CS: FUNDAMENTALS OF PROGRAMMING (LAB)

MANUAL # 05

- **SUBMITTED BY:-**

  ABEER ZAHRA JAFARI (476474)

- **INSTRUCTOR:-**

  MUHAMMAD AFFAN

- **CLASS:-**

  ME-15 (SECTION-C)

- **DUE DATE:-**

  02/11/2023

TASK # 01

- Write a program in C++ to find LCM of any two numbers using HCF.

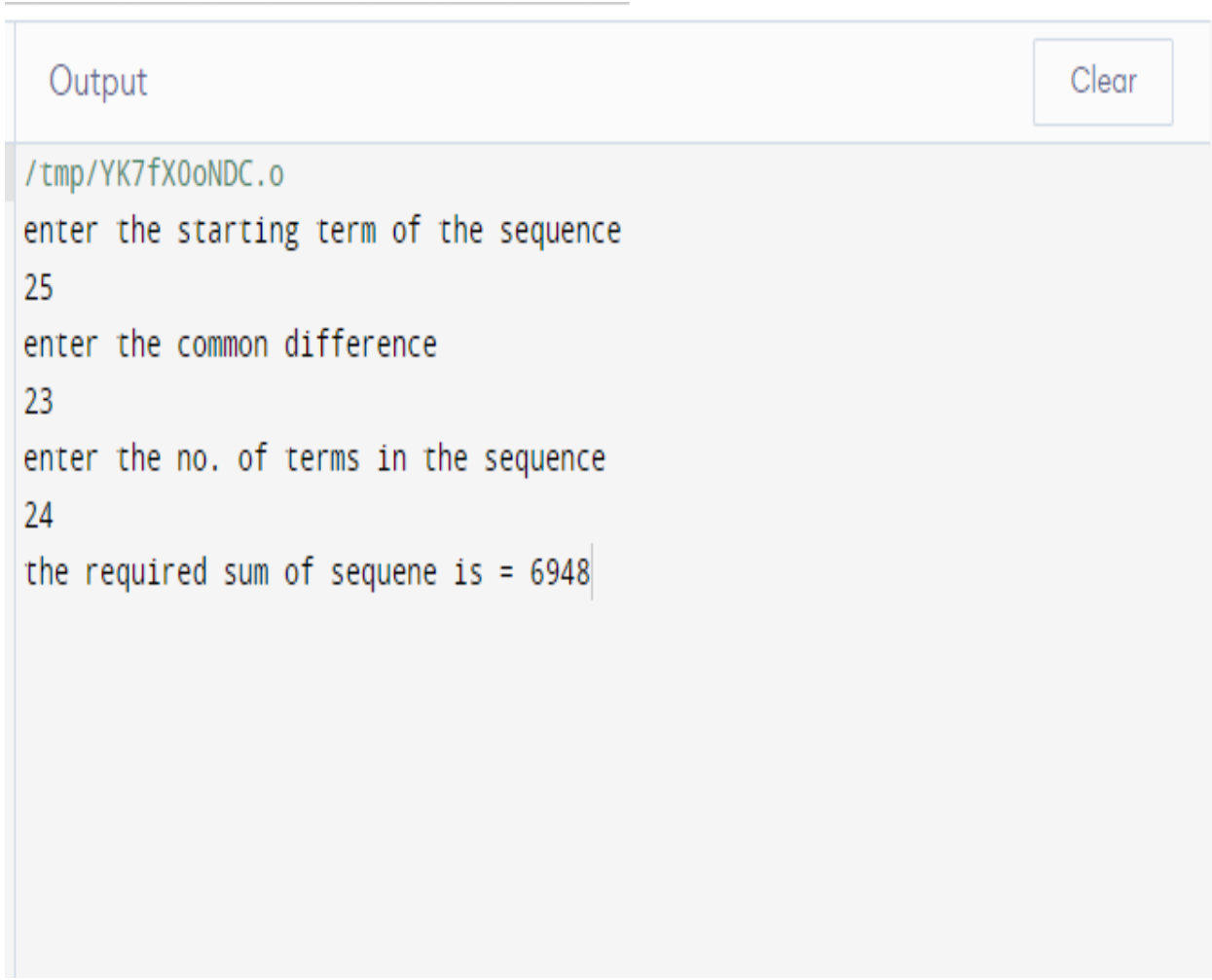
```
#include <iostream>
 using namespace std;
int main() {
  int x,y,z,hcf,lcm;
cout<<"Enter firts integer"<<endl;
cin>>x;
cout<<"Enter second integer"<<endl;
cin>>y;
if (x>y){
for (int n=y;n>=1;n--){
    if ((x%n)==0&&(y%n)==0){
        hcf = n;   // factor is divisible by both numerator and denominator
        cout<<"hcf of given integers is: "<<n<<endl;
        break;
```

```
 }}}
if (y>x){
    for (int n=x;n>=1;n--){
        if ((x%n)==0&&(y%n)==0){
           hcf = n;
        cout<<"hcf of given integers is: "<<n<<endl;
        break;
}}}
if (hcf!=0){
   z=x*y;
  lcm=z/hcf;
  cout<<"lcm of given integers is:"<<lcm<<endl;}
  return 0;
}
```

TASK # 02

- Write a program in C++ to find out the sum of an Arithmetic progression series.

