National University
of computer and emerging sciences

# LAB 08

## Summary

| Items | Description |
|---|---|
| Course Title | Programming Fundamentals |
| Lab Title | Operators in C++ |
| Duration | 3 Hours |
| Operating System/Tool/Language | Ubuntu/ g++/ C++ |
| Objective | To get familiar with use of switch |

### Switch Statements

The ***switch statement*** allows us to execute a block of code among many alternatives. The syntax of the switch statement in C++ is:

```
switch(expression) {
  case x:
    // code block
    break;
  case y:
    // code block
    break;
  default:
    // code block
}
```

This is how it works:

- The switch expression is evaluated once
- The value of the expression is compared with the values of each case
- If there is a match, the associated block of code is executed
- The break and default keywords are optional, and will be described later in this chapter

**Example 01**

The example below uses the Number and will tell you if it's a weekend or not

```
int day = 4;
switch (day) {
  case 6:
    cout << "Today is Saturday";
    break;
  case 7:
    cout << "Today is Sunday";
    break;
  default:
    cout << "Looking forward to the Weekend";
}
// Outputs "Looking forward to the Weekend"
```

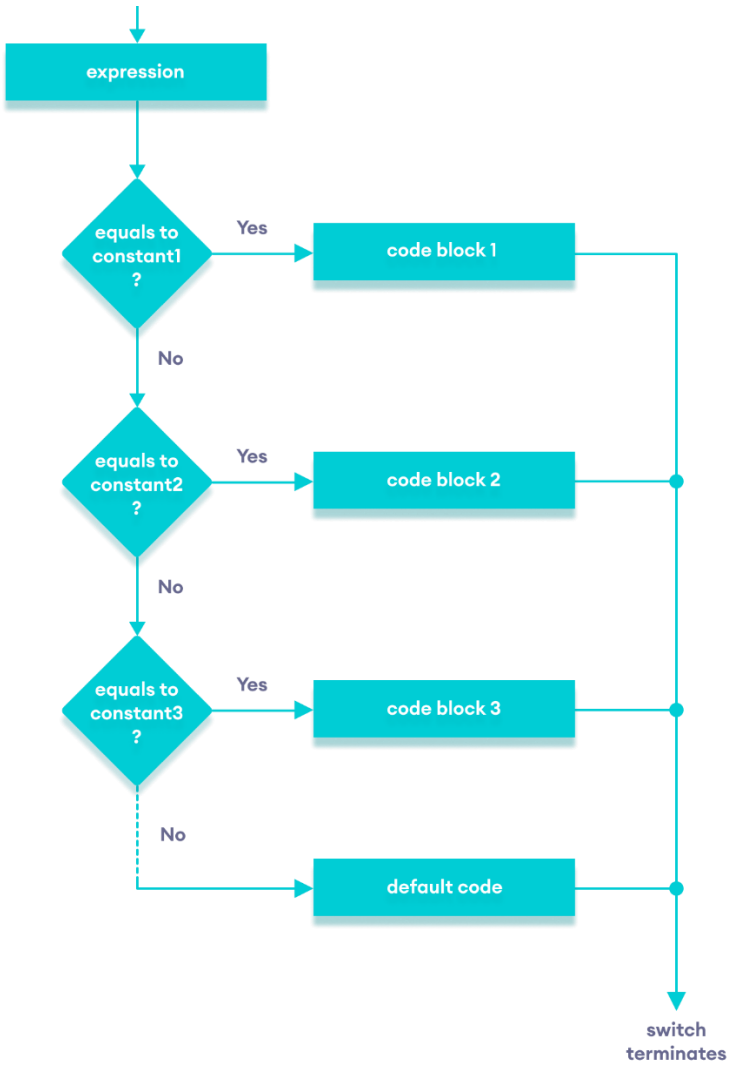


FIGURE 1 FLOWCHART OF C++ SWITCH...CASE STATEMENT

## The break Keyword

When C++ reaches a break keyword, it breaks out of the switch block. This will stop the execution of more code and case testing inside the block.
When a match is found, and the job is done, it's time for a break. There is no need for more testing.

