**Report**

System Implementation:

The system first presents the user with a clock fixed at the time 00:00:00 and position flashes at the hour value which can be increased or decreased using the up and down keys. The user can then navigate along to the minute and second values using the left and right positioned keys, with the functionality of changing them also. Once the user has chosen a time the SELECT button can be pressed which sets the clock and starts the time.

Next the user is presented with a prompt to “Set Alarm? Y/N” with the position of the cursor starting at “Y” and chooses either with the SELECT button. If the user choose “N” then a message will appear displaying “No Alarm Set ☹” and the system is essentially stopped with the clock going on continuously until the RESET button is pressed.

However, if the user chooses to press “Y” then another timer will appear labeled “Alarm” which can be adjusted identically to the clock at the start. Once the alarm is set the display will show a message “Set!” next to the alarm, the clock will then continue to count up until it reaches the same time as the alarm. Once reached the display will begin flashing blue and red to indicate the alarm has gone off to the user, along with the message “Snooze? YES/NO” which continues for 1 minute. The user can either select YES, which delays the Alarm for a further minute and then repeats the snooze message. Or no, which will loop back to the “Set Alarm? Y/N” screen and allow the user to set another alarm if they wish so.

Function Description:

The function **digitalClockDisplay** sets the alarm to 00:00:00 that can be increased or decreased using buttons when the SELECT button has not been clicked and as a result button == 0. If the SELECT button has been clicked then it will then it will display the time that has been set for the remainder of the program until the RESET button is clicked.

The function **printDigits** prints the minutes and seconds for the clock and alarm, if the minute is “3” it will print “:03” instead of “:3” to keep the layout consistent.

The function **printDigitsHour** prints the hours for the clock and alarm, if the hour is “3” it will print “03” to keep the layout consistent and neat.

The functions **hourLoop, minLoop** and **secLoop** are indicators for where the cursor is to allow the user to navigate easily when setting the time of the clock, it prints an empty space and then delays for a period of 250 to give the appearance of a cursor.

The functions **hourLoop2, minLoop2** and **secLoop2** are identical to the previous loops except they work for the alarm instead of the clock.

The function **snoozeLoop** is an indicator for the position of the cursor when the user chooses whether or not to use the snooze function.

The functions **setAlarmY** and **setAlarmN** are blinking indicator for the position of the cursor when the user is setting the alarm.

The function **noAlarmSet** prints “No Alarm Set ☹” to the bottom line of the display.

Flowchart:

NO

NO

Display Clock

Increase Alarm Time By 1 Minute

YES

YES

YES

Alert User and prompt Snooze? YES/NO

Clock Time = Alarm Time?

Alarm Time Set

Set Alarm Time

Set Alarm? Y/N

Set Clock Time

Test and Result Analysis:

Upon testing the clock and alarm functions I found no bugs. However, I did find that the further I got into the program (setting the clock, then setting the alarm, then choosing whether to snooze or not) the longer the user has to hold down a button for it to function properly, this can be seen throughout my demo. I believe this is due to the delays implemented for the blinking cursor which unfortunately means I can do little to resolve it.