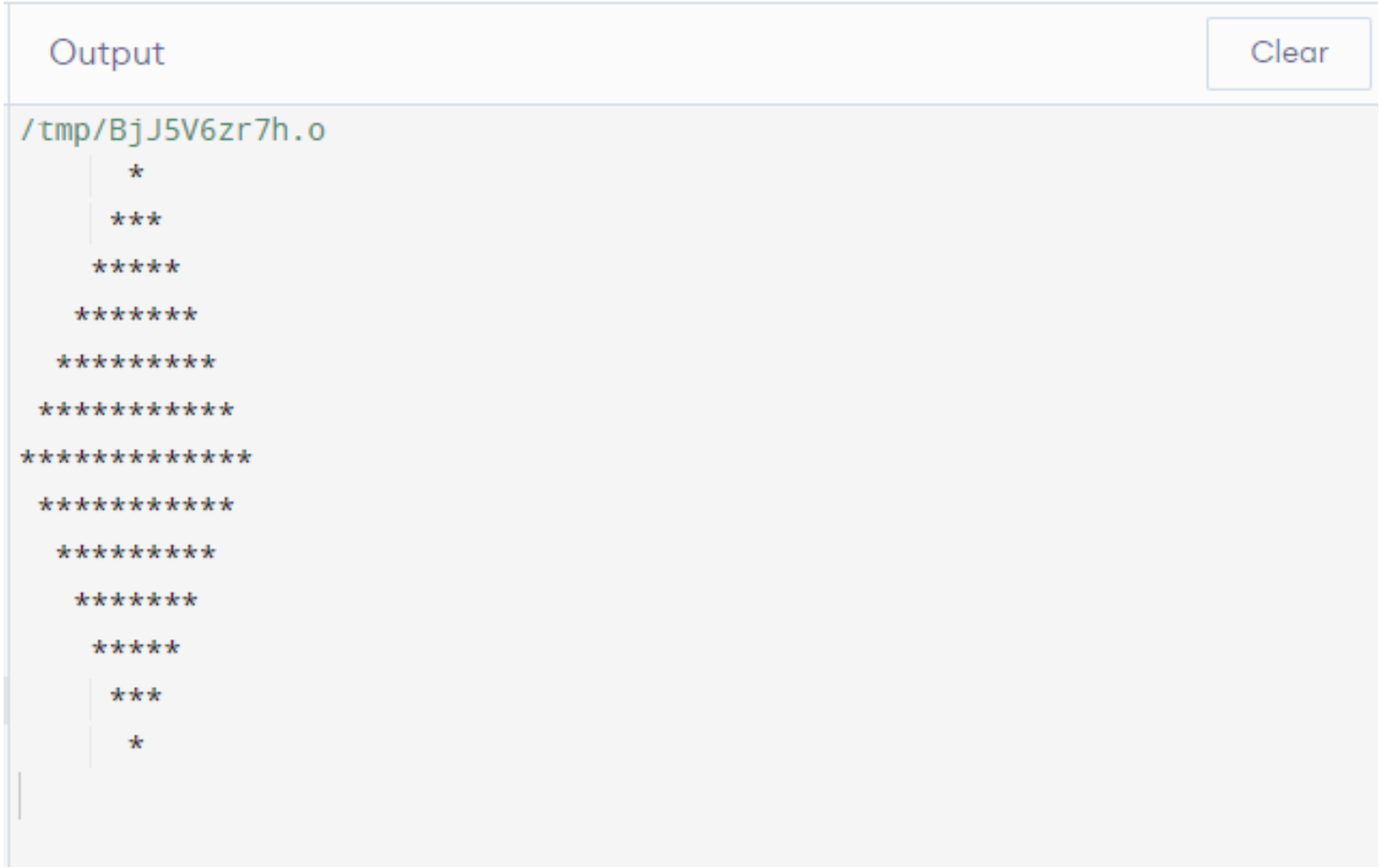
```
#include <iostream>
    using namespace std;
  int main() {
    int x,a,n,d,sum; // initialization
    x=1;sum=0; // declaration
cout<<"enter the starting term of the sequence"<<endl; cin>>a;
cout<<"enter the common difference"<<endl; cin>>d;
cout<<"enter the no. of terms in the sequence"<<endl; cin>>n;
while (x<=n){ // condition
 sum=sum+a;
 a=a+d;
 x=x+1;}    // increment
cout<<"the required sum of sequene is = "<<sum;
 return 0;}
```



TASK # 03

- Write a program in C++ to create a diamond.

