# Lab 1 Pre-lab Example

## Team Information

**Lab number:** 1

**Date:** 2/10/2016

**Team Members:** Brit Briggs, Travis Roser, Mari McCarthy, Tyler Martis

**Team Number/Name:** Team Member Responsibilities

**Software Design:** Brit Briggs

**Hardware Design:** Tyler Martis

**Quality Assurance:** Mari McCarthy

**Systems Integrator:** Travis Roser

# Hardware

### Responsibility (2 pts)

Fill in the table below based on your responsibilities provided in the procedures and grading rubric. This will be what determines your individual grade for the lab.

|  |  |  |
| --- | --- | --- |
| Part 1 | Part 2 | Part 3 |
| The circuit diagram is complete. Appropriate colors are chosen for the wire-wrapping portion | Pin numbers on the LCD and microcontroller are included. Appropriate colors are used for each wire. | Same as part 1 |

### Part 1 (1 pts)

Draw the schematics or create a table detailing the connections for Part 1 of Lab 1. **An example of the level of detail that is expected is given below**.



### Part 2 (1 pts)

Draw the schematics or create a table detailing the connections for Part 2 of Lab 1. You can choose to use a table or use a diagram.

### Part 3 (1 pts)

Draw the schematics or create a table detailing the connections for Part 3 of Lab 1. You can choose to use a table or use a diagram.

# Quality Assurance

### Responsibility (2 pts)

Fill in the table below based on your responsibilities provided in the procedures and grading rubric. This will be what determines your individual grade for the lab.

|  |  |  |
| --- | --- | --- |
| Part 1 | Part 2 | Part 3 |
|  |  |  |

### Part 1 (1 pts)

List the tests that you intend to do based on the Lab 1 procedures. Describe the name of the test, the tool you intend to use, and a description of the test. Do this for each part in Lab 1.

|  |  |  |
| --- | --- | --- |
| Test Name | Tool | Description |
| Continuity Test | Digital Multi-meter | Test all wire connectors, solder joints, and wire-wraps for continuity |
| Power Test | Digital Multi-meter | Test that any created circuits have power correctly flowing |
| Grounding Test | Digital Multi-meter | Test that any switches connected to ground actually ground a powered circuit |
| Component Test | Digital Multi-meter | Test that appropriate pins on the switch are connected |

You may also include any software tests that you intend to make.

|  |  |  |
| --- | --- | --- |
| Test Name | Input | Description |
| timerTick Test |  | Test that timerTick indeed ticks at the correct interval |
| displayTime Test | “10000” | Test that this function assigned the appropriate register to “10:00:00.” |
| Register Test |  | Test that the register configurations for the timer work. |

### Part 2 (1 pts)

### Part 3 (1 pts)

# Software

### Responsibility (2 pts)

Fill in the table below based on your responsibilities provided in the procedures and grading rubric. This will be what determines your individual grade for the lab.

|  |  |  |
| --- | --- | --- |
| Part 1 | Part 2 | Part 3 |
| Buttons are debounced. LEDs are clearly distinguished in the code. The RUN LED is initially on. | All functions work properly | Interrupts are used, state machine implementation, requirements are fulfilled. |

### Part 1 (1 pts)

List the relevant control registers for controlling the LEDs in Part 1 of Lab 1.

|  |  |
| --- | --- |
| Device: | Register(s): |
| LED | TRIS, LAT |

Also describe the function of the microcontroller software as a finite-state machine.

-In Part 1, the microcontroller will be in one of two states, the Run, and Stop state. The Run state will initialize a chosen LED to start as the Run LED, and the other will be the Stop LED. When in the Run LED State the Run LED LAT register will be 1, but 0 in the Stop LED state, and vice versa for the Stop LED.

### Part 2 (1 pts)

List the relevant control registers for controlling the LCD in Part 2 of Lab 1.

|  |  |
| --- | --- |
| Device: | Register(s): |
| Timer | TxCON |

### Part 3 (1 pts)

Also describe the function of the microcontroller software as a finite-state machine in Part 3 of Lab 1.

-Similar to Part 1 this FSM will use the two states plus an extra state as the Init/Reset state. When the program begins it will be in this state, wait for the start button press and then move into the start/run state. In the run state the stopwatch will count up at an accuracy of 1/100th of a second. If the stop button is pressed the FSM will move into the stop state where the timer is paused. In both the start and the stop state if the reset button is pressed the state machine moves back into the Init/Reset state where the stopwatch is reset back to 0:00:00.