

# CmpE213 – Digital Systems Design

## Homework 9

### Applications of the 8051

For the following program, please email me a copy of your completed code as well as turn in a hardcopy in class. Send your code as an attachment to an email with subject line “HW9 - program”. **Please put your name at the top of your program (with the names of anyone you worked with) and comment your code appropriately.**

1. Information on controlling a unipolar 4-phase stepper motor was discussed in class and is shown on pages 152-4 in your book. Create a C-program which will drive the stepper motor 100 steps in the forward direction at a speed of 42 revolutions per minute (RPM), then 200 steps in the reverse direction at 42 rpm, and will then repeat (so: 100 forward, 200 backward, 100 forward, 200 backward, etc – assume the example in the book drives the motor forward). Email me a copy of you completed (debugged and working) program, turn in a hardcopy of your code, and answer the following questions:
  - (a) When calling the function msec, where is the number of milliseconds (variable x in msec(x) ) stored in the assembly language translation so that it can be accessed by the function (i.e. how are parameters passed to the function)?
  - (b) In the function step, how is the static variable *i* stored? What register or memory location is used? Does the method used by your assembled C-program differ from the method used by the ASM code implementation of the stepper driver function on pg. 153?