**EE5673 Embedded Systems**

**Module 8 – Economics of Embedded Systems**

Perform the following tasks:

1. Prompt the user to provide the name of an input file and load it. You can assume that the input file will contain the following variables (represented in italics for the rest of this document): *LOC* and *SLOC.*
2. Write a Matlab function implements the curve shown on slide 25 of Module 8. The function should **take the percentage of utilization as input** and return the inflation factor.
3. Use Matlab to evaluate the following. Suppose that for a certain application, the cost per SLOC is estimated to be *SLOC*, that one line of code can be represented by 1 line in the program memory and that the estimated number of lines of code (words in program flash) is *LOC*. Furthermore, the microcontrollers have been down-selected to the following three options: (i) the **PIC16F1784**, (ii) the **PIC16F1786**, (ii) and the **PIC16F1788** (the datasheet is included). Evaluate and plot the cost per item as a function of number of produced items (ranging from 1000 to 10,000,000) for each of the three options with and without taking into account the utilization. You are required to provide two plots here: one while not taking into account utilization and one while taking into account utilization. Make sure to indicate the curves for the three options by different colors.
4. Suppose that it will be required that these *LOC* lines must be executed within 1.0 milliseconds and that the execution time of each line of code takes 4 clock cycles. Discuss the impact of this on your design choice.
5. Provide a write-up (in Word or other comparable text editor) of your findings. Include all the outputs of your Matlab code in your text. Also, include a short discussion for each of the plots and tasks and make sure to include references to any equations or documents that you used.

In your electronic submission you must include your report and **all** your Matlab source files.