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CSCI 205 Design Manual

Introduction: Using JMusic as our primary library, we've developed a keyboard that activates sound at different pitches, with the ability to to change note length, record a series of notes, and transpose octaves. Additionally, we've created a GUI which works with the code that allows a relatively comfortable user experience. Through the GUI, a user is able to change certain elements of the sound generated by the keyboard.

User Stories:

The user should be able to...

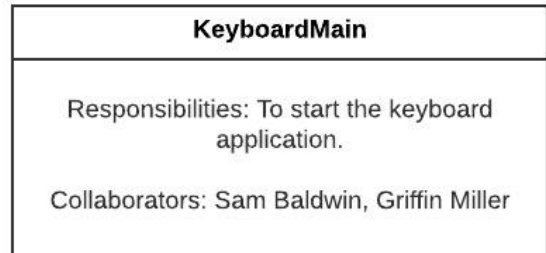
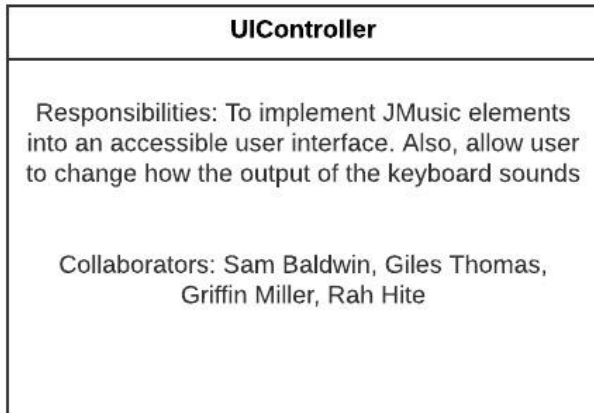
- Completed:
 - Produce synthesized pitches which are part of the 12-tone scale in real time
 - Tell whether a pitch is active
 - Control the volume of the outputted sound
 - The pitches are mapped to the keys on a UI keyboard
 - Record a composition
 - Reset the recording
 - While adjusting sliders, level numbers are displayed.
 - Control the length of a pitch
 - Reset the recording

- Partially Completed:
 - Transpose
 - Explanation: The user can change octaves, but can't transpose by single pitches
 - Interact with a sleek, simple, cohesive design for the keyboard & knobs
 - Explanation: UI design is complete, but knobs were never incorporated
 - Tell what pitch they're playing through labels on keys (ex. C4, F#4, etc.)
 - Explanation: We couldn't find a way to label the keys, but we added a UI element that detects and reports which note the mouse is hovering over
 - Record a composition
 - Explanation: We enabled the dictation of notes on an ASCII staff, but we weren't able to implement playback

