JAZZ

THE DICE GAME

By Nathan Mills

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INTRODUCTION

So first things first, if you want to play a more complex, computerized, instantaneous version of this dice game, you can do so by visiting *https://nathanmills.dev* and it will appear somewhere on the nav table. The purpose of this game is to give a bit of insight to the implementation because I'm too lazy too actually write some docs on how it works.

PREREQUISITES

- 2x Six-sided dice
- Sheet of paper
- Pencil
- At least *some* basic knowledge of music (Like what a whole note, quarter note is)

CHORD SHEET SHEET

(NOTE: FOR SIMPLICITY, ALL KEYS ARE STORE WITH JUST SHARPS (#))

-5 (C# major)

CHORD LETTERS	CHORD NAME
C# - F – G# - C	C#maj7
D# - F# – A# - C#	D#min7
F – G# - C – D#	Fmin7
F# – A# - C# – F	F#maj7
G# – C – D# – F#	G#7
A# – C# – F – G#	A#min7
C – D# – F# – A#	Cmin7b5

-4 (G# major)

CHORD LETTERS	CHORD NAME
G# – C – D# – G	G#maj7
A# – C# – F – G#	A#min7
C – D# – G – A#	Cmin7
C# - F – G# - C	C#maj7

D# - G – A# - C#	D#7
F – G# - C – D#	Fmin7
G – A# - C# – F	Gmin7b5

-3 (D# major)

CHORD LETTERS	CHORD NAME
D# - G – A# - D	D#maj7
F – G# - C – D#	Fmin7
G – A# - D – F	Gmin7
G# – C – D# – G	G#maj7
A# – D – F – G#	A#7
C – D# – G – A#	Cmin7
D - F – G# - C	Dmin7b5

-2 (A# major)

CHORD LETTERS	CHORD NAME
A# – D – F – A	A#maj7
C – D# – G – A#	Cmin7
D - F – A - C	Dmin7
D# - G – A# - D	D#maj7
F – A - C – D#	F7
G – A# - D – F	Gmin7
A – C – D# – G	Amin7b5

-1 (F major)

CHORD LETTERS	CHORD NAME
F – A - C – E	Fmaj7
G – A# - D – F	Gmin7
A – C – E – G	Amin7
A# – D – F – A	A#maj7
C – E – G – A#	C7
D - F – A - C	Dmin7
E - G – A# - D	Emin7b5

0 (C major)

CHORD LETTERS	CHORD NAME
C – E – G – B	Cmaj7
D - F – A - C	Dmin7
E - G – B - D	Emin7
F – A - C – E	Fmaj7
G – B - D – F	G7
A – C – E – G	Amin7
B – D – F – A	Bmin7b5

+1 (G major)

CHORD LETTERS	CHORD NAME
G – B - D – F#	Gmaj7
A – C – E – G	Amin7
B – D – F# – A	Bmin7
C – E – G – B	Cmaj7
D – F# – A - C	D7
E - G – B - D	Emin7

F# – A - C – E	F#min7b5

+2 (D major)

CHORD LETTERS	CHORD NAME
D – F# – A – C#	Dmaj7
E - G – B - D	Emin7
F# – A – C# – E	F#min7
G – B - D – F#	Gmaj7
A – C# – E – G	A7
B – D – F# – A	Bmin7
C# – E – G – B	C#min7b5

+3 (A major)

CHORD LETTERS	CHORD NAME
A – C# – E – G#	Amaj7
B – D – F# – A	Bmin7
C# – E – G# – B	C#min7
D – F# – A – C#	Dmaj7
E – G# – B - D	E7
F# – A – C# – E	F#min7
G# – B - D – F#	G#min7b5

+4 (E major)

CHORD LETTERS	CHORD NAME
E – G# – B – D#	Emaj7

F# – A – C# – E	F#min7
G# – B – D# – F#	G#min7
A – C# – E – G#	Amaj7
B – D# – F# – A	B7
C# – E – G# – B	C#min7
D# – F# – A – C#	D#min7b5

