

INTRODUCTION OF C++ SECTION 3

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C++ LOOPS

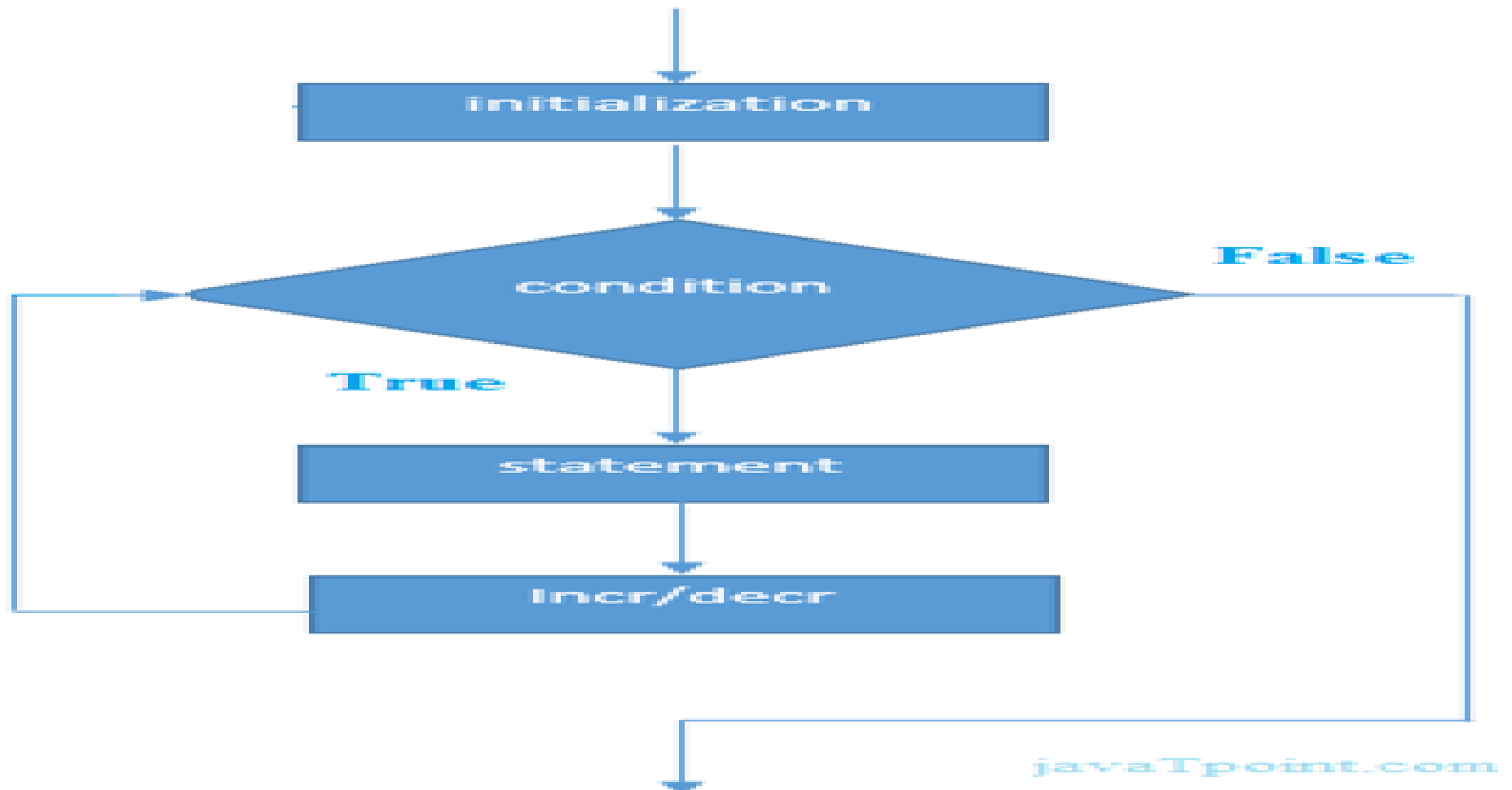
- ❖ Loops can execute a block of code as long as a specified condition is reached.
- ❖ Loops are easy because they save time, reduce errors, and they make code more readable.
- ❖ C++ Loops are :
 - 1) For loop.
 - 2) While loop.
 - 3) Do while loop.