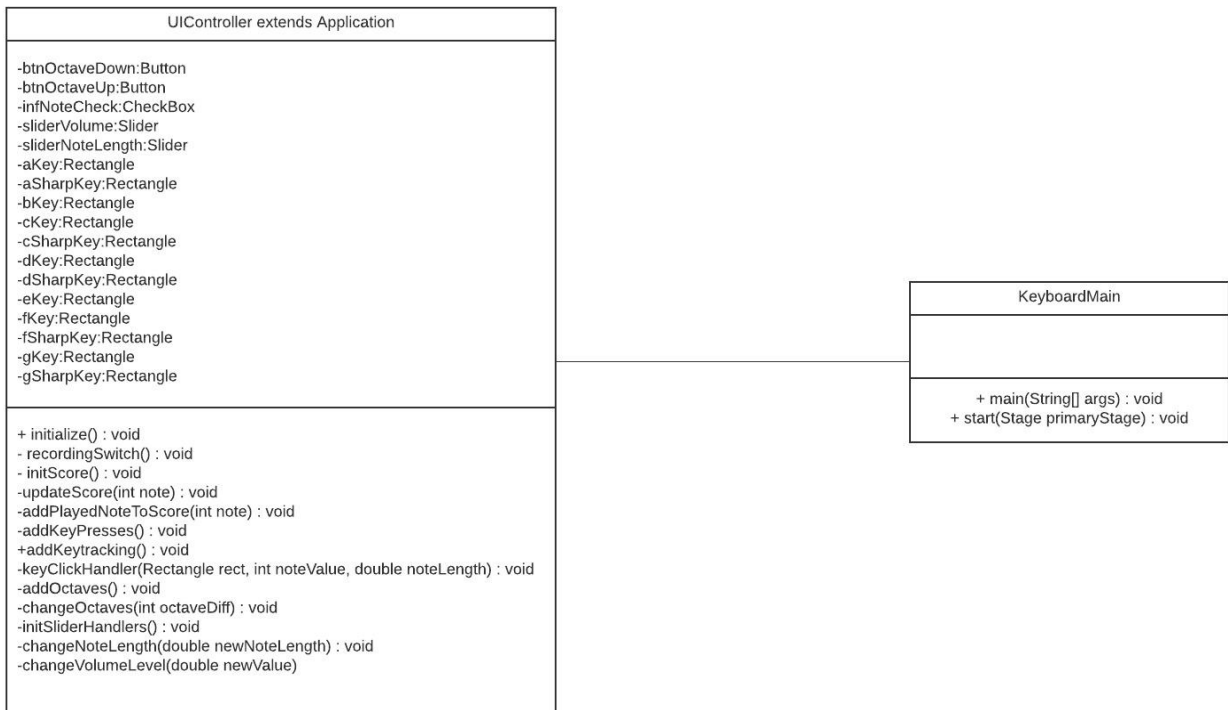
- Not Completed:
 - Have a choice over what sort of synthesizer waveform we can use (Triangle, Square, etc.)
 - Control the timbre of the sound using a Cutoff knob
 - Determine the speed of sound using an Attack knob
 - Determine how quickly a pitch ends using a Release knob
 - Cutoff, attack, and release can be controlled by UI elements
 - Dropdown folder with choices of waveform shapes.
 - Change the instrument sound produced when playing keys

Object-Oriented Design Overview

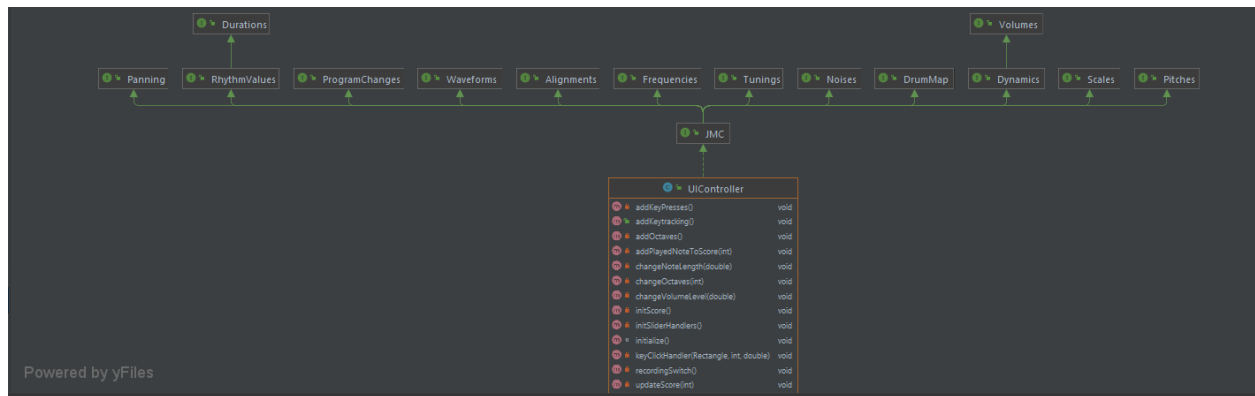
CRC Cards:



UML Diagram:



IntelliJ UML Diagrams:



Citations

Lab 11 instructions -

<https://onedrive.live.com/?authkey=%21AFebZ5S9m6xl%2DFA&cid=8B4B8D135E3EEA4D&id=8B4B8D135E3EEA4D%2114391&parId=8B4B8D135E3EEA4D%211687&o=OneUp>

jMusic tutorials -

<https://explodingart.com/jmusic/jmtutorial/t1.html>

jMusic documentation -

<https://explodingart.com/jmusic/jmDocumentation/index.html>

Synthesizer example -

<https://www.youtube.com/watch?v=q09cNltGhLQ&list=PLuF1v-3Fw9goRMFFIdza3RddAiwaZUqL5>

Frame inside JavaFX (runs at negative frame rate, so had to be removed) -

<https://stackoverflow.com/questions/64616443/how-to-get-awt-window-for-javafx-stage>