Question 1 [6 marks; part marks possible]: Create a file named "**q1.s**" and inside it write ARM assembly to implement the following function which is written in C. You may assume the array X has length m and the array Y has length n and that m and n are greater than or equal to zero. Hints: Recall that the C "char" data type occupies a single byte of memory. The "**||**" operator used in the code below is logical "or". You can load a string into memory using the ".asciz" directive.

```
int func(char *X, char *Y, int m, int n)
{
  if ((m == 0) || (n == 0)) {
    return 0;
  }
  if (X[m-1] == Y[n-1]) {
    return func(X, Y, m-1, n-1) + 1;
  }
  int a = func(X, Y, m, n-1);
  int b = func(X, Y, m-1, n);
  if (a > b) {
    return a;
  }
  return b;
}
```

Calling func with X pointing to a string "ABCBDAB" (where X[0] is 'A', X[1] is 'B', etc…), Y pointing to a string "BDCABA", m set to 7 and n set to 6 should return a value of 4.

Upload your ARM assembly file named "q1.s" via the "Lab Proficiency Test #4" assignment on Canvas before 6:50 pm as the submission site closes at exactly 6:50 pm. Do **NOT** "zip" your submission. The file you upload for this question **must** be called "q1.s" or the autograder script will not mark it.

Your solution will get zero if any of the following are true:
  1. Your **last** "Lab Proficiency Test #4" attempt on Connect does not include "q1.s",
  2. Your q1.s file does not compile with the Altera Monitor Program configured to use the DE1-SoC Computer or the following emulator: https://cpulator.01xz.net/?sys=arm ,
  3. Your q1.s file does not contain a function called func.
  4. Your func does not return control to the caller.

Your mark will be computed using an autograder by running several tests. The "main" function used by the autograder will pass arguments to your function using the ARM calling convention discussed in class. For each test case the autograder will verify the value returned by your func function is correct, that you implement a stack to save and restore registers as per the ARM calling conventions discussed in class and finally that your code for func uses recursion.

This test consists of only the above question.