HW 4

You can make **hw4.txt** or **hw4.doc** to put your answers and attach it your submission. This hw is to practice MIPS instructions and their representations. You can refer to the MIPS Reference sheet from Resources to answer some of the questions.

Background reading

- P&H: Chapter 2.5, 2.8-2.10

Problem 1

Answer the following questions from P&H :

- 2.14 – 2.17
- 2.34, 2.36 – 2.37
- 2.39 – 2.42

Problem 2

What is Stored Program Concept?

How would you write self modifying code?

What is the PC?

Problem 3

What is R-format, I-format and J-format? (give the field and bit widths)

For R-format, how many different instructions can be represented in this one? (Hint: func field)

What can we do to increase the number of possible instructions in R-format?

Problem 4

Define absolute addressing versus relative addressing modes

What is a word-aligned address and bye-aligned address?

What is the range for branch instructions? (ie how far can it go from the current PC)

What is the range for j/jal instructions?

What is the range for jr instructions?

How would you jump to an instruction that is 257MB above the current PC?
(hint: multiple instructions)

Problem 5

```
0x002cff00: loop:    addu $t0, $t0, $t0
0x002cff04:          jal  foo
0x002cff08:          bne  $t0, $zero, loop
...
0x00300004: foo:     jr $ra
```

For each of the 4 instructions, give each field and their corresponding values. Also give the binary representation and/or hex of the instruction.

What instruction is represented by 0x00008A03?