Spring 2014 CDA3101

Programming Assignment II

Date assigned: Jan 29th, 2014

Due date: Feb 7th, 2014, 11:55 pm

Problem Statement:

Transform the following code into MIPS instructions. Your programs should run correctly on the QtSPIM simulator. Your submission should include a single *.s file containing the neatly written/organized MIPS code. Important: Your program should follow the C code with the same procedure call structure. You should use comments ('#' followed by text) in order to make your programs more readable and follow the programming style suggested by the examples from the discussion sections. Note, you can assume the LCM is a 32-bit integer. However, 10 % extra credit will be given if your program can handle any input value of a and b that may produce an LCM bigger than a 32-bit integer.

Code Snippet (Least Common Multiple (LCM)):

```
// Calculates the greatest common divisor
int gcd(int number1, int number2) {
  int remainder = number1 % number2;
  if (remainder == 0) {
    return number2;
  } else {
    Return gcd(number2, remainder);
}

// Calculates the least common multiple
int lcm(int number1, int number2) {
  return number1*number2/gcd(number1, number2);
}

int main() {
  int n1, n2;
  printf("Enter integer a\n");
  scanf("%d", &n1);
  printf("Enter integer b\n");
  scanf("%d", &n2);
  printf("The least common multiple of a and b is %d\n", lcm(n1, n2));
  return 1;
}
```

This piece of code calculates the Least Common Multiple (LCM) of two numbers.

The Least Common Multiple (LCM) of *a* and *b* equals to the product of a and b divided by the Greatest Common Divisor (GCD) of a and b.

$$\mathrm{LCM}(a,b) = \frac{a \times b}{\mathrm{GCD}(a,b)}$$