FOR LOOP IN C++

- ❖ **for loop** is a repetition control structure that allows you to efficiently write a loop that executes a specific number of times.
- ❖ the loop is stopping when the condition becomes false.
- ❖ **Syntax:**

```
for(initialization ; condition ;  
increment )  
{  
    statement(s);  
}
```

FOR LOOP IN C++ “CONT”



EXAMPLES OF FOR LOOP IN C++ “CONT”

```
7      int main()  
8      {  
9          for(int a=0; a<10; a++)  
10     {
```

```
24     int main()  
25     {  
26         for(int a=0; a<50; a+=10)  
27     {
```

```
40     int main()  
41     {  
42         for(int a=10; a>=0; a-=3)  
43     {
```

C++ NESTED LOOP

❖ A loop within another loop is called **a nested loop.**

❖ what is the output of this code ?

```
52 //C++ Nested For Loop Example
53 #include <iostream>
54 using namespace std;
55
56 int main () {
57     for(int i=1;i<=3;i++){
58         for(int j=1;j<=3;j++){
59             cout<<i<<" "<<j<<"\n";
60         }
61     }
62 }
```

"C:\Users\hossam\Desktop\for\for loop\bin\Debug\for loop.exe"

```
1 1
1 2
1 3
2 1
2 2
2 3
3 1
3 2
3 3
```

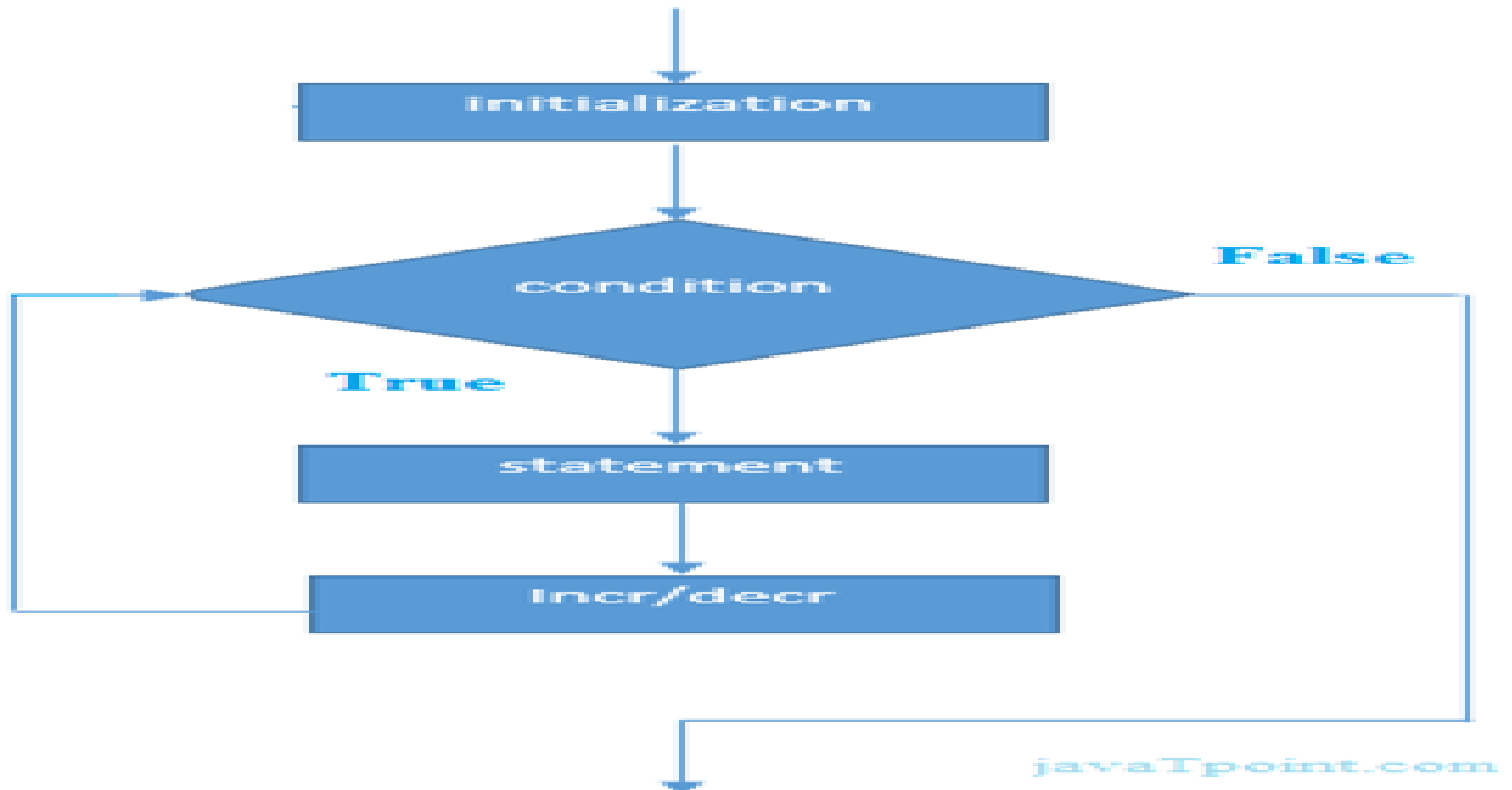
Process returned 0 (0x0) execution time : 0.122 s
Press any key to continue.

