Programming Assignments

Students are responsible for completing the following assignments. All assignments must be completed and demonstrated to the instructor. For each assignment, the student must provide the following:

1. Demonstrate the working board
2. Hard copy of their programming code

Students must adhere to the instructions given for each assignment. Any student who achieves the desired result without following direction will achieve a level 1 mark, with the possibility of a zero.

Students who reuse existing code from another student (cheating) will result in both students receiving a zero for the section. The Programming assignments are broken down into 3 sections.

# Marking

All assignments will be marked as follows:

Demonstration - 10 marks

Programming Code – 30 marks

Any clarification on the assignments will be done in class. Students are urged to ask questions in order to be clear as to what is expected of them.

**Due Date: Friday May 18, 2018**

## Assignment 1 – Morse Code

The Student must flash their first name (as is written on the attendance sheet) using 1 LED. Students may do this in any possible way. The program may run only once or loop infinitely. If it loops infinitely, there must be a noticeable stop.

## Assignment 2 – LED Chaser

The Student must use 6 LED’s and cause them to light up one at a time in order from left to right and then back again. Only 1 LED may be on at any time. The overall look of the program is to accomplish a scanning motion, back and forth. Students must accomplish this using loops in their programming code. You may not simply copy and paste your code over and over. The program must loop infinitely.

## Assignment 3 – Push my Buttons

Students must use 1 push button to light up 1 LED. When the button is not pressed, the LED will be ON. When the student presses the button, the LED will go OFF. This must be accomplished using programming code and the microcontroller, not by using electronic wiring.

## Assignment 4 – Analog Read

Students must use 1 analog input device (like your sensors), and setup serial communication between the input device and the desktop computer. You must read the analog input device and output it’s actual reading and convert that reading to a percentage of it’s overall value. This information must be displayed on the screen in an easy to read manner.

## Bonus Assignment – Random LED Game

Students must wire up 6 LED’s and have the LED’s light up RANDOMLY. If the button is pressed when a RED LED is lit, then both RED LED’s must light up. Same must happen when the YELLOW LED is lit and the GREEN LED is lit (match to appropriate color). If the person presses the button on the same color 3 times in a row, ALL the LED’s must light up and flash. The game is won. If they miss, then the counter must restart and they continue until they win the game. Use ¼ second delay between LED’s in order to test your program.