Procedural Music

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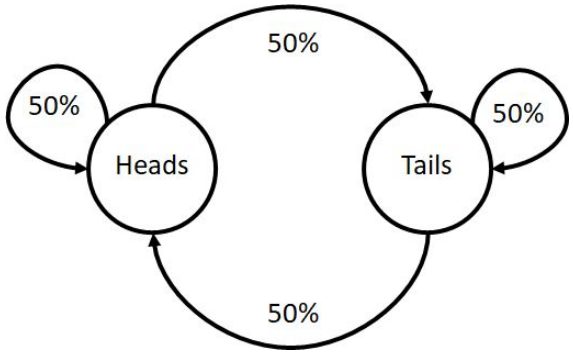
What

- Procedurally generate (hopefully interesting) music
- Create a simple animation that goes along with the music
- The program will
  - Take in a midi file from the user
  - Generate music similar to the input
  - Play the created music
  - Give an option to save the midi file

How

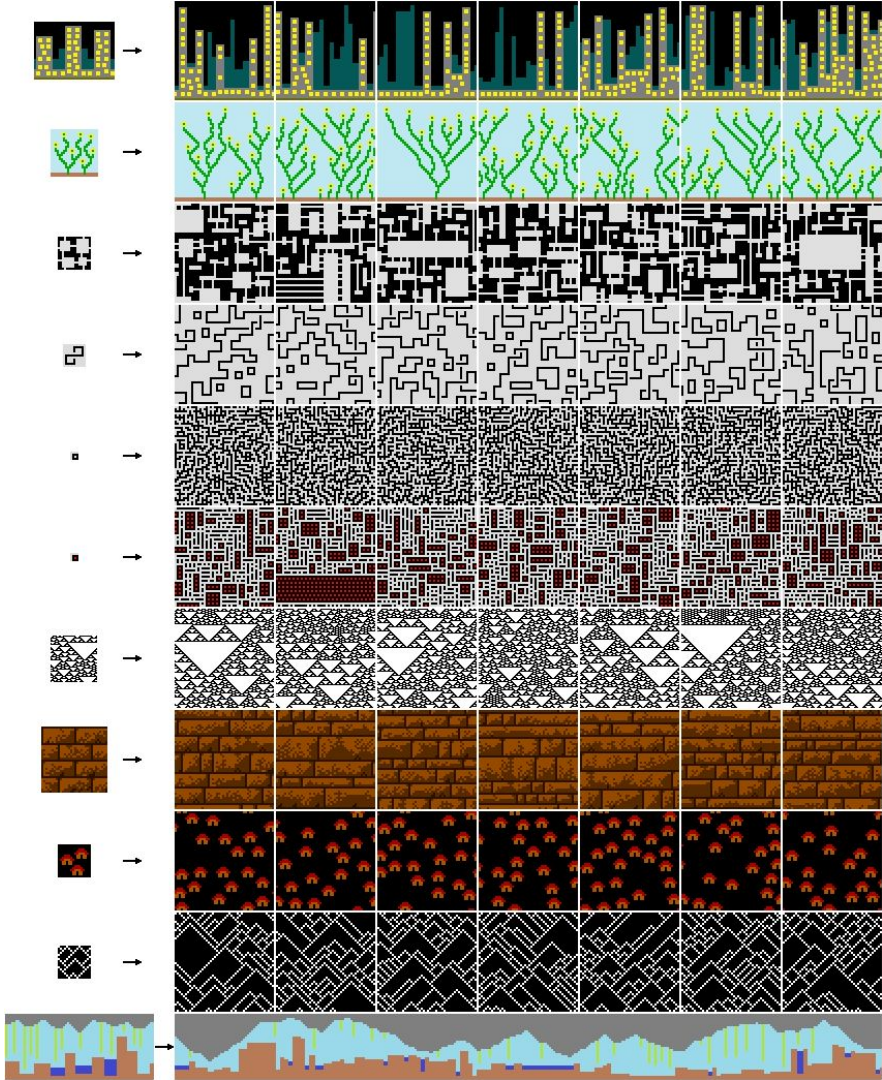
- Create an algorithm that will make the music
  - Constraint based
  - Will use
    - Markov chains
    - Wave function collapse



- Markov chains
  - Use probabilities obtained from rules generated by the input
  - Generate a state diagram
    - Order notes can occur, musical phrases, layering parts, note lengths
- Wave function collapse

Wave Function Collapse

- Texture synthesis algorithm
- Makes images similar to input
- Uses transition rules to propagate constraints
- Translate ideas into music generation

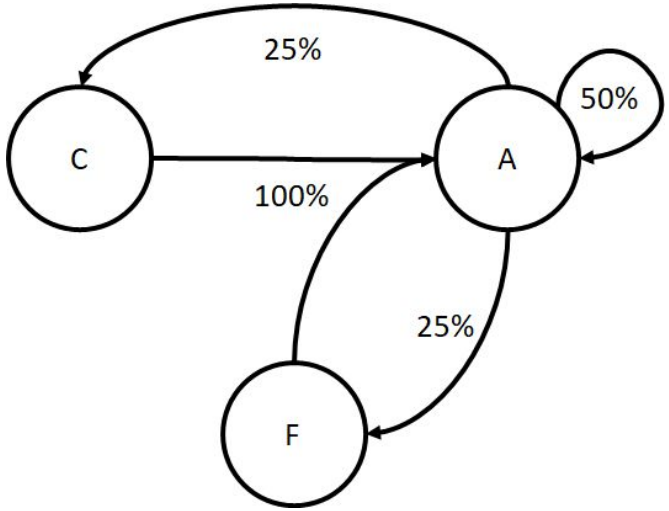


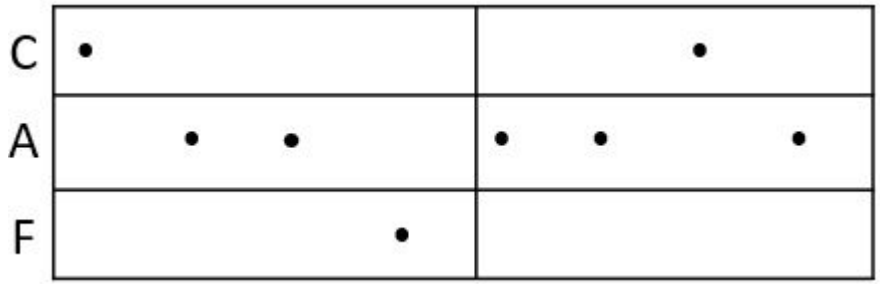
Tools

- Java
- JMusic
  - A library to aid in playing, composing, inputting, and outputting music
- MIDI files as input/output

Current Plans

- Start with something simple
- Generate music with a small rule set
  - Only quarter notes
  - Only one instrument
  - Only look at note-to-note transitions





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C		+	
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Challenges

- How ‘similar’ should the output be?
- What rules should be used?
- How can we efficiently get the rules from the input?
- How will these rules connect between different instruments?
- Probably a lot more...

Questions?