



Nested Loop Constructs available in 'C' are as:

When a loop is used inside another loop, the control structure formed is known as nested loop. Nested loop is of following types, as:

- A. Nested while loop: When a while loop is used inside another while loop, it is known as nested while loop.
- B. Nested do-while loop: When do-while loop is used inside another do-while loop, it is known as nested do-while loop.
- C. Nested for loop: When for loop is used inside another for loop, it is known as nested for loop.
- D. Nested loop: When any of the available loop construct is used inside another loop construct, it is known as Nested loop.

The syntaxes of all the types of nested loop has been presented below:

1. Nested while loop construct

Multiple statements

```
<value_of_outer_loop_variable>;  
while(<outer_condition>)  
{  
<statements>;  
-----;  
<value_of_inner_loop_variable>;  
while(<Inner_condition>)  
{  
<statements>;  
-----;  
<Inner_new_value_statement>;  
}  
<Outer_new_value_statement>;  
}
```

Problem:

```
1  
12  
123  
1234  
12345
```

Example:

```
#include<stdio.h>  
#include<conio.h>  
void main()  
{  
int i,j;  
i=1;
```

Single statement

```
while(<Outer_condition>)  
while(<Inner_condition>)  
<statement_with_outer_and_inner_new_value>;
```

```
#include<stdio.h>  
#include<conio.h>  
void main()  
{  
int i,j;  
i=1,j=1;
```

```

while(i<=5)
{
j=1;
while(i<=j)
{
printf(“%d”,i);
i++;
}
printf(“\n”);
j++;
}
}

```

```

while(i<=5)
while(j<=5)
if(i<=j)
printf(“%d”,i++);
else
i=1, printf(“\n”),j++;
}

```

2. Nested do-while loop construct

Multiple statements

```

do
{
<statements>;
-----;
do
{
<statements>;
-----;
<Inner_new_value_statement>
;
} while(<Inner_condition>);
<Outer_new_value_statement
>;
} while(<Outer_condition>);

```

Single statement

```

do
do
<statement_with_new_value_of_Inner_and_outer_loop
_variable>;
while(<Inner_condition>);
while(<Outer_condition>);

```

3. Nested for loop construct

Multiple statements

```

for(<Outer_value>;<Outer_condition>;
<Outer_new_value>)
{
<statement>;
-----;
for(<Inner_value>;<Inner_condition>;
<Inner_new_value>)
{
<statement>;
-----;
}
-----;
}

```

Single statement

```

for(<Outer_value>;<Outer_condition>;
<Outer_new_value>)
for(<Inner_value>;<Inner_condition>;
<Inner_new_value>)
<statement>;

```

Nested loop syntax:

When the while loop syntax is used inside the do-while loop or for loop or do-while loop syntax is used inside the while loop or for loop or for loop is used inside while or do-while loop, it is known as nested loop.