EE 308 Microcomputer Based System Design Assigned : 09/03/2021
Lab#1 Sessions : 15/03/2021

PART I : Software set-up for EE308L & Digital Clock

Download and install the MPLAB® X IDE from

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https://www.microchip.com/en-us/development-tools-tools-and-software/mplab-x-ide
```

and the XC16 compiler from

```
https://www.microchip.com/en-us/development-tools-tools-and-software/mplab-xc-compilers
```

Once installed launch "MPLAB IDE". Select

```
File -> New Project...
```

and make the following choices:

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1. Choose Project -> Microchip Embedded -> Standalone Project
2. Select Device -> 16-bit MCUs (PIC24) -> PIC24FJ256GB110
4. Select Header -> Hardware Tools -> Simulator
6. Select Compiler -> XC16 -> XC16 (v...
7. Select Project Name and Folder -> Project Name: ee308sim
```

and press "Finish". Download **ee308sim.s** from

```
http://acoustics.sabanciuniv.edu/ee308/codes/
```

into the project folder (which should be named **ee308sim.X**). In the Projects tab of MPLAB, right click "Source Files" under "ee308sim", and select

```
Add Existing Item...
```

Select "ee308sim.s" and press "Select". Double clicking ee308sim.s under "Source Files" should open the source editor in a tab to the right.

Clicking "Build Project" form the tool bar (hammer icon) should compile your code.

To use the debugger, first go to

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Tools -> Options
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click the "Embedded" tab, and select "Halt at Main" in "Debug startup". Then, open

```
Window -> Debugging -> IO View
```

and select "PORT B" from the opened "IO View" tab.

Start the debug session by pressing the "Debug Main Project" icon from the toolbar. Ignore errors. Step commands by either pressing the "Step Over" button or the F8 key, and observe how PORTB changes.

PART I : In-lab Assignment

Modify "ee308sim.s" so that PORTB outputs the time in 24-hour hh:mm format as a BCD number, so that the output might be directly connected to a BD to seven-segment decoder. Observe that minutes and hours roll over 59 and 23, respectively. To speed up the simulation, you may start W0 from an appropriate vaule, such as 0x2355 for the midnight test. Upload your code to SUCourse.

PART II : In-lab Assignment

You will be asked to make further modifications to your code during the laboratory session.

Note:

Further information on debugger use is available at

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https://microchipdeveloper.com/tls0101:lab2
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