+5 (B major)

CHORD LETTERS	CHORD NAME
B – D# – F# – A#	Bmaj7
C# – E – G# – B	C#min7
D# – F# – A# – C#	D#min7
E – G# – B – D#	Emaj7
F# – A# – C# – E	F#7
G# – B – D# – F#	G#min7
A# – C# – E – G#	A#min7b5

+6 (F# major)

CHORD LETTERS	CHORD NAME
F# – A# – C# – F	F#maj7
G# – B – D# – F#	G#min7
A# – C# – F – G#	A#min7
B – D# – F# – A#	Bmaj7
C# – F – G# – B	C#7
D# – F# – A# – C#	D#min7

F – G# – B – D#	Fmin7b5

START

Write down 5 horizontal lines on a piece of paper. This will be your treble staff, so make it pretty long (perhaps the width of the paper). A bit below those lines, draw 5 more horizontal lines, representing the bass clef, the same length of the treble staff from before.

On the top line, right at the beginning, try your best attempt at drawing this (a treble clef symbol):

On the bottom line, right at the beginning, try your best attempt at drawing this (a bass clef symbol):

From there, draw 8 vertical lines for each staff, lining up in the same place for both, each distributed approximately evenly. These represent your measures in the music.

KEY GENERATION

Roll two die. Add the two die together, subtract 7. This will be symbolic for your initial key signature. Write this number under your first bar measure. Now, go to the next measure and repeat the same process, add the two die together, subtract 7 and now, add the number from the measure before to this. . If this number is less than or equal to -6, add 12. If its greater than positive 6, subtract 12. Now, write it under measure 2, Repeat this process until you run out of measures.

CHORD GENERATION

For your initial starting chord, refer to the Chord Cheat Sheet and roll 1 six-sided dice once. Find the number that you've written under the first measure and find the number in the Cheat Sheet and its corresponding key signature. Once you find the number and corresponding key signature go down the rows the number you got rolling the dice. Now, write down the chord name and chord letters somewhere nearby. You technically don't need the chord name, but if you are trying to actually play the jazz piece, it will help a lot.

For each successive chord, find the key signature of the next measure again in your cheat sheet. Now, once you locate it, refer to the chord letters you've written in the previous measure. In addition you will also need to calculate the difference between current measures key and the previous measure's.

If the current absolute value of this number is less than or equal to 1:

> Try to find a couple chords in the current measure's key signature that have the least amount of notes in common with the previous chord.

Else (if the current absolute value of this number is greater than 1):

> Try to find a couple chords in the current measure's key signature that has the two most amount notes in common with the previous chord

Once you've found these two chords, roll a single dice, if the dice rolls greater 3, go with the second chord option, relative to the cheat sheet's row. Else, go with the first option relative to the cheat sheet's

row. Write the chord's information down, (its chord notes, and chord name). Go back to the "For each successive chord" paragraph at repeat until you are out of measures.

Now that you're done, congrats! You now have a (very likely original) Jazz chord progression! Feel free to improvise over your creation!

BASS LINE

Now that you have your chords, you can now start generating the bass lines! Start on measure one, and go to the chord from the measure and refer to the chord manual. Now, roll a dice, and play the notes of the chord in quarter notes in this order based off your dice roll

Dice roll	Playing order
1	1 – 2 – 3 - 2
2	1 – 4 – 3 - 2
3	1 – 3 – 2 – 1
4	3 – 1 – 2 - 1
5	3 – 2 – 4 – 3
6	3 – 4 – 1 - 2

Write the notes down on your bass line. Here's a guide I found if you are not well-versed in writing in the bass line: (Source: Bass Clef Note Names (Quick Guide) – Professional Composers)

If your note has a sharp (#), just simply add a small hashtag symbol to the right

….

And that's all for the bass line! Repeat this process for each measure in your piece.

SOLO LINE (RHYTHM)

Its recommended that you come up with your own solo if you want this to sound good, since even the site version isn't even too good, but for kicks sake, here's an die-based implementation of what I have on my site.

