

22C:060: Computer Organization

Spring 2008

Assignment 2

Total points = 50

Assigned February 12, due Feb 19, 2008. 11:59:59 PM

Instructions to submit your homework

1. Be generous about using comments to improve readability. This includes a comment at the beginning specifying the purpose of the program.
2. To submit the program, *zip* (or *tar*) them into a single file that has your last name as the prefix. Use ICON dropbox to submit your assignment. If you encounter a problem with the dropbox then email the assignment to the TA.

The Question

Write a program using MIPS assembly language to multiply two 8-bit unsigned integers x and y . For each integer as well as the product, use a 32-bit representation. Since the integers are small, there should not be any problem with overflow. Use two different methods for multiplication:

Part 1. (10+20=30 points)

Method 1. Use repeated addition to carry out multiplication. The algorithm is trivially simple.

Method 2. Use addition and shifting to carry out multiplication. The basic algorithm can be found in Section 3.4 and Fig. 3.6 of your textbook. Modify it according to your need.

For each part, 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 should be displayed on the screen as “Product = “

*(It must be obvious that you should not use the **mult** instruction of MIPS for this exercise)*

Part 2. (20 points)

Use one of the programs in Part 1 as a subroutine to compute the square of the elements of an unsigned integer array $A = [3, 12, 17, 50, 99, 160, 200, 255]$. You can enter the array elements directly in the data section of your program. Print out the result as “A square =”