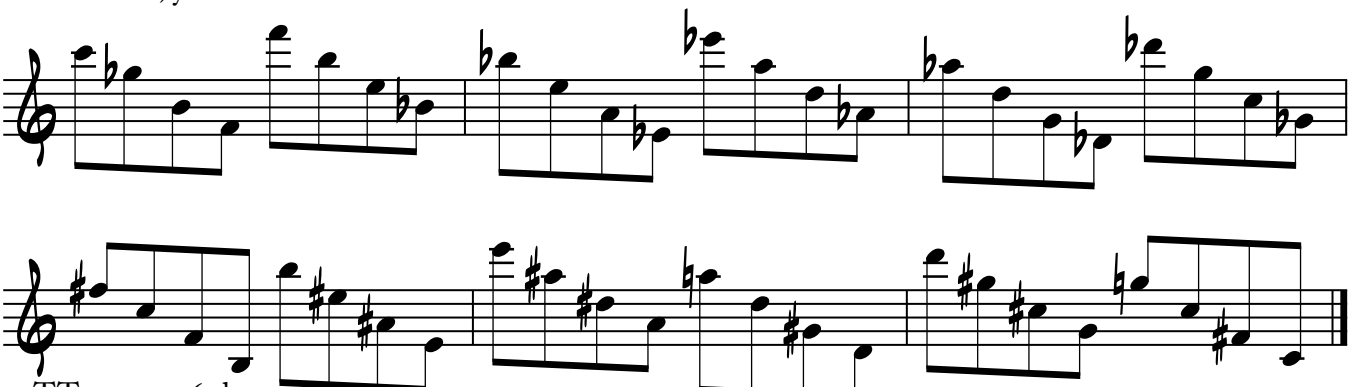

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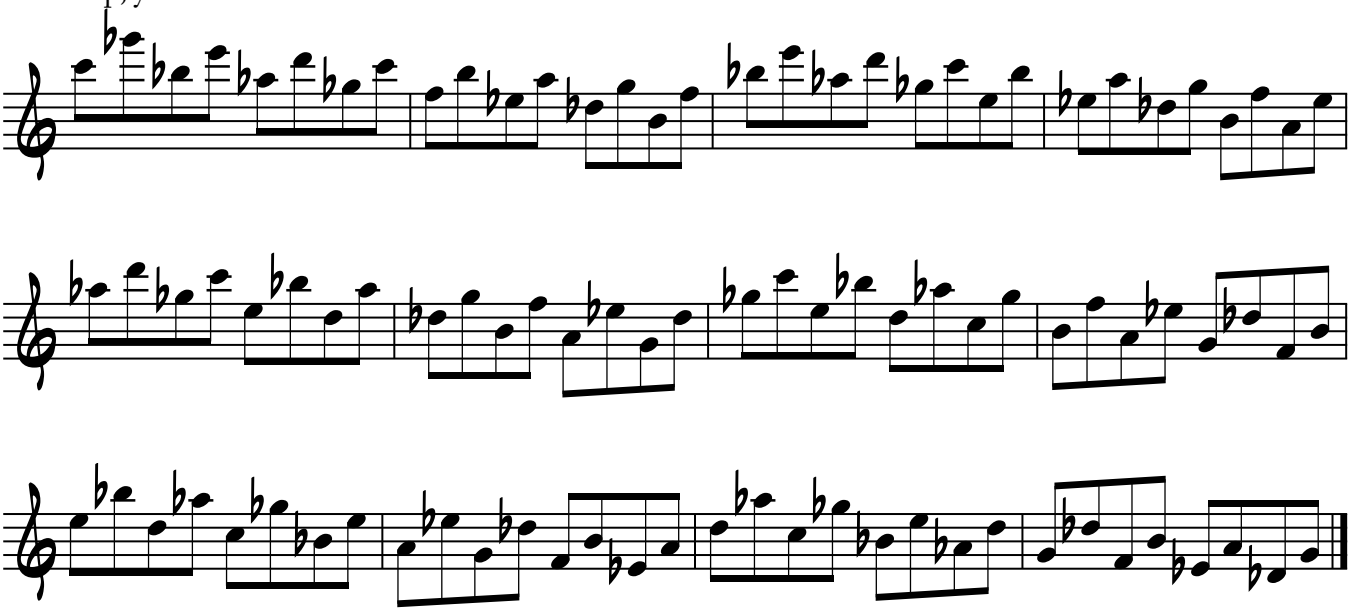

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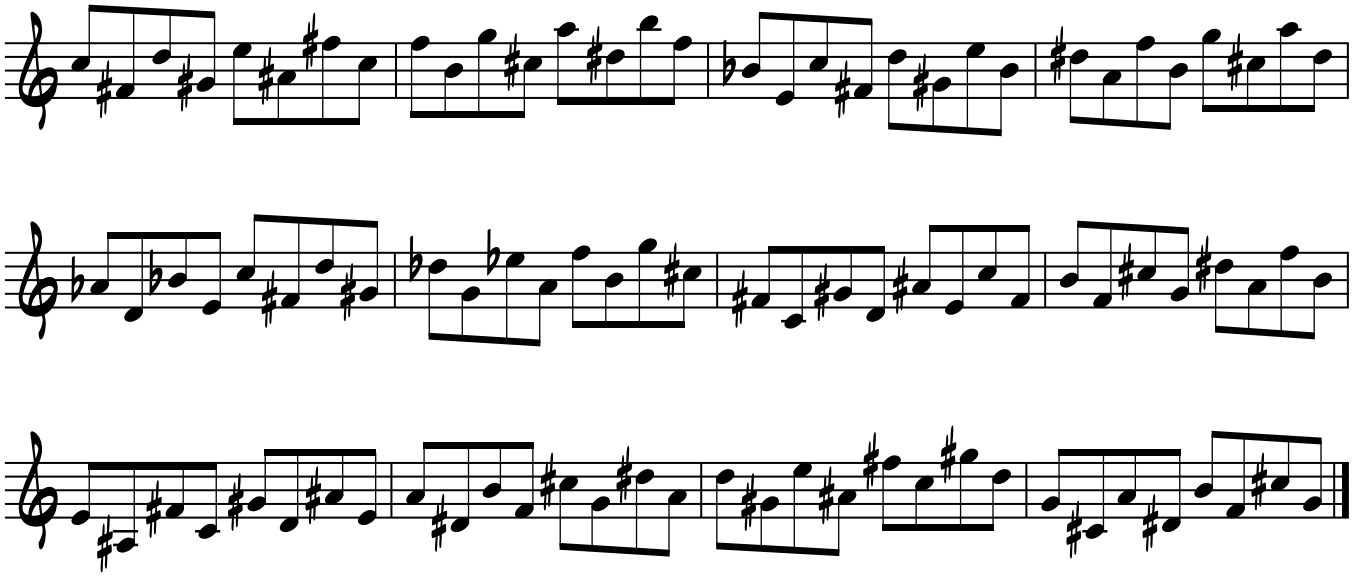

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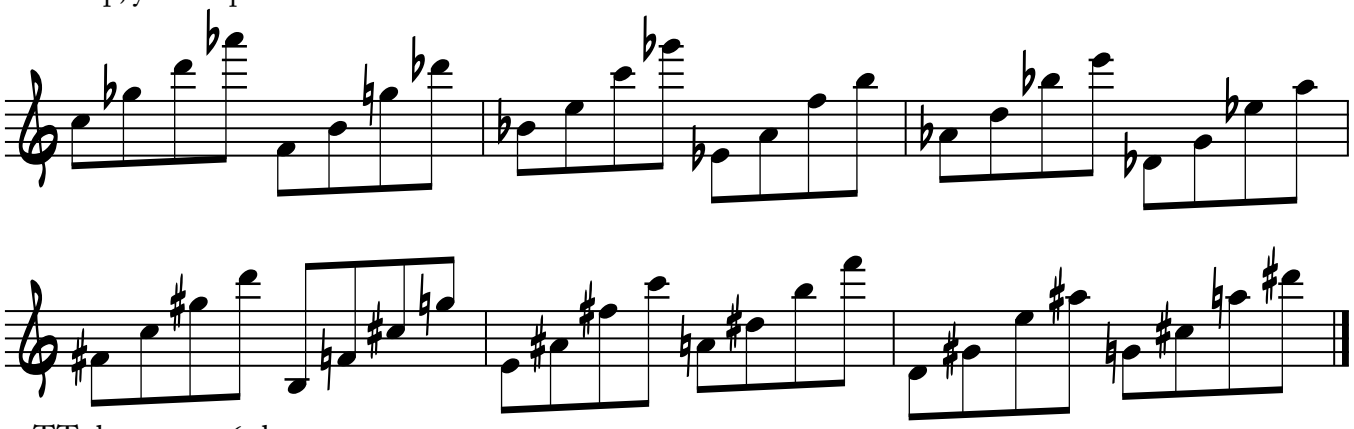

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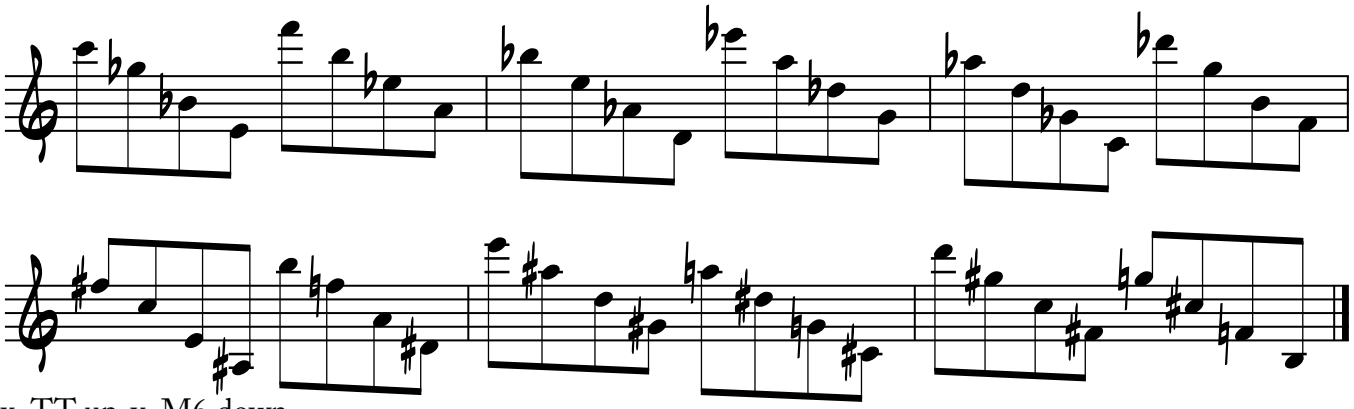

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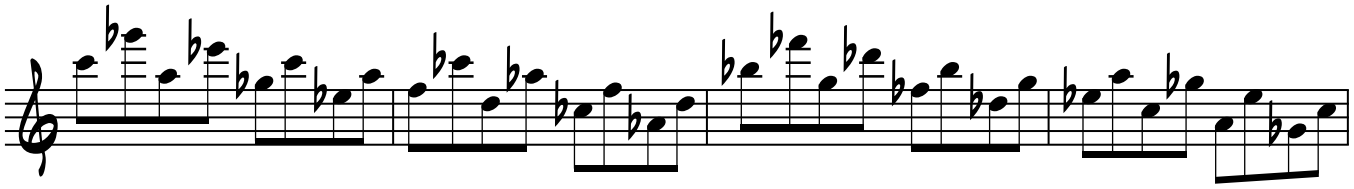

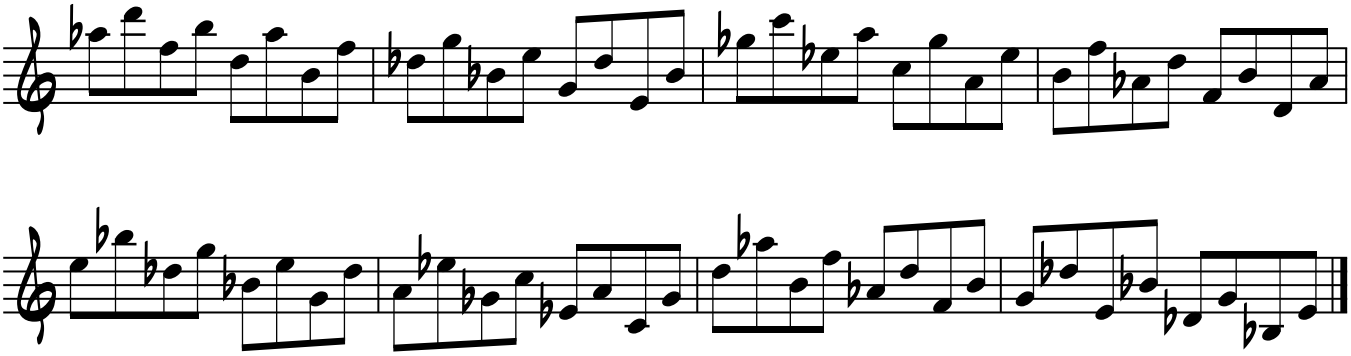

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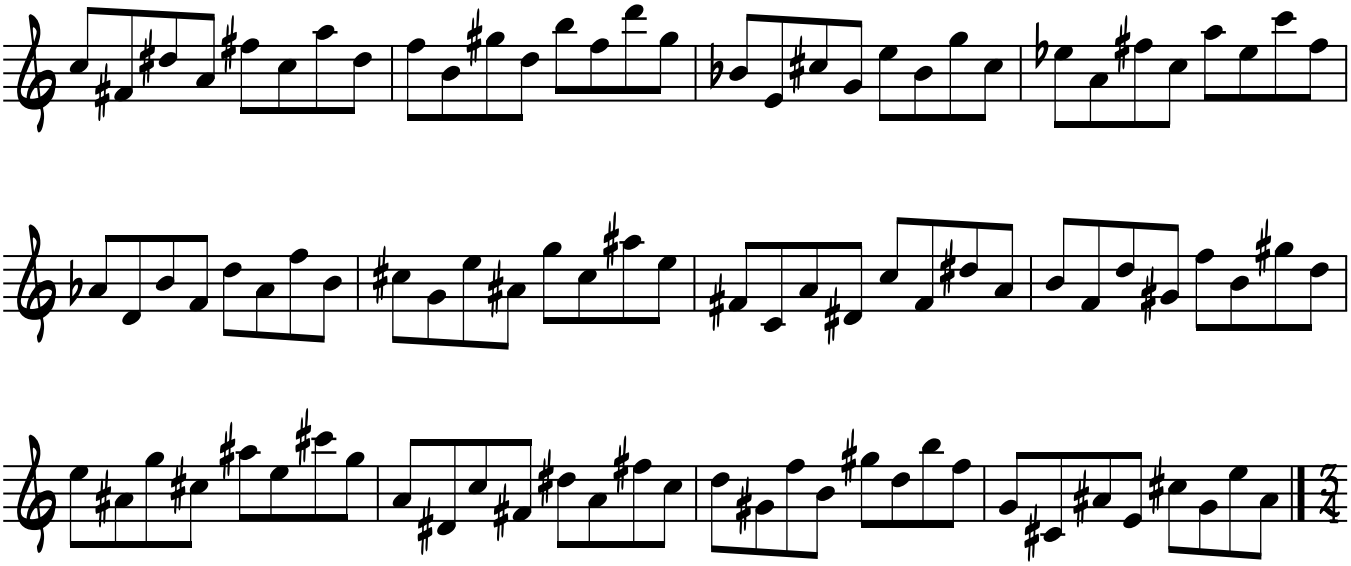

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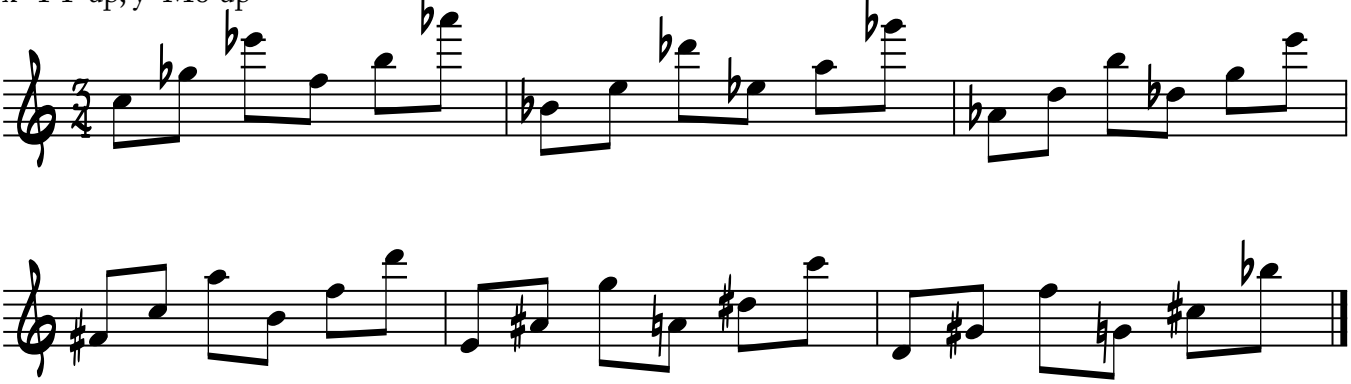

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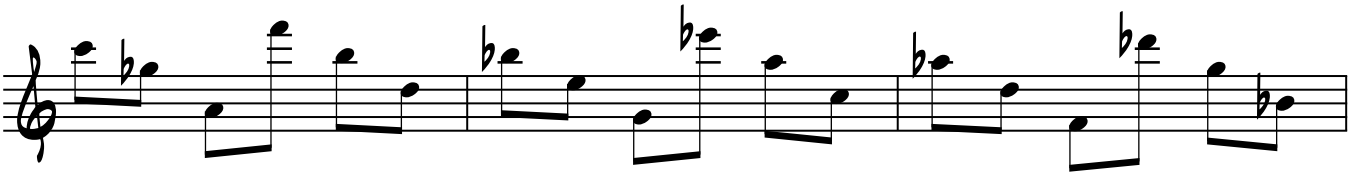

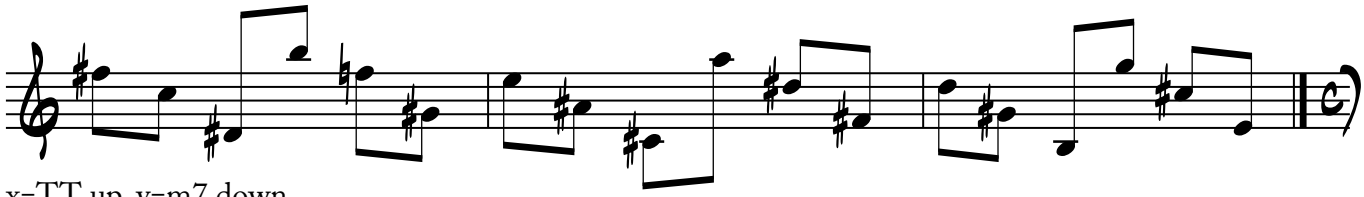

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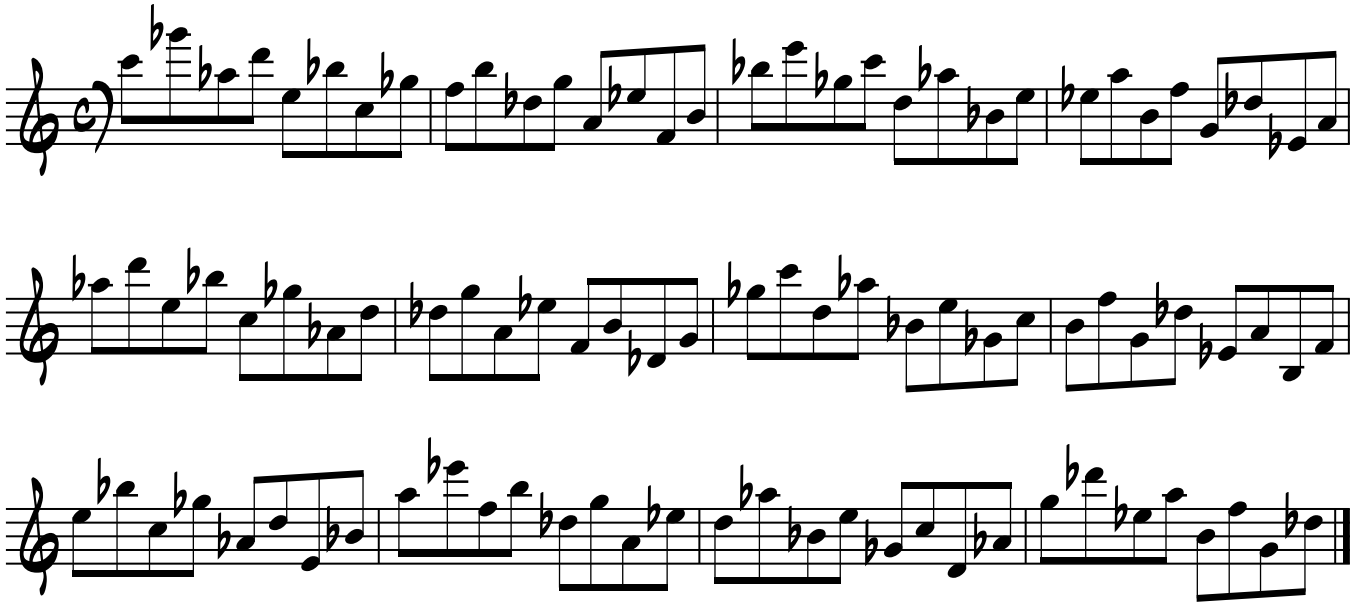

