

## Loops in C

Loop:-it is a block of statement that performs set of instructions. In loops

Repeating particular portion of the program either a specified number of time or until a particular no of condition is being satisfied.

There are three types of loops in c

### 1.While loop

### 2.do while loop

### 3.for loop

### While loop

Syntax:-

```
while(condition)
```

```
{
```

```
Statement 1;
```

```
Statement 2;
```

```
}
```

```
Or   while(test condition)
```

```
    Statement;
```

The test condition may be any expression .when we want to do something a fixed no of times but not known about the number of iteration, in a program then while loop is used.

Here first condition is checked if, it is true body of the loop is executed else, If condition is false control will be come out of loop.

Example:-

```
/* wap to print 5 times welcome to C */  
  
#include<stdio.h>  
  
void main()  
{  
int p=1;  
While(p<=5)  
{  
printf("Welcome to C\n");  
P=p+1;  
}  
}
```

Output: Welcome to C

```
    Welcome to C  
    Welcome to C  
    Welcome to C  
    Welcome to C
```

So as long as condition remains true statements within the body of while loop will get executed repeatedly.

### **do while loop**

This (do while loop) statement is also used for looping. The body of this loop may contain single statement or block of statement. The syntax for writing this statement is:

Syntax:-

```
Do
{
Statement;
}
while(condition);
```

Example:-

```
#include<stdio.h>
void main()
{
int X=4;
do
{
Printf(“%d”,X);
X=X+1;
}while(X<=10);

Printf(“ ”);
}
```

Output: 4 5 6 7 8 9 10

Here firstly statement inside body is executed then condition is checked. If the condition is true again body of loop is executed and this process continue until the condition becomes false. Unlike while loop semicolon is placed at the end of while.

There is minor difference between while and do while loop, while loop test the

condition before executing any of the statement of loop. Whereas do while loop test condition after having executed the statement at least one within the loop.

If initial condition is false while loop would not executed it's statement on other hand do while loop executed it's statement at least once even If condition fails for first time. It means do while loop always executes at least once. **Notes:**

Do while loop used rarely when we want to execute a loop at least once.

## **for loop**

In a program, for loop is generally used when number of iteration are known in advance. The body of the loop can be single statement or multiple statements. Its syntax for writing is:

Syntax:-

```
for(exp1;exp2;exp3)
{
Statement;
}
```

Or

```
for(initialized counter; test counter; update counter)
{
Statement;
}
```

Here exp1 is an initialization expression, exp2 is test expression or condition and exp3 is an update expression. Expression 1 is executed only once when loop

started and used to initialize the loop variables. Condition expression generally uses relational and logical operators. And updation part executed only when after body of the loop is executed.

Example:-

```
void main()
{

int i;
for(i=1;i<10;i++)
{
    Printf(“ %d ”, i);

}

}
```

Output:-1 2 3 4 5 6 7 8 9

### **Nesting of loop**

When a loop written inside the body of another loop then, it is known as nesting of loop. Any type of loop can be nested in any type such as while, do while, for. For example nesting of for loop can be represented as :

```
void main()
{

int i,j;
for(i=0;i<2;i++)
for(j=0;j<5; j++)
printf(“%d %d”, i, j);
}
```

Output: i=0

j=0 1 2 3 4

i=1

j=0 1 2 3 4

