

Lecture 5

Looping

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Loops provide a way to repeat commands and control how many times they are repeated. C provides a number of looping way.

while loop

The most basic loop in C is the while loop. A while statement is like a repeating if statement. Like an If statement, if the test condition is true: the statements get executed. The difference is that after the statements have been executed, the test condition is checked again. If it is still true the statements get executed again. This cycle repeats until the test condition evaluates to false.

Basic syntax of while loop is as follows

Basic syntax of while loop is as follows:

```
while ( expression )  
{  
    Single statement  
    or  
    Block of statements;  
}
```

EXAMPLE:

```
#include <stdio.h>
```

```
main()
```

```
{
```

```
    int i = 10;
```

```
    while ( i > 0 )
```

```
    {
```

```
        printf("Hello %d\n", i );
```

```
        i = i - 1;
```

```
    }
```

```
}
```

OUTPUT

```
Hello 10
```

```
Hello 9
```

```
Hello 8
```

```
Hello 7
```

```
Hello 6
```

```
Hello 4
```

```
Hello 3
```

```
Hello 2
```

```
Hello 1
```

WAP to find the sum of first 10 natural numbers using the while loop

```
#include<stdio.h>
```

```
main()
```

```
{
```

```
    int num=1,s=0;
```

```
    while(num<=10)
```

```
    {
```

```
        s+=num;
```

```
        num+=1;
```

```
    }
```

```
    printf("sum of first 10 natural number is: %d",s);
```

```
}
```

do...while loop

do ... while is just like a while loop except that the test condition is checked at the end of the loop rather than the start. This has the effect that the content of the loop are always executed at least once.

Basic syntax of do...while loop is as follows:

```
do  
{  
    Single statement  
    or  
    Block of statements,  
}while(expression);
```

do...while loop

```
#include <stdio.h>
main()
{
    int i = 10;
    do
        {
            printf("Hello %d\n", i
);
            i = i - 1;
        }while ( i > 0 );
}
```

Output

Hello 10
Hello 9
Hello 8
Hello 7
Hello 6
Hello 5
Hello 4
Hello 3
Hello 2
Hello 1

WAP to find the sum of first 10 natural numbers using the do- while loop

```
#include<stdio.h>
```

```
Main()
```

```
{
```

```
    int num=1,s=0;
```

```
    do
```

```
    {
```

```
        s+=num;
```

```
        num+=1;
```

```
    } while(num<=10);
```

```
    Printf("sum of first 10 natural number is: %d",s);
```

```
}
```


for loop

for loop is similar to **while**, it's just written differently. **for** statements are often used to process lists such a range of numbers:

Basic syntax of for loop is as follows:

```
for( expression1; expression2; expression3)
```

```
{
```

```
    Single statement
```

```
    or
```

```
    Block of statements;
```

```
}
```


for loop

In the above syntax:

expression1 – Initialises variables.

expression2 – Conditional expression, as long as this condition is true, loop will keep executing.

expression3 – expression3 is the modifier which may be simple increment of a variable.

for loop

```
#include <stdio.h>
main()
{
    int i;
    int j = 10;
    for( i = 0; i <= j; i ++ )
    {
        printf("Hello %d\n", i );
    }
}
```

Output

Hello 0

Hello 1

Hello 2

Hello 3

Hello 4

Hello 5

Hello 6

Hello 7

Hello 8

Hello 9

Hello 10

WAP to find the sum of first 10 natural numbers using the
for loop

```
#include <stdio.h>
```

```
main()
```

```
{
```

```
    int num=1,s=0;
```

```
    for(i=1;i<=10;i++)
```

```
        s=s+i;
```

```
    printf("sum of first 10 natural number is:
```

```
%d",s);
```

```
}
```

Generate odd series from 1 to 50

```
Void main()
{
    int i = 1;
    clrscr();
    printf("the series of odd no. from 1 to 50 is:\n");
    Do
    {
        printf ("%d\t", i);
        i=i+2;
    }
    while(i<=50);
    getch();
}
```