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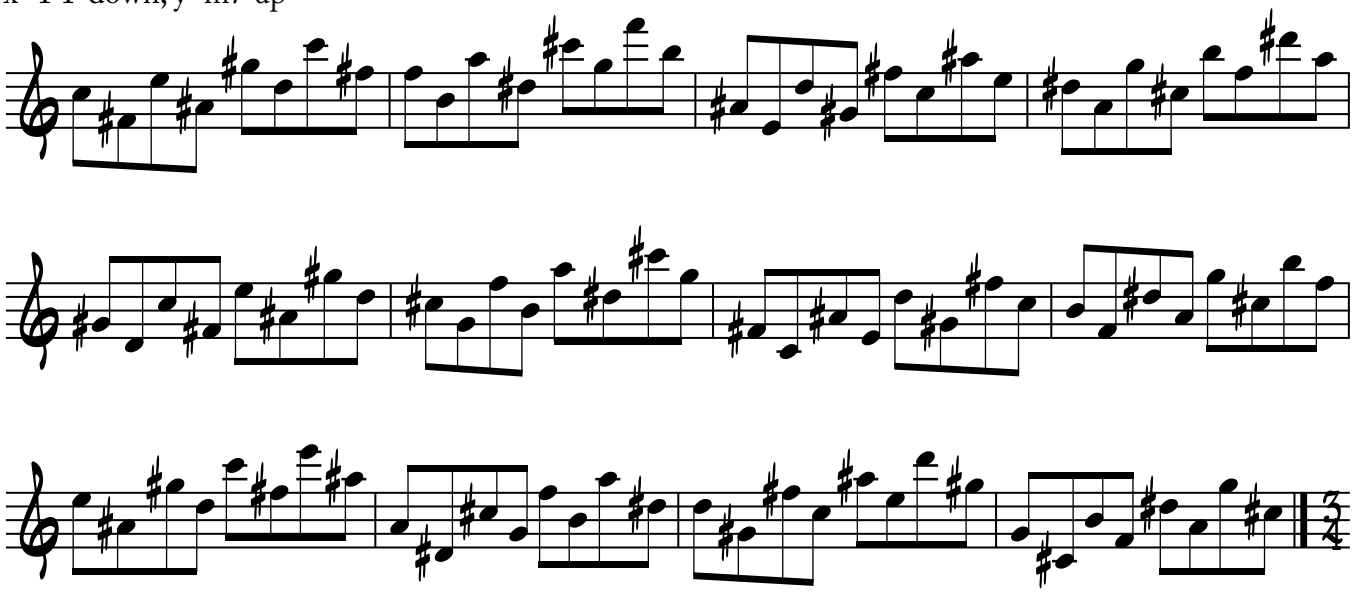

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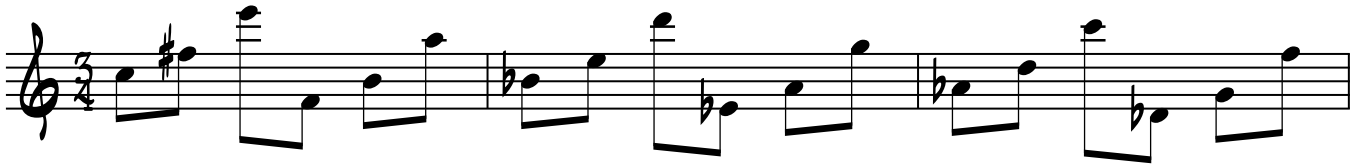

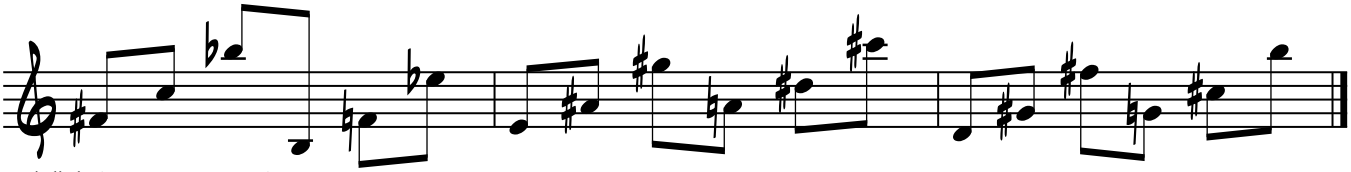

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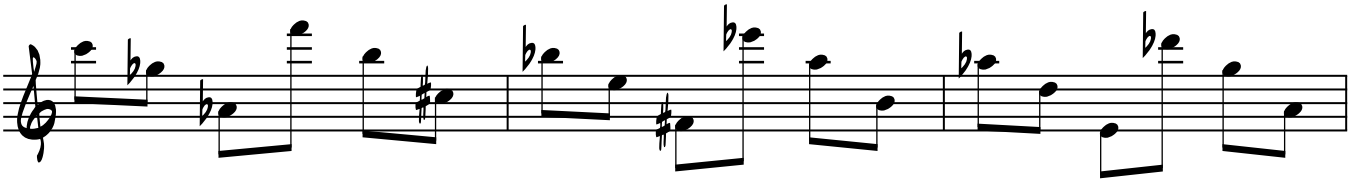

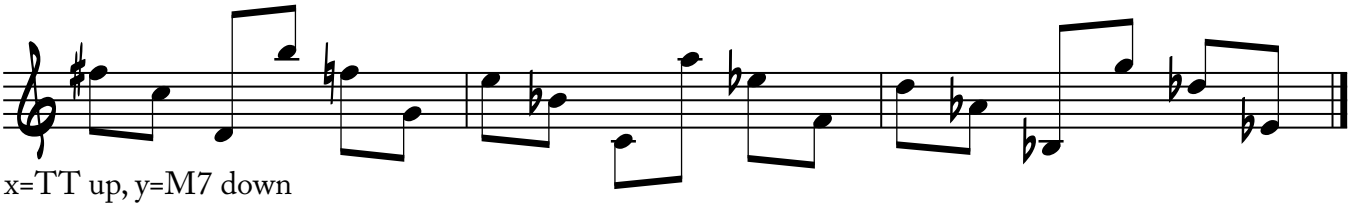

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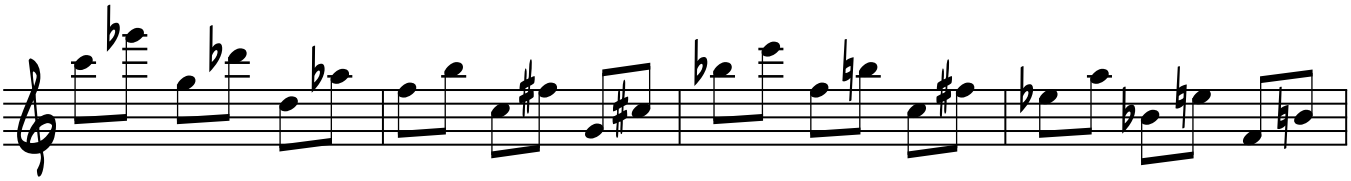

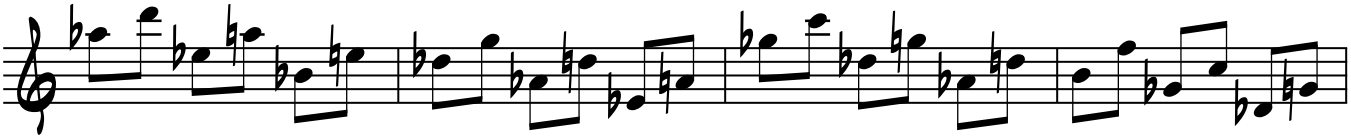

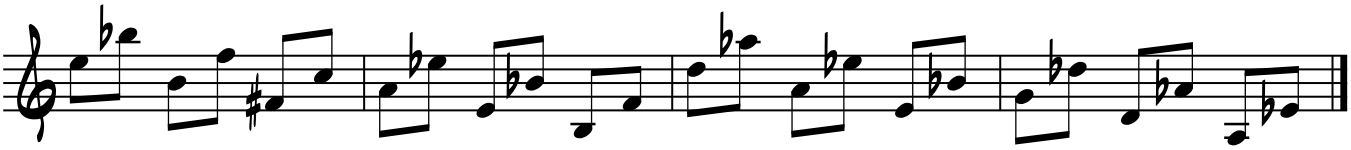

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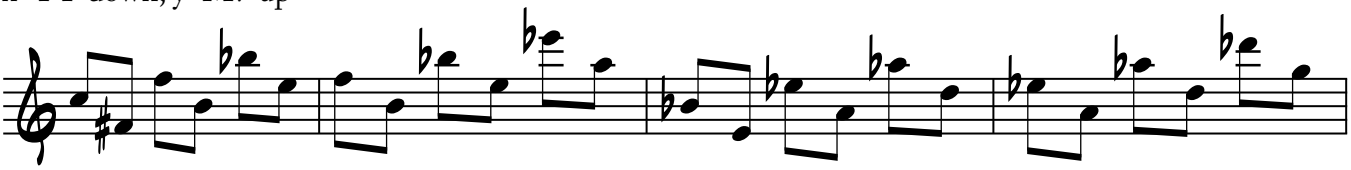

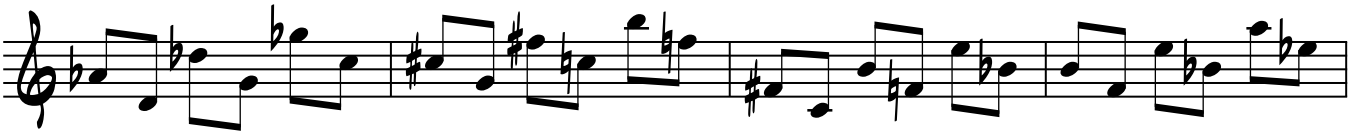

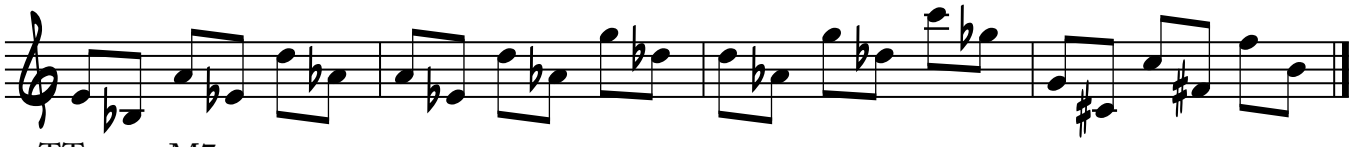

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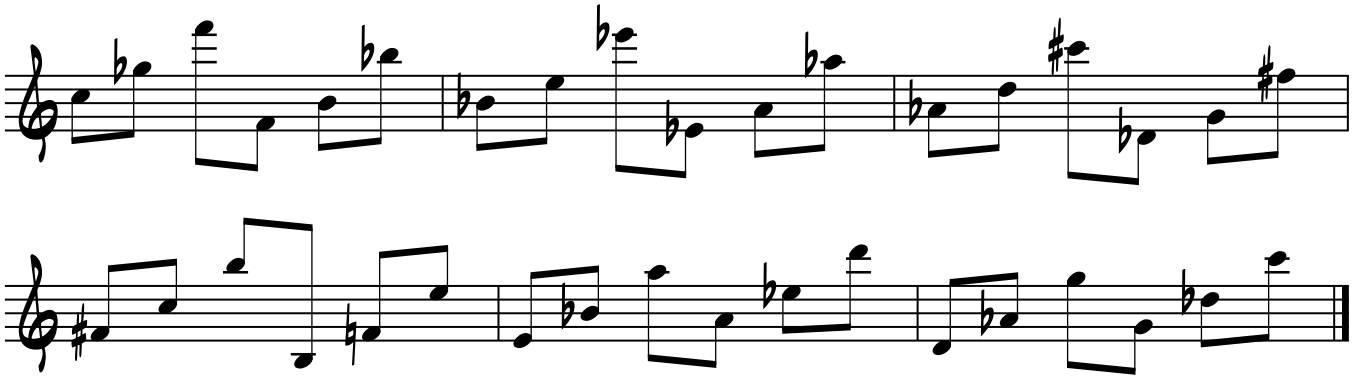

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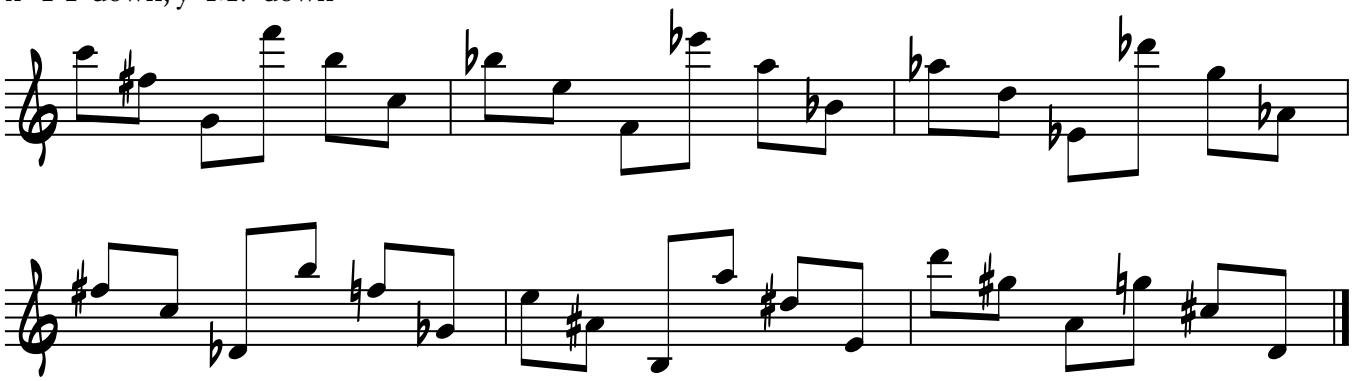

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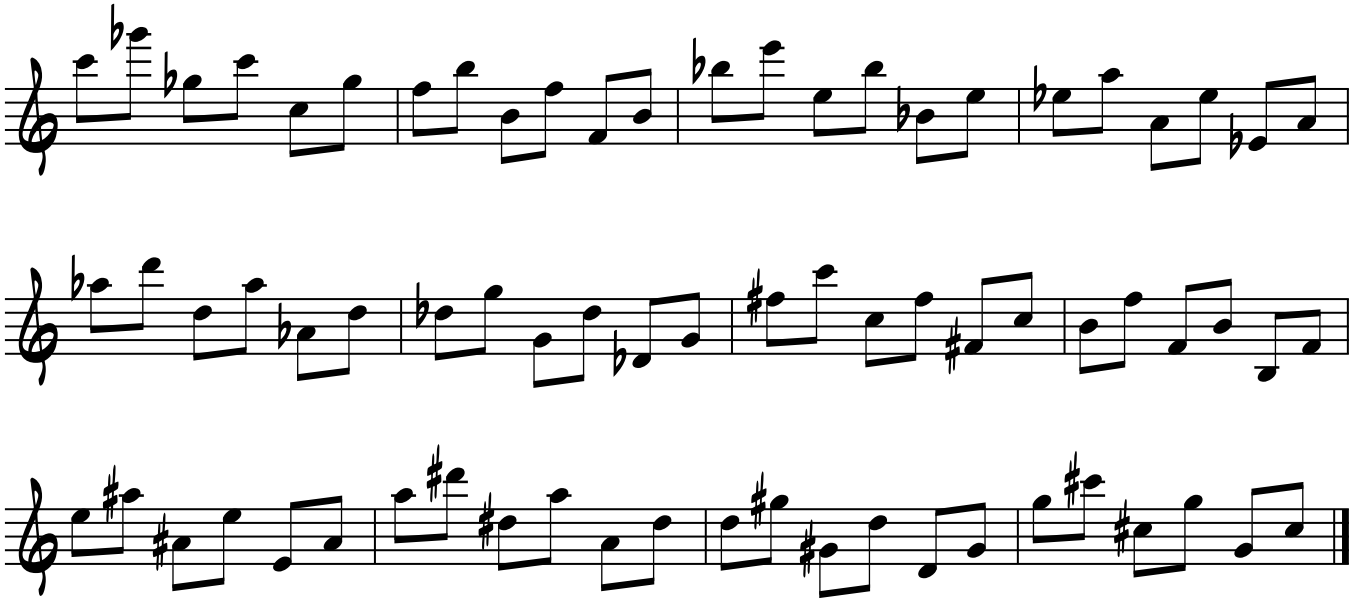

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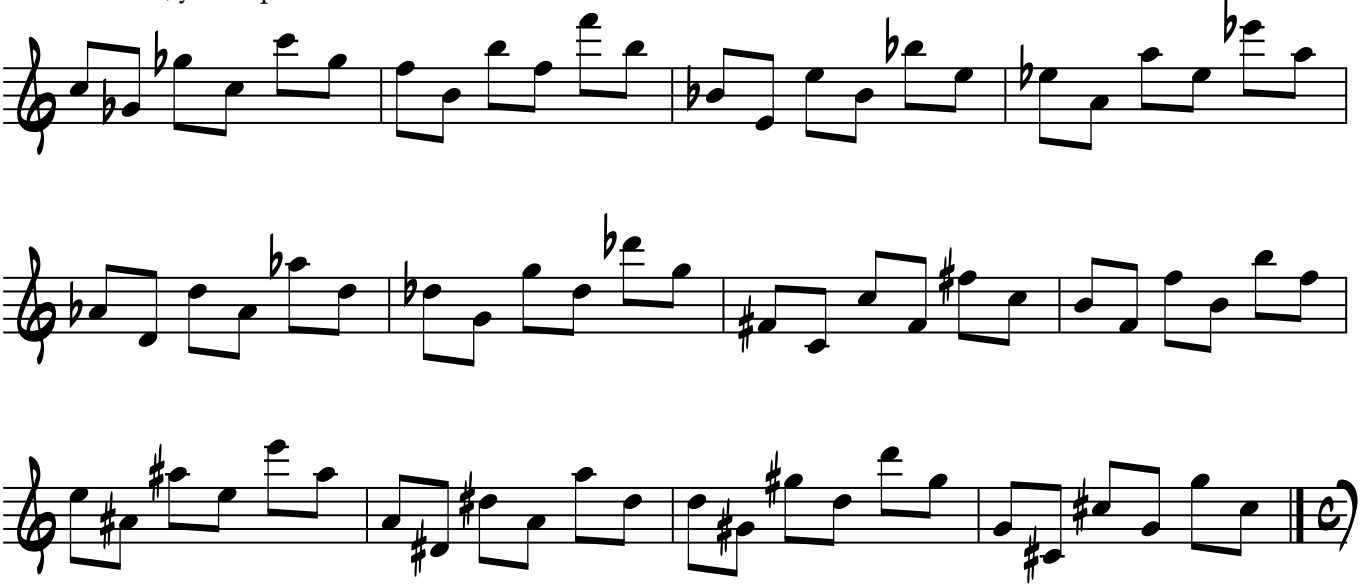

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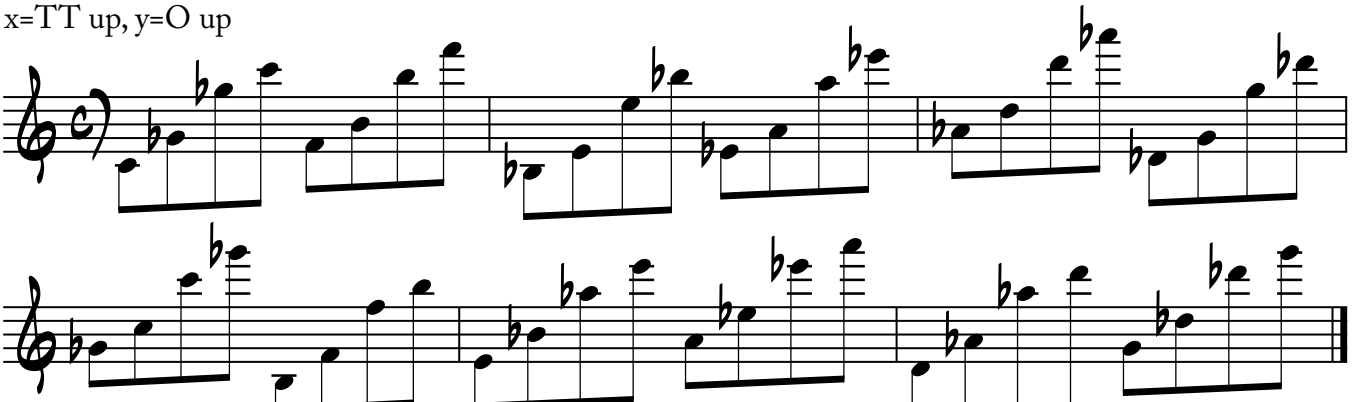

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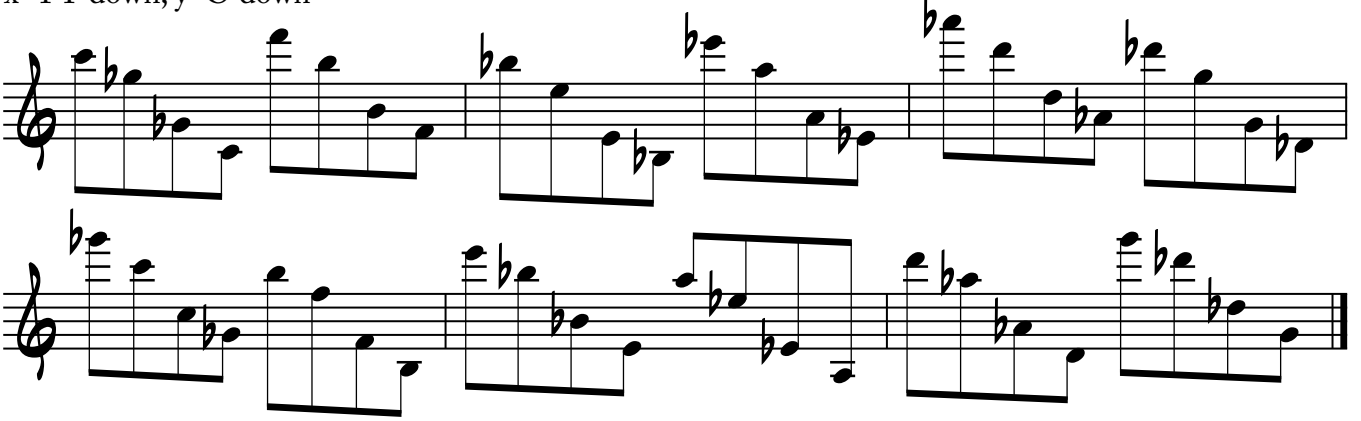
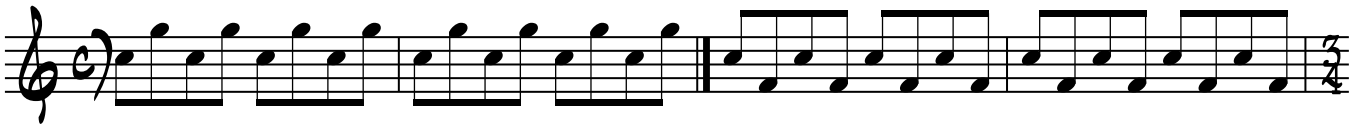


