

Problem Set #1

Date Assigned: Monday, February 8, 2016

Date Due: Monday, February 15, 2016

Points: 50

1. (8 pts) Compare and contrast a high end x86 Samsung Laptop with a low end x86 Dell. Is the biggest difference in the architecture or organization of the computers? Explain three of the biggest differences in what you selected as the biggest difference.

Give Web references to the web pages where you found the information for each of the models listed.

2. (13 pts) Given the memory contents of the IAS computer shown below:

Address	Contents
000	0100A0500B
001	110000000C
...	
00A	000000000F
00B	0000000001
00C	

- a. Show the assembly language code for the program starting at address 000.
 - b. In general, what does this program do? Do not tell me what each instruction does or you will receive 0 credit for this part of the question. In general, this program does what?
 - c. After fetching the left and right instructions at address 1, what are the hexadecimal values of each of the following registers: MBR, IBR, IR, PC, MAR?
3. (9 pts) Simplify each of the following Boolean expressions using the postulates and theorems we discussed in class. You do not need to identify the postulate or theorem being applied but only apply one postulate or theorem at a time as you simplify each expression.
 - a. $Y + (\overline{XY})$
 - b. $\overline{X}(X + Y) + (Y + X)(X + \overline{Y})$
 - c. $X\overline{Y}\overline{Z} + XY\overline{Z} + XYZ$

4. (20 pt) Using the IASSim Assembler, you are to write an IAS assembly language program to find the sum of up to 10 values stored in an array which starts at location 1E. The actual number of elements in the array will be stored in location 1D. Your program is to start at address 0 and the sum is to be placed in the accumulator when the program finishes execution.

There is a simulator called IASSim on each of the Windows machines in the CS lab in C:\Program Files\Architecture that you can type in your assembly language code and test.

Save the assembly language program as arraysum.txt.

Once you are finished with the program, take a screen shot of your assembly language program and associated machine language code after running your program with an array of 5 values where the values are -2, 10, 8, -10, 22. Copy the screen shot into your word document.

Error check to make sure the array size is between 0 and 10 inclusive.

How to turn in your solution:

- Please make sure your problem sets are typed, answered in order, and stapled together. Name your word document 01punet.docx.
- A hard copy of your Problem Set Solution is due on the instructor's desk by 9:15am on the day the assignment is due.
- Create a folder named (01punetid) and place: a) the word document with all of your solutions typed up and b) the file arraysum.txt into the folder. Then drop the 01punetid folder into the CS 430 drop folder on Grace.
- Please do your own work. I don't want you comparing answers as these problem sets are individual work.