A break can save a lot of execution time because it "ignores" the execution of all the rest of the code in the switch block.

## The default Keyword

The default keyword specifies some code to run if there is no case match:

The default keyword must be used as the last statement in the switch, and it does not need a break.

**Example 02**

The example below uses the weekday number to calculate the weekday name

```
int day = 4;
switch (day) {
  case 1:
    cout << "Monday";
    break;
  case 2:
    cout << "Tuesday";
    break;
  case 3:
    cout << "Wednesday";
    break;
  case 4:
    cout << "Thursday";
    break;
  case 5:
    cout << "Friday";
    break;
  case 6:
    cout << "Saturday";
    break;
  case 7:
    cout << "Sunday";
    break;
}
```

***Output: Thursday***

*Note: We can do the same thing with the if...else. If ladder. However, the syntax of the switch statement is cleaner and much easier to read and write.*

## Lab Tasks

### Task#01

Write a C++ program to print the following:

10. Ibn `Umar and Abu Hurairah (may Allah be pleased with them) reported:

We heard the Messenger of Allah saying (while delivering Khutbah on his wooden pulpit),

"**Either some people stop neglecting the Friday prayers, or Allah will seal their hearts and they will be among the heedless.**" (Muslim)

### Tsk#02

Write a program to ask a student to enter his/her GPA. The program should display letter grade to the student using switch statements according to following criteria:

| CGPA | GRADE |
|---|---|
| 4 | A+ |
| 3 | A |
| 2 | B |
| 1 | C |

*Note: Please don't consider floating point numbers.*

### Task#03

1. **Calculator**: Write a c++ program that will display the following menu options to the user.

```
Menu
-----------------------------------
+ Addition
- Subtraction
* Multiplication
/ Division
. Cancel
```

- Take 2 numbers and an operator as an input from the user.

- Perform calculations according to the operator entered by the user.
- Each menu option should call a separate ***function*** *to perform the desired operation*.

```
-----------------------------------
Enter 1st number = 4
Enter 2nd number = 10
Enter operation = +
-----------------------------------
4 + 10 = 14
```

## Task#04

Write a c++ program that will take two integer values from the user and display whether the first number is greater, smaller or equal to the second number.

On the basis of that decision, if the first number is not greater than second number you program should check whether the second number is greater, smaller or equal to the first number.

**(using nested switch case)**

```
Enter the 1st Number: 9

Enter the 2nd Number: 15

------------------------------
 2nd Number is Greater
------------------------------
```

## Task#05

Write a c++ program to check whether an input value is an alphabet, digit or a special character.

**(Use if-else within a switch case statement.**
**You are only allowed to use one switch statement)**

```
Enter input : 3

It is a Number.

Enter input : r

It is a small Alphabet character
```

National University
of computer and emerging sciences

Task#06

*Note: You are only allowed to use nested ternary statements for this program*
Write a program that reads score of a student in a subject and displays his grades according to the following criteria:

| Score | Grade |
|---|---|
| >= 90 | A+ |
| 80 – 89 | A |
| 70 – 79 | B |
| 60 – 69 | C |
| 50 – 59 | D |
| < 50 | F |

Output

```
Grade Calculator
-----------------------------------
Enter your Score =  85
Your Grade is A
```

**Practice Question:**
**Run all sample programs**

**Submission Instructions:**

1. Save all .cpp files with your roll no and task number
   e.g. i21XXXX_Task01.cpp
2. Save all screenshots of terminal with your roll no and task number
3. Now create a new folder with name ROLLNO_LAB03 e.g. i21XXXX_LAB03
4. Move all your .cpp files to this newly created directory and compress it into .zip file.
5. Now you must submit this zipped file on Google Classroom.

OR
You can make a single file where you will be pasting all your solutions with screenshots.