ECEN 5613 Fall 2019	Embedded System Design Lab #1 Signoff Sheet – Part 1 Elements	Week #1 8/26/2019

You will need to obtain the signature of your TA on the following items in order to receive credit.

The Part 1 Elements of Lab #1 should be completed and signed off by **Friday, Sept. 6, 2019** in order to give you time to complete the Part 2 Elements upon receipt of your parts kit. Both signoffs are due by **Friday, Sept. 20, 2019**. You need to submit both of your signoff sheets and other required elements by **11:59pm Saturday, Sept. 21, 2019**. Labs completed after the signature due date or submitted after the submission due date will usually receive grade reductions, but there is leniency on Lab #1.

Print your name below and then demonstrate your working hardware/firmware in order to obtain the necessary signatures. All items must be completed to get a signature, but partial credit is given for incomplete labs. Receiving a signature on this signoff sheet does not mean that your work is eligible for any particular grade; it merely indicates that you have completed the work at an acceptable level.

Student Name: HARSH RATHORE

Checklist

- ☑ Student demonstrates detailed knowledge of a simulator (including changing register values, editing data memory, using breakpoints, single stepping, uses /overlay option, etc.)
- ☑ Student assembly program works correctly
- ☑ Student demonstrates detailed knowledge of WinCUPL and WinSim, logic equations correct

Student Answers to Lab Questions

1. **How many bytes of code space does your program require?**
   (Show how you arrived at your answer.)
   Code Size? 576 bytes

2. **How long did your program take to execute for X=0x60 and Y=0x0A? Assume an 11.0592 MHz clock and include the instructions executed from the beginning until you reach the ENDLOOP label. Show the TA your detailed calculations on the code listing during your signoff.**
   Execution Time? 197.5 µs

9/9/19

Instructor/TA Comments: ☐ ☐ ☐ **TA signature and date**

FOR INSTRUCTOR USE ONLY	Not Applicable	Poor/Not Complete	Meets Requirements	Exceeds Requirements	Outstanding
SPLD code	☐	☐	☑	☐	☐
Assembly Language Code Style	☐	☐	☑	☐	☐
Required Elements functionality	☐	☐	☑	☐	☐
Sign-off done without excessive retries		☐	☑		
Student understanding and skills	☐	☐	☑	☐	☐
Overall Demo Quality	☐	☐	☑	☐	☐

Comments: NOT FAMILIAR WITH EMULY52 OPERATION ON 1ST ATTEMPT, WINCUPL NOT WORKING SOME CONFUSION ON WINCUPL + USE OF EMULY52. ACCEPTABLE

NOTE: This submission sheet should be the top/first sheet of your submission.

Submission Sheet 1

0x7F	127	255	FF
0x19	25	50	32
0x02	2	1	01

```
MOV A, #06H 2
MOV B, #0AH 2

L1: RLC A      1
    JC L2      2
    SJMP L3    2

L2: MOV 20H, A 2
    MOV 30H, #07H 3
    SJMP       2

L3: XCH        1
    JZ         2
    XCH        1
    SJMP       2

L4: MOV        3
    SJMP       2

L5: SUBB       1
    SJMP       2

L6: JC         2
    JNC        2

L7: ADD        1
    MOV        2
    MOV        2
    MOV        3
    SJMP       2

L8: INCR1      1
    SJMP       2

L9: SJMP L9    2
```

Byte Size = 57 bytes loaded

Oscillator Period = 12 (Machine cycle)

Clock frequency = 11.0592 MHz

No of times instructions executed = 182

Time taken to execute program

$$\frac{1\,s}{11.0592\times10^{6}\,clk} \times \frac{12\,clk}{1\,mach} \times \frac{182\,mach}{Program}$$

$$= 1.975\times10^{-4}\,s$$

$$= 197.5\,\mu s$$

1 machine cycle takes $= \frac{12}{11.0592\times10^{6}} = 1.085\,\mu s$