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CSCI 362 Software Engineering

September 27, 2016

## **Test Plan**

### **The Testing Process**

The testing process will begin with manual testing, during which individual methods will be tested for expected outputs via the terminal. Manual testing will be done on a select number of methods, before moving on to automated testing. For automated testing, the selection of methods to be tested will be expanded, and these methods will be tested through a unit testing framework.

### **Requirements Traceability**

- freqToNote - This method converts a frequency value given in hertz to the corresponding midi note value and midi pitch bend value
- noteToFreq - This method converts a midi note value to a frequency value in hertz
- getDelay - This method returns the delay time set for a particular timer
- getRepeat - This method returns whether or not a timer is set to repeat
- getSlopeR2 - This method calculates the slope,  $R^2$  value, and the y-intercept of the trendline of a zipf distribution.

### **Tested Items**

The tested items will consist of the python programs within JythonMusic including timer.py, music.py, audio.py, midi.py, zipf.py. Methods to be tested within these programs include freqToNote and noteToFreq within music.py. In the timer.py program, the methods getDelay and getRepeat will be tested. In zipf.py, the method getSlopeR2 will be tested. More tests will be added in the future.

## **Testing Schedule**

Sept. 27 - Specify and develop 5 test cases, implement manually

Oct. 4 - Have 10 test cases specified

Oct. 11 - Have 15 test cases specified

Oct. 18 - Develop automatic testing framework, implement 5 test cases within the framework

Oct. 25 - Have 10 test cases implemented within framework, have 20 test cases specified

Nov. 1 - Have 20 test cases implemented within framework, have 25 test cases specified

Nov. 10 - 25 test cases implemented within an automatic framework

Nov. 17 - Have 5 faults designed and injected into code and retest using automatic framework

Nov. 22 - Analyze results of testing and fault injection

## **Test Recording Procedures**

The test recording will be accomplished through the use of test case specification, oracles, and test reports. Each test will include a file describing the requirement, components, and methods being tested along with the test inputs and expected outputs. These expected outputs are specified through the use of oracles, where the outputs are manually calculated. A report is then generated with the test descriptions, the expected output, and the actual output of the test.

## **Hardware and Software Requirements**

The main software these test cases will be used on is JythonMusic. The additional software required for this testing process will include a Jython compiler, and the java music programs jMusic and jsyn. Hardware requirements would include a midi output device like speakers.

## **Constraints**

The main constraint affecting this testing process will be due to time limitations. Each deliverable is due only a few weeks apart from the next, thus there is a limit as to how many tests can be performed within that timespan. Other constraints include the size of the development group and the funding. There are only three people in this team and it is an unfunded project.