Project 2: Simple Calculator Program

Handed out Monday, October 28.
Due Sunday, November 10, Midnight.

Project Description:
This program will perform a simple calculator functions based on the following user’s input:

- `'+': addition of two integers.
- `' '-': subtraction of two integers.
- `'*': multiplication of two integers.
- `'/': division of two integers. Error checking must be done for denominator is not 0.
- `'%': modulus of two positive integers. Error checking must be done for positive numbers.
- `'g' or 'G': Compute a Greatest Common Divisor (GCD) of two positive integers. Error checking must be done for positive numbers.
- `q' or 'Q': Quit the program.

Write a C program to perform the above simple functions and output the corresponding results. The program will be in a loop until user enters a `q' character to quit the program.

Project Grading:

- All projects are to be done independently. Instances of academic dishonesty will be dealt with harshly, and usually result in a grade of F.
- Late project is subject to the following late penalties: subtract 20% each day after the due date (Saturday, Sunday and holidays count as days).
- Please write project according to the C Coding Standards and Indentation Style as posted in our class website, http://www.cs.umbc.edu/courses/undergraduate/104/fall02/chen/projs/.
- To submit your project, type ”submit cs104-0301 proj2 filename”. See above website for more information.

Your project will be graded based on the following:

- Correctness: 80 points
  - Addition, Subtraction, Multiplication, Division, Modulus: 10 points each
  - GCD: 25 points
  - Quit case: 5 points
  - Program does not compile: 0 points
  - No error checking: subtract 10 points
  - No loop for continuous input: subtract 10 points
- Good Structure and Documentation: 20 points
Here is a sample of comment blocks required for this project:

/********************************************************
**
** Course: CMSC104 Section 0301
** Project: proj2.c
** Date: 11/10/2002
** Author: Li-Chuan Chen
** SSN: 123-45-67689
** E-mail: lichen@umbc.edu
**
**
** Description:
**
** Input:
**
** Output:
**
** Pseudocode:
**
********************************************************/

Here is a sample output run:

1. Run the program.
linux2% a.out

This program will perform the following math functions:

Enter one of the following character :
'+' : addition of two integers
'-' : subtraction of two integers
'*' : multiplication of two integers
'/' : division of two integers
'%' : modulus of two integers
'g' or 'G' : GCD of two positive integers
'q' or 'Q' : Quit the program.

a

Illegal input character ...

Enter one of the following character :
'+' : addition of two integers
'-' : subtraction of two integers
'*' : multiplication of two integers
'/' : division of two integers
'%' : modulus of two integers
'g' or 'G' : GCD of two positive integers
'q' or 'Q': Quit the program.
+

Addition case ...
Enter two integers: m and n
3 2
3 + 2 = 5

Enter one of the following character :
'+' : addition of two integers
'-' : subtraction of two integers
'*' : multiplication of two integers
'/' : division of two integers
'%' : modulus of two integers
'g' or 'G' : GCD of two positive integers
'q' or 'Q' : Quit the program.
-

Subtraction case ...
Enter two integers: m and n
3 2
3 - 2 = 1

Enter one of the following character :
'+' : addition of two integers
'-' : subtraction of two integers
'*' : multiplication of two integers
'/' : division of two integers
'%' : modulus of two integers
'g' or 'G' : GCD of two positive integers
'q' or 'Q' : Quit the program.
*

Multiplication case ...
Enter two integers: m and n
3 2
3 * 2 = 6

Enter one of the following character :
'+' : addition of two integers
'-' : subtraction of two integers
'*' : multiplication of two integers
'/' : division of two integers
'%' : modulus of two integers
'g' or 'G' : GCD of two positive integers
'q' or 'Q' : Quit the program.
Division case ...
   Enter two integers: m and n
3 0
   n can not be 0. Enter another integer, n
0
   n can not be 0. Enter another integer, n
2
3 / 2 = 1

Enter one of the following character :
   '+': addition of two integers
   '-': subtraction of two integers
   '*': multiplication of two integers
   '/': division of two integers
   '%': modulus of two integers
   'g' or 'G': GCD of two positive integers
   'q' or 'Q': Quit the program.
%

Modulus case ...
   Enter two positive integers: m and n
3 2
   3 mod 2 = 1

Enter one of the following character :
   '+': addition of two integers
   '-': subtraction of two integers
   '*': multiplication of two integers
   '/': division of two integers
   '%': modulus of two integers
   'g' or 'G': GCD of two positive integers
   'q' or 'Q': Quit the program.
g
GCD case ...
   Enter two positive integers: m and n
-24 -9
   m must be >= 0. Enter a positive integer, m
-24
   m must be >= 0. Enter a positive integer, m
24
   n must be >= 0. Enter a positive integer, n
-9
   n must be >= 0. Enter a positive integer, n
9
   GCD(24,9) = 3
Enter one of the following character:
'+' : addition of two integers
'-' : subtraction of two integers
'*' : multiplication of two integers
'/' : division of two integers
'%' : modulus of two integers
'g' or 'G' : GCD of two positive integers
'q' or 'Q' : Quit the program.

G

GCD case ...
Enter two positive integers: m and n
9 24
m must be greater than n. Swapping m and n now ...
GCD(24,9) = 3

Enter one of the following character:
'+' : addition of two integers
'-' : subtraction of two integers
'*' : multiplication of two integers
'/' : division of two integers
'%' : modulus of two integers
'g' or 'G' : GCD of two positive integers
'q' or 'Q' : Quit the program.

q

Quitting the program ...

2. Run the program again to test 'Q' for quitting the program.
linux2% a.out

This program will perform the following math functions:

Enter one of the following character:
'+' : addition of two integers
'-' : subtraction of two integers
'*' : multiplication of two integers
'/' : division of two integers
'%' : modulus of two integers
'g' or 'G' : GCD of two positive integers
'q' or 'Q' : Quit the program.

Q

Quitting the program ...