PERFECT 5ths

x=P5 up, y=P5 down

x=P5 down, y=P5 up



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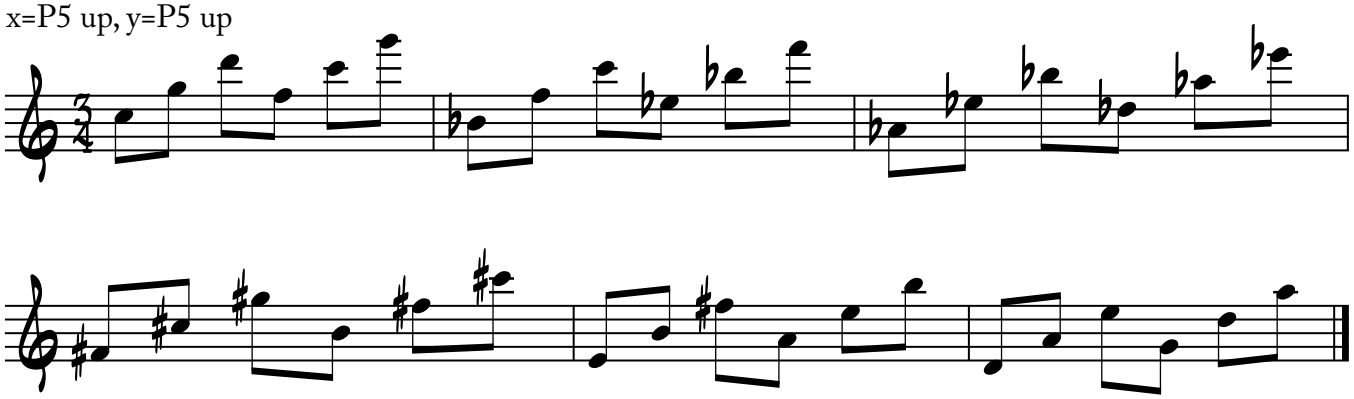

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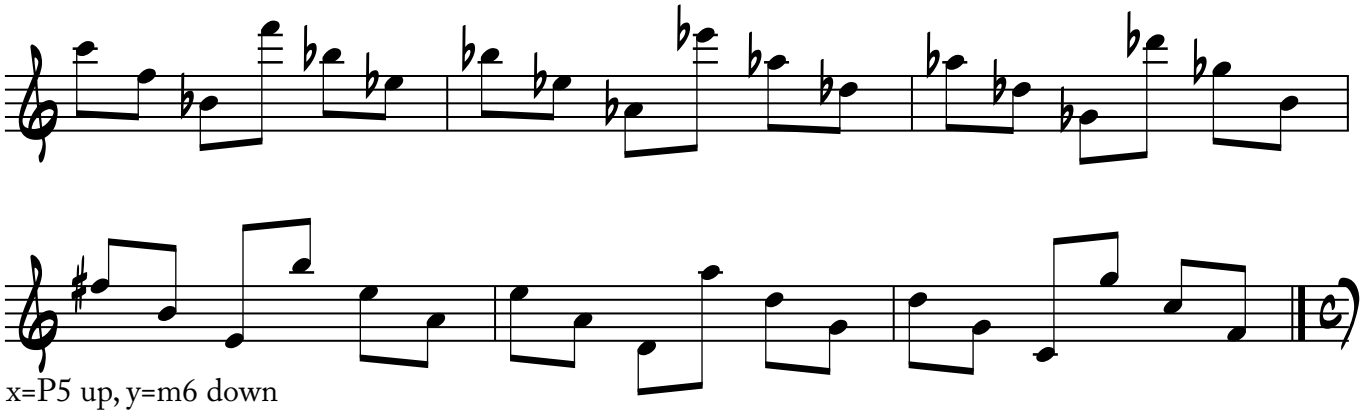

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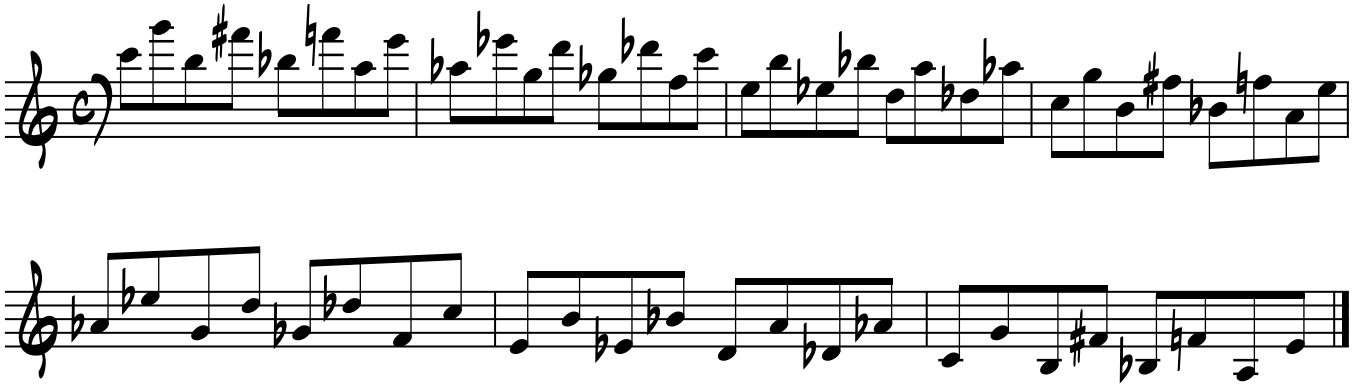

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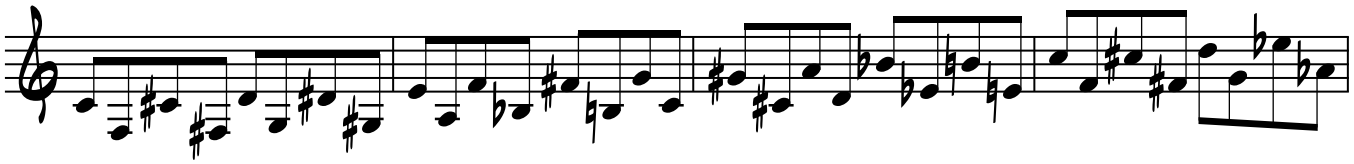

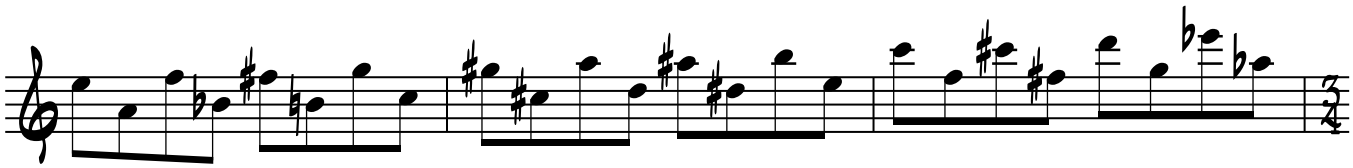

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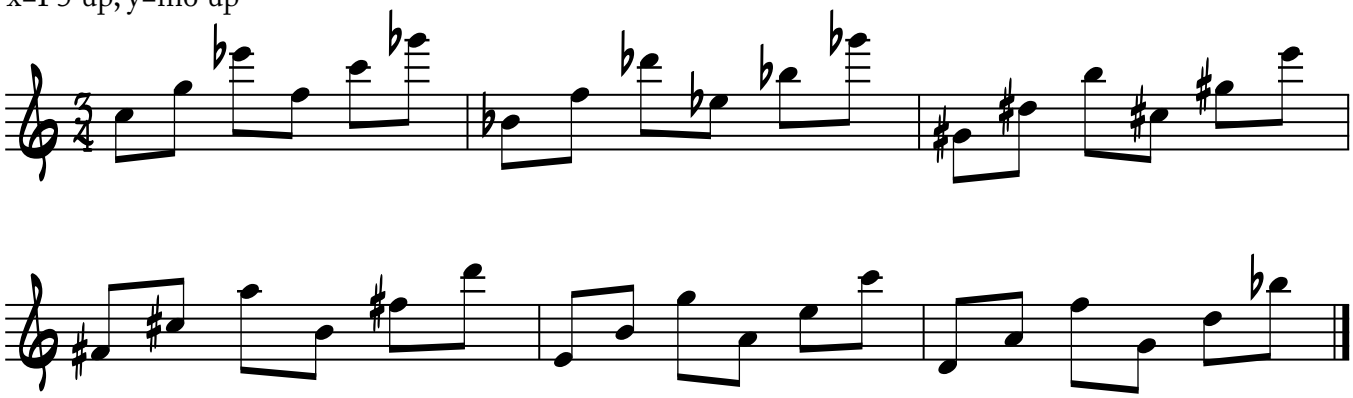

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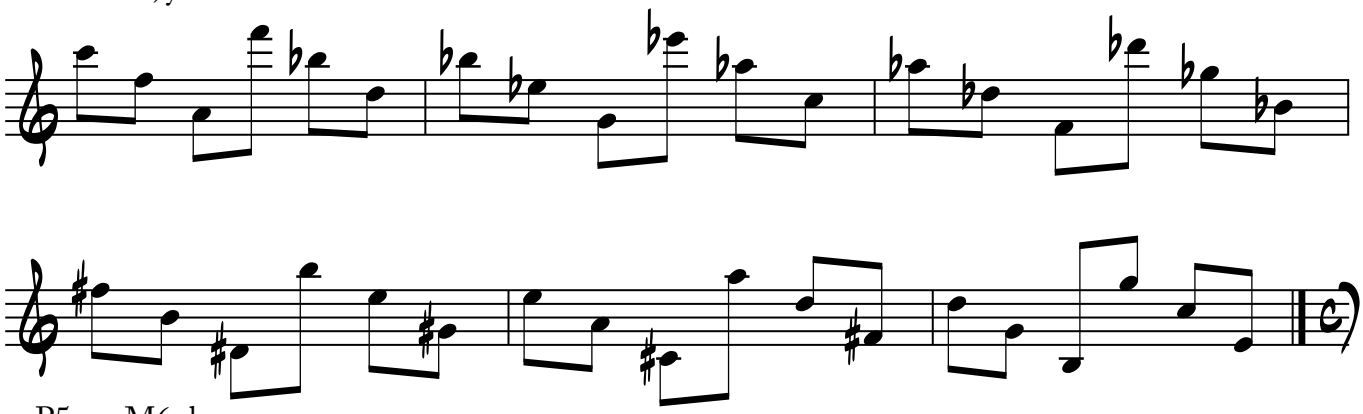

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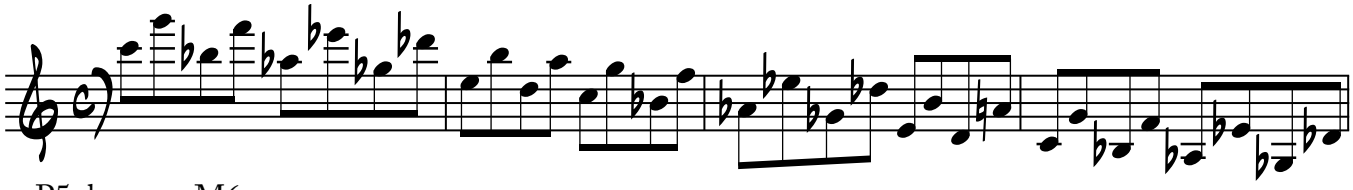

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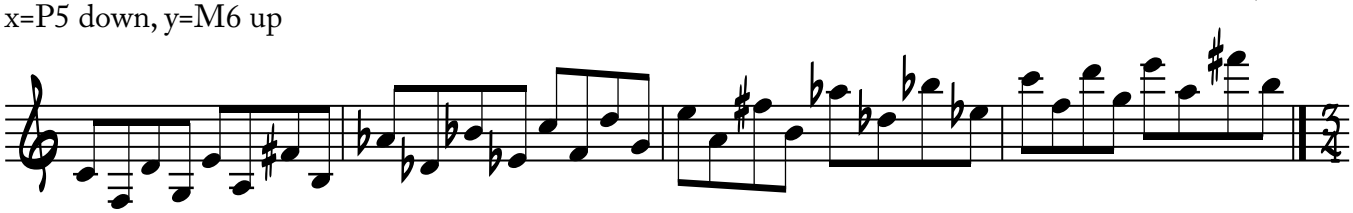

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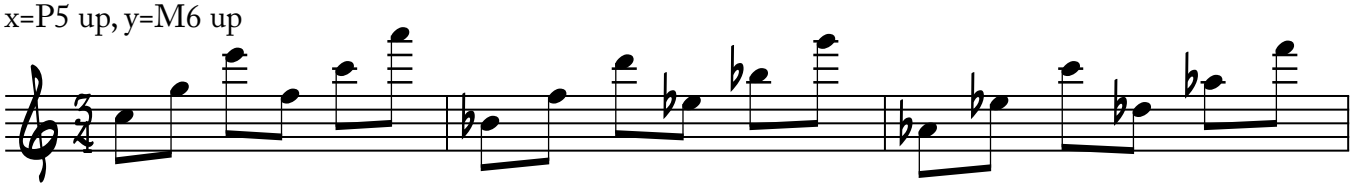

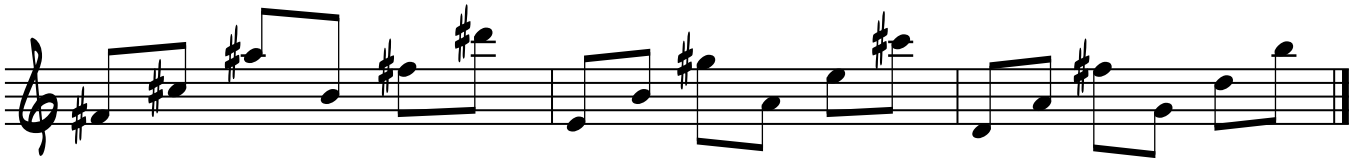

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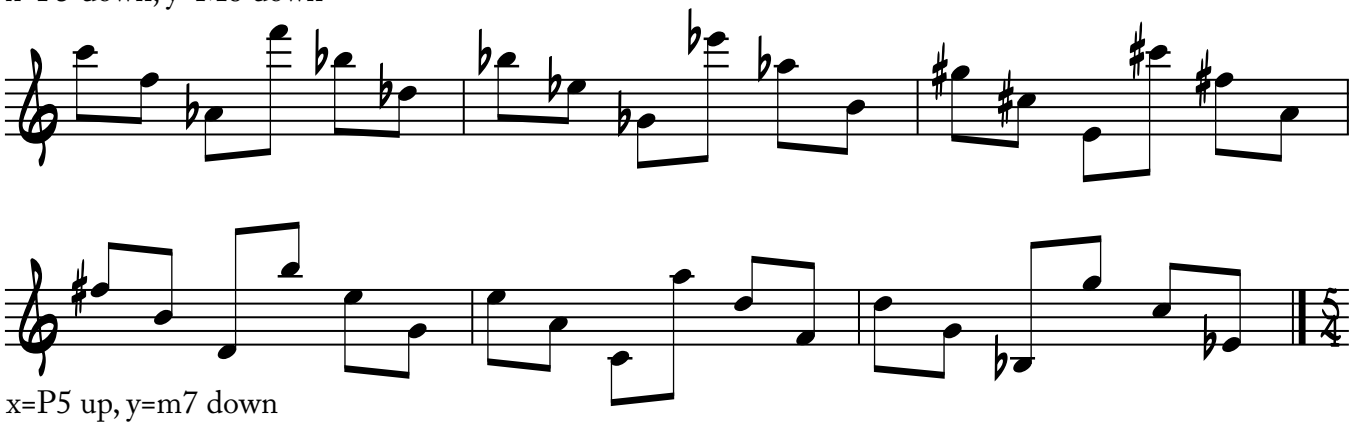

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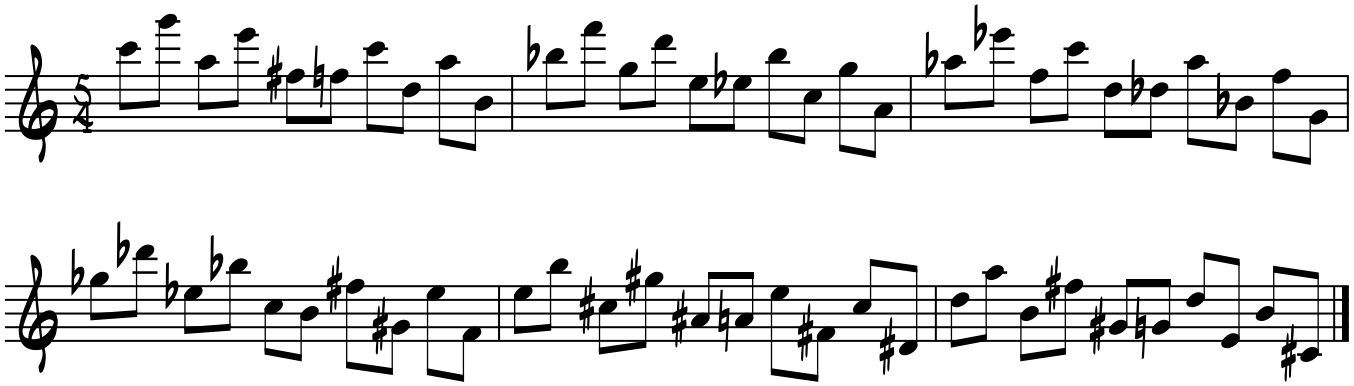

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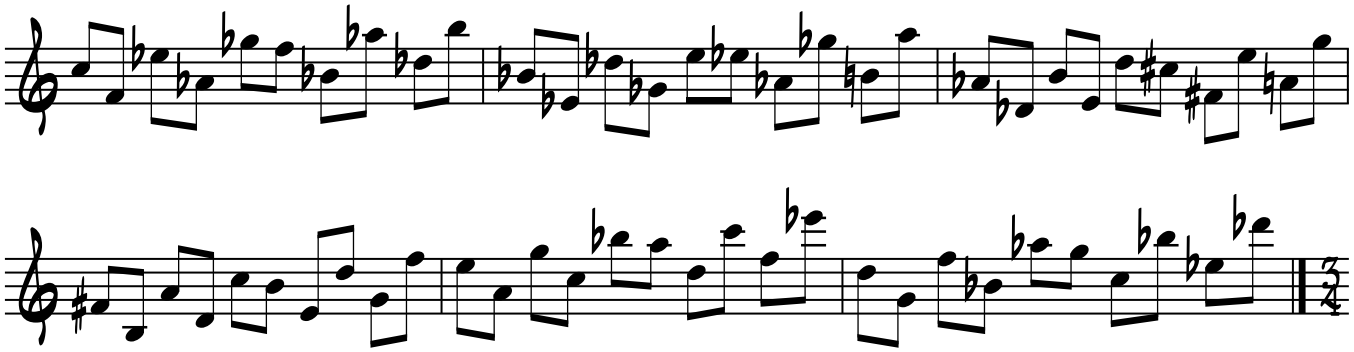

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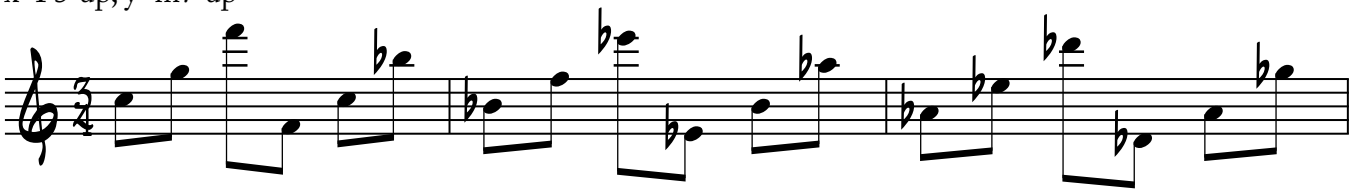

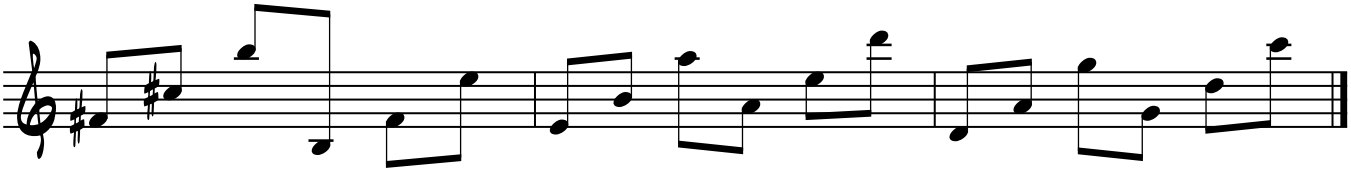

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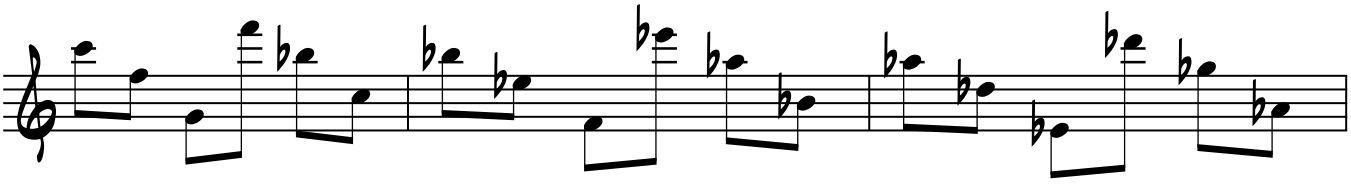