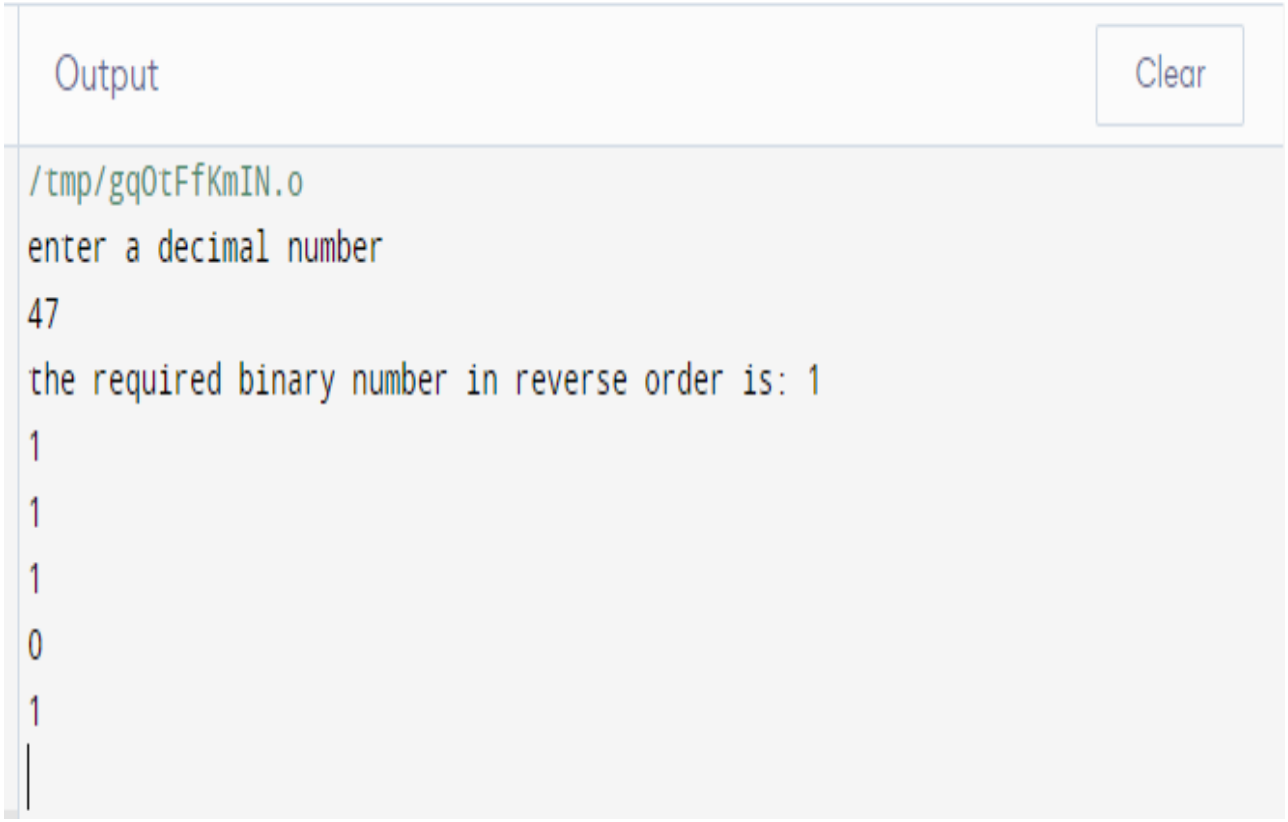
```
#include <iostream>
using namespace std;
int main() {
  int x,y,z;
for (x=0;x<7;x++){ // determining no. of rows
        for(y=0;y<7-x-1;y++){ //inserting space
            cout<<" ";}
         for (z=0;z<2*x+1;z++){ //inserting asterisk
             cout<<"*"; }  cout<<endl;}
for ( x = 7-2; x >= 0; x--) {   // reversing the triangle
      for ( y = 0; y < 7- x - 1; y++) {
        cout<<"*";}
      for ( z = 0; z < 2 * x + 1; z++) {
        cout << "*"; }  cout <<endl; }
return 0;}
```



TASK # 04

- Write a program in C++ to convert a decimal number to binary number.

```
#include<iostream>
    using namespace std;
int main (){
   int x,y;
cout<<"enter a decimal number"<<endl;
cin>>x;      // taking input from user
cout<<"the required binary number in reverse order is: ";
while (x>0){
   y=x%2;   // dividing decimal number by two
               and using remainder in  output
   x=x/2;   // dercrement
   cout<<y<<endl; // displaying output
}
return 0;
}
```



METHODOLOGY

- All the tasks performed before hand use for loops and nested loops.
- Loops are repetitive structures used to carry out a single command multiple times. Basic types of loops include while loop, do while loop, and for loop.
- Among all the types of loops, for loop is the easiest and the most effective as it allows the user to initialize the variable, determine the starting and ending points as well as mention the increments all in one step. That is why for loop has been predominantly used in the tasks above.