STUDY OF FOR AND NESTED FOR LOOPS

Loop

There are many situations where a certain operation is repeated number of time, this repetition is termed "loop" in programming languages.
There are three types of Loops:

- for Loop
- while Loop
- do - while Loop

Nesting may extend these loops.

For Loop

There are different loop statements in C++ language and "For" is one of them. These statements also allow one or more statements to be repeated. The "For" loop is considered most flexible loop because it allows number of variations. In its most common form, the "For" loop is used to repeat a statement or a block of statements a specified number of items.

General syntax:

for (initialize ;condition ;increment)
{
Do this;
}

Example- 1

```
#include <stdio.h>
void main (void)

{
        int count;
        for ( count = 0 ; count<10 ; count++ )
        cout<<" Count"<<count<<endl;
}
```

Output:-

The result of the program will be as:

Count = 0
Count = 1
Count = 2

```
Count =  3
Count =  4
Count =  5
Count =  6
Count =  7
Count =  8
Count =  9
```

Nested loops

When the body of one loop contains another, the second loop is said to be the nested loop inside the first. Any of the c language‟s loops may be nested with in any other loop.

Looping and Indentation

When you are using loops in a program then you have to take special care for indentation and formatting of the program. This will help you debugging the program during any modification and error checking. It will be easy to other programmer as well to understand the code of the program easily and quickly. One should indent the coding of the program in the following way:

```
void main (void)
{
initialization;
statements;
.
.
for (initialization; conditional test ; increment)
        {
        for (initialization; conditional test ; increment)
          statements
        }
}
```

The body of the outer „for‟ loop is indented and the body of the inner loop is further indented. If more nested loops are present more indentation are required to make a program simpler and easier to understand.

Example- 2

This program produces multiplication table organized in rows and column.

```
#include<conio.h>
#include<iostream>
using namespace std;

void main (void)
{
int col, row;
for (row = 1; row < 13 ; row++ )
{
for ( col = 1 ; col < 13 ; col++ )
{
 cout<< col * row <<endl;
}
cout<<"\n"<<endl;
}
getch();
}
```

Output

The result of this program will be as:

1	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3	6	9	12	15	18	21	24	27	30	33	36
4	8	12	16	20	24	28	32	36	40	44	48
5	10	15	20	25	30	35	40	45	50	55	60
6	12	18	24	30	36	42	48	54	60	66	72
7	14	21	28	35	42	49	56	63	70	77	84
8	16	24	32	40	48	56	64	72	80	88	96
9	18	27	36	45	54	63	72	81	90	99	108
10	20	30	40	50	60	70	80	90	100	110	120
11	22	33	44	55	66	77	88	99	110	121	132
12	24	36	48	60	72	84	96	108	120	132	144