ASSIGNMENT-1

ASSUMPTIONS DOCUMENT

QUESTION-1:

Given two numbers M and N compute the quotient and remainder for M/N.

MY ASSUMPTIONS :

(Done as Mentioned In the mail.)

- When given two Numbers as input, The first Number is the Dividend and the Second Number is the divisor.
- The first Line in the Output is the Qoutient and the second is the Remainder.

- **When Given 2 Positive Numbers as Input, it gives Quotient and Remainder**
  Ex: If the Input Numbers are 8 5, then the Quotient is 1 and the Remainder is 3
  (8=5*1 + 3)
- **When Given 2 Negative Numbers as Input, it gives Quotient and Remainder**
  Ex: If the Input Numbers are -8 -5, then the Quotient is 1 and the Remainder is -3
  ((-8)=(-5)*1 + (-3))
- **When one of the Input Numbers is Negative, it gives Quotient and Remainder**
  Ex: If the Input Numbers are 8 -5, then the Quotient is -2 and the Remainder is -2
  (8=(-5)*(-2) + (-2))
- **When the first Input Number(Dividend) is 0, it gives Quotient and Remainder**
  Ex: If the Input Numbers are 0 2, then the Quotient is 0 and the Remainder is 0
  (0=2*0 + 0)
- **When the Second Input Number(DIvisor) is 0, it gives Quotient and Remainder**
  Ex: If the Input Numbers are 2 0, ...This is an Invalid case.
  So, Here The program will give -1 and -1 as Output.

QUESTION-2:

Given two numbers M and N calculate the greatest common divisor(GCD) of M,N.

MY ASSUMPTIONS :

(Done as Mentioned In the mail.)

- Two Numbers are given as Input
- The Output is the GCD of the Two Numbers
- I took in a way that the GCD is always Non-Negative.

- **When Given 2 Positive Numbers as Input, it gives GCD**
  Ex: If the Input Numbers are 8 5, then the GCD is 1
  If the Input Numbers are 4 2, then the GCD is 2

- **When given 2 Negative Numbers as Input, it gives GCD**
  Ex: If the Input Numbers are -8 -5, then the GCD is 1
  If the Input Numbers are -12 -2, tehn the GCD is 2

- **When one of the Input Numbers is Negative, it gives GCD**
  Ex: If the Input Numbers are 8 -5, then the GCD is 1
  If the Input Numbers are -12 2, then the GCD is 2

- **When one of the Input Numbers is 0, it gives GCD**
  Ex: If the Input Numbers are 2 0, then the GCD is 2
  If the Input Numbers are 0 2, then the GCD is 2
  If the Input Numbers are -2 0, then the GCD is 2
  If the Input Numbers are 0 -2, then the GCD is 2
  (i.e... if Input Numbers are a and 0, then the GCD is |a|)

- **When Both of the Input Numbers is 0, then the GCD is 0.**

QUESTION-3:

Given a number N check if it is a prime number.

MY ASSUMPTIONS :

(Done as Mentioned In the mail.)

- **When Given a Number as Input, If it is a Prime ....then it outputs "TRUE"**
  Ex: If the Input Number is 2, then the Output is True

- **When Given a Number as Input, If it is not a Prime ....then it outputs "FALSE"**
  Ex: If the Input Number is 4, then the Output is False

- **When the Input Number is <=1, then also the Output is "FALSE"**
  (As 1 is neither a prime nor composite, the Output is False
  And for Numbers which are not Natural Numbers, we don't define Prime and Composite...i.e, The Output is False)

QUESTION-4:

Given a number N, find its largest Prime Factor

MY ASSUMPTIONS :

(Done as Mentioned In the mail.)

- **When Given a Number as Input, it gives its Largest Prime Factor as Output**
  Ex: If the Input Number is 2, the Output is 2
  If the Input Number is 10, the Output is 5
- **When the Input Number is 1, it outputs -1 (As in Natural Numbers, only for 1 there is only 1 factor which is 1 and which is not a prime)**

QUESTION-5:

Given a number N, compute Sum Of Squares from 1 to N.

MY ASSUMPTIONS :

(Done as Mentioned In the mail.)

- **When Given a Number as Input, it gives the Sum Of Squares from 1 to N as Output**
  Ex: If the Input Number is 4, the Output is 30 (1*1 + 2*2 + 3*3 +4*4 = 30)
  If the Input Number is 1, the Output is 1
- **As we are using long long int)... there will be an overflow.**
  The largest value of long long int is 9,223,372,036,854,775,807.
  If our resultant Sum of Squares is Larger than this value... then we take mod.