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CIS 443/543: User Interfaces
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The set_clock program allows the user to pick a day and time. This program uses auditory output along with visual elements to help the user have a better understanding of their task and the capabilities of the program.

Python GUI is used in this program to visualize the user interface, and pyaudio is used for auditory outputs. The sound files that are used are available in "wav_files_provided" directory, and the "sound.py" python file was provided and is written by Professor A. Hornof (ajh) - Sept 2017. And finally, the "set_clock.py" python file is written by Parsa Bagheri.

Two versions of the program are provided, one for windows and one for macOS. The reasons to this are firstly, some functionalities such as background colors for widgets and image library are not available in the macOS, and secondly, the program was initially built in windows but after running on mac, the arrangement of the widgets were off, therefore some additional changes in the mac version had to be made.

Upon running the program, the parent frame of the interface is booted and the sound files are loaded into the program through calling the function "createSoundFileNames()" and the button and label widgets are made. Some additional helper functions are added to the program for creating and removing menus of the different stages. makeMainMenu(), makeSetDayMenu(), and makeNumberMenu(), respectively create the main menu, set day menu and set hour and set minute menus. Each of these menus create label widgets to show the items on the menu and colors the chosen item grey to distinguish it from the other items. destroyMainMenu(), destroySetDayMenu(), and destroyNumberMenu(), respectively remove the widgets that were created by their makeMenu function and resets the widgets back to their default arrangement.

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"forward(self, stage)" corresponds to the "RIGHT" button on the UI. It firstly determines whether the program is in the main menu or other menus (i.e. stage is a Boolean value; when it is true, the program is in the main menu, when it's false, the program is in the other menus). After determining the stage of the program, it increments the respective counter of that stage and applies the widget changes to be shown on the UI and plays the appropriate sound files.

"back(self, stage)" corresponds to the "LEFT" button on the UI. Similar to forward() , back() firstly determines whether the program is in the main menu or other menus. After determining the stage of the program, it decrements the respective counter of that stage and applies the widget changes to be shown on the UI and plays the appropriate sound files.

"set(self)" corresponds to the "SET" button on the UI. Similar to the previous two functions, it first determines the stage of the program. Then upon it prepares the program for entering the next stage, by destroying the current menu and making the menu to be shown in the next stage, playing the appropriate sound files and displaying appropriate widgets on the interface.

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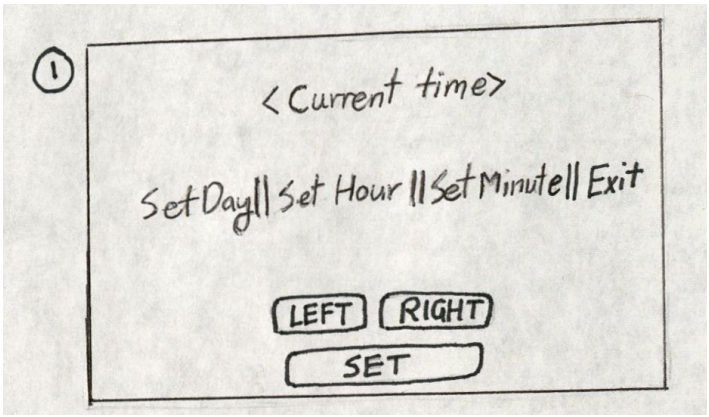
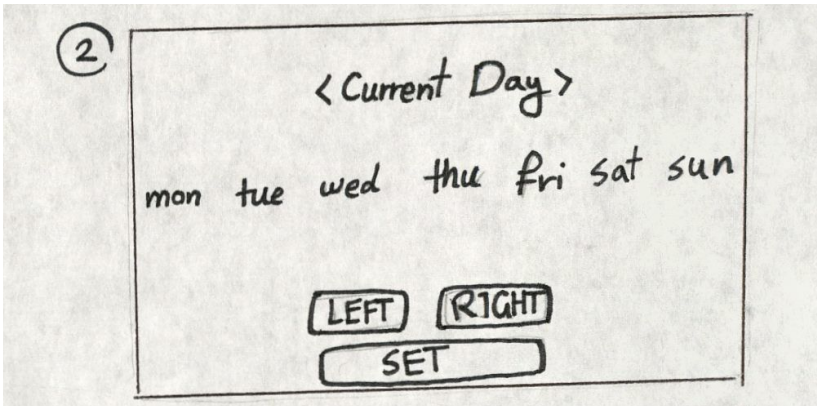
The following diagrams the different stages of the program:

