Task 5: Basic Number Theory 1

TIC TAC TOE

King Thevar of time limit exceeded is really fascinated about Tic Tac Toe. He organizes a national level contest for Tic Tac Toe every year in Time Limit Exceeded. every year the contest has lots of participants. This year there are n participants from all over the country. The king want to know the sum of sqiz from 1 to n. Now as you already know Moron is not good with maths, he asks you to help him.

Aim: To write and execute the program for given scenario based on basic number theory-1

Algorithm:

1. Read the integer n.
2. calculate the minimum value of the sum as (n*(n-1)(2n-1)/6 modulo 1000000007
3. calculate the maximum value of the sum as((n*(n-1)(2*n-1)/3 - ((n(n-1))/2)*(2*n-1)) modulo 1000000007
4. Print the minimum and maximum value of the sum as output.
5. end the program.

Output:

No. of inputs: 2

5
20 30

Program:

```
#include <stdio.h>
#include<math.h>
#define MOD 1000000007
int main()
{
 int t;
scanf("%d", &t);
while(t--){
long long n;
scanf("%lld",&n);
long long min_sum =((n-1)*(n-1)*(n+4)) %MOD;
long long max_sum =((n*(n+1)*(3*(n+1))/(12))%MOD;
printf("%lld %lld\n", min_sum, max_sum);
}
return 0;
}
```

problem:

Given two integer, and a recursive technique to find their GCD is the Euclidean Algorithm. The algorithm state that, for computing the GCD of two positive integers if and are equal there are few optimizations that can be made to the above logic.

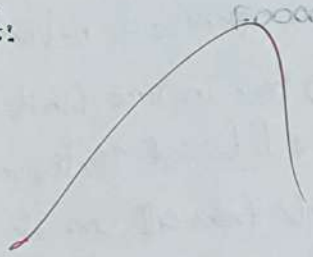
Output:

Sample Input:

1 5

Sample Output:

1



Algorithm:

1. Read the two positive integers a and b
2. If b is zero, return a as the GCD
3. Otherwise, recursively call the function with arguments b and the remainder of a divided by b.
4. Return the result of the recursive call as the GCD.

Program:

```
#include <stdio.h>
int gcd(int a, int b){
    if(b==0){
    return a;
  }
  return gcd(b, a%b);
}
 int main(){
    int a,b;
   scanf("%d %d",&a,&b);
   int result=gcd(a,b);
   printf("%d\n",result);
    return 0;
}
```

Result: Thus the program is executed successfully

VEL TECH - CSE	
PE NO.	6
PERFORMANCE (5)	5
RESULT AND ANALYSIS (3)	3
VIVA VOCE (3)	3
RECORD (4)	4
TOTAL (15)	14
SIGN WITH DATE	