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Senior Design Writing Assignment 2

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Artificial Instructor

User input is a necessary element of the Artificial Instructor because the overall goal is to facilitate learning and growth of skills for the users. In order to help teach the user new skills and techniques it is required to get input of their ability so the program is able to provide feedback. Much like a human instructor the Artificial Instructor must determine what the user is attempting to play, provide a overview of the expected results, listen to the attempt, and finally give comments on the areas the user excelled and the ones that require improvement. To ensure the above steps are conducted as accurately as possible the program will require the user to create, or load, a configured instrument and profile so that their progress may be accessed and updated as they continue to complete lessons.

When a user first loads the program they will be prompted to either select a pre-existing configured profile or create a new profile if one has not been created. This will simply require the user to enter basic information such as their username, password, a 4-digit pin code(for password recovery), and a security question. Once the user has created a profile they will be directed to the application's home page, which has several options available and require the user's input to determine what to do next. The three options the user will choose from is "Select An Instrument", "Tune Your Instrument", or "Start a Lesson". If the user has not selected an instrument, but attempt to tune an instrument or start a lesson they will be prompted that they must first select an instrument.

When the user navigates to the select an instrument they will be redirected to a page that contains a list of instruments that have been created and saved using their username(limit of 10 instruments per profile). If they have not yet created an instrument they must select the “Add New Instrument” option, which prompts the user to input the company that manufactures the instrument, the model of their bass, the number of strings(4 or 5-string bass), and their “default tuning”. After this instrument is created and the user selects the “Save Instrument” button, filling out the required information, they will be redirected to the “Select An Instrument” page where they will now see the list of instruments with the newly created instrument added. After the user clicks the instrument they would like to play with and clicks the “Select This Instrument” button at the bottom of the page they will be redirected back to the home page.

Now that the user has selected an instrument to play with they have the ability to select, either of, the two other options “Tune Your Instrument” or “Start a Lesson”. if a user has not yet tuned an instrument in several days, if at all, the system will give a pop-up message that encourages they do so in order to ensure the most accurate results. When a user selects the “Tune Your Instrument” option on the home page they will be redirected to the corresponding page. To start the process the user must first select, from a preset drop-down list, the tuning they would like to apply to the instrument and press the “Start Tuning” button to begin the process. Once the user has prompted to start tuning the system will start by outputting the expected sound of the first string. The user will require the user to strum that string and adjust the tension on their instrument until the note their instrument is outputting matches the note they are attempting to tune to. While tuning the system will have two large text boxes, one to display the value(in hertz) of the expected frequency and the note value that corresponds to that frequency and the second to

display the user's input while strumming. This text box with the user's input will display a real time value(in hertz) of the incoming frequency so as they adjust the string's tension they can see the effect on the value. After they are satisfied with tuning that string they will prompt the system to move on to the next string by clicking the "Save and Continue" button at the bottom of the screen.

This process will continue until the user has tuned all of the strings and selected the "Complete Tuning" button. If the user attempts to select the "Complete Tuning" before every string has been tuned the system will display a warning that not all strings have been adjusted and that the results may not be accurate if they continue. If they continue anyway then only the strings that have been adjusted and saved will have the updated tuning values, while the other strings will have the values from the last tuning stored. The date of the last tuning will also be saved in the instrument in order to allow the user to know the last date they tuned their instrument and so the system is able to alert the user when it is recommended to re-tune the instrument.

After tuning is complete and they save their configuration, the user will be returned to the home screen. Finally, when the user selects the "Start A Lesson" option they will be navigated to the "Classroom" page. This page will display the user's score at the top of the page as well as all the levels of lessons. As the user's increase their score, by attempting the lessons they will receive points, which unlock new lessons as the score increases. A first time user will have to start at level one and complete the lessons in order to be able to navigate into the higher level of lessons. After the user selects a level on the "Classroom" page they will be redirected to a page that contains the different lessons that comprise that level. The user will be required to select a

lesson by clicking a radio button and clicking the “Select Lesson” button at the bottom of the page. By starting the lesson the user will be taken to the “Testing” page where they can first hear the expected output from the lesson and get an understanding of the different notes and rhythm they are supposed to play. The user can play the expected lesson by simply clicking “Listen to Lesson” button at the bottom of the page. After they feel comfortable with what they are expected to play they then select the “Start Lesson” button in order to begin their attempt. The lesson will give the user a five second countdown in order to allow them to get properly positioned before the lesson begins.

As the user is attempting the lesson there will be two text boxes, much like the tuning page, where the one shows expected output and the other shows the actual input from the user. The expected output will be a little more complex in order to better prepare the user to play by not only showing the note they should be playing but also the four notes that follow. In order to avoid confusion the note they are currently expected to play will be highlighted a different color. The other textbox will remain the same as the tuning feature and is only intended to let the user know if they are strumming the correct note so that they can correct themselves to avoid hitting the wrong note multiple times. The user may quit a lesson before the attempt is complete by simply clicking the “Quit Attempt” button, however this will cause them to not be assigned a score for their attempt. If the user, however, does complete the lesson the program will end and take them to their results page where they will be given their score and some feedback.

Here the user is able to click the different sections in order to view their attempt. They may expand the notes, rhythm and overall sections in order to see more in-depth analysis of their attempt. To do this they will simply have to click the different labels for the heading and the

information will be shown on the same screen. The user will also be able to playback both the expected lesson audio and their attempt in order to hear the differences in the two audio files. If they would like to save their attempt then they may do so and have the file exported to their local desktop by selecting the “Save Attempt” button and inputting the name of the file. Once the user is satisfied with their attempt, they will select the “Return to Classroom” button to be directed back to the classroom page in order to select another lesson. Additionally, they may select the “Return Home” button to go back to the home screen of the application.

This concludes all of the user input of the application, and all other input will be a series of adding new instruments as well as selecting new lessons. If the user would like they may create multiple profiles in order to have different users keep their progress on the same machine. The users may also re-attempt any lesson they have already completed in order to try to gain a higher score. The input required from the user is clearly defined so that the users may use the system without any instructions or training.