

**LEADING UNIVERSITY**

**Course Title: Compiler Design & Construction Sessional**

**Course Code: CSE-3316**

**Submitted To**

**Dipta Chandra Paul**

Lecturer

Department of Computer Science and Engineering

Leading University

**Submitted by**

**Md. Abdullah Ar Rezwan**

ID: 1912020148

Section: 9(D)

Department of Computer Science and Engineering

Leading University

**Date of Submission: 15/11/2021**

**Experiment – 01**

* **While Loop**

A while loop statement repeatedly executes a target statement as long as a given condition is true.

**Syntax:**

The syntax of a while loop in C++ is :

while(condition) {

// body of the loop or statement();

}

Here, statement() may be a single statement or a block of statements. The loop iterates while the condition is true.

When condition returns false, the control comes out of loop and jumps to the next statement in the program after while loop.

**Example:**

#include<iostream>

using namespace std;

int main()

{

    int i=1;

    cout<<"All even numbers between 1 to 10 are: ";

    while(i<10) {

        if(i%2==0){

            cout<<i<<endl;

        }

        i++;

    }

    return 0;

}

**Output:**

All even numbers between 1 to 10 are: 2

4

6

8

**Explanation:**

1. Program starts.

2. i is initialized with value 1.

3. While loop condition is checked. 1 < 10 yields true.

* Condition statement not executed.
* Updating is done. Now i = 2.

4. While loop condition is checked. 2 < 10 yields true.

* Condition is true, then value of i printed 1st time.
* Updating is done. Now i = 3.

5. While loop condition is checked. 3 < 10 yields true.

* Condition statement not executed.
* Updating is done. Now i = 4.

6. While loop condition is checked. 4 < 10 yields true.

* Condition is true, then value of i printed 2nd time.
* Updating is done. Now i = 5.

7. While loop condition is checked. 5 < 10 yields true.

* Condition statement not executed.
* Updating is done. Now i = 6.

8. While loop condition is checked. 6 < 10 yields true.

* Condition is true, then value of i printed 3rd time.
* Updating is done. Now i = 7.

9. While loop condition is checked. 7 < 10 yields true.

* Condition statement not executed.
* Updating is done. Now i = 8.

10. While loop condition is checked. 8 < 10 yields true.

* Condition is true, then value of i printed 4th time.
* Updating is done. Now i = 9.

11. While loop condition is checked. 9 < 10 yields true.

* Condition statement not executed.
* Updating is done. Now i = 10.

12. While loop condition is checked. 10 < 10 yields false.

13. Flow goes outside the loop to return 0.

* **Do…While Loop**

The do…while loop is a variant of the while loop. This loop will execute the code block once, before checking if the condition is true, and then it will repeat the loop as long as the condition is true.

The do…while loop should be used when the number of iterations is not fixed, and the loop must execute for at least once. The C++ compiler executes the loop body first before evaluating the condition. That means the loop must return a result.

**Syntax**

The basic syntax of C++ do…while loop is as follows:

do{

//code or statement

}while(condition);

The condition is test expression. It must be true for the loop to execute. The { } mark the body of do while loop. It comes before the condition. Hence, it is executed before the condition.

**Example:**

#include<iostream>

using namespace std;

int main(){

     int i=1;

          do{

              cout<<i<<endl;

              i++;

          }while(i<=10);

    return 0;

}

**Output:**

1

2

3

4

5

6

7

8

9

10

**Explanation:**

1. Program starts.
2. Declaring one integer variables i. The variable i has been initialized to 1.
3. Creating a do-while loop. The { marks start of outer loop body.
4. Before checking condition of do…while loop, print the value of i which is initialized by 1.
5. Increasing value of i by 1 after every iteration.
6. The } marks the end of the loop body. The test expression has been added to the end of the loop body. It tests whether the value of i is not greater then 11. When the value of i is greater than 10, the loop should terminated.
7. Flow goes outside the loop to return 0.

* **Difference Between While loop and Do…While loop**

Here, the differences are given below:

| **While** | **Do…While** |
| --- | --- |
| Condition is checked first then statement(s) is executed. | Statement(s) is executed at least once, thereafter condition is checked. |
| It might occur statement(s) is executed zero times, If condition is false. | At least once the statement(s) is executed. |
| No semicolon at the end of while. while(condition) | Semicolon at the end of while. while(condition); |
| If there is a single statement, brackets are not required. | Brackets are always required. |
| Variable in condition is initialized before the execution of loop. | Variable may be initialized before or within the loop. |
| While loop is entry controlled loop. | Do…while loop is exit controlled loop. |
| while(condition) { statement(s); } | do { statement(s); } while(condition); |

* **If else condition in while loop**

Code is given below:

#include<iostream>

using namespace std;

int main()

{

    int i = 1;

    cout<<"All even numbers between 1 to 10 are:"<<endl;

    while(i<=10) {

        if(i%2==0)

            cout<<i<<" is even number"<<endl;

        else

            cout<<i<<" is odd number"<<endl;

        i++;

    }

    return 0;

}

**Output:**

All even numbers between 1 to 10 are:

1 is odd number

2 is even number

3 is odd number

4 is even number

5 is odd number

6 is even number

7 is odd number

8 is even number

9 is odd number

10 is even number

* **If else condition in Do…While loop**

Here, code is given below:

#include <iostream>

using namespace std;

int main()

{

    int i = 1;

    cout<<"All even numbers between 1 to 10 are using Do...While loop:"<<endl;

    do{

        if(i%2==0)

            cout<<i<<" is even number"<<endl;

        else

            cout<<i<<" is odd number"<<endl;

        i++;

    }while(i<=10);

    return 0;

}

**Output:**

All even numbers between 1 to 10 are using Do...While loop:

1 is odd number

2 is even number

3 is odd number

4 is even number

5 is odd number

6 is even number

7 is odd number

8 is even number

9 is odd number

10 is even number