On the back of your paper, draw a tree structure. You likely want to make this around half the side of your paper, or the whole if you have extra scrap paper. It should look like this, where the number of boxes on the very bottom should be equal to the number of measures of your piece:
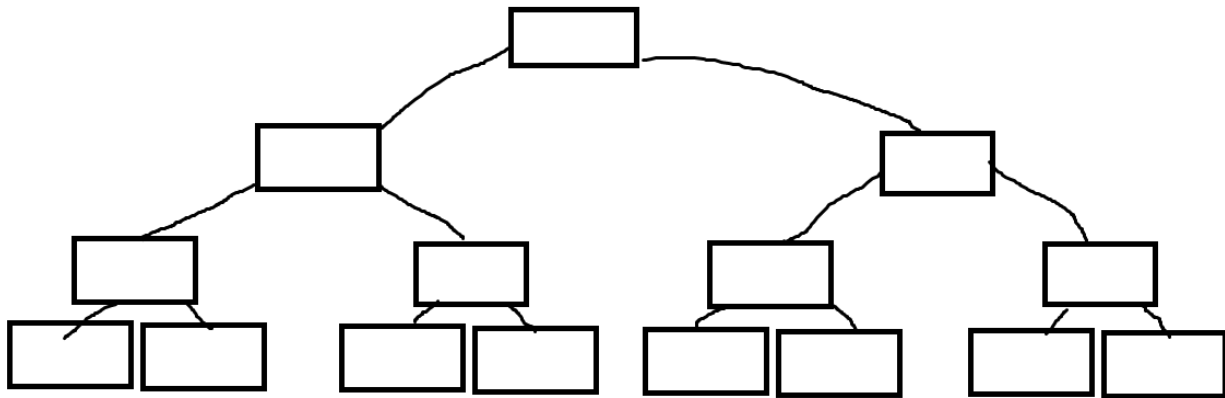
First, write the number 4 in the very top box. This is representative of a whole note and it will be subdivided as we recurse down the tree.

In the two boxes branching off the root, roll one dice and refer to the rhythm ruleset below and apply the rules to the number.

| Roll	Rule
1	Bring parent down, unchanged (Keep the same)

2	(Same as roll 1)
3	Subdivide the parent evenly by 2 if value is greater or equal to 1, so the resulting values should be at minimum, 0.5 (For example, if the parent was 1, the resulting values would be 0.5 and 0.5)
4	(Same as roll 3)
5	If the value of the parent is 1, subdivide evenly by 3 (So 1 would turn into 1/3 1/3, 1/3), else do the ruleset for roll 1 (keep the same) If it is the final layer in the tree, you may supplement a rest instead of ruleset 1 if you want
6	Subdivide the parent unevenly by multiplying a value of 0.75 for the first value and 0.25 for the second value Only if value is greater or equal to 1 AND hasn't been subdivided by this before, so the resulting values should be at minimum, 0.75 and 0.25

Write down the number that you get when going through each number and subdividing each on the tree on the below branch. Go through each layer recursively and do this relative to the single parent right above the current row. Once you finally get to the bottom row, that is the rhythm of your solo for the piece!

SOLO LINE (NOTES)

For the notes of the solo, luckily you do not have to do a recursive process again (I'm sure that took a while!) Instead, it is somewhat like the chord generation in that it is an optimization problem.