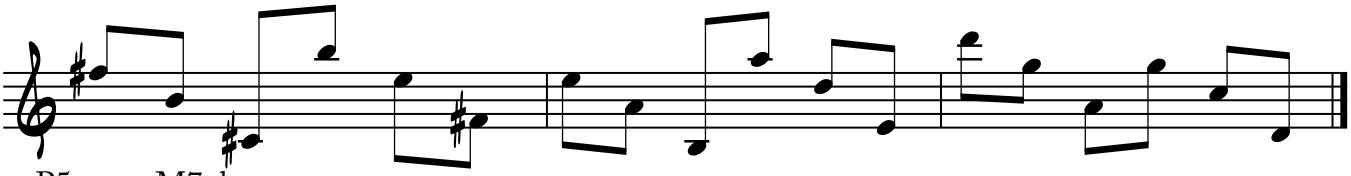

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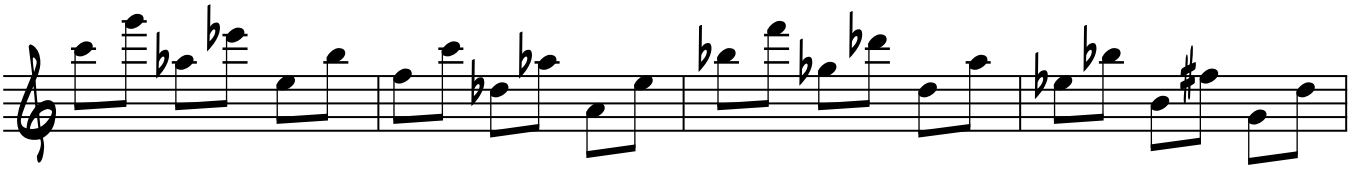

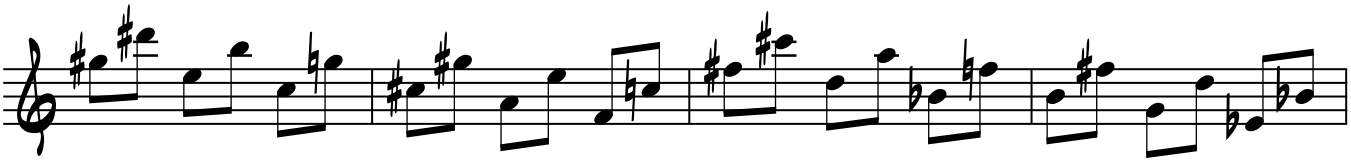

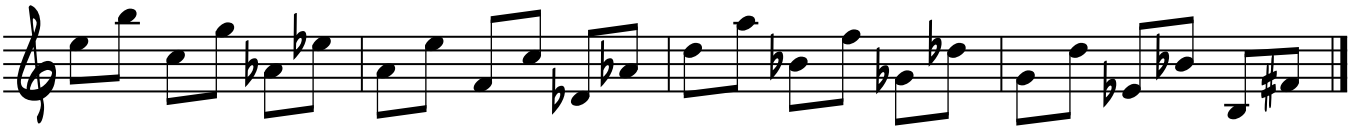

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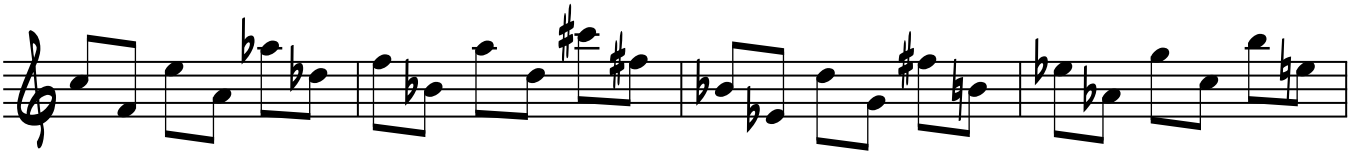

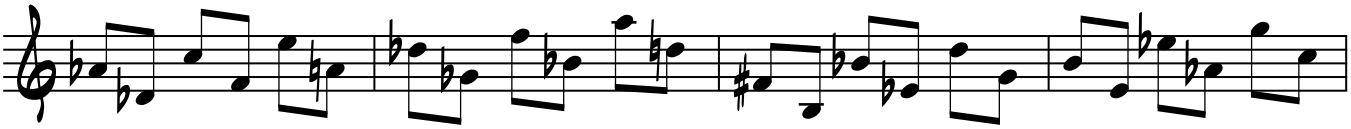

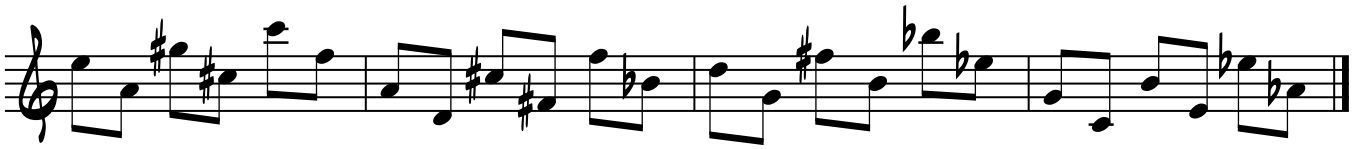

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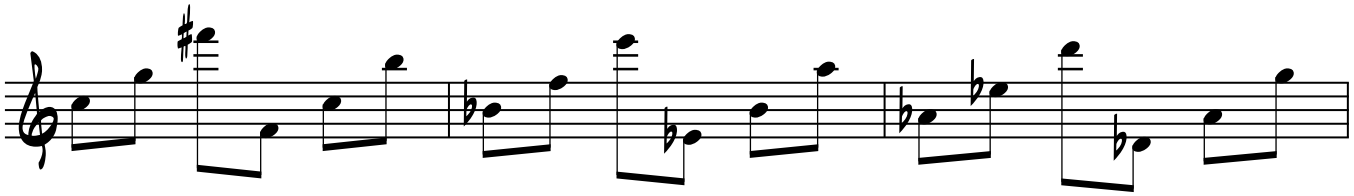

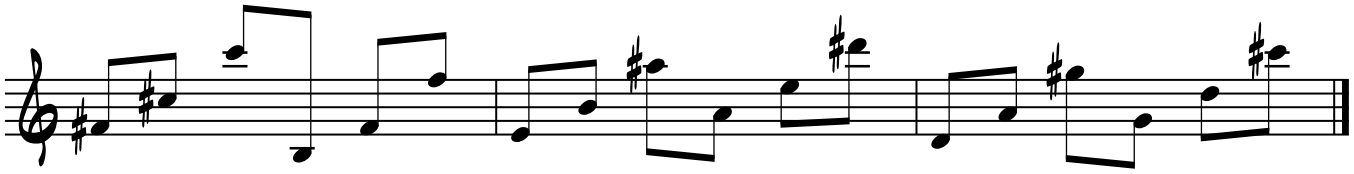

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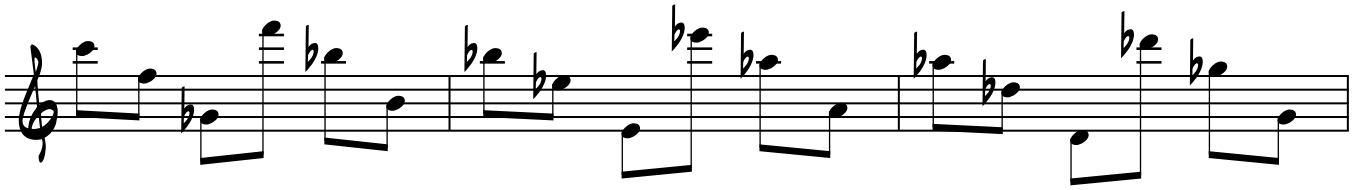

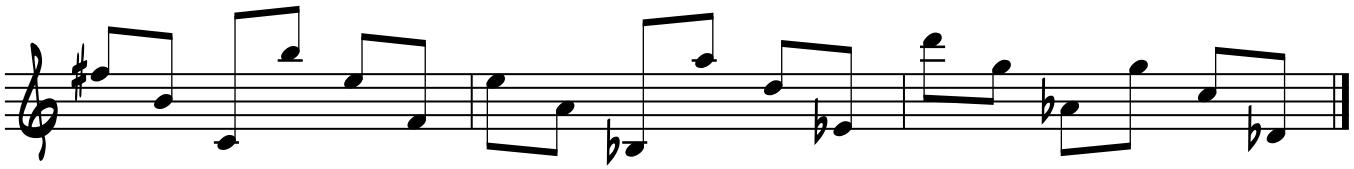

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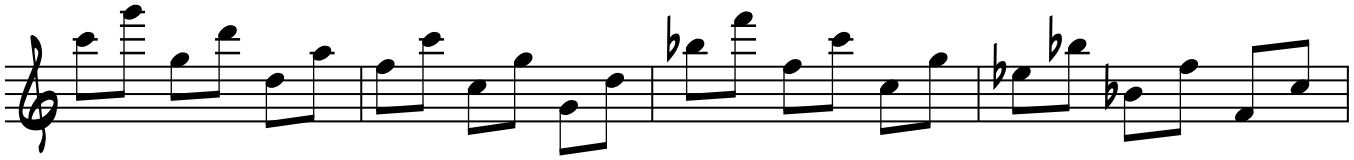
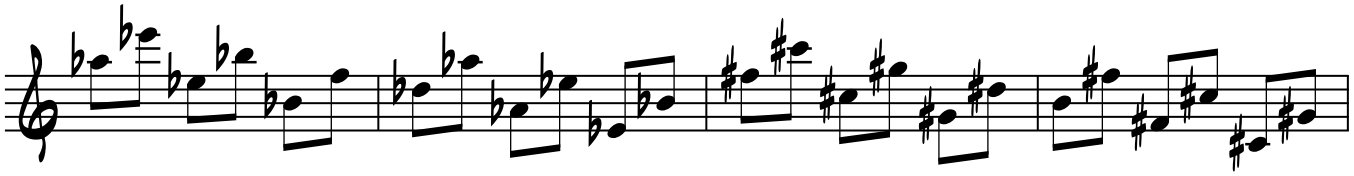
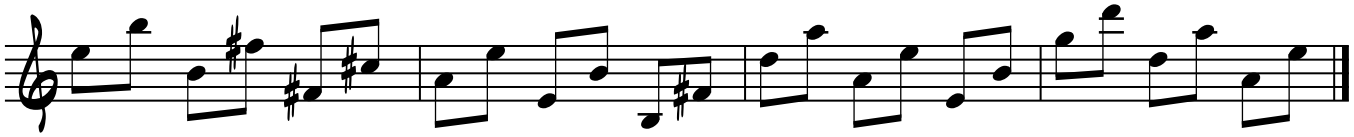
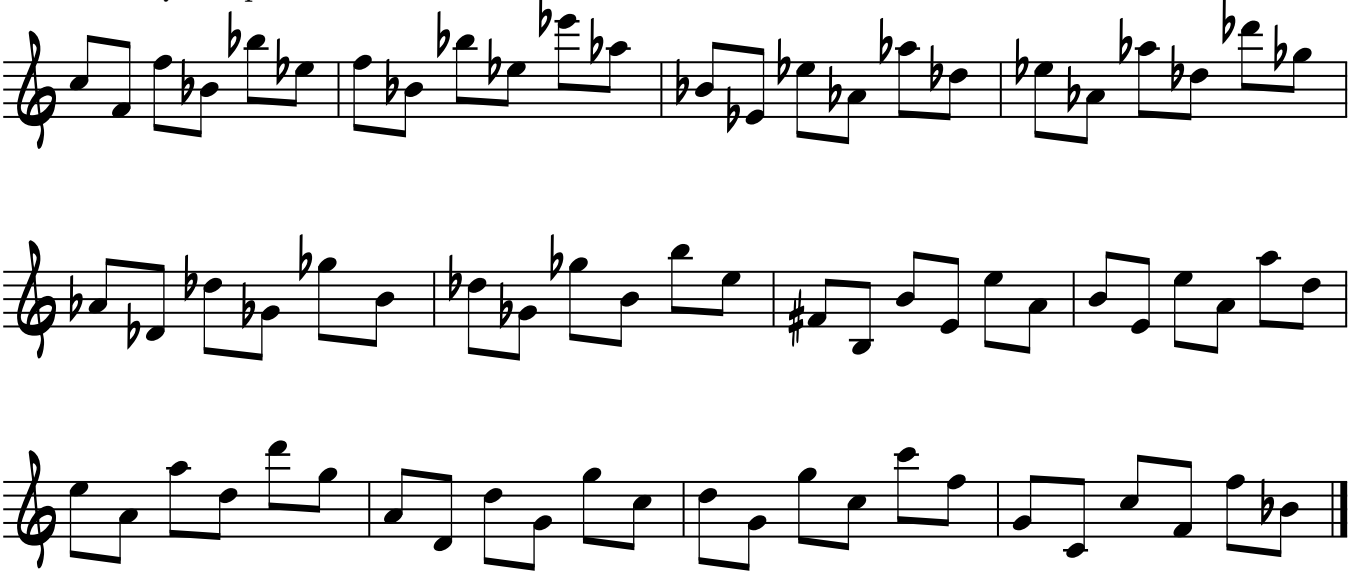


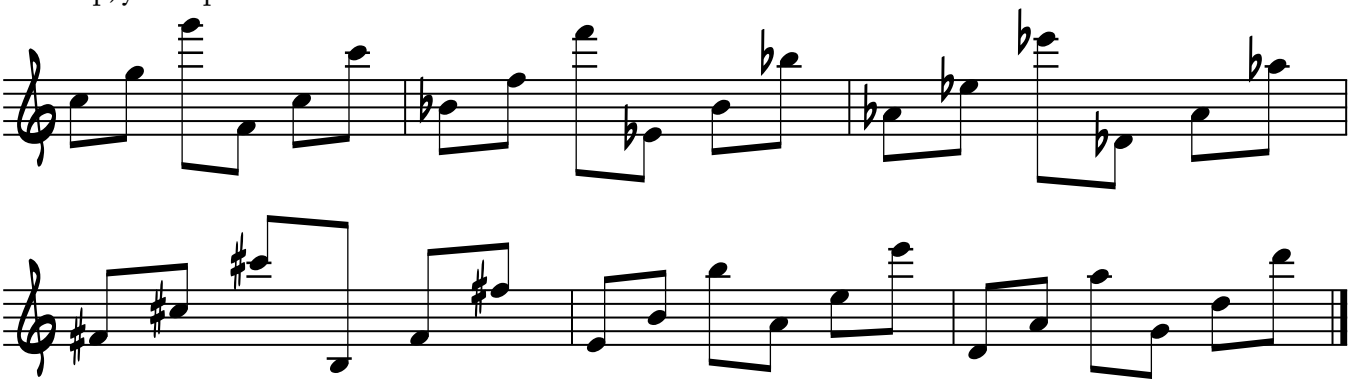




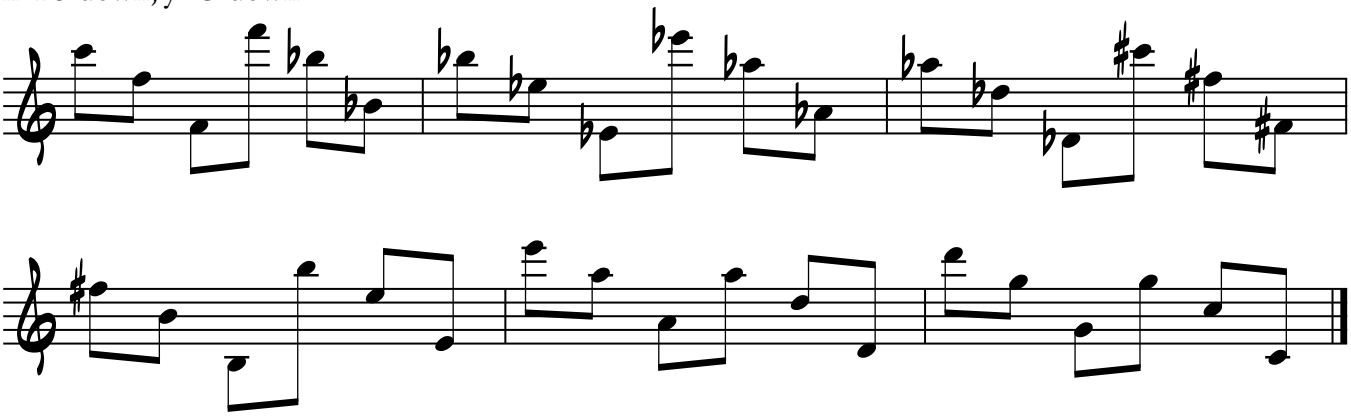
x=P5 down, y=O up



x=P5 up, y=O up



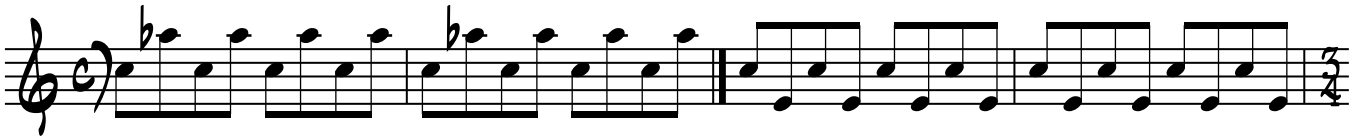
x=P5 down, y=O down



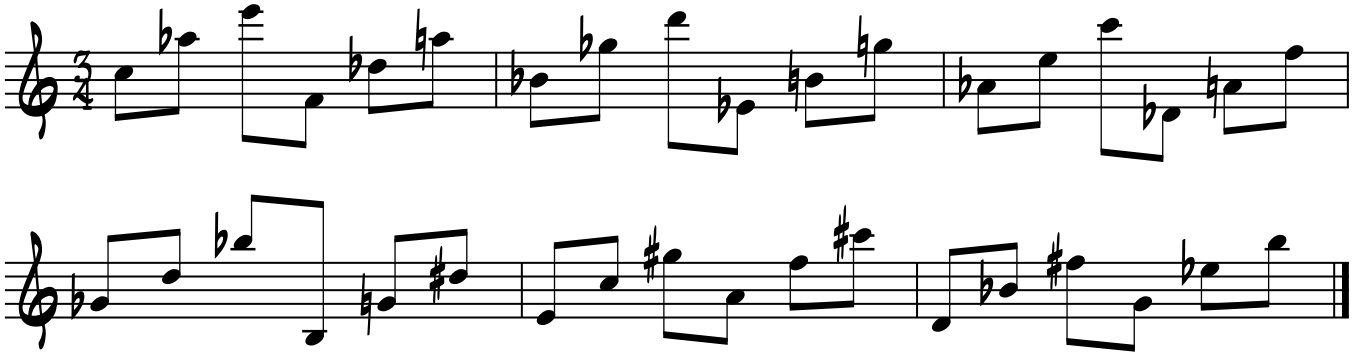
MINOR 6ths

x=m6 up, y=m6 down

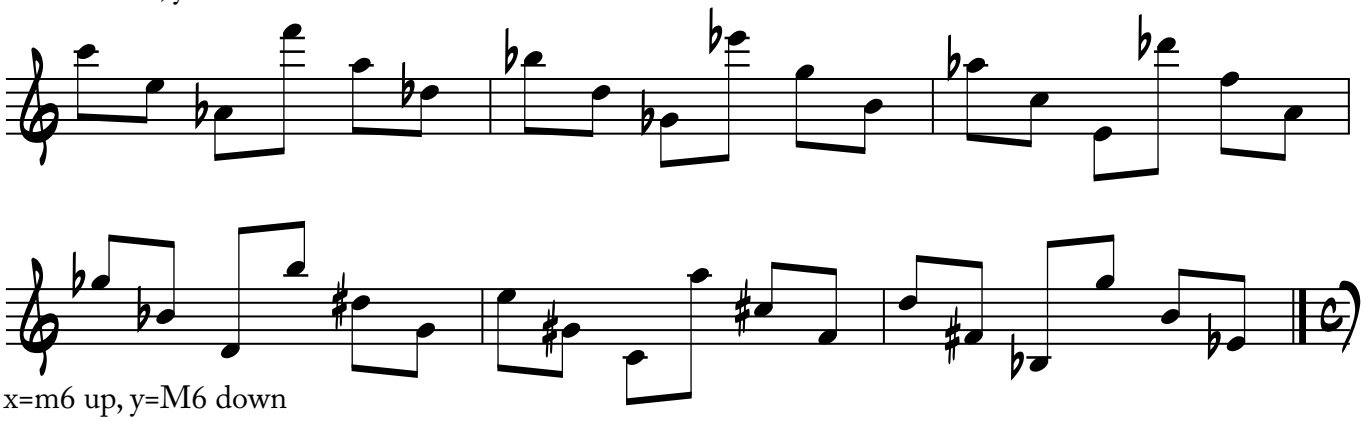
x=m6 down, y=m6 up



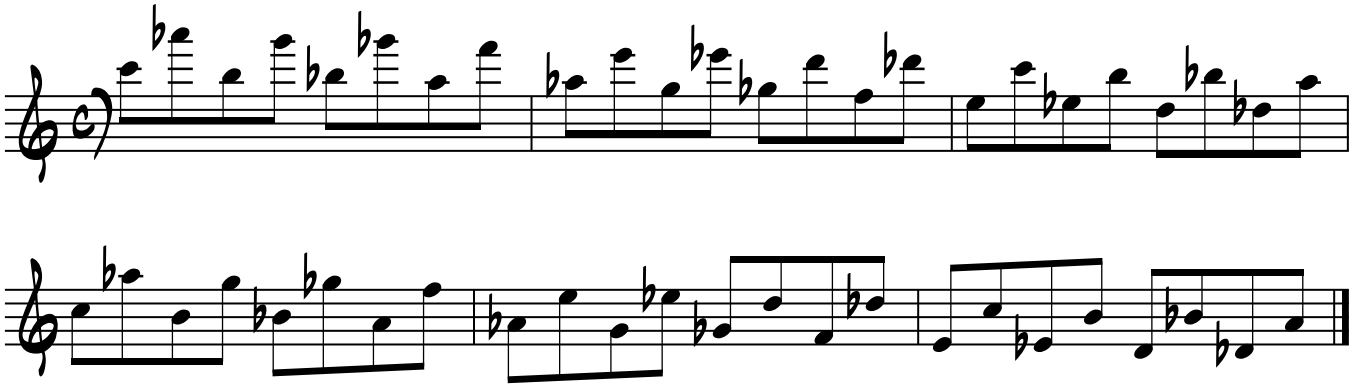
x=m6 up, y=m6 up (Augmented)