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FOR LOOP IN C++ “CONT”



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58         for(int j=1;j<=3;j++){
59             cout<<i<<" "<<j<<"\n";
60         }
61     }
62 }
```

"C:\Users\hossam\Desktop\for\for loop\bin\Debug\for loop.exe"


```
1 1
1 2
1 3
2 1
2 2
2 3
3 1
3 2
3 3
```

Process returned 0 (0x0) execution time : 0.122 s
Press any key to continue.

C++ INFINITE FOR LOOP

❖ If we use **double semicolon in for loop**, it will be **executed infinite times**.

```
67 //C++ Infinite For Loop
68 #include <iostream>
69 using namespace std;
70
71 int main () {
72     for (; ; )
73     {
74         cout<<"Infinite For Loop";
75     }
76 }
```

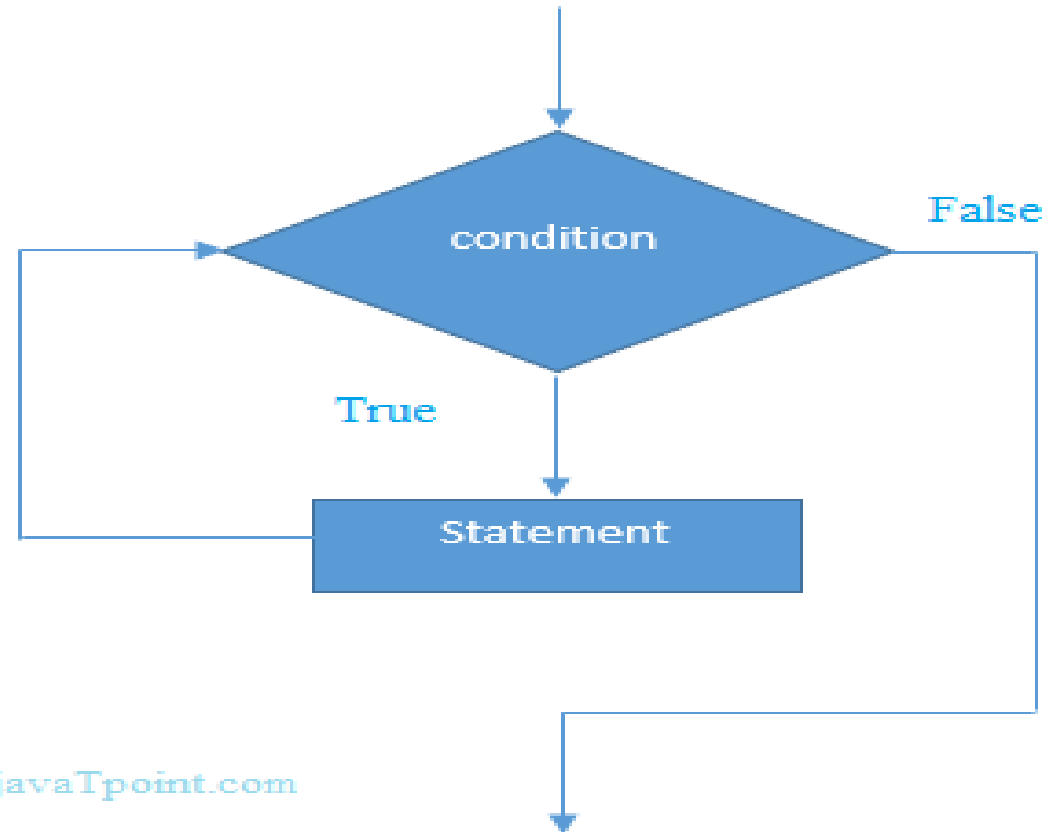
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```

C++ WHILE LOOP

- ❖ while loop is used to iterate a part of the program several times.
- ❖ If the number of iteration is not fixed, it is recommended to use while loop than for loop.
- ❖ Syntax:

```
while(condition){  
  //code to be executed  
}
```



C++ WHILE LOOP “CONT”

❖ what is the output of this code ?

