Special Final Integration Project

Take the code that your team has successfully implemented on "Fan Speed measurement with Speed control through PWM" lab and take the implementation done in "Hardware/Software I2C Bus Implementation" lab to read the temperature and the time. The purpose is to display the room temperature and the time along with the speed of the fan as shown on the following picture.

The new display screen will no longer shows the bar graphs but the basic Volt, Duty Cycle and RPM data are still displayed at the bottom of the screen.

In the main program, a while loop will perform the following tasks:

1) Check for INT0 and INT1 flags to turn off and to turn on the fan respectfully.
2) Check for INT2 flag to Setup the time
3) To read the time
4) To perform a check on whether a new second has been updated. If not, do nothing
5) If a new second has been detected, do the following:
    a. Read the temperature and calculate the degree F equivalent
    b. Read the voltage
    c. Check if the fan is enabled. If it is, then perform the function Monitor_Fan(). If not, do nothing
    d. Finally, call the function Update_Screen() to display

The Update_Screen() routine must be implemented to fill in the temperature in degree C and degree F, the time and date.

The functions ‘draw_bar_graph_dc(int dc)’ and ‘draw_bar_graph_rpm(int rpm)’ should be modified to display the text data of the value of the duty cycle and rpm respectfully. No more graph is to be drawn.

The screen should have the time updated every second as it was on the previous lab.

Task #3: Addition of the fan control

Go back to "External Interrupts" lab, move the code to measure and to control the

fan's speed by:

a) Move the code related to the Tach_cnt in the T0_ISR() routine

b) Move the code in the main program to handle the INT0_flag and INT1_flag in order to control the duty cycle variable 'dc' and to update the pwm.

c) Add the code to compute the variable RPM just before calling the routing 'Update_Screen()'

d) Don't forget to initialize the Timer 1

Once the implementation is completed, then the speed of the fan can be displayed on the screen along with the duty cycle.