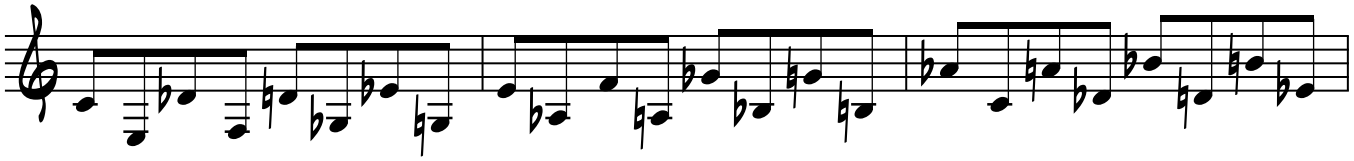
x=m6 down, y=m6 down

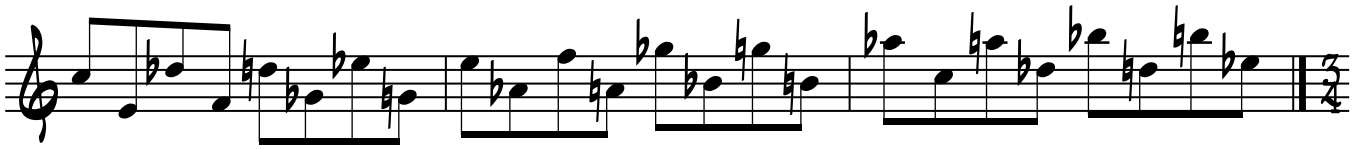


x=m6 up, y=M6 down

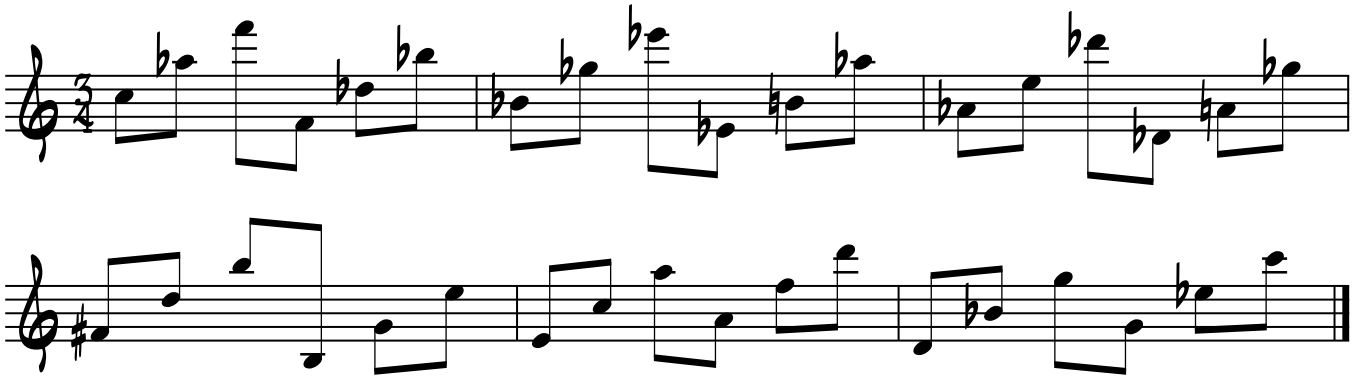


x=m6 down, y=M6 up

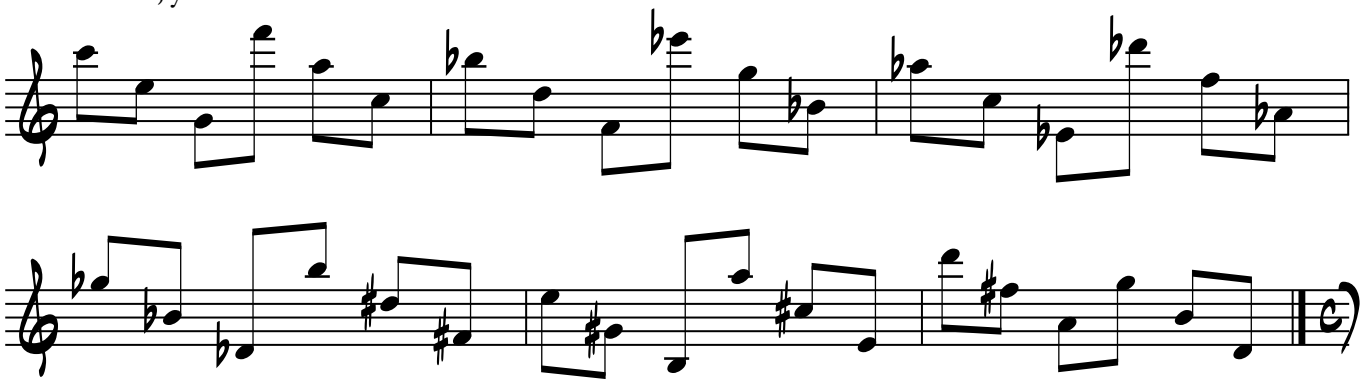




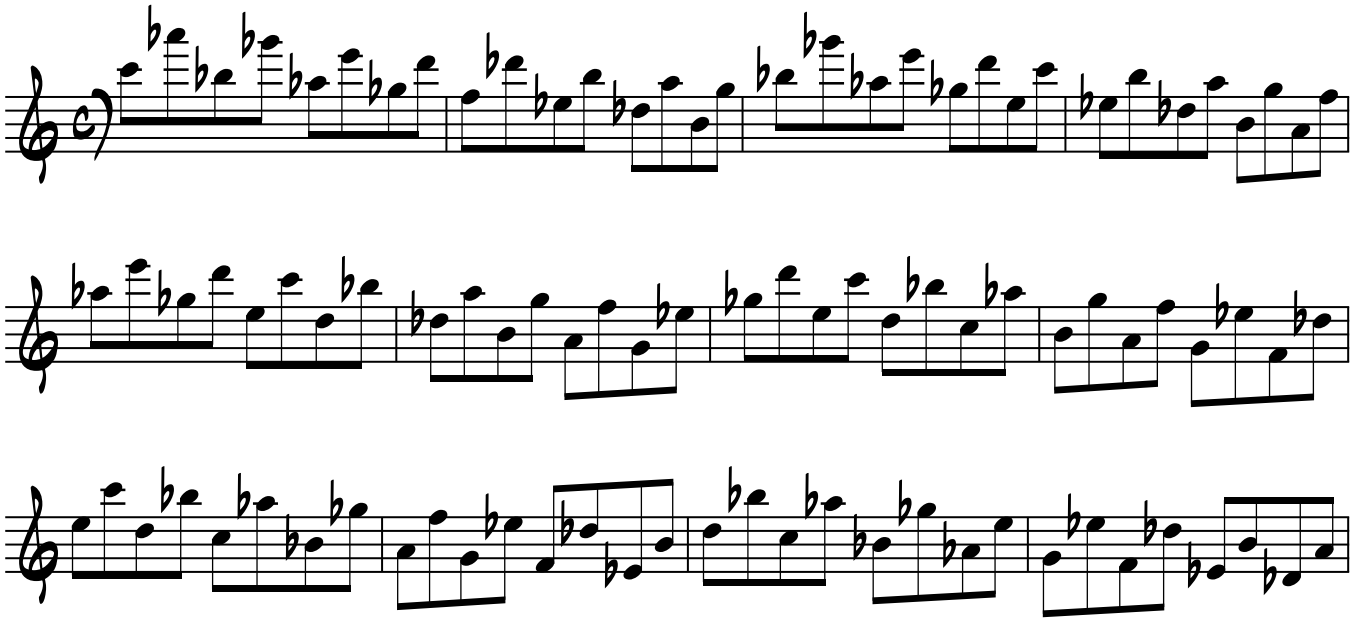
x=m6 up, y=M6 up



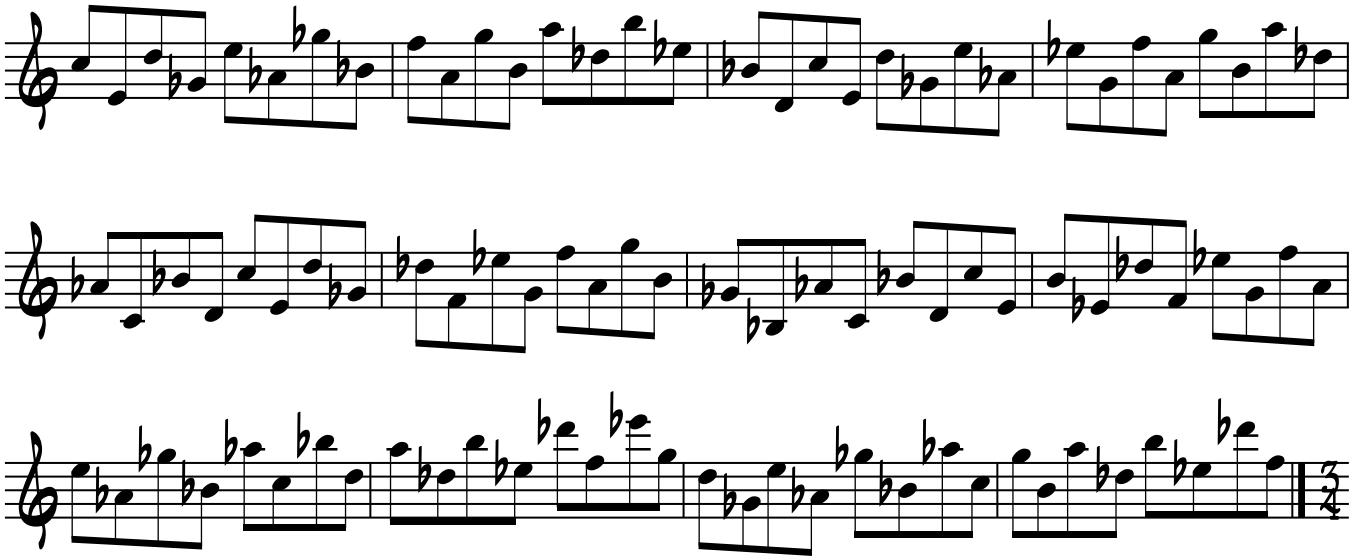
x=m6 down, y=M6 down



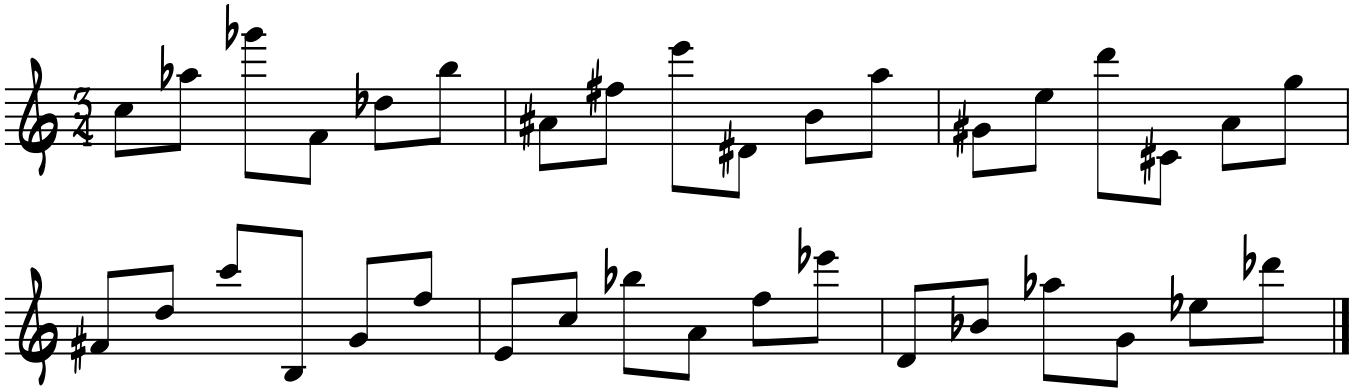
x=m6 up, y=m7 down



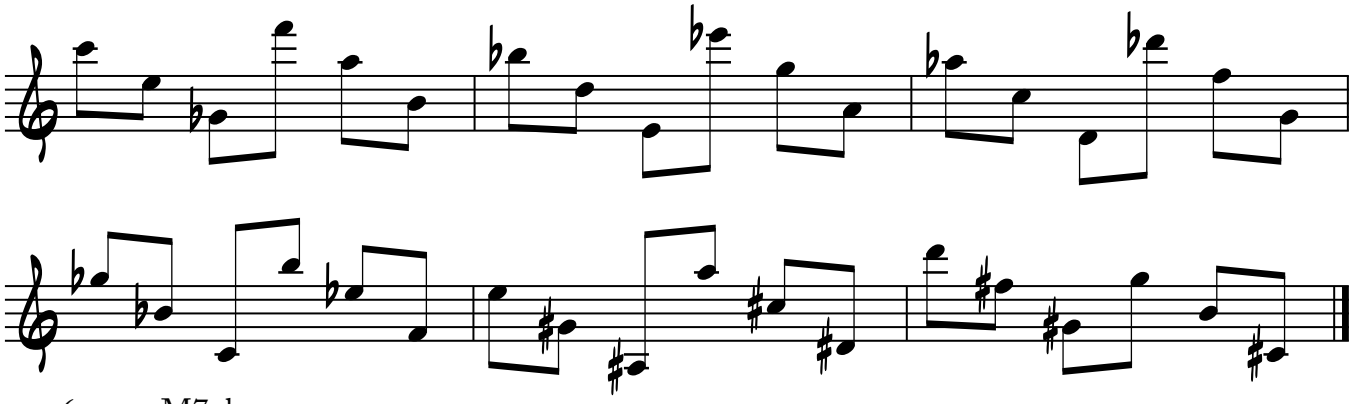
x=m6 down, y=m7 up



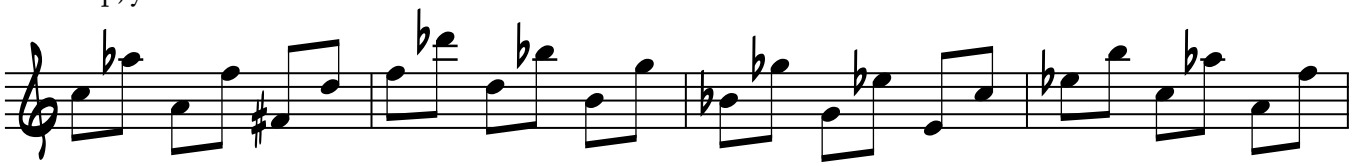
x=m6 up, y=m7 up

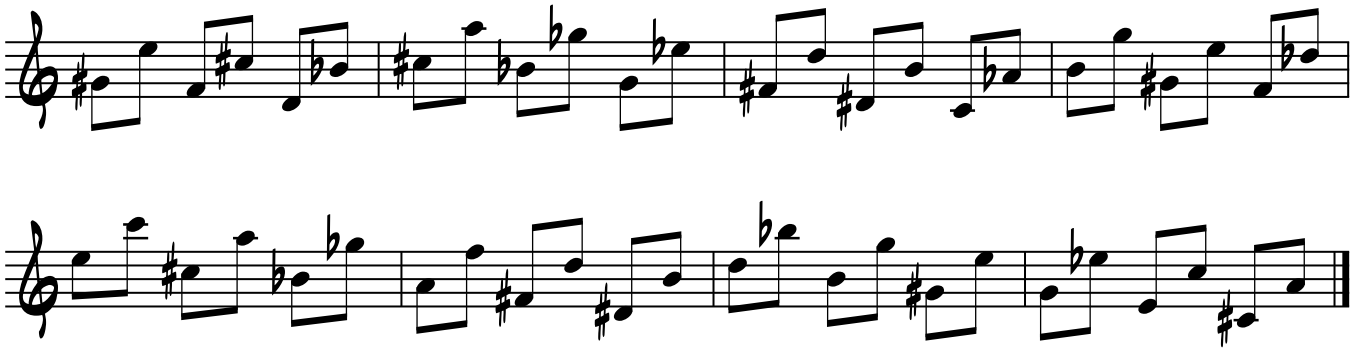


x=m6 down, y=m7 down

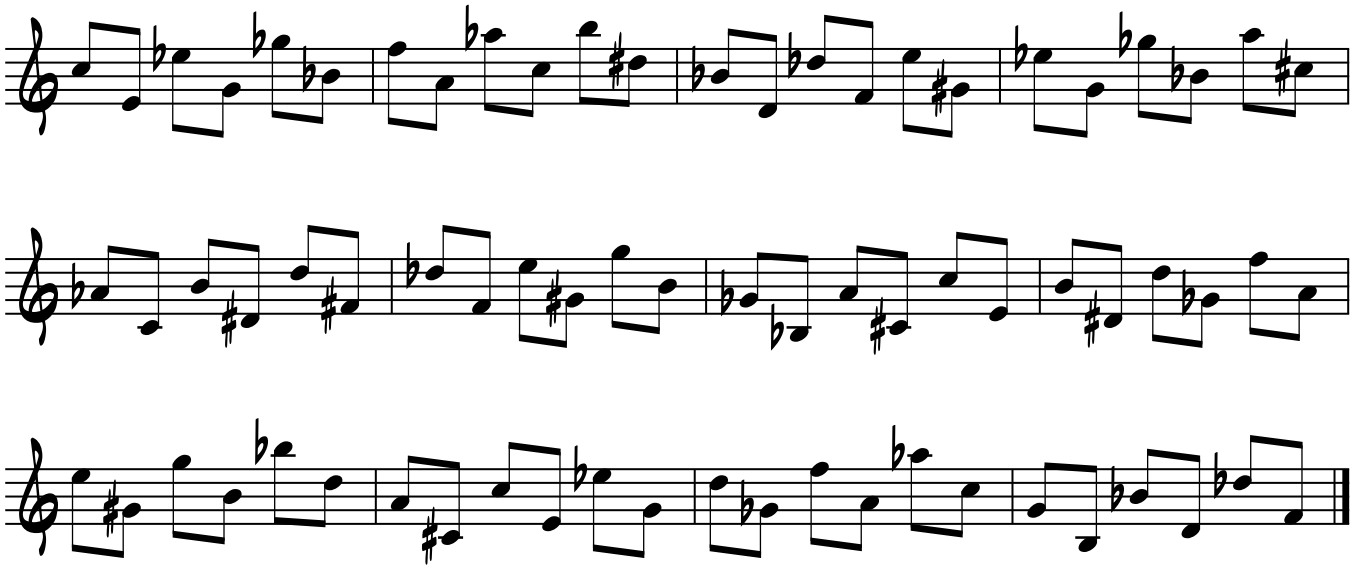


x=m6 up, y=M7 down

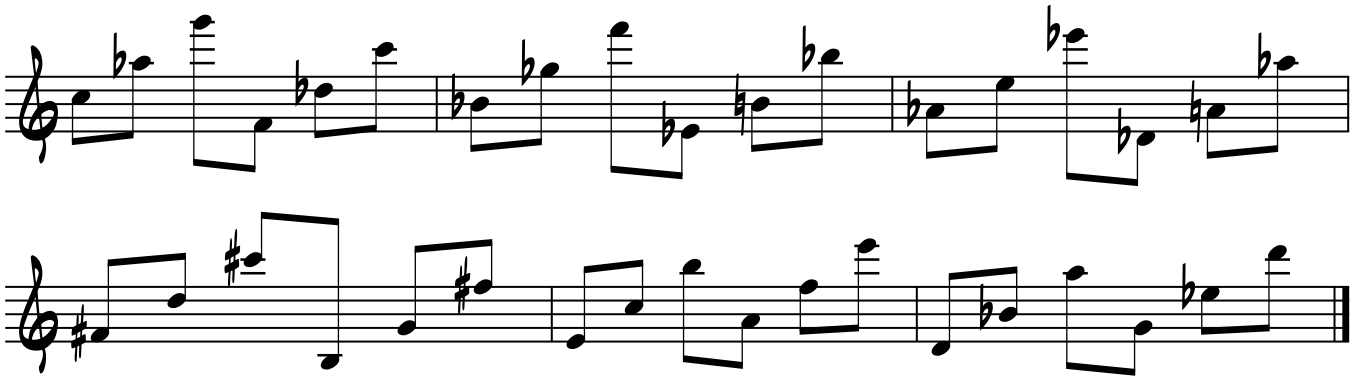




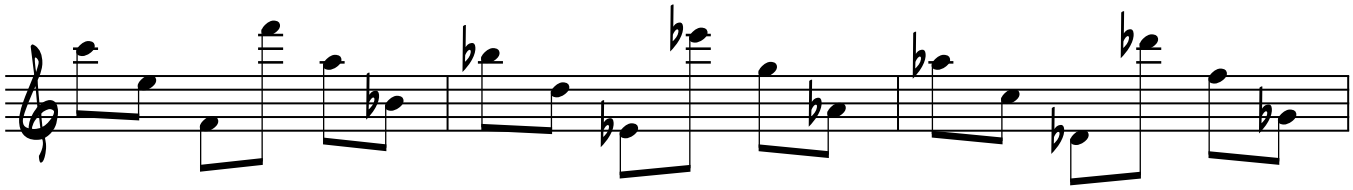
x=m6 down, y=M7 up

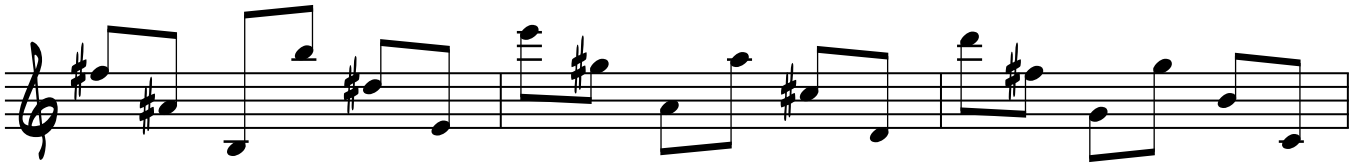


x=m6 up, y=M7 up

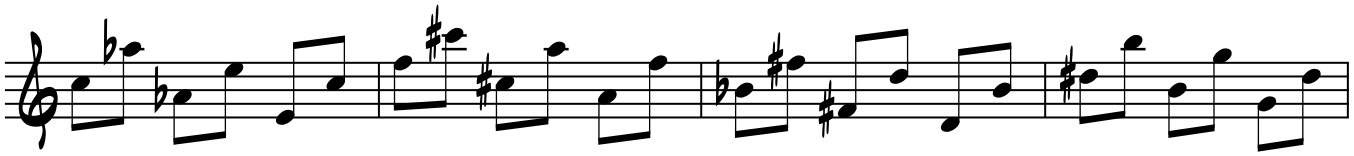


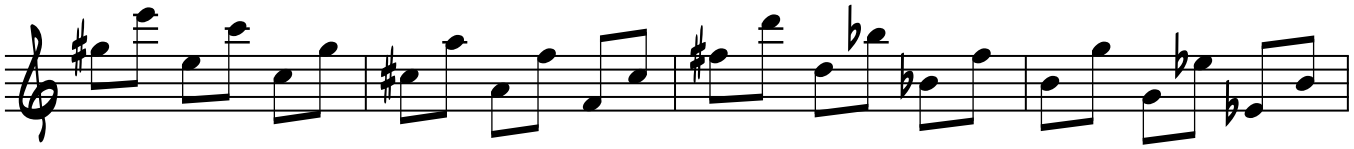
x=m6 down, y=M7 down

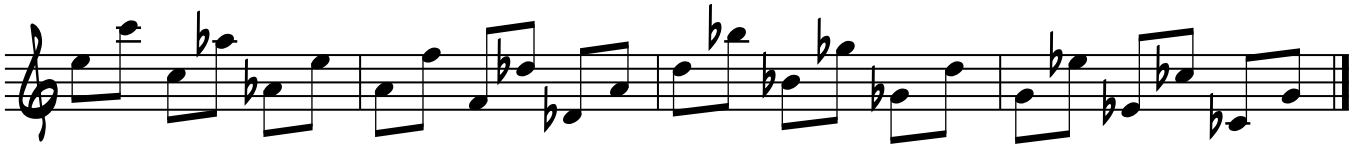




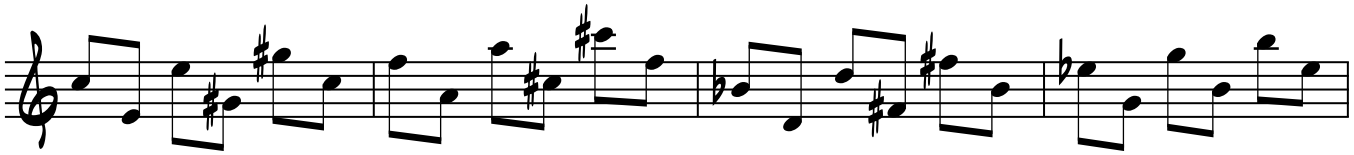
