CSE220: SYSTEMS FUNDAMENTALS I

Assignment 8
Due on 5 Dec, by 5 PM

Each program should be written and tested separately (i.e., with a distinct "main"), but all should be handed-in in a single file. The results of the testing should be included in the same file, after each corresponding "main".

You are advised to first carefully develop the corresponding algorithms and to not leave the assignment work to the last minute.

1. Write a MIPS assembly-language function that divides two positive numbers and returns the quotient and remainder.
    a. The dividend and divisor should be passed in $a0 and $a1.
    b. The quotient and remainder should be returned in $v0 and $v1.
    c. Other than result registers, any registers whose contents are modified should have contents saved and restored appropriately.

    Write a "main" that appropriately tests the function.

    Be sure to include meaningful comments in your code.

2. Write MIPS assembly-language function that counts the number of times a given number appears in an array.
    a. The base address and length of the array should be passed in $a0 and $a1.
    b. The number to be searched for should be passed in $a2.
    c. The result should be returned in $v0.
    d. Other than result registers, any registers whose contents are modified should have contents saved and restored appropriately.

    Write a "main" that appropriately tests the function.

    Be sure to include meaningful comments in your code.

3. Recall the *strcmp* function in C. It compares two strings and returns 0 if they are equal, a positive number if the first string is greater than the second, and a negative number if the first string is less than the second.

    Write a MIP assembly-language version of that function.
    a. The addresses of the two strings should be passed in $a0 and $a1.
    b. The result should be returned in $v0
    c. Other than result registers, any registers whose contents are modified should have contents saved and restored appropriately.

    Write a "main" that appropriately tests the function.

    Be sure to include meaningful comments in your code.