School Of Mechanical & Manufacturing Engineering, NUST

Department of Mechanical Engineering

CS-114 - Fundamental of Programing

Home Tasks - 5
(Lab Manual 5)

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HOME TASK 1:

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

Code:

```cpp
#include <iostream>

using namespace std;
int main()
{
//  HOME TASK 1
    int x;
    int y;
    int hcf;
    cout<<"Please enter the two numbers, and make sure the second number is the lower: "<<endl;
    cin>>x>>y;
    if(x>y){hcf=y;}
    if(y>x){cout<<"Please follow the instructions"<<endl;return 0;}
    do{
        if(x%hcf == 0 && y%hcf == 0 && hcf<=y){break;}
        else{hcf-=1;}
    }while(x>1);
    cout<<"hcf check: "<<hcf<<endl;
    cout<<"The LCM is: "<<(x*y)/hcf<<endl;

    return 0;
}
```

Result:

```
Please enter the two numbers, and make sure the second number is the lower:
516
48
hcf check: 12
The LCM is: 2064

--------------------------------
Process exited after 3.948 seconds with return value 0
Press any key to continue . . .
```

HOME TASK 2:

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

Code:

```cpp
#include <iostream>

using namespace std;
int main()
{
//  HOME TASK 2
    int a;
    int n;
    int d;
    int sum;
    int t;
    cout<<"Please enter the first term: "<<endl;
    cin>>a;
    cout<<"Please enter the number of terms: "<<endl;
    cin>>n;
    cout<<"Please enter the common difference: "<<endl;
    cin>>d;
    for(int i = 1; i <= n; i+=1){
        t = a + (i-1)*d;
        sum = sum+t;
    }
    cout<<"The sum is :"<<sum<<endl;

    return 0;
}
```

Result:

```
Please enter the first term:
1
Please enter the number of terms:
10
Please enter the common difference:
2
The sum is :100

--------------------------------
Process exited after 9.133 seconds with return value 0
Press any key to continue . . .
```

HOME TASK 3:

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

Code: (works for both odd and even number of rows)

```cpp
#include <iostream>

using namespace std;
int main()
{
//  HOME TASK 3
    int rows;
    int x;
    cout<<"Please enter the rows of the pyramid"<<endl;
    cin>>rows;
    if(rows % 2 == 0 || rows <1){
        for(int k=0; k<=rows/2; k+=1){
            for(int i=rows/2-k; i>0; i-=1){
                cout<<" ";}
            for(int z=0; z<4*k; z+=2){
                if(z%2==1){continue;}
                cout<<"*";}
            cout<<endl;}


        for(int k=0; k<=rows/2; k+=1){
            for(int i=0; i<k; i+=1){
                cout<<" ";}
            for(int z=rows-2*k; z>0; z-=1){
                cout<<"*";}

            cout<<endl;}
    }
    else{
        for(int k=0; k<=rows/2; k+=1){
            for(int i=rows/2-k; i>0; i-=1){
                cout<<" ";}
            for(int z=1; z<=4*k+2; z+=2){
                if(z%2==0){continue;}
                cout<<"*";}
            cout<<endl;}


        for(int k=0; k<rows/2; k+=1){
            for(int i=-1; i<k; i+=1){
                cout<<" ";}
            for(int z=rows-2*k-2; z>0; z-=1){
                cout<<"*";}

            cout<<endl;}
        }
    return 0;
}
```

Result:

```
Please enter the rows of the pyramid (only odd numbers):
9
    *
   ***
  *****
 *******
*********
 *******
  *****
   ***
    *

--------------------------------
Process exited after 1.407 seconds with return value 0
Press any key to continue . . .
```

```
Please enter the rows of the pyramid
10

    **
   ****
  ******
 ********
**********
**********
 ********
  ******
   ****
    **


--------------------------------
Process exited after 2.201 seconds with return value 0
Press any key to continue . . .
```

HOME TASK 4:

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

Code:

```cpp
#include <iostream>

using namespace std;
int main()
{
//  HOME TASK 4
    int num;
    int bin;
    int rem;
    int t = 1;
    cout<<"Please enter the number: "<<endl;
    cin>>num;
    do{
        rem = num % 2;
        num = (num-rem)/2;
        bin = bin + rem*t;
        t=t*10;
    }while(num >= 1);
    cout<<"The number in binary is: "<<bin<<endl;
    return 0;
}
```

Result:

```
Please enter the number:
47
The number in binary is: 101111

--------------------------------
Process exited after 0.6332 seconds with return value 0
Press any key to continue . . .
```