CS2630: Computer Organization

Homework 2

Total points = 50
Due September 25, 2015, 11:59 PM

Late submissions will not be accepted

1. Do not consult others. You must solve the problems on your own.
2. Be generous about using comments to improve readability. Always include a comment at the beginning specifying the purpose of the program.
3. To submit the program, zip (or tar) them into a single file that has your last name as the prefix. Use ICON drop box to submit your assignment.

**Problem 1** (20 points)

Write a program using MIPS assembly language to multiply two 8-bit unsigned integers x and y. For each integer as well as for the product, use a 32-bit unsigned integer representation. Since the integers are small, there should be no problem with overflow. *Use repeated addition to carry out multiplication*. The algorithm is trivially simple, and does not need any explanation. The user should be able to enter a number between 0 and 255 after the prompts “Enter x” and “Enter y” are displayed on the screen. The result will be displayed on the screen as “Product = “

*Do not use the mult instruction of MIPS for doing any part of this assignment*

**Problem 2** (15 points)

Use the multiply program in Part 1 as a subroutine to compute the product of the elements of two unsigned integer arrays A and B, each of size 8. Enter the following array elements for A and B directly into the data section:

A = [9, 13, 10, 20, 1, 6, 9, 14]        B = [41, 3, 5, 7, 19, 2, 1, 7]

Show the result as Product = [9×41, 13×3, 10×5, ..., 14×7]

*Do not use the mult instruction of MIPS for doing any part of this assignment. Only use your own program as a subroutine*
You can declare the array elements into the data section of your program as follows.

array1: .byte 10, 15, 7  # create a 3-element integer array initialized to 10, 15, 7
array3: .space 40       # reserves 40 consecutive bytes, with storage uninitialized.
                          # You can use it as a 40-element character array, or a 10-element
                          # integer array; a comment should explain your preference

**Problem 3** (15 points)
Write a program that accepts as inputs an ascii string consisting of a sequence of words separated by one or more blanks, and outputs the string with all blanks removed. Example:

```
input:  "the quick brown fox"
output: "thequickbrownfox"
```

The user should be able to enter any string of maximum length 64 characters after the prompt “Enter the input string:” and the result will be displayed on the screen as “The output string is:”