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FACULTY OF ENGINEERING & TECHNOLOGY

CSPS103: Object Oriented Programming

Lecture-08

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OBJECTIVES

In this lecture, you will learn to:

- ❖Loop Control Structures
- ❖While loop
- ❖The do-while Loop
- ❖For Loop

LOOP CONTROL STRUCTURES

❑A loop statement allows us to execute a statement or group of statements multiple times.

❑Loops or iterative statements tell the program to repeat a fragment of code several times or as long as a certain condition holds.

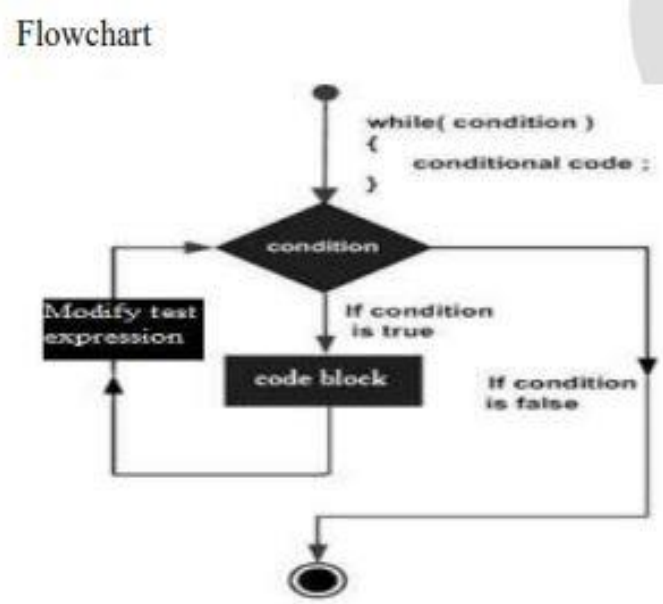
❑C++ provides three convenient iterative statements:

1) **while**
2) **for**
3) **do-while.**

WHILE LOOP

- A while loop statement repeatedly executes a target statement as long as a given condition is true.
- It is an entry-controlled loop.
- The syntax of a while loop in C++ is:

```
while(condition)
{
statement(s);
}
```



PROGRAM : WHILE LOOP

// A program to display numbers from 1 to 100

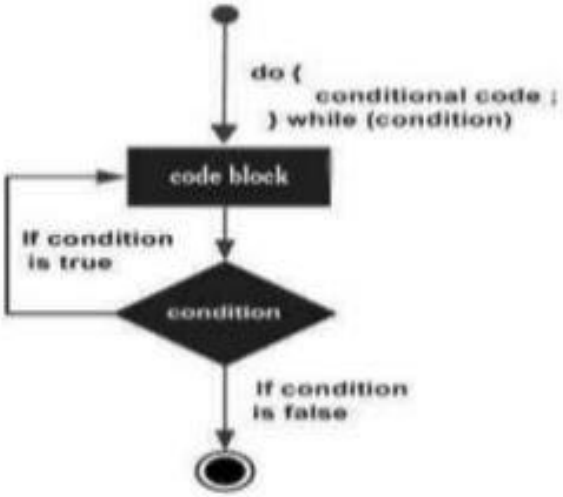
```
#include<iostream.h>

#include<conio.h>

int main(){

int i=1;

while(i<=100){

cout<<i ;

 i++;

}

return 0;

}
```

THE DO-WHILE LOOP

- The do-while loop differs from the while loop in that the condition is tested after the body of the loop.
- This assures that the program goes through the iteration at least once.
- It is an exit-controlled loop.
- The syntax of a do-while loop in C++ is:

```
do
{
statement(s);
}while( condition );
```

Flowchart



PROGRAM : DO-WHILE LOOP

// A program to display numbers from 1 to 100

```
#include<iostream.h>

#include<conio.h>

int main( ){

int i=1;

do

{ cout<<i ;

i++;

} while(i<=100);

return 0;

}
```

FOR LOOP

❑A for loop is a repetition control structure that allows you to efficiently write a loop that needs to execute a specific number of times.

❑The syntax of a for loop in C++ is:

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

Here is the flow of control in a for loop:

1. The init step is executed first, and only once. This step allows you to declare and initialize any loop control variables. You are not required to put a statement here, as long as a semicolon appears.

2. Next, the condition is evaluated. If it is true, the body of the loop is executed. If it is false, the body of the loop does not execute and flow of control jumps to the next statement just after the for loop.

3. After the body of the for loop executes, the flow of control jumps back up to the increment statement. This statement allows you to update any C++ loop control variables. This statement can be
left blank, as long as a semicolon appears after the condition.

4. The condition is now evaluated again. If it is true, the loop executes and the process repeats itself (body of loop, then increment step, and then again condition). After the condition becomes false, the for loop terminates.

PROGRAM : FOR LOOP

// A program to display numbers from 1 to 100

```
#include<iostream.h>

#include<conio.h>

int main() {

int i ;

for (i=1;i<=100;i++)

{

cout<<i ;

return 0;

}
```

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Multiple Choice Question:

Q1. How many types of loops are there in C++?

a) 4

b) 2

c) 3

d) 1

Multiple Choice Question:

Q2. Which looping process is best used when the number of iterations is known?

a) for

b) while

c) do-while

d) all looping processes require that the iterations be known

Multiple Choice Question:

Q3. Which one is not a loop?

a) for

b) have

c) do

d) while

Multiple Choice Question:

Q4. What loops needs a semi colon after?

a) for

b) do

c) while

d) None

Multiple Choice Question:

Q5. What loops will always execute at least once?

a) for

b) do

c) while

d) None

Summary

In this lecture, you learned that:

- The loop control structure of C++

    1. while loop
    2. do-while loop
    3. for loop