```
2 //example of while loop to print table of 1.
3 #include <iostream>
4 using namespace std;
5 int main() {
6     int i=1;
7     while(i<=10)
8     {
9         cout<<i <<"\n";
10        i++;
11    }
12 }
```

C:\Users\hossam\Desktop\while1\while\bin\Debug\while.exe

1
2
3
4
5
6
7
8
9
10

Process returned 0 (0x0) execution time : 0.100 s
Press any key to continue.

C++ NESTED WHILE LOOP

❖ while loop inside another while loop, it is known as **nested while loop**.

❖ what is the output of this code ?

```
15 //example of nested while loop in C++ programming language.
16 #include <iostream>
17 using namespace std;
18 int main () {
19     int i=1;
20     while(i<=3)
21     {
22         int j = 1;
23         while (j <= 3)
24         {
25             cout<<i<<" "<<j<<"\n";
26             j++;
27         }
28         i++;
29     }
30 }
```

"C:\Users\hossam\Desktop\for\for loop\bin\Debug\for loop.exe"

```
1 1
1 2
1 3
2 1
2 2
2 3
3 1
3 2
3 3
```

Process returned 0 (0x0) execution time : 0.1
Press any key to continue.

C++ INFINITIVE WHILE LOOP

❖ We can also create infinite while loop by **passing true as the test condition.**

❖ example of infinite while loop in C++ :

```
33
34     #include <iostream>
35     using namespace std;
36     int main () {
37         while(true)
38         {
39             cout<<"Infinitive While Loop";
40         }
41     }
```

C:\Users\hossam\Desktop\while1\while\bin\Debug\while.exe

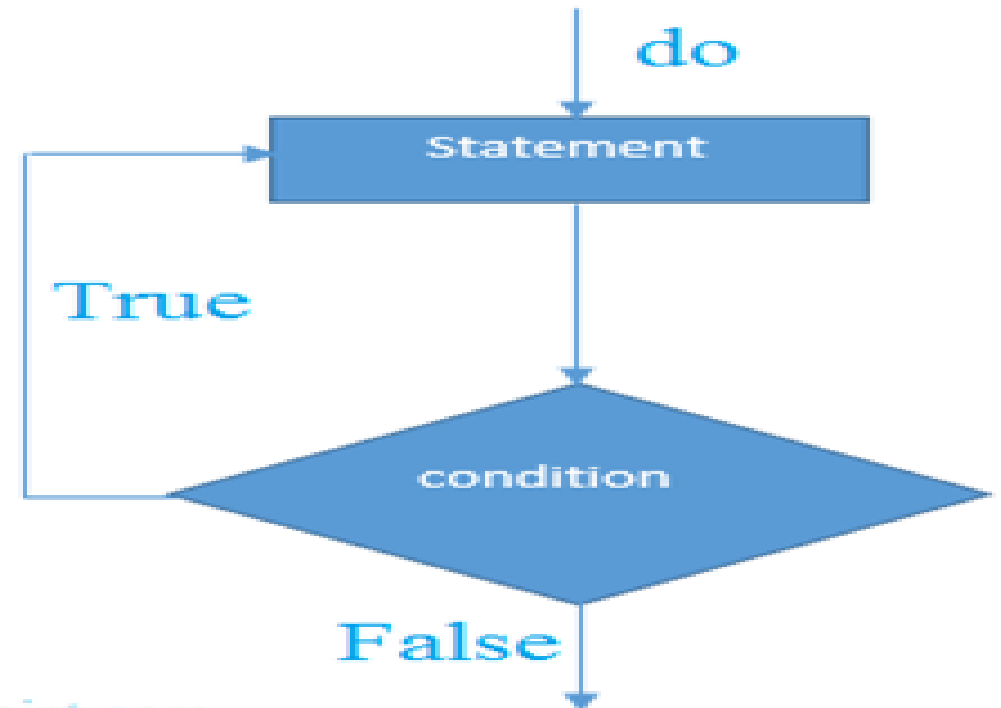
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```

C++ DO/WHILE LOOP

- ❖ The C++ do-while loop is executed **at least once** because condition is checked **after loop body**.
- ❖ Do while loop **is similar to** a while loop.
- ❖ Difference between do while loop and while loop, Do while is executed **at least one time**.

- ❖ **Syntax:**

```
do {  
    // code block to be  
    executed  
}  
while (condition);
```



C++ DO/WHILE LOOP“ CONT”

❖ what is the output of this code ?

