
Fall 2017 CDA3101

Programming Assignment 2

Date assigned : Sep. 21th, 2017

Due date : Oct. 1st, 2017, 11:55 pm

A 24-hour grace period with 20% penalty is given. No submission is accepted after the grace period.

Instructions

Transform the following code into MIPS instructions. Your programs should run correctly on the QtSPIM simulator. Submit your assembly solution (project2.s) containing the neatly written/organized MIPS code in e-Learning (Canvas) website before the deadline.

Important

You should use comments ('#' followed by text) in order to make your programs more readable.

The name of the file submitted **MUST** be "project2.s"

You **MUST** verify that your submission in Canvas is successful by downloading your submission from Canvas and successfully testing it again using SPIM simulator. This will ensure that you uploaded the right file in eLearning and the upload is successful.

Basic Problem (80 pts):

Given two integers, write a program to find the Greatest Common Divisor (GCD) and Least Common Multiple (LCM) of them.

Your assembly implementation **should follow** the pseudo code sequence given below. **Please do not perform any optimization at pseudo code level or at assembly level.**

Input validation (20 pts):

The input numbers need be in range [0, 255]. Besides, both inputs cannot be zero at the same time since GCD(0,0) is undefined.

So, you should verify the input numbers are valid.

Tips:

For printing to/reading from console, you should first load **correct** value to register \$v0, and then call "syscall" method. If there is an input, the value would be returned in \$v0.

```
// Calculates the greatest common divisor
int gcd(int n1, int n2) {

    if (n2 == 0) {
        return n1;
    }

    else {
        return gcd(n2, n1%n2);
    }

}

// Calculates the least common multiple
int lcm(int n1, int n2) {

    return n1*n2/gcd(n1, n2);

}

int main()
{
    int n1, n2;

    printf("Enter first integer n1: ");
    scanf("%d", &n1);
    printf("Enter second integer n2: ");
    scanf("%d", &n2);

    printf("The greatest common divisor of n1 and n2 is %d\n", gcd(n1, n2));
    printf("The least common multiple of n1 and n2 is %d\n", lcm(n1, n2));

    return 0;
}
```