CSS-114- FUNDAMENTALS OF PROGRAMMING

LAB MANUAL #5

LAB AND HOME TASK

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Home Task:

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

```cpp
#include<iostream>
using namespace std;
int main(){
    cout<<"HOME TASK 1."<<endl; //Write a program to find LCM of 2 numbers using HCF of the numbers
    int x,y,z,HCF,LCM;
//Input two integer values from the user, with the second always being the greater
    cout<<"Please Enter your two Numbers, with the second being the greater:"<<endl;
    cin>>x>>y;
//if the guideline was followed, a variable z=1 is declared, which must always be less than the sum of 1 and the smaller integer entered
    if (y>x){
    for( z=1; z<(x+1); z++) {
//if the modulus of both x and y relative to z is 0, then z is the HCF for these two numbers
    if (x%z == 0 && y%z == 0)
      HCF = z; }
//According to a known formula, the product of the HCF and LCM of the two numbers is equal to the product of the two numbers, so:
   LCM = (x*y)/HCF;
  cout<<"LCM of "<<x<<" and "<<y<<" is: "<<LCM<<endl; }
  //if the second number is less than the first, the program will show an error message
   else { cout<<"ERROR: Please follow the given instructions."<<endl; }
  return 0;
}
```

CODE RESULT:

```
HOME TASK 1.
Please Enter your two Numbers, with the second being the greater:
76
194
LCM of 76 and 194 is: 7372

--------------------------------
Process exited after 17.32 seconds with return value 0
Press any key to continue . . .
```

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

```cpp
#include<iostream>
using namespace std;
int main(){
    cout<<"HOME TASK 2."<<endl; //A program to find the sum of an Arithmetic series
    //Input the number of terms as an integer value and the first term and common difference as float values from the user
    int n;
    float a,b,sum;
    cout<<"For the Arithmetic sequence, please set:\n -the first term\n -the common difference\n -the nth term:"<<endl;
    cin>>a>>b>>n;
    //the program will run and i<n number of times, and the result of each term will be added
    for (int i=0;i<n;i++) {
    //the first term will be added to first sum, 0
      sum = sum + a;
    //the value of d will be added to each stage a number of i<n times, until the final sum is calculated
      a = a + b; }
      cout<<"The Sum of the constructed Arithmetic series is:"<<sum<<endl;
      return 0; }
```

CODE RESULT:

```
HOME TASK 2.
For the Arithmetic sequence, please set:
 -the first term
 -the common difference
 -the nth term:
3
7
19
The Sum of the constructed Arithmetic series is:1254

--------------------------------
Process exited after 13.19 seconds with return value 0
Press any key to continue . . .
```

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

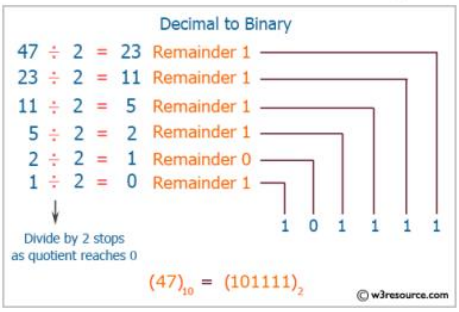
```
    *
   ***
  *****
 *******
*********
 *******
  *****
   ***
    *
```

```cpp
#include<iostream>
using namespace std;
int main(){
    cout<<"HOME TASK 3."<<endl; //write a program that prints a diamond.
    int a,b;
    //Input a desired number of rows from the user
    cout<<"Please enter your desired number of rows:"<<endl;
    cin>>a;
    //in this program, a is the number of rows, and b is the number os spaces
    b = a - 1;
    //for the upper part of the diamond:
    for(int i=1;i<=a;i++){
        for(int j=1;j<=b;j++)
        cout<<" ";
        b--;
        for(int j=1; j<= 2*i-1; j++ )
        cout<<"*";
        cout<<endl;
    }

    //For the lower part of the diamond:
    b = 1;
    for(int i=1;i<=a-1;i++){
        for(int j=1;j<=b;j++)
        cout<<" ";
        b++;
        for(int j=1;j<=(2*(a-i)-1);j++)
        cout<<"*";
        cout<<endl;
    }
    cout<<endl;
    return 0;
}
```

CODE RESULT:

```
HOME TASK 3.
Please enter your desired number of rows:
5
    *
   ***
  *****
 *******
*********
 *******
  *****
   ***
    *


--------------------------------
Process exited after 6.671 seconds with return value 0
Press any key to continue . . .
```

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




```cpp
#include<iostream>
using namespace std;
int main(){
    cout<<"HOME TASK 3."<<endl; //a program to convert a number from decimal to binary
    //Input a decimal value from the user
    int Dec,Bin;
    cout<<"Please enter a decimal number:"<<endl;
    cin>>Dec;
    //The final statement is coded before the loop so that it does not get printed for each stage
    cout<<"The Converted Binary Number (from bottom to top) is:"<<endl;
    //using for loop, declare an integer i = 0, i++, and set the condition that the decimal number must be greater than 0
    for (int i=0; Dec>0; i++){
    // when the modulus of the number w.r.t. 2 is found, this will be the last value of the overall binary number
        Bin = Dec % 2;
    //the number is then divided by two, and then the first stage is repeated for every value of the binary number
        Dec /= 2;
    //the binary number will be printed bottom to top
        cout<<Bin<<endl; }
        return 0; }
```

CODE RESULT:

```
HOME TASK 3.
Please enter a decimal number:
47
The Converted Binary Number (from bottom to top) is:
1
1
1
1
0
1

--------------------------------
Process exited after 7.563 seconds with return value 0
Press any key to continue . . .
```