

Sample C-Programs for CHAPTER4

1. 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;
}
```

In the above syntax:

- expression1 - Initializes 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.

Example 1:

```
#include<stdio.h>

intmain(){

inta;

/* for loop execution */
for(a=10;a<20;a=a+1){
printf("value of a: %d\n",a);
}

return0;
}
```

Example 2:

```
#include
main()
{
    int i;
    int j = 10;

    for( i = 0; i <= j; i ++ )
    {
        if( i == 5 )
        {
            continue;
        }
        printf("Hello %d\n", i );
    }
}
```

Example 3: Find the factorial of a positive integer value

```
#include <stdio.h>
int main()
{
    int val;
    int cnt=1;
    int prod = 1;

    printf("Please enter an integer value less than 12.\n");
    scanf("%d",&val);
    printf("\n");
    while (cnt <= val )
    {
        prod = prod * cnt;
        printf("%d\n",prod);
        cnt ++;
    }
    printf("\nFactorial of %d is %d.\n",val, prod);

    return 0;
}
```

Output:

Please enter an integer value less than 12.

5

1

2

6

24

120

Factorial of 5 is 120.

Process exited after 2.658 seconds with return value 0

Press any key to continue . . .

Example 4:

```
#include <stdio.h>

int main(){

int i,j;

for (i=1;i<=10; i++)
{
for (j=1; j<=i; j++)
{
printf("*");
}

printf("\n");

}

return 0;
}
```

Output:

```
*
**
***
****
*****
*****
*****
*****
*****
*****
```

Process exited after 0.01701 seconds with return value 0

Press any key to continue . . .

Example 5:

```
#include <stdio.h>

int main(){

    int i,j;

    for (i=10;i>=0; i--)
    {
        for (j=1; j<=i; j++)
        {
            printf("*");
        }

        printf("\n");

    }

    return 0;
}
```

Output:

```
*****
*****
*****
*****
*****
*****
*****
*****
*****
*****
*****
```

Process exited after 0.01387 seconds with return value 0
Press any key to continue . . .

Example 6: Draw a triangle using space and * symbols

```
#include <stdio.h>
int main()
{
int n, c, k, space = 1;

printf("Enter number of rows\n");
scanf("%d", &n);
space = n - 1;

for (k = 1; k <= n; k++)
{
for (c = 1; c <= space; c++)
printf(" ");
space--;
for (c = 1; c <= 2*k-1; c++)
printf("*");

printf("\n");
}
return 0;
}
```

Output:

Enter number of rows

7

*

Process exited after 1.145 seconds with return value 0

Press any key to continue . . .

Example 7: Draw a diamond using space (" ") and * symbols

```
#include <stdio.h>

int main()
{
int n, c, k, space = 1;

printf("Enter number of rows\n");
scanf("%d", &n);

space = n - 1;

for (k = 1; k <= n; k++)
{
for (c = 1; c <= space; c++)
printf(" ");

space--;

for (c = 1; c <= 2*k-1; c++)
printf("*");

printf("\n");
}

space = 1;

for (k = 1; k <= n - 1; k++)
{
for (c = 1; c <= space; c++)
printf(" ");

space++;

for (c = 1 ; c <= 2*(n-k)-1; c++)
printf("*");

printf("\n");
}

return 0;
}
```

Output:

Enter number of rows

7

*

*

Process exited after 2.439 seconds with return value 0

Press any key to continue . . .