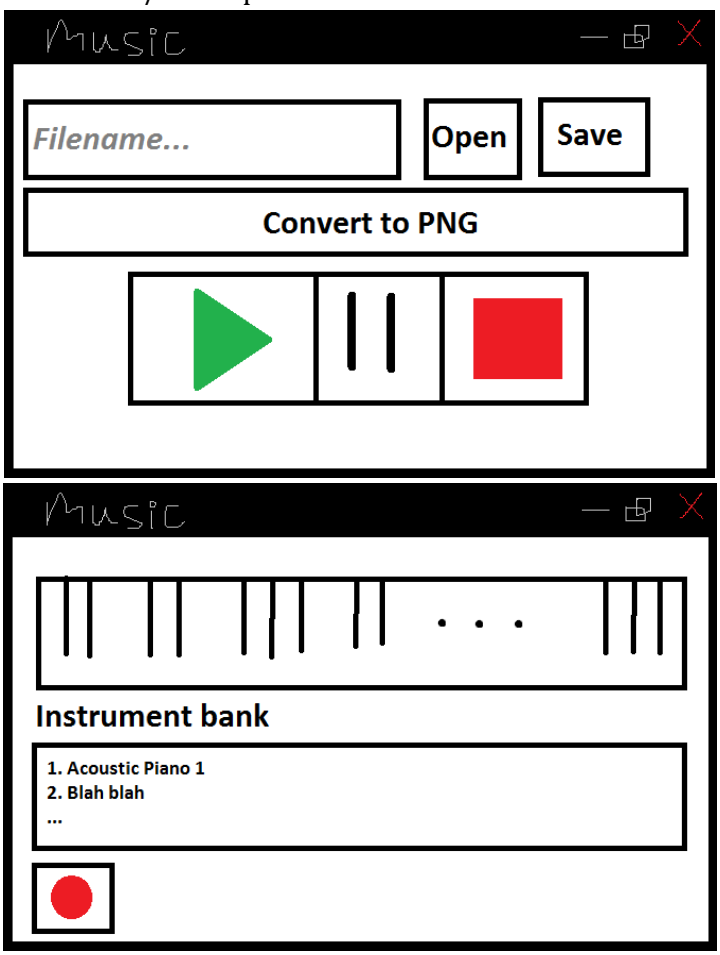
CS 242 Final Project Proposal: Graphical MIDI Player

Abhishek Chatterjee [chattrj3]

1. Abstract
    - 1.1 Document Purpose: This document details the functionality and development plan of a graphical MIDI player that plays and records MIDI files, and as a bonus allows the user to convert PNG images into MIDI files and vice versa.
    - 1.2 There are no special definitions in this document of which the reader need be aware.
    - 1.3 Background/Motivation: MIDI is a protocol used to encode musical data that is usually generated by a synthesizer and parsed and played back by a sequencer. This project makes use of the system's built-in MIDI synthesizer and sequencer rather than writing them from scratch, which would be a laborious and unnecessary task. My motivation for doing this is that I like music, and most notation software makes use of MIDI data, or at the very least supports importing and exporting such data. It is a useful way for musically inclined people to explore ideas that it would not be possible for them to explore through traditional media (e.g. defining a mapping from images to music) – even better if they are not encumbered with a shred of talent.
2. Technical Specifications:
    - 2.1 Platform: Java
    - 2.2 Programming Language: Java
    - 2.3 Coding Standard: Oracle's *Code Conventions for the Java™ Programming Language*
    - 2.4 SDK: None
    - 2.5 JDK: JDK 7
    - 2.6 IDE: IntelliJ
    - 2.7 Interface: Java API
3. Functional Specifications
    - 3.1 Affordances

      This program is aimed at composers or enthusiasts of music who use notation software to compose their music, or may otherwise find occasion to use the MIDI format. Also aimed at people who might for whatever reason be curious to see whether good art does indeed make bad music, and good music bad art.
    - 3.2 Features
        - 3.2.1. Load a MIDI file
        - 3.2.2. Start, pause, and stop playback of a MIDI file
        - 3.2.3. Record and save MIDI files using an onscreen, mouse-operated keyboard
        - 3.2.4. Load a PNG file, and play it back as a MIDI file
        - 3.2.5. Convert MIDI files to PNG files
    - 3.3 Scope:
        - 3.3.1. PNG → MIDI conversion will probably be very primitive (e.g. invariant note length, etc.).
        - 3.3.2. Recording music will probably be very primitive, and limited to just one track (or voice or instrument).

3.4 Prospective Look/Mockup:



Weekly Timeline:

I. Week 1:
   i. Backend code for MIDI playback
   ii. PNG ↔ MIDI conversion
II. Week 2:
   i. Backend code for user-recorded music
   ii. Come up with skeleton for view
III. Week 3:
   i. Start work on controller, which will probably be the hardest part
   ii. Make modifications to model and view as necessary
IV. Week 4:
   i. Finish work on controller (I expect it will be more than a week's worth of work)
   ii. Finish other work that may not have been finished in previous weeks

Future Enhancements: Rendering MIDI files in music notation. (Perhaps MusicXML or something more apposite.) In the meantime, for the purposes of the current project, any good notation software will suffice for rendering MIDI files (Notation™ Composer, MuseScore, etc.).