

NESTED LOOPS IN C

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C programming language allows to use one loop inside another loop. Following section shows few examples to illustrate the concept.

Syntax:

The syntax for a **nested for loop** statement in C is as follows:

```
for ( init; condition; increment )
{
    for ( init; condition; increment )
    {
        statement(s);
    }
    statement(s);
}
```

The syntax for a **nested while loop** statement in C programming language is as follows:

```
while(condition)
{
    while(condition)
    {
        statement(s);
    }
    statement(s);
}
```

The syntax for a **nested do...while loop** statement in C programming language is as follows:

```
do
{
    statement(s);
    do
    {
        statement(s);
    }while( condition );
}while( condition );
```

A final note on loop nesting is that you can put any type of loop inside of any other type of loop. For example, a for loop can be inside a while loop or vice versa.

Example:

The following program uses a nested for loop to find the prime numbers from 2 to 100:

```
#include <stdio.h>

int main ()
{
    /* local variable definition */
    int i, j;

    for(i=2; i<100; i++) {
        for(j=2; j <= (i/j); j++)
            if(!(i%j)) break; // if factor found, not prime
        if(j > (i/j)) printf("%d is prime\n", i);
    }

    return 0;
}
```

```
}
```

When the above code is compiled and executed, it produces the following result:

```
2 is prime  
3 is prime  
5 is prime  
7 is prime  
11 is prime  
13 is prime  
17 is prime  
19 is prime  
23 is prime  
29 is prime  
31 is prime  
37 is prime  
41 is prime  
43 is prime  
47 is prime  
53 is prime  
59 is prime  
61 is prime  
67 is prime  
71 is prime  
73 is prime  
79 is prime  
83 is prime  
89 is prime  
97 is prime
```