x=m6 up, y=O down

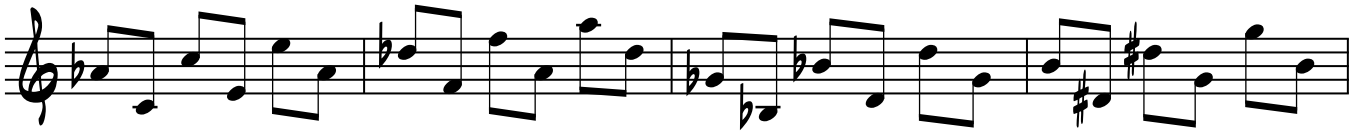


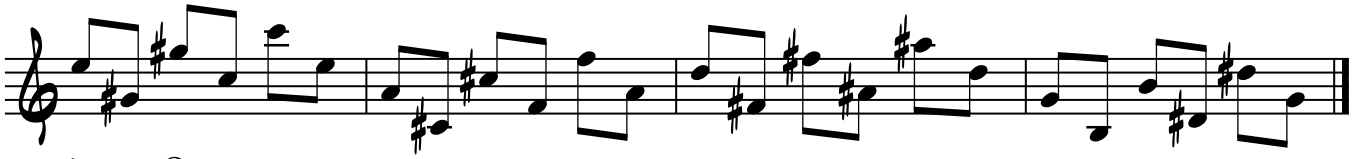




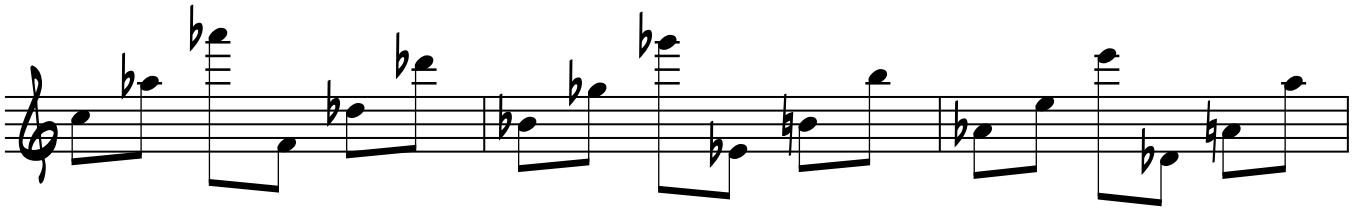
x=m6 down, y=O up

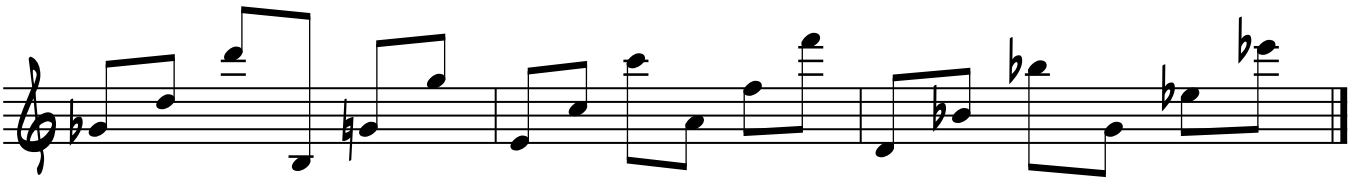




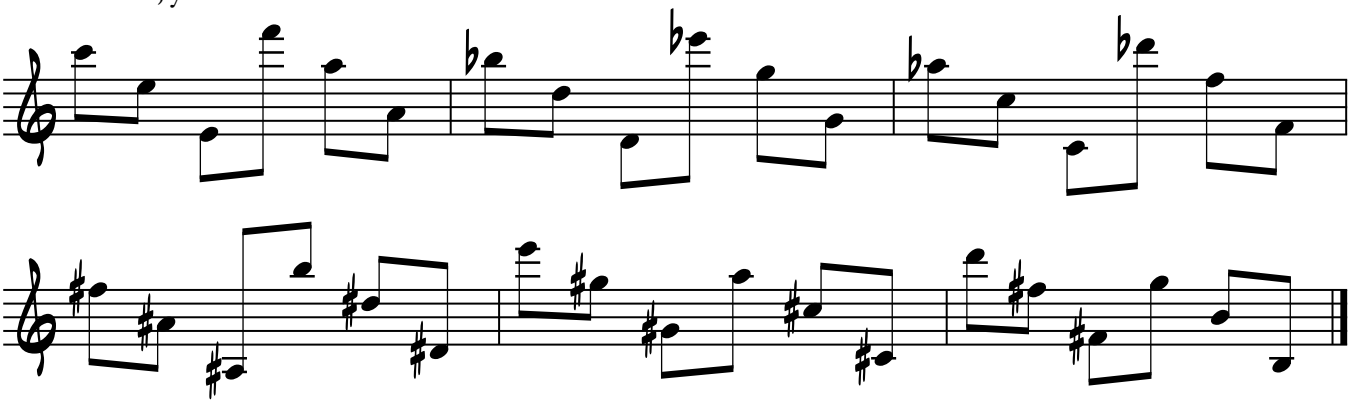


x=m6 up, y=O up



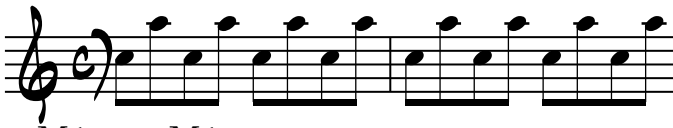


x=m6 down, y=O down

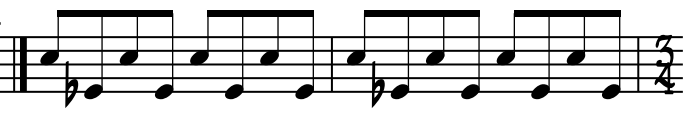


Major 6ths

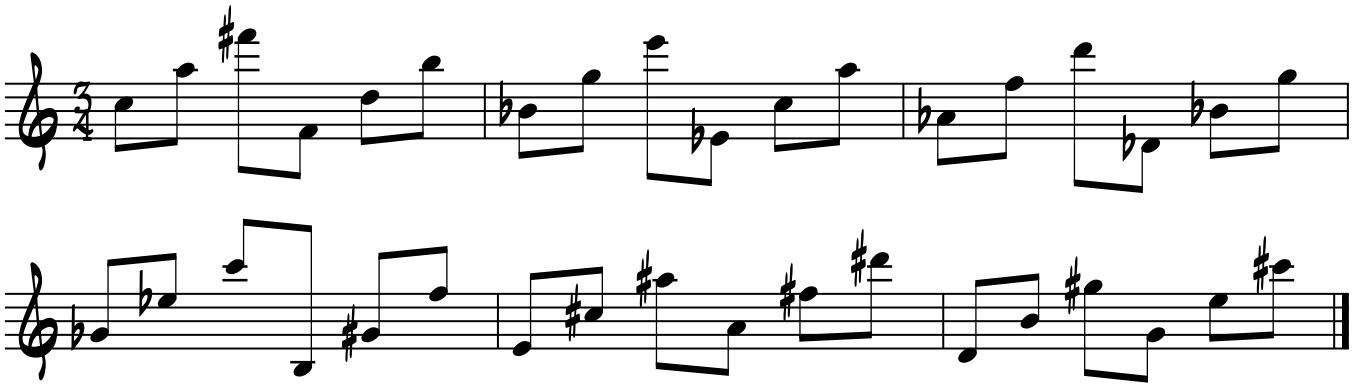
x=M6 up, y=M6 down



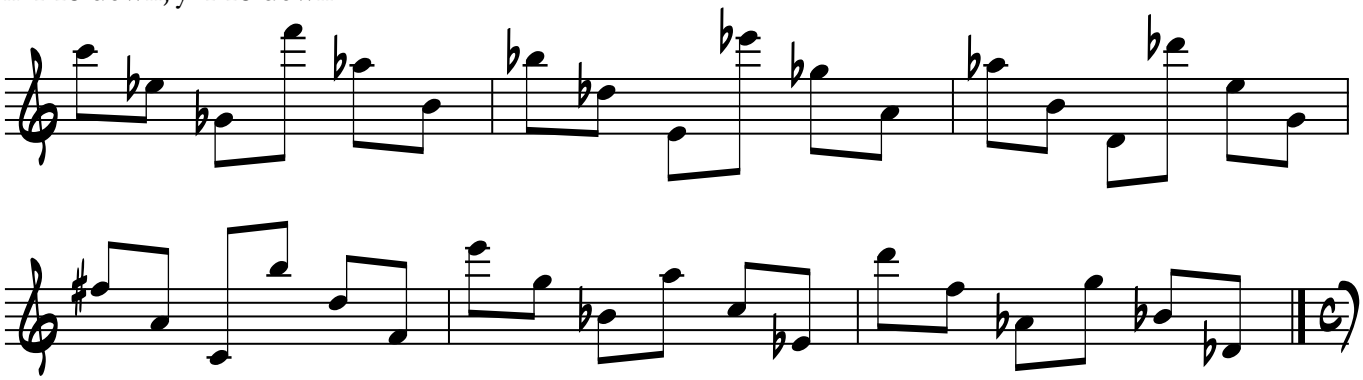
x=M6 down, y=M6 up



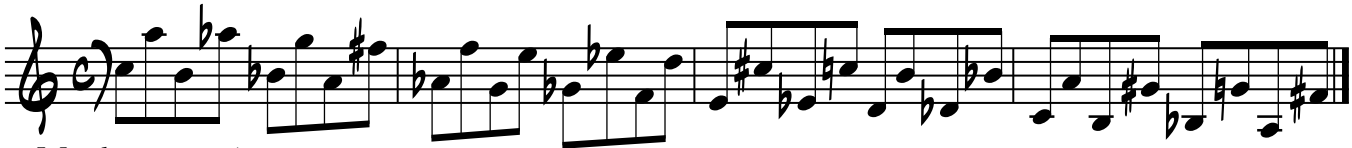
x=M6 up, y=M6 up



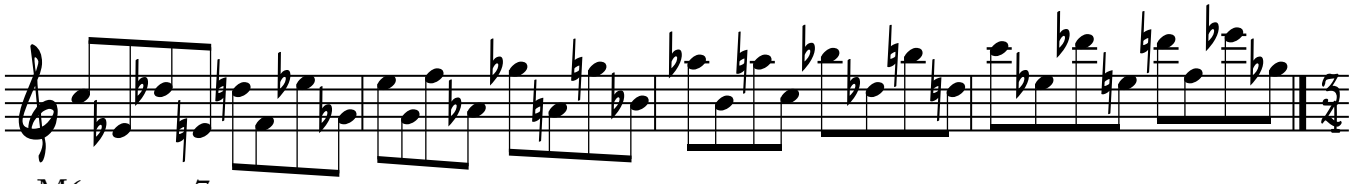
x=M6 down, y=M6 down



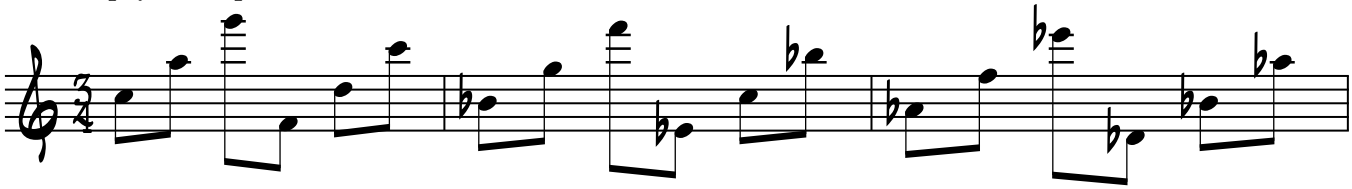
x=M6 up, y=m7 down

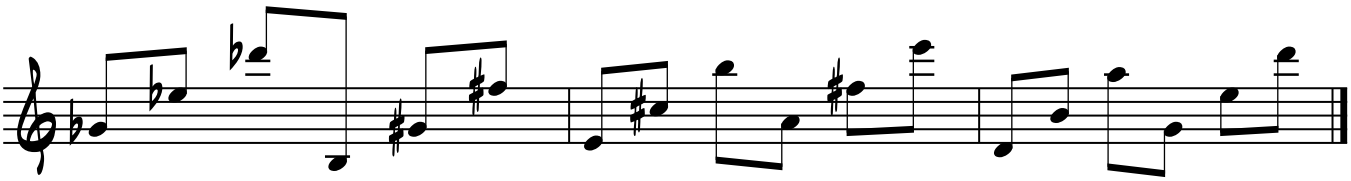


x=M6 down, y=m7 up

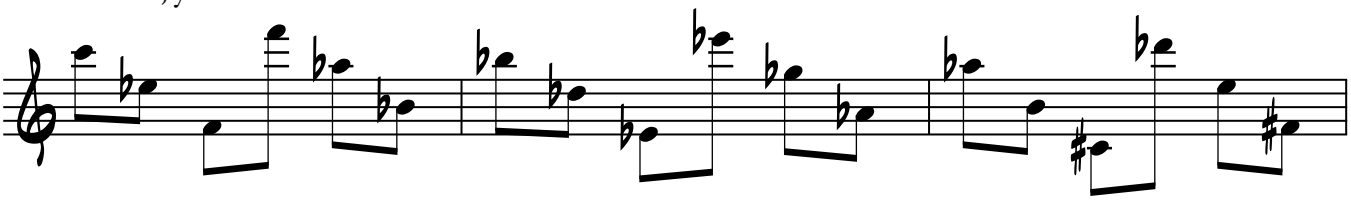


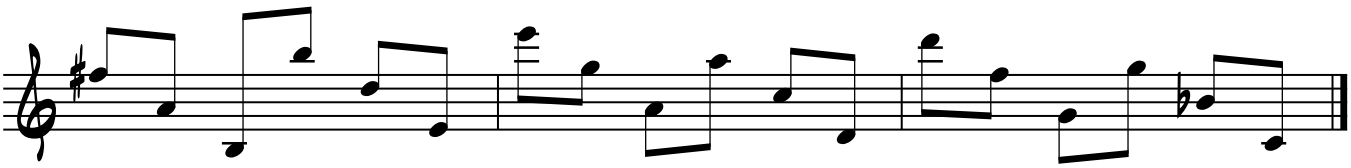
x=M6 up, y=m7 up



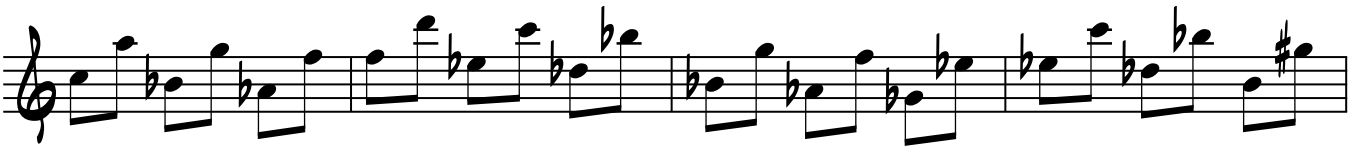


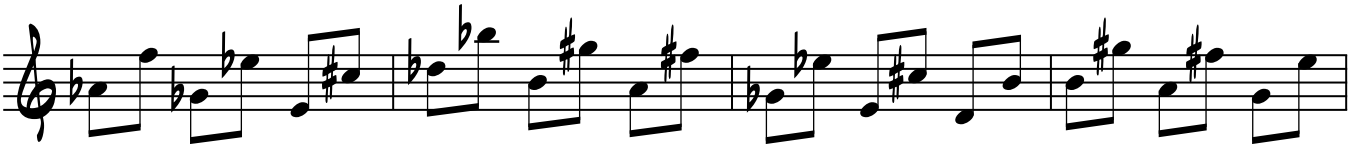
x=M6 down, y=m7 down

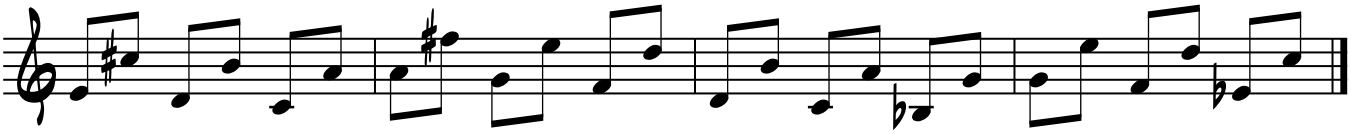




