NUST-SMME-

CS-114 Fundamentals of Programming Lab Manual #07

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Lab Manual-6- Lab Tasks (Nested if-else and pattern printing)

Lab Tasks: -

Task 1: -

Q. Create the Fibonacci sequence using nested loops.

```cpp
#include<iostream>
using namespace std;
int main()
{
    cout<<"TASK 1:- Fibonacci \n";
//Generate the fibonacci sequence using nested loops
int a=0, b=1, c, n;
cout<<"Please enter the number of terms in  your sequence:- \n";
cin>>n;
//Inputting number of terms in sequence
for(int j=0; j>=0; j++)
{
//Nested if-else loop. EXternal loop to check whether input value is VALID or not
if(n<=0)
{cout<<"INVALID NUMBER ENTERED, PLEASE RE-ENTER\n";
cin>>n;
continue;
}
else{
cout<<"The fibonacci sequence is:-\n";
//Outputting first two terms of the sequence
cout<<a<<' '<<b;
//Interal loop to generate the actual sequence
for (int i=0; i<=(n-3); i++)
{
    c= a + b;
    a = b;
    b = c;
//Progressively adding 2 adjacent terms to output the 3rd term
    cout<<' '<<c;
}
break;
}

```

OUTPUTS: -

```
TASK 1:- Fibonacci
Please enter the number of terms in  your sequence:-
12
The fibonacci sequence is:-
0 1 1 2 3 5 8 13 21 34 55 89
```

```
TASK 1:- Fibonacci
Please enter the number of terms in  your sequence:-
-3
INVALID NUMBER ENTERED, PLEASE RE-ENTER
0
INVALID NUMBER ENTERED, PLEASE RE-ENTER
5
The fibonacci sequence is:-
0 1 1 2 3
```

Task 2:

Q. Create Floyd's triangle with nested loops.

```
37  cout<<"\n TASK 2:- Floyds's Triangle \n";
38  /*Write a C++ program to create floyd's triangle with nested loops
39  1
40  2 3
41  4 5 6
42  7 8 9 10
43  */
44  cout<<"Enter how many rows you want in the triangle? \n";
45  int n1, p=1;
46  //Input number of rows
47  cin>>n1;
48  //Nested loops being used
49  cout<<"The Floyd's triangle is: - \n";
50  for (int i=0; i<=n1; i++)
51  //EXternal loop for number of rows
52      {
53          //Internal loop used to output elements for each column
54          for(int j=1; j<=i; j++)
55          { cout<<p<<' ';
56          //Displaying progressively increasing numbers
57          p++;}
58
59          cout<<endl;
60      }
61
62  return 0;
63  }
```

OUTPUT: -

```
 TASK 2:- Floyds's Triangle
Enter how many rows you want in the triangle?
5
The Floyd's triangle is: -

1
2 3
4 5 6
7 8 9 10
11 12 13 14 15

--------------------------------
Process exited after 12.39 seconds with return value 0
Press any key to continue . . .
```

```
 TASK 2:- Floyds's Triangle
Enter how many rows you want in the triangle?
7
The Floyd's triangle is: -

1
2 3
4 5 6
7 8 9 10
11 12 13 14 15
16 17 18 19 20 21
22 23 24 25 26 27 28

--------------------------------
Process exited after 8.258 seconds with return value 0
Press any key to continue . . .
```

Home Tasks: -

Task 1: -

Q. Write a program using break or continue statement that only adds prime numbers from 1 to 50 and displays the sum on screen.

```cpp
#include<iostream>
using namespace std;
int main()
{
    cout<<"TASK 1:- Adding Prime Numbers from 1 to 50\n";
//program using break or continue statement that only adds prime numbers from 1 to 50 and displays the sum on screen.
bool isprime=true;
//bool statement storing true and false value for whether number is prime or not
int sum=0;
//running eXternal loop to run natural numbers from 1 to 50.
//1 is eXcluded since it is neither prime nor composite
for (int num=2; num<=50; num++)
{
    //Internal loop to check whether said number at a certain iteration is prime or not
  for(int i=2; i<=num/2; i++ ){
    /*if number is less than 2 or divisible by any of the iterating values
     then isprime becomes false, if not following the if and else if conditions;
       isprime is true*/
    if(num<2)
    {isprime = false;
    break;}
    else if(num%i==0)
    {isprime = false;
     break;
    }
    else
    { isprime = true;}
    }
    /*if number is prime, the value of the sum of the numbers is stored in 'sum'
        by progressively adding the neXt prime number*/
  if(isprime==true)
  {sum = sum + num; }
  else
  {continue;}
}
cout<<sum;
```

OUTPUT: -

```
TASK 1:- Adding Prime Numbers from 1 to 50
328
```

Task 2: -

Q. Write a Program in C++ to create the following pattern.

1

1 2

1 2 3

1 2 3 4

1 2 3 4 5

```
   cout<<"\n TASK 2:- Printing the pattern:- \n";
/*Write a program in C++ to create the following pattern:-
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
*/
cout<<"How many rows do you want in your pattern?"<<endl;
int n; //Inputting number of rows
cin>>n;
cout<<"Your pattern is:- \n";
//EXternal loop for number of rows
for(int i=1; i<=n; i++)
{
    /*Internal loop for number of columns and the elements in the columns, the
     iterating value of j for each ro is displayed as output which gives the required patterm*/
    for(int j=1; j<=i; j++)
    {cout<<j<<' ';
    }
    cout<<endl;
}
```

OUTPUT: -

```
 TASK 2:- Printing the pattern:-
How many rows do you want in your pattern?
8
Your pattern is:-
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
1 2 3 4 5 6
1 2 3 4 5 6 7
1 2 3 4 5 6 7 8
```

```
 TASK 2:- Printing the pattern:-
How many rows do you want in your pattern?
5
Your pattern is:-
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```

\

Task 3: -

Q. Write a C++ program to print

1

2 2

4 4 4 4

6 6 6 6 6 6

```
    cout<<endl;
}

   cout<<"\n TASK 3:- Printing the patterm:- \n";
cout<<"How many rows do you want in your pattern?"<<endl;
int n1; //Inputing number of rows
cin>>n1;
cout<<"Your pattern is:- \n";
//EXternal for loop for number of rows
for(int i=0; i<2*n1; i+=2)
{
    if(i==0)
        //to display the first column
        {
        cout<<'1';}
    else{
        //INternal for loop inside the else statement to display rest of the columns
        for(int j=0; j<i; j++ )
        {
        cout<<2*(i/2)<<' ';
        }
        }
    cout<<endl;
}
return 0;
}
```

OUTPUTS: -

```
 TASK 3:- Printing the patterm:-
How many rows do you want in your pattern?
4
Your pattern is:-
1
2 2
4 4 4 4
6 6 6 6 6 6

--------------------------------
Process exited after 6.651 seconds with return value 0
Press any key to continue . . .
```

```
 TASK 3:- Printing the patterm:-
How many rows do you want in your pattern?
7
Your pattern is:-
1
2 2
4 4 4 4
6 6 6 6 6 6
8 8 8 8 8 8 8
10 10 10 10 10 10 10 10 10 10
12 12 12 12 12 12 12 12 12 12 12 12

--------------------------------
Process exited after 7.115 seconds with return value 0
Press any key to continue . . .
```