TUTORIAL

Iteration - nested loops

Chapter

1. Iteration - nested loops

    Topics

    1.4   for loop inside while and vice-versa

Like if and other constructs the loops can also be nested. To see how nested looping works, see the below program:

```c
#include <stdio.h>

int main()
{
  int var1, var2;
  for(var1 = 1; var1 <= 3; var1++)          // loop1
  {
    for(var2 = 1; var2 <=2; var2++)         // loop2
    {
      printf("var1 = %d \t var2 = %d\n",var1, var2);
    }
  }
  return 0;
}
```

It will print the following output: -

```
var1 = 1    var2 = 1
var1 = 1    var2 = 2
var1 = 2    var2 = 1
var1 = 2    var2 = 2
var1 = 3    var2 = 1
var1 = 3    var2 = 2
```

The control of the program will go to the first loop and then for one iteration of first loop it will complete the second loop. Second loop will run two times as per its conditions. So for var1 = 1, the second loop run 2 times, similarly, for var1 = 2, the second loop will run 2 times and so on. So in this way the loops can be nested.

for loop inside while and vice-versa

We can also nest the for loop inside while and vice-versa as shown below: -

```c
#include <stdio.h>

int main()
{
  int var1, var2;
  var1 = 1;
  while(var1 <= 3)
  {
    for(var2 =1; var2 <= 2; var2++)
    {
      printf("var1 = %d\t var2 = %d\n", var1, var2);
    }
    var1++;
  }
  return 0;
```

```
16  }
17
```

Below program is a nesting of while loops: -

```c
#include <stdio.h>

int main()
{
  int var1, var2;
  var1 = 1;
  while(var1 <= 3)
  {
    var2 = 1;
    while(var2 <= 2)
    {
      printf("var1 = %d\t var2 = %d\n", var1, var2);
      var2++;
    }
    var1++;
  }
  return 0;
}
```