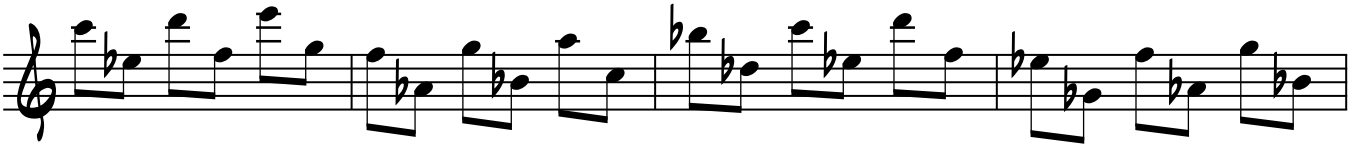
x=M6 up, y= M7 down

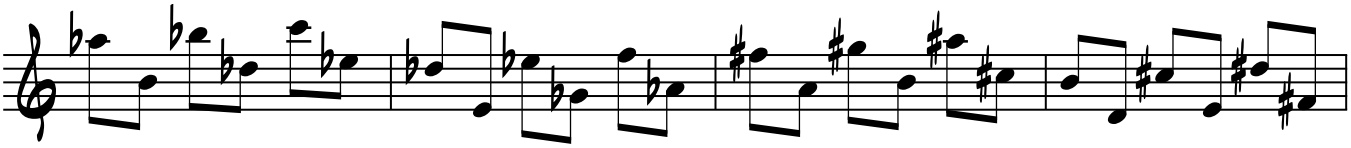


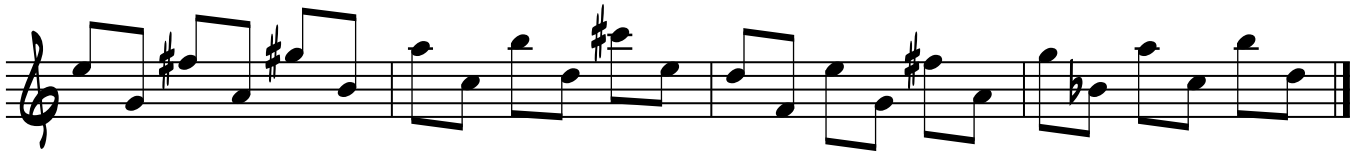




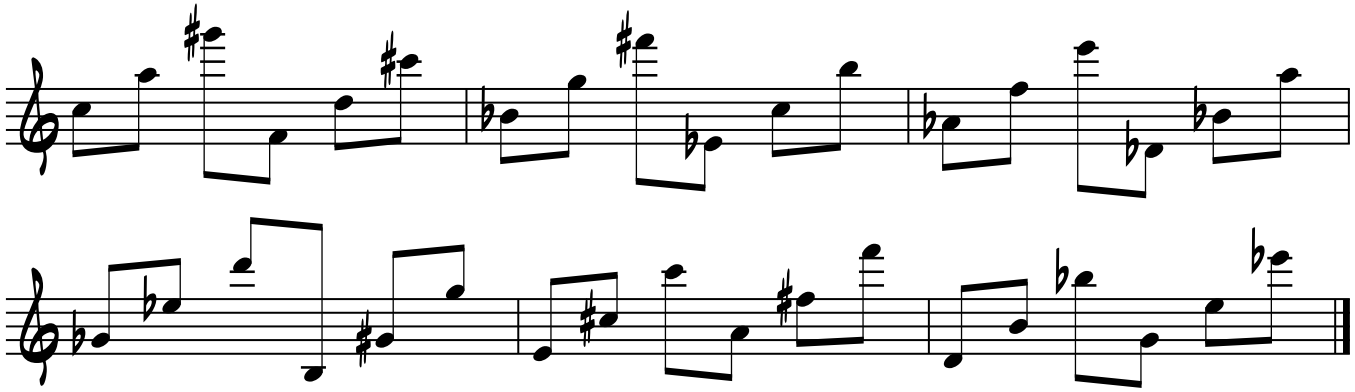
x=M6 down, y=M7 up



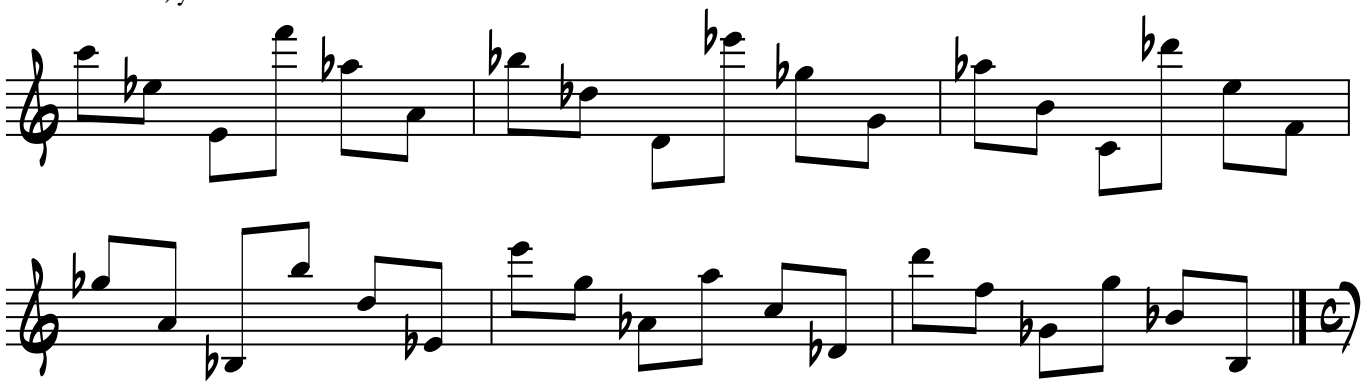




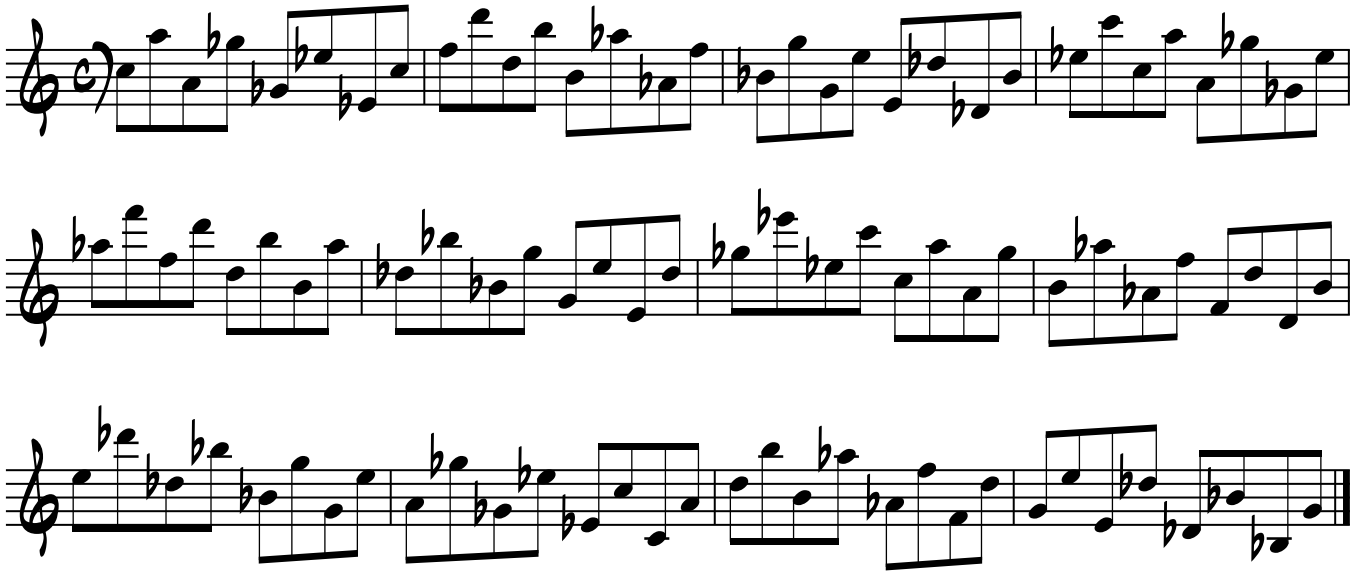
x=M6 up, y=M7 up



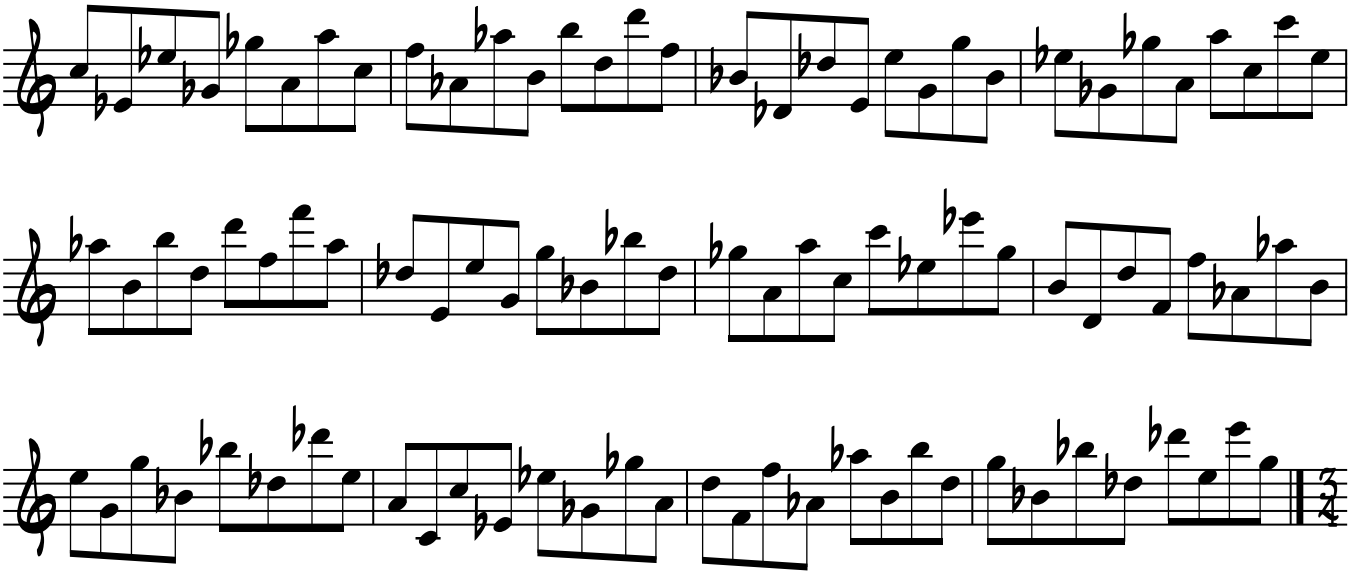
x=M6 down, y=M7 down



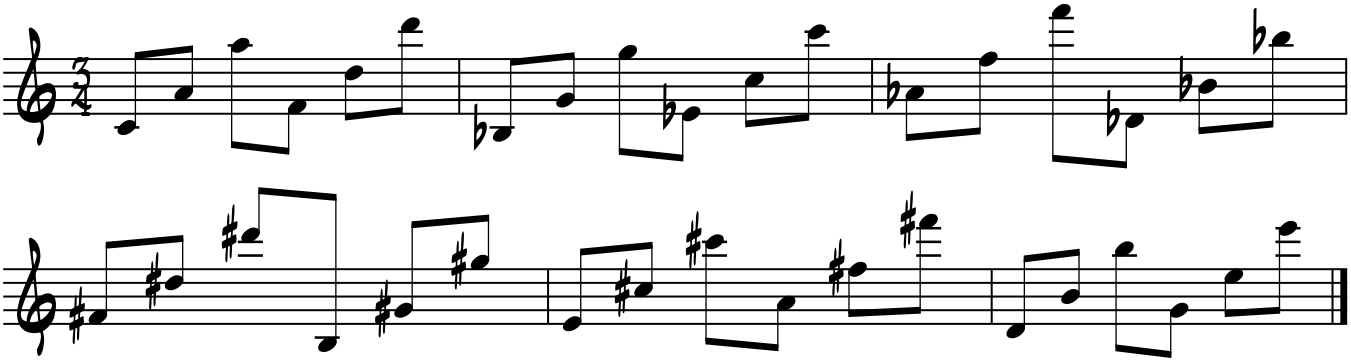
x=M6 up, y=O down



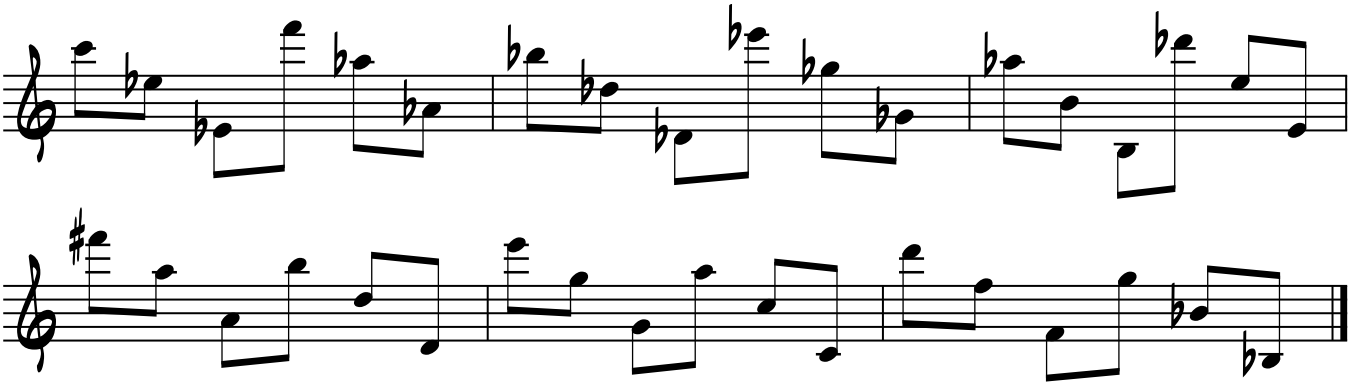
x=M6 down, y=O up



x=M6 up, y=O up



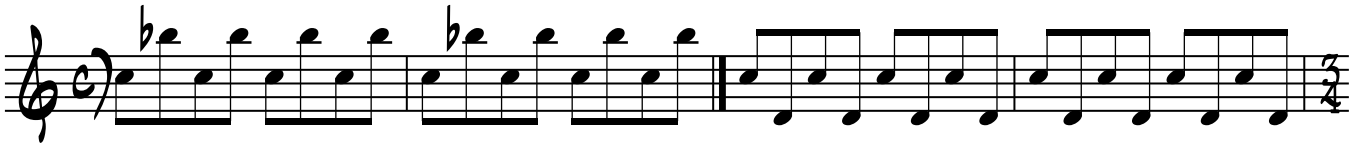
x=M6 down, y=O down



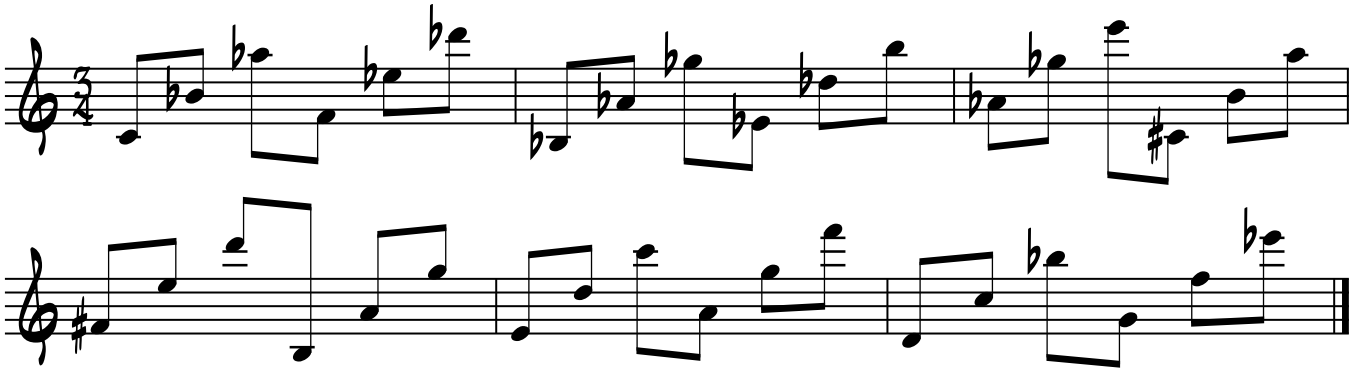
MINOR 7ths

x=m7 up, y=m7 down

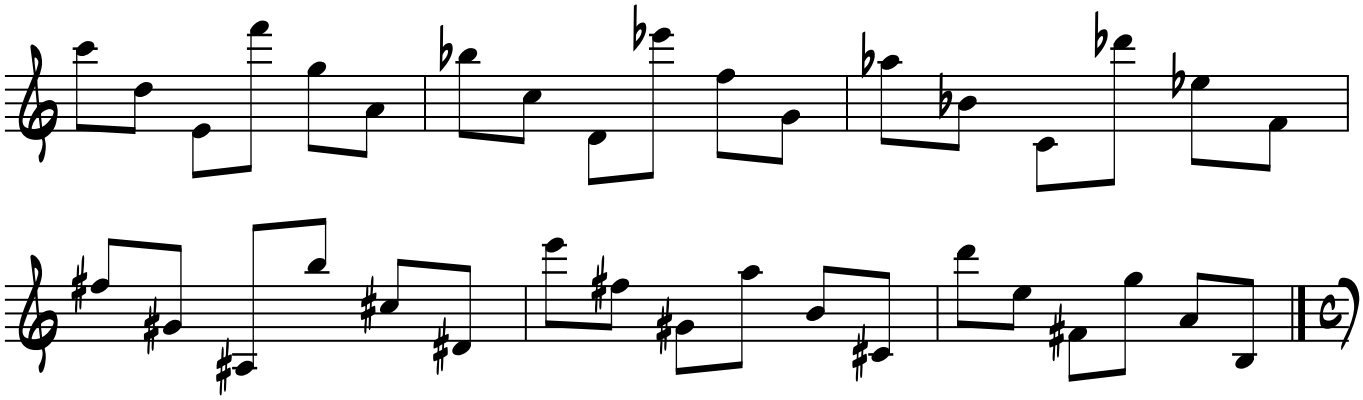
x=m7 down, y=m7 up



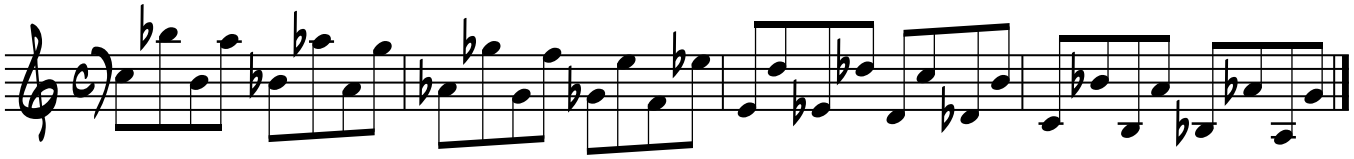
x=m7 up, y=m7 up



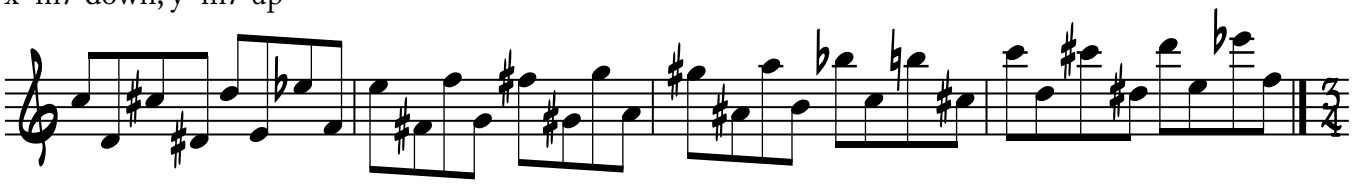
x=m7 down, y=m7 down



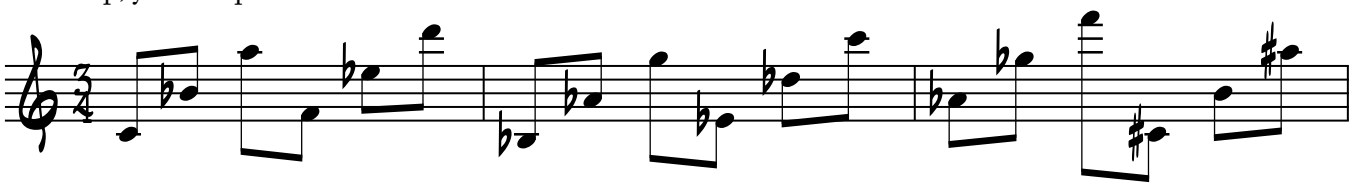
x=m7 up, y=M7 down

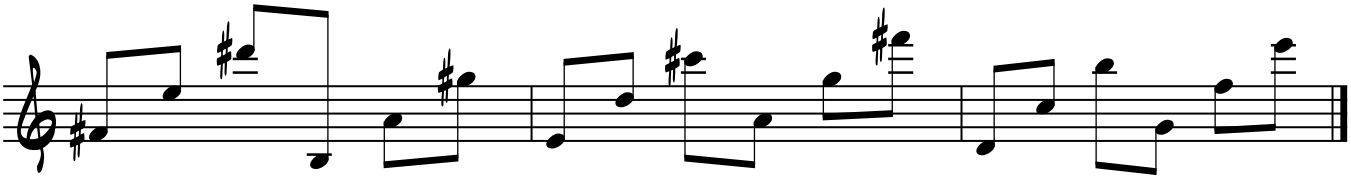


x=m7 down, y=m7 up

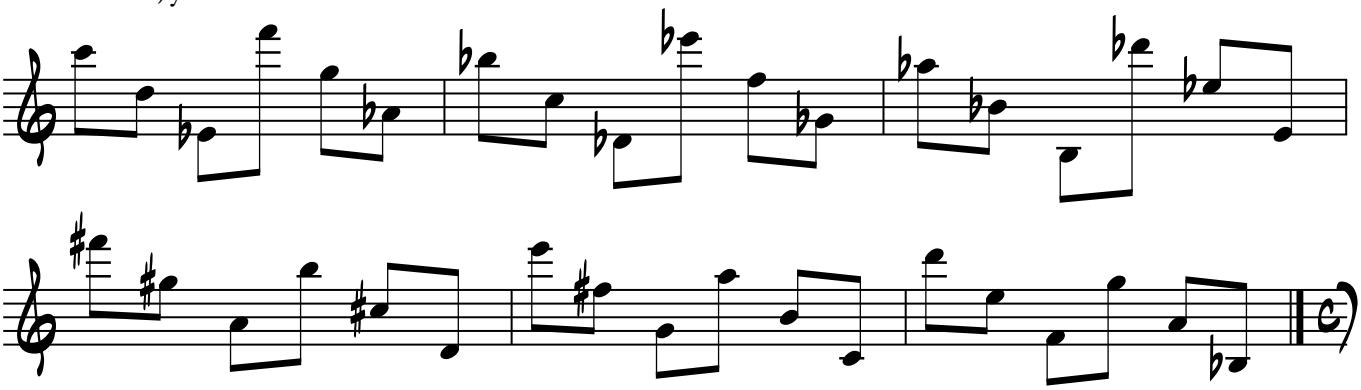


x=m7 up, y=M7 up

