



U2 Iteration and Loops

Mr. J. Mishra
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Objectives

Introduction

Iteration
Statement

Loop Example

Different
Iteration
Statement

Exercise

References

Conditional Branching and Loops-III

Iteration and Loops

Course: BTech in CSE

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Outline

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Objectives

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Objectives

- Study on iteration statements
- Study on break and continue statement in iterative block



Introduction[1],[2],[3]

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- Any iterative process (include set of instructions) demand loop statement
- Based on a condition, set of statements could execute for finite or infinite times
- A loop can contain set of statements with more conditional statement such as if...else and switch...case
- In C language, three type of loop statements are available as for(), while(), do ...while().



Iteration Statement (Old Style)

label and goto statement

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Use of label and goto statement

```
1 #include <stdio.h>
2 int main()
3 {
4     int number;
5     number=1;
6
7     repeat:
8         printf("%d\t", number);
9         number++;
10        if(number<=10)
11            goto repeat;
12
13        return 0;
14 }
```

Output

1 2 3 4 5 6 7 8 9 10



Iteration Statement

for(;;) loop Statement

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for loop Statement Syntax

```
1  for(initialization; condition; increment)
2  {
3      statement1;
4      statement2;
5      statement3;
6  }
```

Output



Iteration Statement

while() loop Statement

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while loop Statement Syntax

```
1
2 //initialization
3 statement1;
4 statement2;
5
6 //condition
7 while(condition)
8 {
9     statement3;
10    statement4;
11
12 //increment
13    statement5;
14 }
```

Output



Iteration Statement

do ...while loop Statement

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do ...while() loop Statement Syntax

```
1 //initialization
2 statement1;
3 statement2;
4
5 //condition
6 do
7 {
8     statement3;
9     statement4;
10
11 //increment
12 statement5;
13 } while(condition);
```

Output



Loop Example

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for(;;) loop Example

```
1 #include<stdio.h>
2 int main()
3 {
4     int count;
5     for (count=1; count<=10;
6         count++)
7         printf("%d\t", count);
8
9
10
11     return 0;
12 }
```

Output

1 2 3 4 5 6 7 8 9 10

while() loop Example

```
1 #include<stdio.h>
2 int main()
3 {
4     int count;
5     count=1;
6     while(count<=10)
7     {
8         printf("%d\t", count);
9         count++;
10    }
11
12    return 0;
13 }
```

Output

1 2 3 4 5 6 7 8 9 10

do ...while() loop Example

```
1 #include<stdio.h>
2 int main()
3 {
4     int count;
5     count=1;
6     do
7     {
8         printf("%d\t", count);
9         count++;
10    } while(count<=10);
11
12    return 0;
13 }
```

Output

1 2 3 4 5 6 7 8 9 10



Different Iteration Statement

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Different Iteration Statement

- Nested Loops
- Loop and conditional branch
- break statement
- continue statement
- exit statement (used to exit from function)



Iteration Statement Examples

Example 1

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Nested loop example (Draw pattern)

```
1 #include<stdio.h>
2 int main()
3 {
4     for(int count1=0; count1<10; count1++)
5     {
6         for(int count2=0; count2<count1; count2++)
7         {
8             printf("*\t");
9         }
10        printf("\n");
11    }
12    return 0;
13 }
```

Output

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



Iteration Statement Examples

Example 2

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Loop and conditional branch (Prime Number Checking)

```
1  #include <stdio.h>
2  int main()
3  {
4      int num; int c=0;
5      printf("Enter a number:\t");
6      scanf("%d", &num);
7      for(int count=2; count<=num/2; count++)
8      {
9          if(num%count==0)
10             c++;
11     }
12     if(c==0)
13         printf("\nEntered number is prime number");
14     else
15         printf("\nEntered number is not prime number");
16
17     return 0;
18 }
```

Output

Enter a number: 37

Entered number is prime number



Iteration Statement Examples

Example 3

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break Statement (exit from loop)

```
1 #include<stdio.h>
2 int main()
3 {
4     int count;
5     for(count=1; count<=10; count++)
6     {
7         if(count==5)
8             break;
9         printf("%d\t",count);
10    }
11    return 0;
12 }
```

Output

1 2 3 4



Iteration Statement Examples

Example 4

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continue Statement (skip lower part and continue loop execution)

```
1 #include<stdio.h>
2 int main()
3 {
4     int count;
5     for(count=1; count<=10; count++)
6     {
7         if(count==5)
8             continue;
9         printf("%d\t",count);
10    }
11    return 0;
12 }
```

Output

1 2 3 4 6 7 8 9 10



Exercise

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Exercise

- Write a program to check a given number is prime number or not with minimum number of loop execution.
- Write a C code to check a given number is palindrome or not. Also, write its pseudo code (algorithm and flowchart).



References I

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Thank You...