# Test Plan

1. Introduction
   a. Document identifier
2. Scope
   The purpose of this document is to describe the test procedures, methods, and details thereof for the Music Assistant
   a. References
      i. 829-2008 - IEEE Standard for Software and System Test Documentation
      ii. Requirements Document
3. Features to be Tested
   a. Obtained from Requirements Document
   b. Student Features
      i. The student will be able to view the sheet music digitally.
         1. Normal Function
            a. Objective
               i. This test case verifies that the student can open and view a known good example of sheet music
            b. Inputs
               i. Default Sheet Music
            c. Outcomes
               i. The sheet music should display as the default sheet music should
      ii. The student will be able to listen to any combination of parts in the sheet music.
         1. All Parts
            a. Objective
               i. This test case verifies that the student can listen to sheet music with all parts enabled
            b. Inputs
               i. Default Sheet Music and all parts enabled
            c. Outcomes
               i. The sheet music should play all the parts
         2. Student's Part
            a. Objective
               i. This test case verifies that the student can listen to sheet music with only their part playing
            b. Inputs
               i. Default Sheet Music and only the student part enabled
            c. Outcomes
               i. The sheet music should play only the student's part
         3. No Parts Test
            a. Objective
               i. This test case verifies that the sheet music can play without any parts playing
            b. Inputs
               i. Sheet music with no parts enabled
            c. Outcomes
               i. Sheet music plays, but no audio is produced
         4. All Parts but Student Test
            a. Objective
               i. This test case verifies that the sheet music can play all the parts but the student's
            b. Inputs
               i. Sheet music with only the student's part disabled
            c. Outcomes
               i. Sheet music plays all parts except the students
         5. All Combinations Test
            a. Objective
               i. This test case verifies that the student can listen to sheet music with any combination of parts enabled
            b. Inputs
               i. A series of inputs with every possible combination of parts and the default sheet music
            c. Outcomes
               i. A series of outputs where every possible combination of parts is played
            d. Notes
               i. Inefficient test case, above test cases test the more relevant inputs
      iii. The student can practice their part and observe the pitch and other statistics as they sing
         1. Normal
            a. Objective
               i. This test case will verify that the student's pitch can be displayed as they sing
            b. Input
               i. Audio stream of singing
            c. Outcome
               i. Pitch is displayed as the singing continues
                  1. Pitch updates 60 times a second
                  2. Pitch updates are displayed in 15 ms
         2. Empty Audio

        a. Objective
           i. This test case will verify that, if there is no singing, there a pitch of 0 is displayed.
        b. Input
           i. Audio stream of singing
        c. Outcome
           i. Pitch of 0 is displayed as the singing continues
               1. Pitch updates 60 times a second
               2. Pitch updates are displayed in 15 ms

3. Known Audio
    a. Objective
        i. This test case will verify that the pitch is within a certain degree of accuracy
    b. Input
        i. Audio stream of a constant pitch at X Hz
    c. Outcome
        i. Pitch within 3% of X Hz is displayed
           1. Pitch updates 60 times a second
           2. Pitch updates are displayed in 15 ms

iv. The student will be able to practice their own part both during and without playback with the sheet music. A general outline of student practice is provided in Figure 2.
    1. General Test Case
        a. Objective
           i. This verifies that the student can practice their own while the sheet music plays different part combinations
        b. Inputs
           i. The 3.ii Test cases, but with student practicing enabled (3.iii tests being overlaid on the sheet music)
        c. Outcomes
           i. The student should be able to practice for all test cases

v. The student will be able to view exercises generated during prior performance.
    1. General Test Case
        a. Objective
           i. This verifies that the student will be able to view exercises
        b. Inputs
           i. Pre-generated default exercise.
        c. Outcomes
           i. The pre-generated exercise should be displayed to the student

vi. The student will be able to send individual and group messages to other students and teacher.
    1. Group Message Test
        a. Objective
           i. This test case verifies that the student can send a message to the student group
        b. Inputs
           i. Default Message and the Group
        c. Outcomes
           i. A second person viewing the group messages will see the default message appear with the student as the sender
    2. Teacher Message Test
        a. Objective
           i. This test case verifies that the student can send a message to the teacher
        b. Inputs
           i. Default Message and the Teacher
        c. Outcomes
           i. A teacher account viewing their messages will see the default message appear with the student as the sender

c. Teacher Features
  i. The teacher will be able to view individual statistics of a target student from previous practices.
    1. Default
        a. Objective
           i. This test case verifies that the teacher can view the statistics of an individual student
        b. Inputs
           i. Default Student Statistics
        c. Outcomes
           i. The Default Student Statistics will be displayed

ii. The teacher will be able to view group statistics of all students and small groups of students with a summary overview of each statistic.
    1. Default
        a. Objective
           i. This test case verifies that the teacher can view the statistics of the student group
        b. Inputs
           i. Default Group Statistics
         c. Outcomes
           i. The Default Group Statistics will be displayed

iii. The teacher will be able to view and manage generated exercises for individual students.

1. View exercises
   a. Objective
      i. This test case verifies that the teacher can view test cases
   b. Inputs
      i. Student and list of exercises assigned to student
   c. Outcomes
      i. Displays all exercises in list generated for the student

iv. The teacher will be able to send individual and group messages to students.
   1. Group Message Test
      a. Objective
         i. This test case verifies that the teacher can send a message to the student group
      b. Inputs
         i. Default Message and the Group
      c. Outcomes
         i. A second person viewing the group messages will see the default message appear with the teacher as the sender
   2. Student Message Test
      a. Objective
         i. This test case verifies that the teacher can send a message to a specific student
      b. Inputs
         i. Default Message and a specific Student
      c. Outcomes
         i. The student account viewing their messages will see the default message appear with the teacher as the sender

v. The teacher will be able to assign and access grades for students assigned to exercises and general practice.
   1. Grade view
      a. Objective
         i. This test case verifies that the teacher can view the student grades
      b. Inputs
         i. Sample Grades
      c. Outcomes
         i. Sample Grades are displayed for the teacher
   2. Grade Assignment
      a. Objective
         i. Verifies that the teacher can assign grades
      b. Inputs
         i. Sample Grades, Student, Assignment, and Grade
      c. Outcome
         i. The Student's Grade for the Assignment should be updated in the Sample Grades database

vi. The teacher will be able to oversee student messages.
   1. Default
      a. Objective
         i. This verifies that the teacher can observe student messages within the group
      b. Inputs
         i. Student Account A, Default Message, Group
      c. Outcomes
         i. The teacher should be able to observe Default Message within the Group with sender Student A