Assignment number 8 for Computer Architecture

The assignment is to create a MIPS program that does an integer divide using subtracts. The program is to input two integers (they may be positive or negative). The program will then use subtracts to do an integer divide. The program’s output will be the answer to the problem (the quotient and the remainder). Remember to consider negative numbers. **The remainder will always be positive**, but the quotient may be positive or negative. Make certain to have a prompt before the number input, so that the user will know what to do. Also have a message stating what the output is (denote the quotient and the remainder with messages). Verify that the divisor the user inputs is not zero and if it is zero, display and error message and request that the divisor be entered again.

For this assignment, turn in your code, a screenshot showing the output of a run of your program, and an observations file with a comment about how much time you spent on the program and what you learned doing it. Note that I may test the code with additional cases.

If the input is -32 and 6 the output should be something like:

For -32 divide by 6, the quotient is -5 and the remainder is 2

or

-32/6 = -5 R 2

Make certain that you have your name and the assignment number at the top of your observations file as well as at the top of your code file. Also have a lot of comments in your program.

This program is worth 25 points.

This program is due on November 15. As always, turn the assignment in on the class website DropBox for the assignment.

Note that this is an individual assignment, you are not to work with someone on it. It is OK to ask for and to give some help for a problem within the assignment, but the work must be your own. Note that you may borrow code from any example programs that I have placed out on the class website.

Below is a C function that I copied off the Internet that show how to do an integer divide using subtracts to make your coding a little simpler.

// Function to perform division `x/y` of two numbers `x` and `y`

int divide(int x, int y)

{

// handle divisibility by 0

if (y == 0) {

printf("Error!! Divisible by 0");

exit(-1);

}

// store sign of the result

int sign = 1;

if (x \* y < 0) {

sign = -1;

}

// convert both dividend and divisor to positive

x = abs(x), y = abs(y);

// initialize quotient by 0

int quotient = 0;

// loop till dividend `x` becomes less than divisor `y`

while (x >= y) {

x = x - y; // perform a reduction on the dividend

quotient++; // increase quotient by 1

}

printf("The quotient is %d and remainder is %d\n", sign\*quotient, x);

}