Embedded Systems Design

EECE 4038C, Embedded System Design

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Laboratory Assignment – 6

Preparation:

1. Go through Lessons 4 and 5 in Chapter 3 of the "44-Pin Demo Board User's Guide" and execute the corresponding programs on the demo board with PIC 16F887.

Assignment:

Bicycle Lights

A toy bicycle has two turn lights. When the child holds the handle in the neutral mid position, both lights should be off. If the handle is turned to the left (right) the left (right) light blinks at a rate directly proportional to the degree of angular turn from the neutral position.

You are asked to develop a prototype embedded system for this situation using the PIC16F887 demo board. Use the potentiometer on RA0 to model the handle movement and LEDs on RD7 and RD0 to model the left and right lights respectively.

Show a flow chart and develop the corresponding assembly program to read the potentiometer and drive RD7 and RD0. State any assumptions you may have made. Include comments in the program to make it understandable.

In addition note that,

1. Your report must include a flow chart for your solution.
2. You must draw the circuit diagram and include a photograph of your circuit setup. You must describe the design decisions made during the circuit design process and any other alternative designs you have considered.
3. Your code must be well documented and must correspond to your flow chart.
4. You must use macros and subroutines wherever appropriate to improve modularity and maintainability of the code.

5. You must use a good template design for your program, following the coding practices you have noticed in your reading assignments.
6. You must discuss the algorithmic, circuit design and programming choices you have made while developing this solution.