

CptS260: Introduction to Computer Architecture Homework 4

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What and how to submit: Please submit your zipped folder to blackboard by the due date. Your submission package should include your program code for the problem, as well as a report (in pdf or doc format) addressing questions in each problem.

Coding Problem 1:

In this program, you are asked to write a program in assembly which works as a simple calculator. The program will get two integer numbers, and based on the requested operation, the result should be shown to the user.

- a. The program should print a meaningful phrase for each input, and the result.
 - i. "Enter the first number"
 - ii. "Enter the second number"
 - iii. "Enter the operation type"
 - iv. "The result is"
- b. The user should enter 0, 1, and 2 to tell the program the types of operation add, sub, and multiply, respectively.
- c. How many registers do you need to implement this program?

8 registers

- d. What system calls do you need to write this program?

```
print integer $v0 1
print string $v0 4
read integer $v0 5
read string $v0 8
exit (terminate execution) $v0 10
```

Coding Problem 2:

In this program, you should define an array of 10 elements in your data segment with these values:

$$A = \{11, 12, -10, 13, 9, 12, 14, 15, -20, 0\}$$

- a. Write a function which finds the maximum value of this array.
- b. Write another function which calculates the summation of this array.
- c. Call these functions in your main program, and print the outputs of these functions to the user
 - i. "The maximum is 15"
 - ii. "The summation is 56"
- d. What is the address that has been used by the simulator for this array?

Array **R6** [a2] = 7ffffe60

NOTE: You can find system calls codes in QtSIMP Help or you can find at this address:
<http://www.tfinley.net/notes/cps104/mips.html>