```
47 //C++ do-while loop to print the table of 1.
48 #include <iostream>
49 using namespace std;
50 int main() {
51     int i = 1;
52     do{
53         cout<<i<<"\n";
54         i++;
55     } while (i <= 10) ;
56 }
```

C:\Users\hossam\Desktop\while1\while\bin\Debug\while.exe

1
2
3
4
5
6
7
8
9
10

Process returned 0 (0x0) execution time : 0.059 s
Press any key to continue.

C++ NESTED DO-WHILE LOOP

❖ do-while loop inside another do-while loop, it is known as **nested do-while loop**.

```
60 //example of nested do-while loop in C++.
61 #include <iostream>
62 using namespace std;
63 int main() {
64     int i = 1;
65     do{
66         int j = 1;
67         do{
68             cout<<i<<"\n";
69             j++;
70         } while (j <= 3) ;
71         i++;
72     } while (i <= 3) ;
73 }
```

C:\Users\hossam\Desktop\while1\while\bin\Debug\while.exe

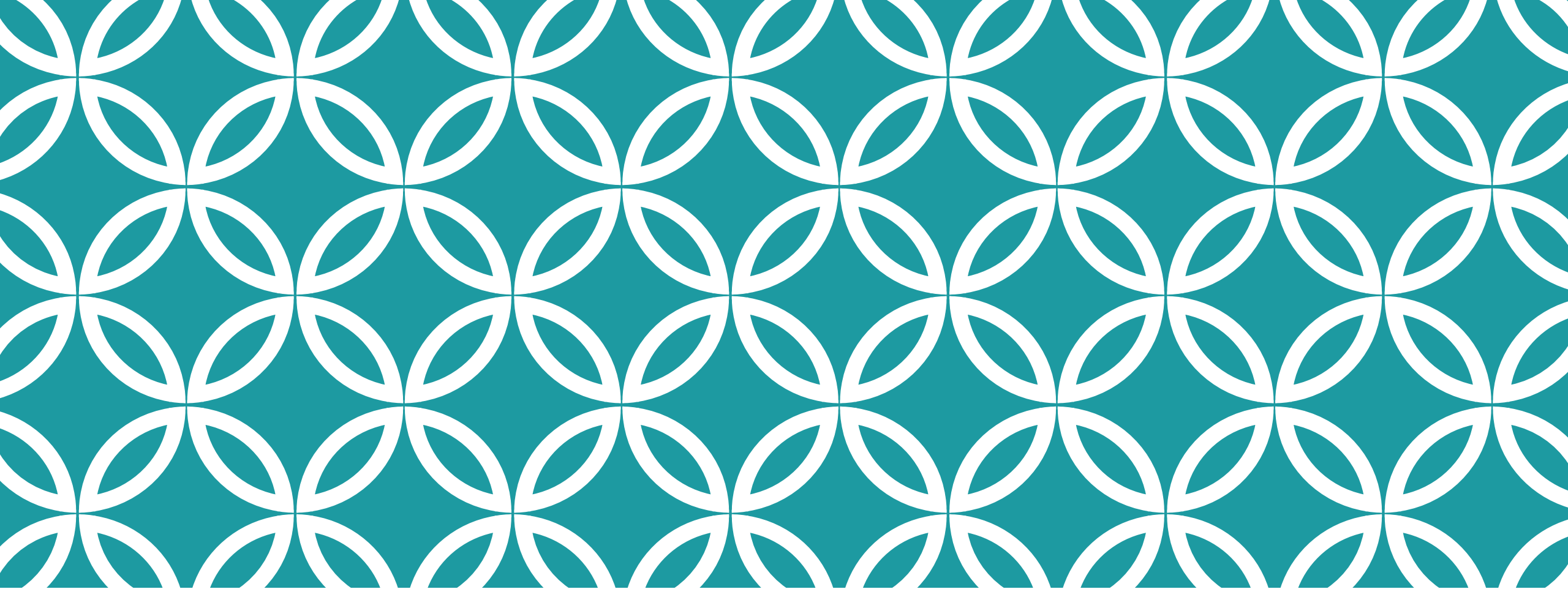
```
1
1
1
2
2
2
3
3
3
Process returned 0 (0x0)   execution time : 0.
Press any key to continue.
```

❖ if you **pass true** in the do-while loop, it will be **infinite do-while loop**.

```
78 //C++ Infinitive do-while Loop Example
79 #include <iostream>
80 using namespace std;
81 int main() {
82     do{
83         cout<<"Infinitive do-while Loop";
84     } while(true);
85 }
```

C:\Users\hossam\Desktop\while1\while\bin\Debug\while.exe

[illegible]



THANKS

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