School Of Mechanical & Manufacturing Engineering, NUST

Department of Mechanical Engineering

CS-114 - Fundamentals of Programming

Lab Report # 06

Course Instructor: Dr Jawad Khan

Lab Instructor: Mr. Muhammad Affan, Mr. Saqib

Student Name: Ayesha Khan
CMS ID: 478212

DATE:
28-11-23

School Of Mechanical & Manufacturing Engineering, NUST

Department of Mechanical Engineering

Lab Report # 06
Nested Loops

Objectives:
To understand repetition structure and nested for, while and do while loops in C++.

Lab Tasks:
Task 1:
Generate the Fibonacci sequence using nested loops.

Code:

```cpp
#include <iostream>
using namespace std;

int main()
{
    int n, n1 = 0, n2 = 1, sum;

    cout<<"Enter the number of terms for the Fibonacci series: ";
    cin>>n;
    cout<<"Fibonacci Sequence: "<<n1<<" "<<n2<<" ";
    for(int i = 3; i <= n; i++)
    {
        sum = n1 + n2;
        cout<<sum<<" ";
        n1 = n2;
        n2 = sum;
    }

    return 0;
}
```

Output:

```
Enter the number of terms for the Fibonacci series: 8
Fibonacci Sequence: 0 1 1 2 3 5 8 13
--------------------------------
Process exited after 1.522 seconds with return value 0
Press any key to continue . . .
```

Task 2:

Create Floyd's triangle with nested loops.

Code:

```cpp
#include <iostream>
using namespace std;

int main()
{
    int rows, num = 1;

    cout << "Enter number of rows: ";
    cin >> rows;

    for(int i = 1; i <= rows; i++)
    {
        for(int j = 1; j <= i; j++)
        {
            cout<<num<<" ";
            num++;
        }
        cout<<endl;
    }
    return 0;
}
```

Output:

```
Enter number of rows: 5
1
2 3
4 5 6
7 8 9 10
11 12 13 14 15

--------------------------------
Process exited after 2.505 seconds with return value 0
Press any key to continue . . .
```

Home Tasks:

Task 1:

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

Code:

```cpp
#include <iostream>
using namespace std;

int main()
{
    int sum=0;
    for(int i=2; i<=50; i++)
    {
        bool is_prime = true;

        for(int j=2; j<i; j++)

        { if(i % j == 0) { is_prime=false; break; } }
    }
        if(is_prime)
        {
            sum += i;
        }
    }
    cout<<"The sum of all Prime Numbers from 1 - 50 is : "<<sum;
    return 0;
}
```

Output:

```
The sum of all Prime Numbers from 1 - 50 is : 328
--------------------------------
Process exited after 0.0746 seconds with return value 0
Press any key to continue . . .
```

Task 2:

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

Code:

```cpp
#include <iostream>
using namespace std;

int main()
{

    for(int i = 1; i <= 5; i++)
    {
        for(int j = 1; j <= i; j++)
        {
            cout<<j<<" ";
        }
        cout<<endl;
    }
    return 0;
}
```

Output:

```
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5

--------------------------------
Process exited after 0.07856 seconds with return value 0
Press any key to continue . . .
```

Task 3:

Write a C++ program to print:

1

2 2

4 4 4 4

6 6 6 6 6 6

Code:

```cpp
#include <iostream>
using namespace std;

int main()
{
    int num = 1;

    cout<<"1"<<endl;
    for(int i = 1; i <= 3; i++)
    {
        for(int j = 1; j <= 2*i; j++)
        {
            cout<<2*i<<" ";
        }
        cout<<endl;
    }
    return 0;
}
```

Output:

```
1
2 2
4 4 4 4
6 6 6 6 6 6

--------------------------------
Process exited after 0.0766 seconds with return value 0
Press any key to continue . . .
```