
Notes:

- The main purpose of this week is to practice about multiplication (mult) and division (div) instructions in MIPS.
- Students compress the assembly files then submit on e-learning.

Question 1. Given the following Multiplication and Division program with MIPS assembly.

```
######### Multiplication ###############
        lui $t0, 0x5000
        li $t1, 4
        mult $t0, $t1
        mflo $s0
        mfhi $s1

######### Division #####################
        li $t0, 10
        li $t1, 7
        div $t0, $t1
        mflo $s0
        mfhi $s1

######### Exit #########################
        li $v0, 10
        syscall
```

Students run the program and answer the following question

1. What is the function of mflo and mfhi instruction?
2. What is the value of `$s0` and `$s1` after the multiplication.
3. What is the value of `$s0` and `$s1` after the division?
4. What is the role of lo and hi register in multiplication?
5. What is the role of lo and hi register in division?
6. Do hi and lo is a part of 32 general purpose register of MIPS processors?

Question 2. Given the following log 2 procedure in C:

```
int log_2(int n)
{
int ret = 0;
for (; n/2 != 0; ret = ret + 1) n = n / 2;
return ret;
}
```

Assume that all input is the exponent of 2. Implement a MIPS program that:

1. Receive input value from user.
2. Call the log_2 procedure.
3. Get the return value of log_2 procedure and print to screen.

Question 3. Implement the following C code by using MIPS code. Assume that b and c are 10 and 7, respectively while input variable is read from keyboard. Print value of a to the terminal.

```
switch (input){
 case 0: a = b + c; break;
 case 1: a = b - c; break;
 case 2: a = b * c; break; // print both low and high word
 case 3: a = b / c; break;
 case 4: a = b % c; break;
 default: printf{"Your choice is invalid\n"}; break;
}
```

——————the end——————