1) Main Menu:



in the main menu, on the top of the screen, it prints “Entering the main menu, current time is:<time>” and a sound file plays the same content. through the LEFT, RIGHT, and SET buttons, the user can choose between, set day, set hour, set minute, and exit. Each one of these, except for exit, takes the user to a different menu, “exit” exits the program.

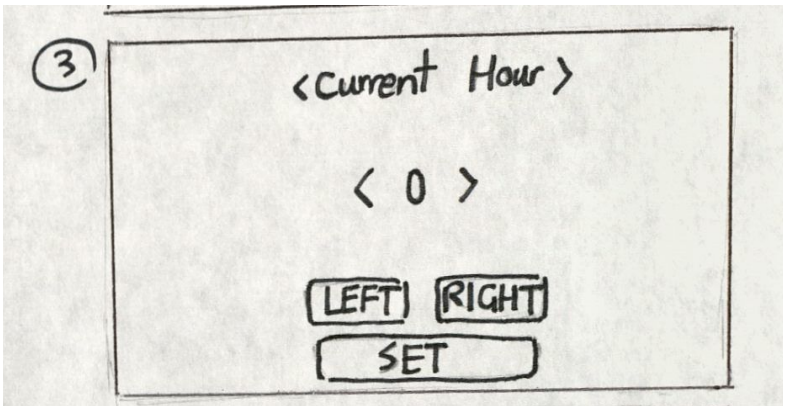
2) Set Day Menu:



In the set day menu, on top of the screen, it prints “Entering the set day menu, current setting is:<day>” and a sound file that says this message is played. With LEFT

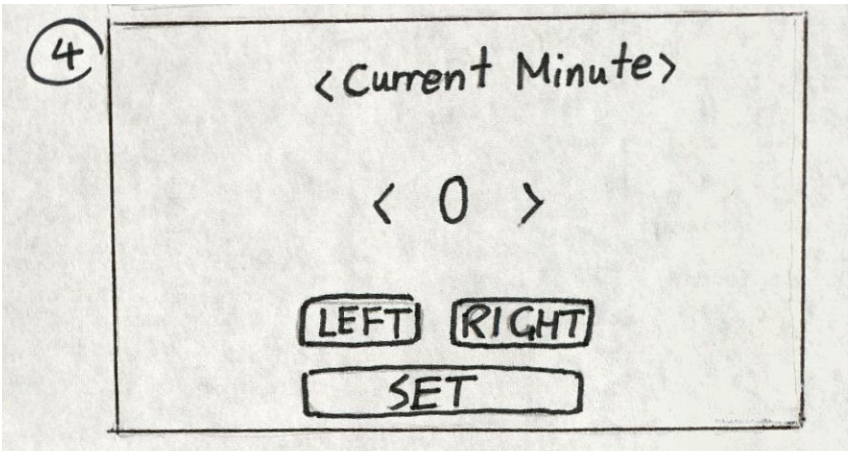
and RIGHT buttons, the user can navigate through the days and a sound file corresponding to the day is played. By pressing SET, the user selects that day.

3) Set Hour:



Similar to above, the Set Hour menu shows the message "Entering the set hour menu. Current setting is: <Hour>" with a voice that says the current hour. With LEFT and RIGHT buttons, the user can navigate through a set of numbers between 0 and 23. A sound file corresponding to that number is played. By pressing SET, the user selects that number as the hour.

4) Set Minute:



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Similarly, the Set Minute menu shows the message “Entering the set minute menu. Current setting is: <Minute>” with a voice that says the current minute. With LEFT and RIGHT buttons, the user can navigate through a set of numbers between 0 and 59. A sound file corresponding to that number is played. By pressing SET, the user selects that number as the Minute.

BUTTON MAPPING:

RIGHT = ‘k’

LEFT = ‘J’

SET = ‘space’