CPE 325: Embedded Systems Laboratory
Laboratory Assignment #4

Assignment [100 pts]

1. For this lab assignment, please implement the problem in Lab1 Assignment 2 all over again. But this time, your implementation should be in assembly program. Please store the count value in a variable (defined using .data in your code). You should display this value using memory browser. *Hint: Please create an assembly project as mentioned in the tutorial for Lab4. You can re-use the idea from Lab1 or use the optimized technique that the instructor discussed with you. You do not need to print the result in console window.* **[50 pts]**

   Please include a flowchart for your implementation.

2. Write an assembly program where you would define a variable which is a string. This character array should indicate a mathematical expression. For example: your mathematical expression can be as following (which can be evaluated to an integer).

   "4-3+5"

   You are required to evaluate the string and send the value to P2OUT. You should demonstrate the value using register window. **[50 pts]**
   Hint: The mathematical expression can be formed with all single digit numbers only. The mathematical operators can be restricted to "+" and "-".

3. **(Bonus: up to 15pts)**: Write an assembly program where you would declare a string as shown below. You are required to update the contents of the strings to uppercase letters if they are lowercase letters. This means you need to change the value in their original location.
   Hint: You need to declare your variable in data segment (.data) of the code to make them readable and writable as shown below.

```
            .data
myString:   .cstring        "I enjoy learning msp430"     ;
```

   You should demonstrate the correct functionality of your program by viewing the memory browser.

Deliverables

1. Lab report which includes:
   a. Screenshots if any
2. Source files (.asm files or attached in a report)