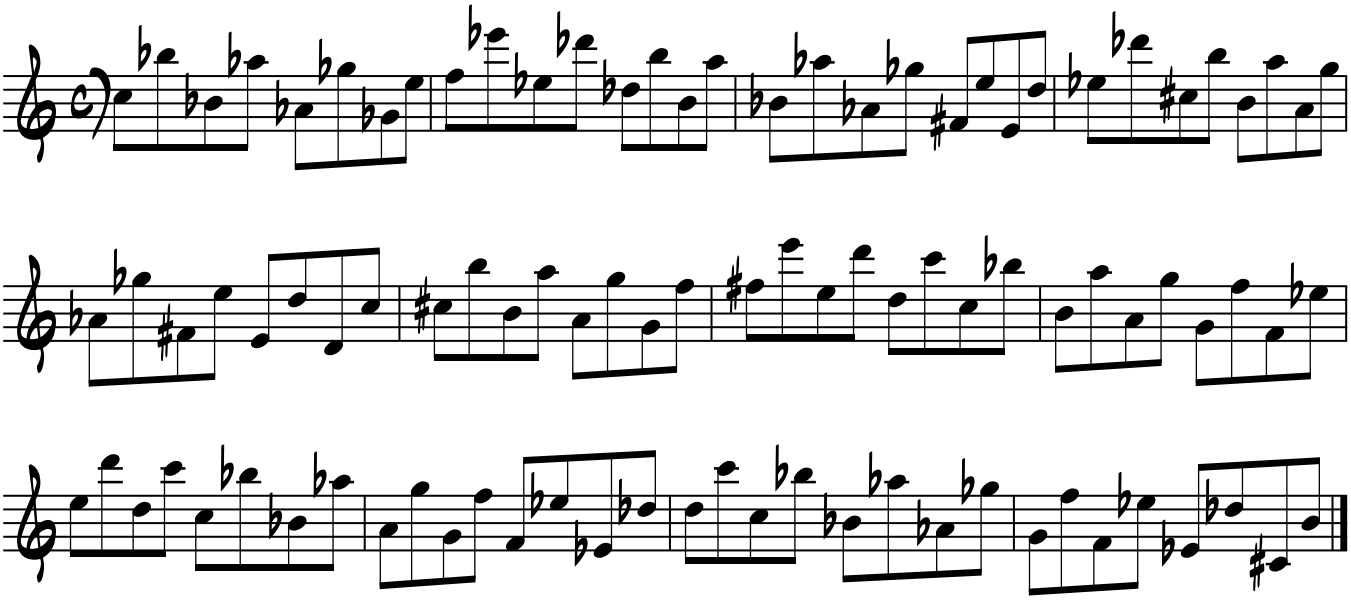




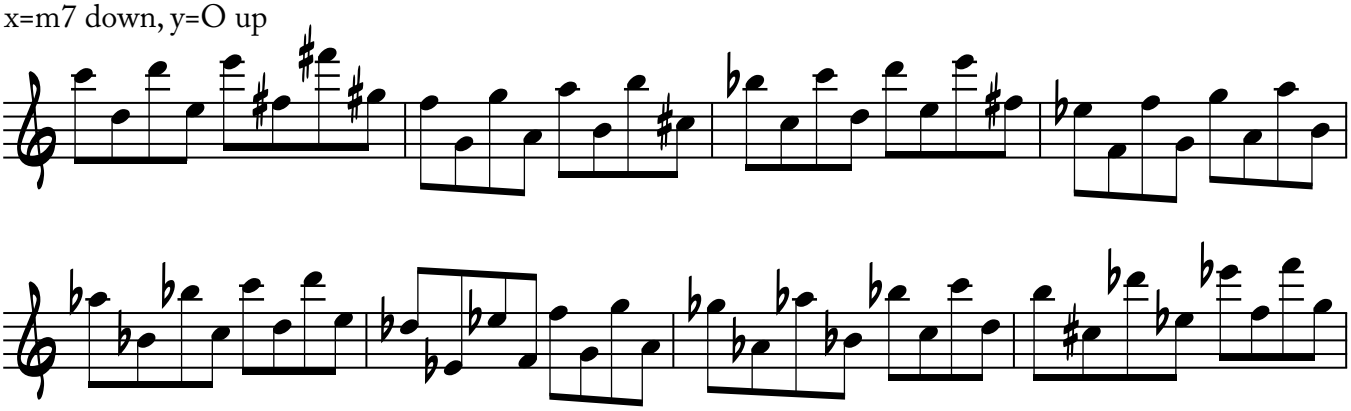
x=m7 down, y=M7 down

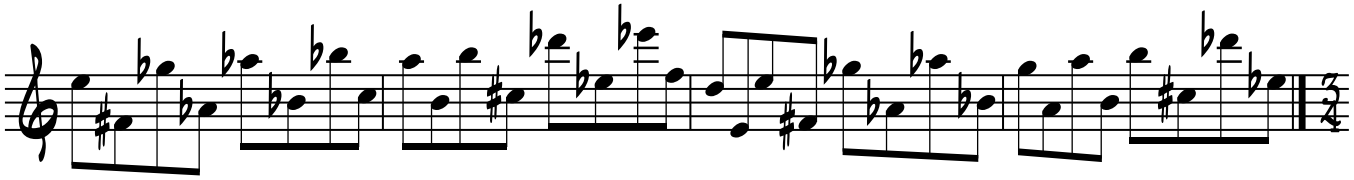


x=m7 up, y=O down

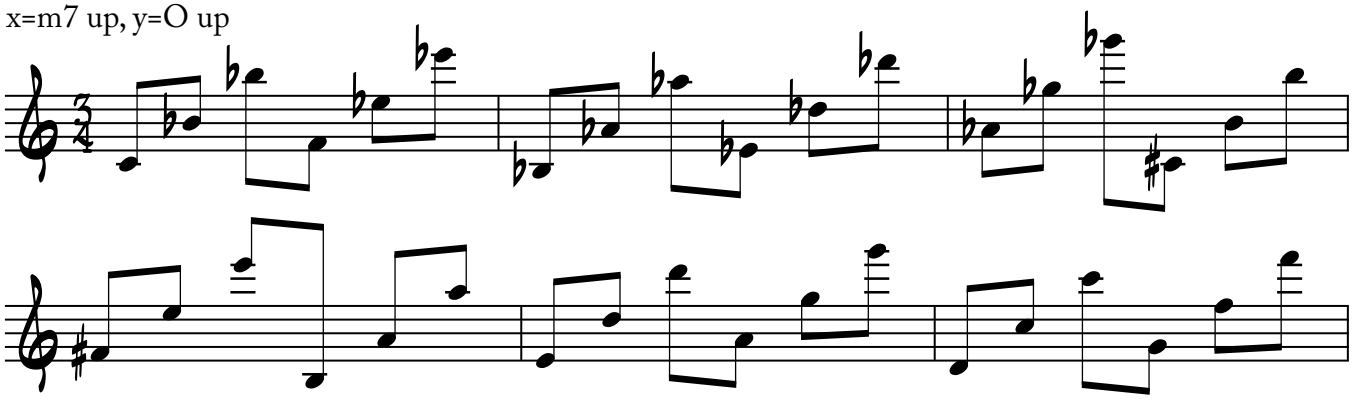


x=m7 down, y=O up

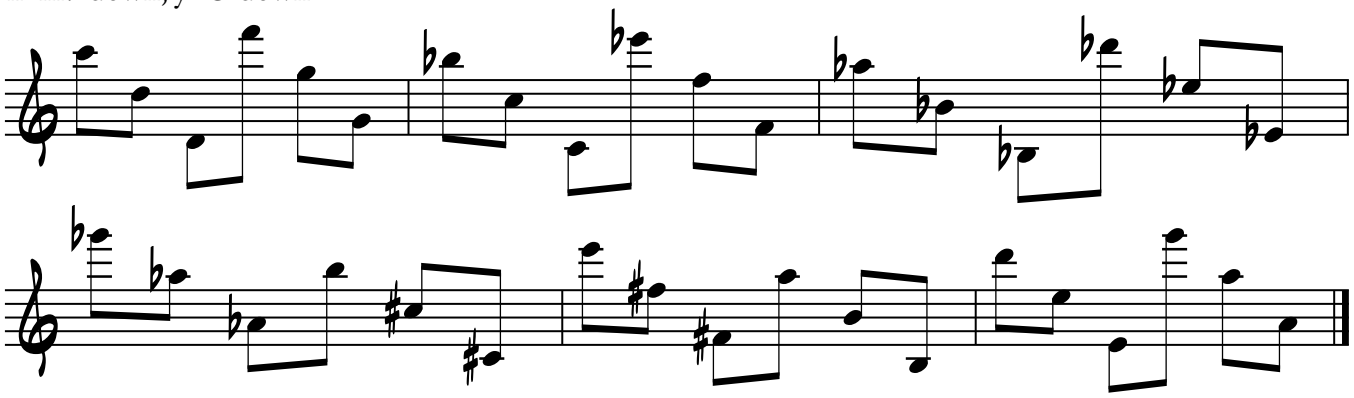




x=m7 up, y=O up



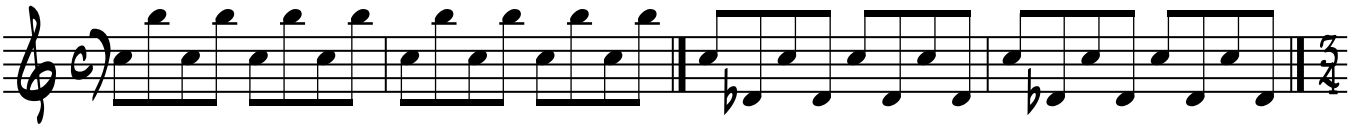
x=m7 down, y=O down



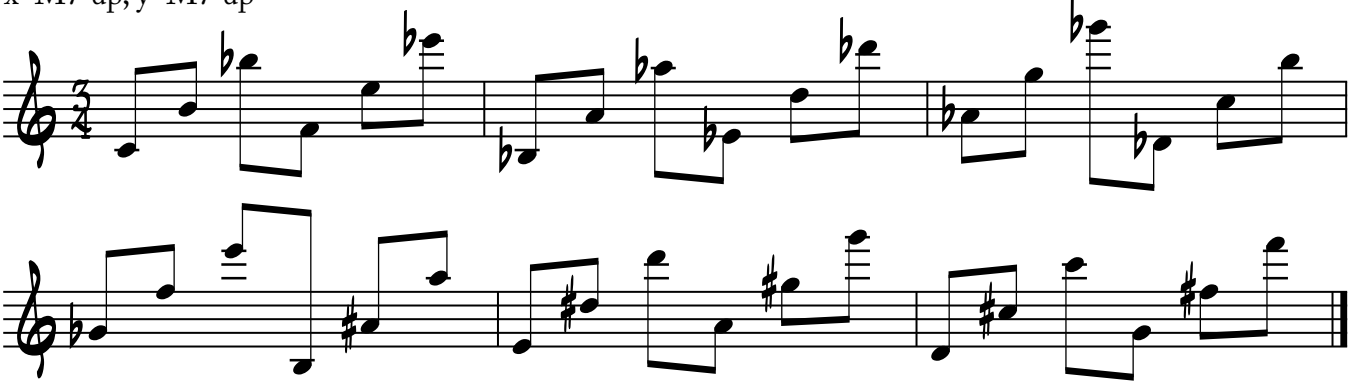
MAJOR 7ths

x=M7 up, y=M7 down

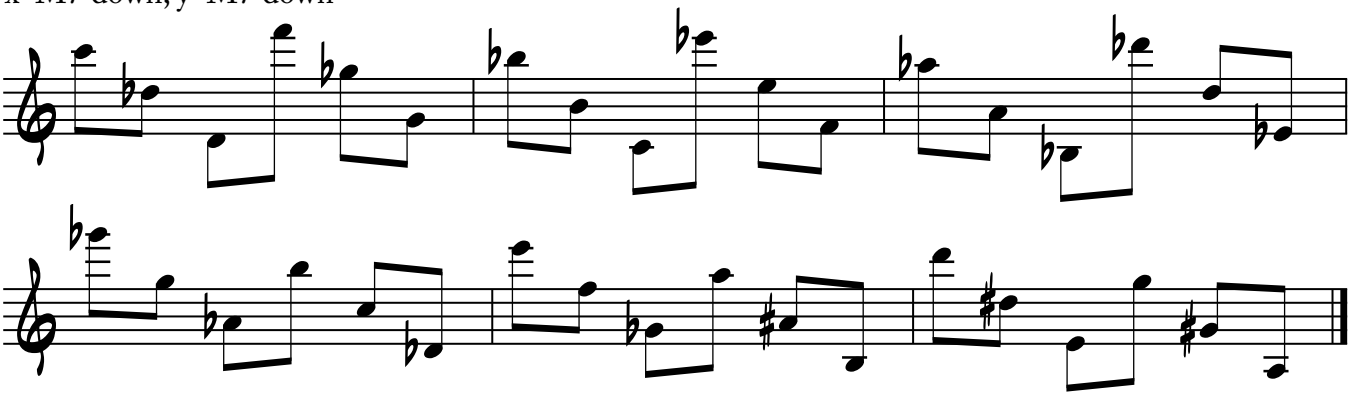
x=M7 down, y=M7 up



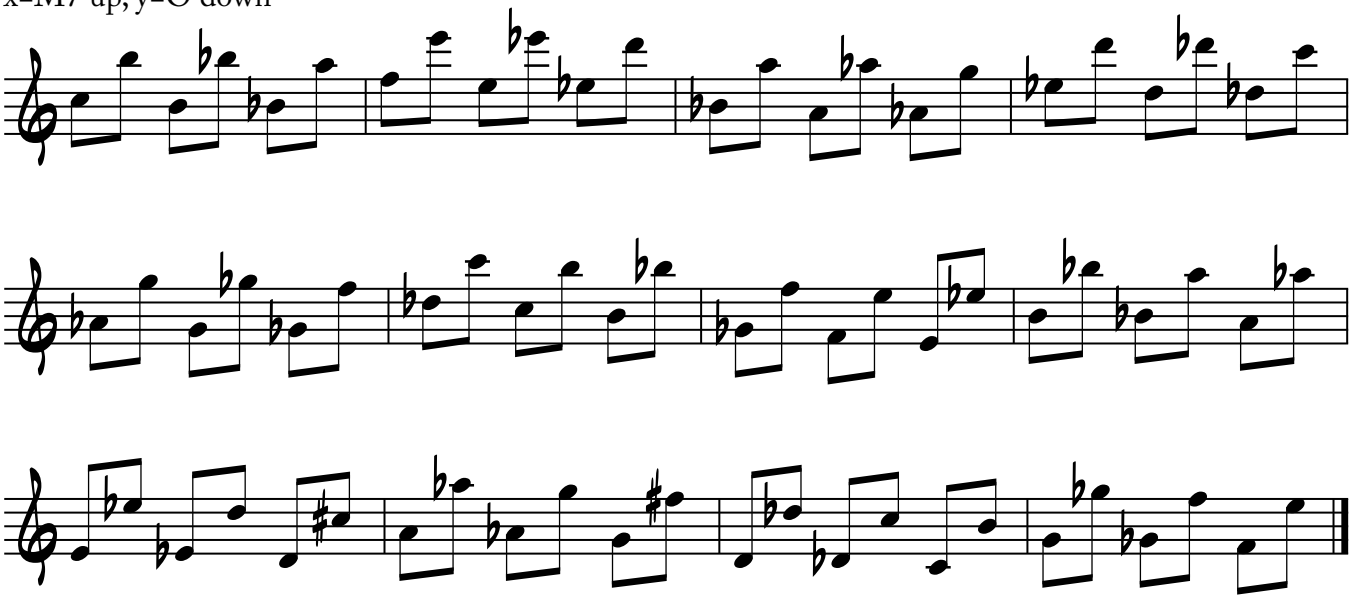
x=M7 up, y=M7 up



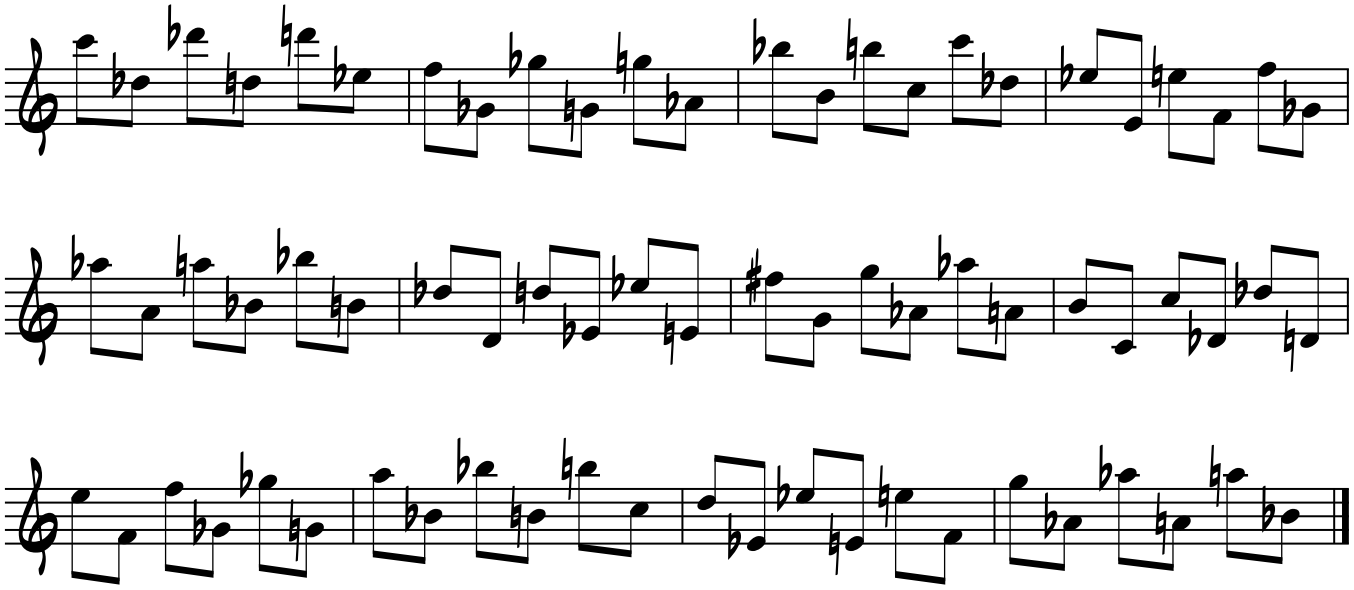
x=M7 down, y=M7 down



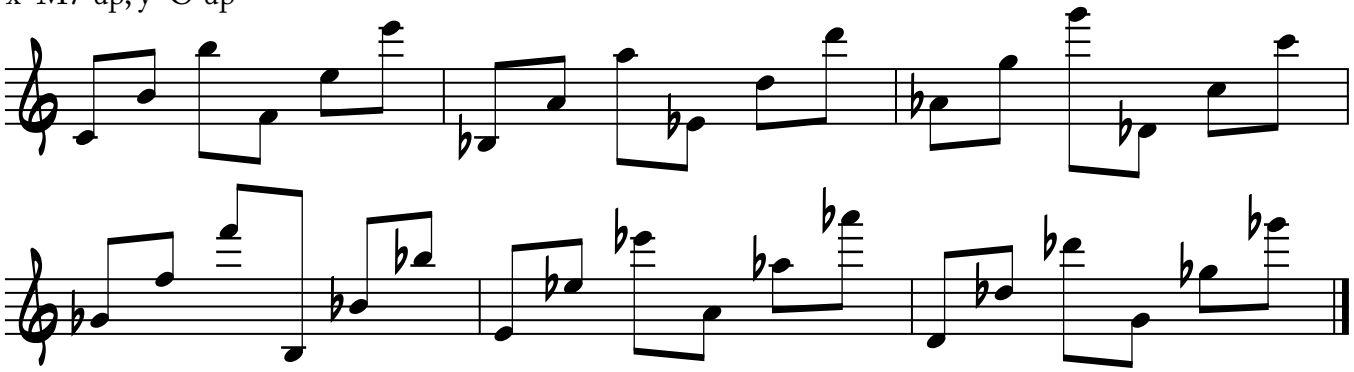
x=M7 up, y=O down



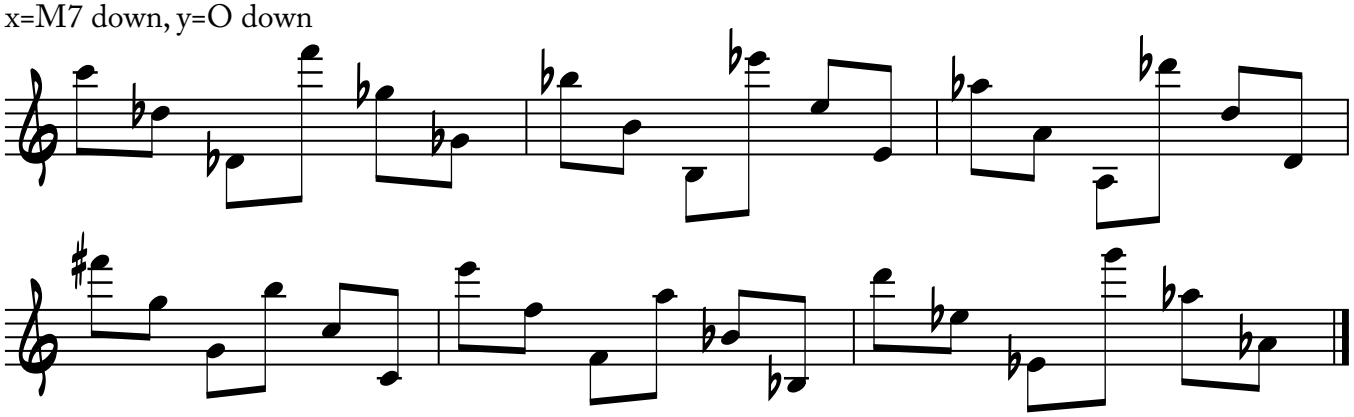
x=M7 down, y=O up



x=M7 up, y=O up

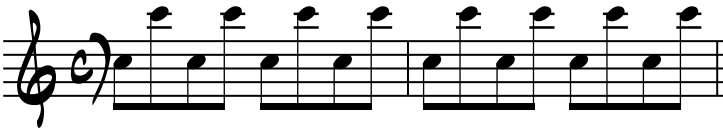


x=M7 down, y=O down

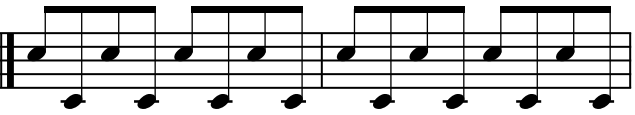


OCTAVES

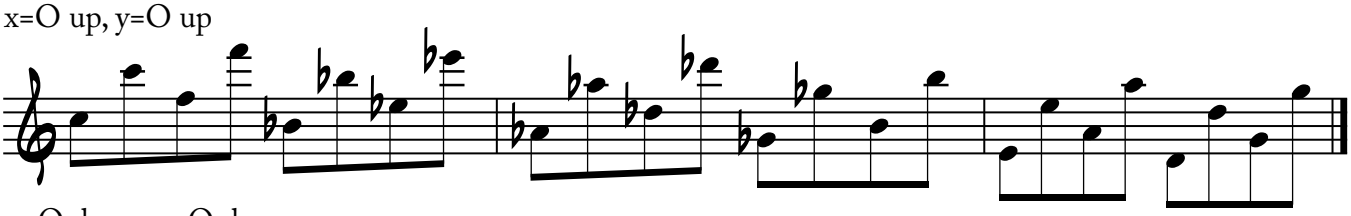
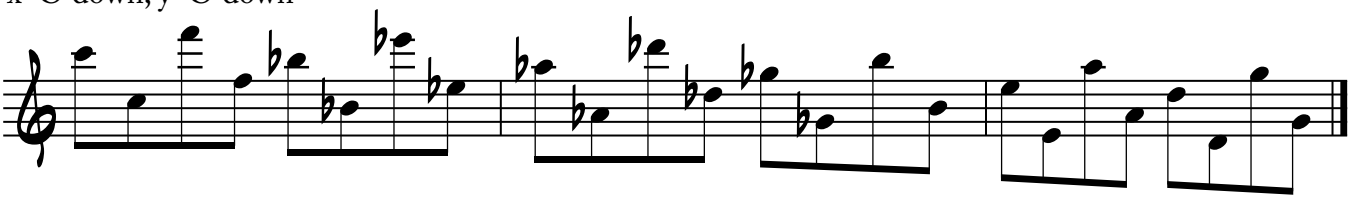
x=O up, y=O down



x=O down, y=O up



x=O up, y=O up



x=O down, y=O down