

ECE 476/676 - Homework #8

Text Files, Temperature Sensors, Heart Pulse Sensor - Due Monday, March 24th

Temperature Sensor: How much does a damp towel cool down?

- 1) Write a Python program which
 - Records the temperature of a DS18B20 sensor every 1.0 seconds
 - Displays the data on the LCD display, and
 - Displays the coldest temperature recorded so far

- 2) Using this program, record
 - The temperature of a damp towel, and
 - The temperature of a damp towel after waving it in the air to let the water evaporate
 - Repeat three times

- 3) From your data, compute the 90% confidence interval for how much cooler a towel gets when you wave it in the air.

Heart Sensor

Write a Python program which

- Uses the Heart & Pulse sensor to record your pulse
 - Detects each pulse automatically,
 - Computes your heart rate in beats-per-minute, and
 - Displays your pulse as a graph on the graphics display as well as your beats-per-minute.
- 4) Write a Python program which measures and displays your pulse
 - Give the program listing as well as the result on your graphics display

 - 5) Write a Python program which detects each beat
 - Flash an LED for 100ms each pulse
 - Beep the beeper for 100ms each pulse

 - 6) Write a Python program which measures the time between pulses with a resolution of 1us
 - Display the results on the terminal window
 - Give the results of your program

 - 7) Modify this program to output on the graphics display
 - The measured pulse signal as a graph
 - The time between pulses in micro-seconds, and
 - Your beats-per-minute, with a resolution of 0.01bpm

 - 8) Demonstrate your program