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Fundamentals of Programming

Home task 5

TASK 1

```
#include <iostream>

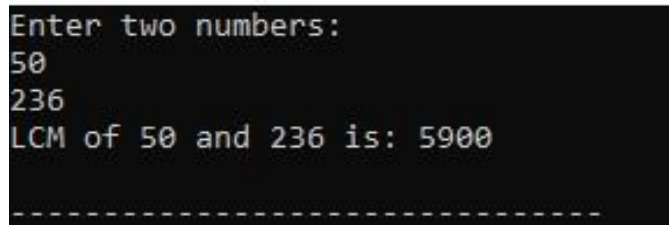
using namespace std;

int main () {

    int num1,num2;
    int a,b,value;
    cout<<"Enter two numbers: "<<endl; cin>>num1>>num2;
    a=num1;
    b=num2;

    while (b!=0) {
        value =b;
        b=a%b;
        a=value;
    }
    int HCF,LCM;
    HCF=a;
    LCM= (num1*num2)/HCF;
    cout<<"LCM of "<<num1<<" and "<<num2<<" is: "<<LCM<<endl;

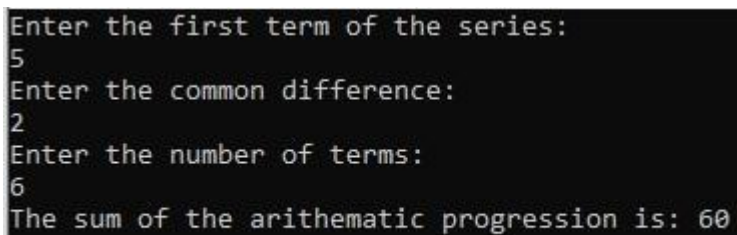
    return 0;
}
```



A screenshot of a terminal window showing the output of the C++ program. The text is as follows: "Enter two numbers:" followed by two lines of input, "50" and "236". The next line shows the result: "LCM of 50 and 236 is: 5900". The terminal ends with a dashed line.

TASK 2

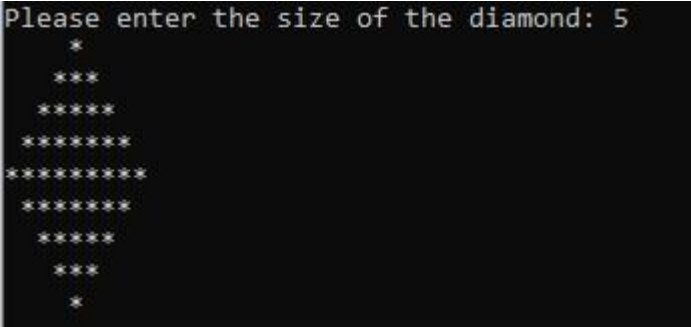
```
int main () {  
  
    int term1,term,diff,n;  
  
    cout<<"Enter the first term of the series: "<<endl; cin>>term1;  
    cout<<"Enter the common difference: "<<endl; cin>>diff;  
    cout<<"Enter the number of terms: "<<endl; cin>>n;  
    term=term1;  
    int sum=0;  
    for (int i=0; i<n; i++) {  
        sum+=term;  
        term+=diff;  
    }  
    cout<<"The sum of the  
    arithmetic progression is: "<<sum<<endl;  
  
    return 0;  
}
```



A screenshot of a terminal window showing the execution of the C++ program. The output matches the prompts and user input in the code: 'Enter the first term of the series:' followed by '5', 'Enter the common difference:' followed by '2', 'Enter the number of terms:' followed by '6', and finally 'The sum of the arithmetic progression is: 60'. A dashed line is visible at the bottom of the terminal window.

TASK 3

```
int main() {  
    int size;  
  
    // Get the size of the diamond from the user.  
    cout << "Please enter the size of the diamond: "; cin >> size;  
  
    for (int i=1;i<=size;i++) {    //This step determines the upper part of the diamond.  
  
        for (int j=1;j<=size-i;j++) { //This step prints the spaces for each row.  
            cout << " ";  
        }  
  
        for (int j=1;j<=2*i-1;j++) { //This step prints the stars for the diamond.  
            cout << "*";  
        }  
        cout << endl;  
    }  
  
    //This section prints the lower part of the diamond  
    for (int i=size-1;i>=1;i--) {  
  
        for (int j=1;j<=size-i;j++) { //This step prints the number of spaces for the lower part.  
            cout << " ";  
        }  
  
        for (int j=1;j<=2*i-1;j++) { //This step prints the stars for each row.  
            cout << "*";  
        }  
        cout << endl;  
    }  
    return 0;  
}
```



```
Please enter the size of the diamond: 5  
  *  
 ***  
*****  
*****  
*****  
*****  
*****  
  *  
 ***  
  *
```

TASK 4

```
int main() {

    int Dnum;

    cout << "Enter a decimal number: ";
    cin >> Dnum;

    if (Dnum<0) {
        cout << "Please enter a non-negative decimal number." << endl;
        return 1;
    }

    int binaryDigits[32]; //This step sets the conversion for 32 bit binary
    int index = 0;        //This variable keeps track of the position of binary number

    if (Dnum==0) {
        binaryDigits[index++]=0;        // Special case: 0 in binary is 0
    } else {
        while (Dnum>0) {
            int remainder = Dnum%2;
            binaryDigits[index++] = remainder;
            Dnum/=2;
        }
        cout << "The inputted number in binary is: ";

        for (int i = index - 1; i >= 0; i--) { //This step prints the binary number from least significant to
            cout << binaryDigits[i];
        }
        cout << endl;
        return 0;
    }
}
```

```
Enter a decimal number: 340
The inputted number in binary is: 101010100
-----
```