NAME: POSSIBLE POINTS: 10

STUDENT ID:

COURSE DATE & TIME:

### OBJECTIVE:

* To learn how to create, simulate and debug a simple 8051 C program in Keil uVision4.
* To drive an output on the 8051 port.

### DIRECTIONS:

Follow the lab tutorial on creating and simulating a Keil uVision project. This will demonstrate how to create a project that targets an 8051 Simulation. Once you have the sample program running in the simulator and you are debugging, you have to figure out how to set two breakpoints. One breakpoint on each line that writes out to the output port.

PROGRAM:

The program will:

Have a Superloop architecture.

Write 0xF5 to Port1 followed by a small for loop delay (busy wait)

Write 0x0A to Port1 followed by a small for loop delay (busy wait)

DELIVERABLES - LAB WRITE-UP:

The lab write-up will include this page as the cover sheet, the source code, two screenshots and all questions answered. The 2 screenshots will be of the program running in the simulator with the execution halted and clearly showing the expected output of the Port 1 Peripheral, make sure you have executed the entire Superloop at least once before taking the screenshot.

Screenshot 1 – taken while the execution has halted at the line that writes 0xF5

Screenshot 2 – taken while the execution has halted at the line that writes 0x0A

DEMO:

When your project is ready, you will demo to the instructor that you can run the simulator to each of the two breakpoints and that the Port I/O Peripheral on the simulator is changing.

INCLUDE:

(Screenshot 1) Halted at the line that writes 0xF5 to Port 1 with the Peripheral open

Q1: What is 0xF5 in Binary \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ What is 0x0A in Binary \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Q2: Why does the Port 1 Peripheral show 0 0 0 0 1 0 1 0 and not 1 1 1 1 0 1 0 1 ?

(Screenshot 2) Halted at the Line that writes 0x0A to Port 1 with the Peripheral open

Q3: Why does the Port 1 Peripheral show 1 1 1 1 0 1 0 1 and not 0 0 0 0 1 0 1 0 ?

Q4: What line of code is responsible for creating the Superloop in our program?

Q5: Why is an infinite loop needed for software running on a microcontroller?

Q6: What happens if no infinite loop exists?

Q7: How many iterations does each busy wait for-loop delay execute?

Q8: Why is it called busy wait?

Q9: What line of code is the entry point for the program?

Q10: List all the lines of code from main.c that are actual instructions executed by the CPU inside the MCU.