For this section, you will need to know what the notes of the treble clef scale are and how to write said notes on a scale. You will also likely need to refer to online sources to see all of the notes in each scale. Here is a basic guide though if you do not know how
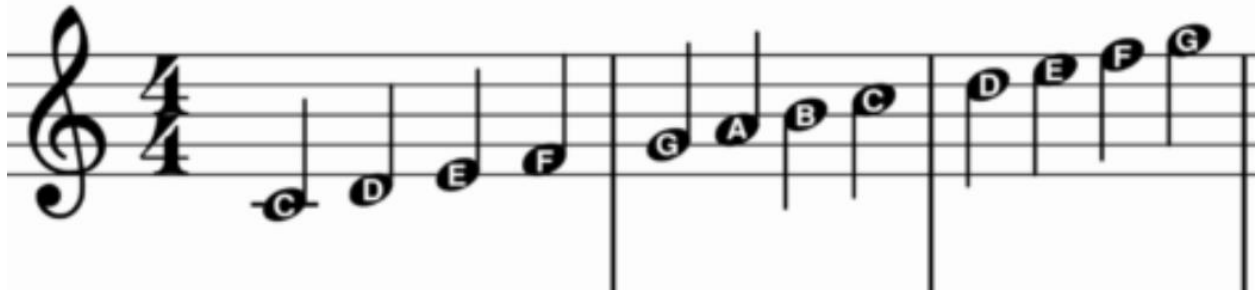
(Source: [Bass Clef Note Names (Quick Guide) – Professional Composers](#))

These are the notes of the treble clef scale, displayed as quarter notes.

Now, for the notes. Write any one of the notes in your first chord at the beginning. All of the notes on the treble clef are represented by the tree table that you generated at the bottom, so a 1 on the page is a quarter note, 0.5 is an eighth note, 0.75 dotted eighth note, 2 half note, etc. So write the note in that style and the note you start on is determined by this roll:

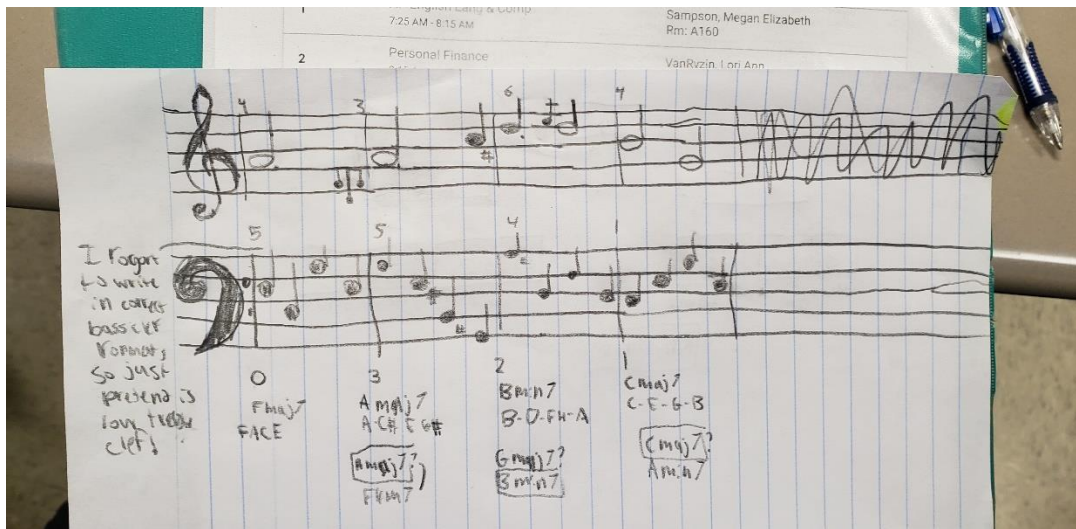| Roll	Note number
1	1
2	1
3	2
4	2
5	3
6	4

From that note, each note sequence will be relative to the one before it. Each note sequence is 3 notes, and just based off the relative position in the line. Roll again and put the sequence on your paper. (Optional rule: If you want your solo to sound better, reroll until at least 1 of the notes generated are in your chord)

Roll	Up/down amount
1	+1, +1, +1
2	-1, -1, -1
3	+2, +2, +2
4	-2, -2, -2
5	-1, -1, +1
6	+1, +1, -1

Go up the amount of spaces and write in your note with your according rhythm. Repeat this process until you run out of notes generated from the rhythm generator from before.

CONCLUSION

That's it! You now hold an absolute jazz masterpiece in your hands. The only thing left for you to do would be to get you and your band buddies to play it. Alternatively, you can transcribe the piece to be MIDI and play it that way if you have no one to play it with. Here is a brief example I generated if you want a reference:

… And the back …