IAP LAB 6

BY

ENG. JOUD KHATTAB

ARITHMETIC OPERATORS

3 ARITHMETIC OPERATORS KINDS

Square root	sqrt
Power	^
Unary	-
Unary Plus	+
Sub-expressions	()
Multiplication	*
Division	/
Addition	+
Subtraction	-

4 ARITHMETIC OPERATORS EXAMPLE

- Problem:
  - What is the result of X?
  - X = 5 * (9 - 7) + 6 ^ 2
- Solution:
  - X = 5 * (9 - 7) + 6 ^ 2
  - X = 5 * 2 + 6 ^ 2
  - X = 5 * 2 + 36
  - X = 10 + 36
  - X = 46

5 EXERCISE 1

- Problem:
  - Write a program that reads 3 values x, y, and z from user and calculates the value of (w) according to the following equation:
- Solution 1:
  - float x, y, z, w ;
  - cin >> x >> y >> z ;
  - float tmp1, tmp2, tmp3, tmp4, tmp5 ;
  - tmp1 = x*x*x + 1 ;
  - tmp2 = y*z ;
  - tmp3 = tmp1 / tmp2 ;
  - tmp4 = x – 4 * z ;
  - tmp5 = tmp3 / tmp4 ;
  - w = tmp5 + 3 ;
  - cout << w << endl ;

$$w = \frac{\frac{(x^3 + 1)}{y * z}}{(x - 4 * z)} + 3$$

6 EXERCISE 1

- Problem:
  - Write a program that reads 3 values x, y, and z from user and calculates the value of (w) according to the following equation:

$$w = \frac{\frac{(x^3+1)}{y*z}}{(x-4*z)} + 3$$

- Solution 2:
  - float x, y, z, w ;
  - cin >> x >> y >> z ;
  - w=(((x*x*x+1)/(y*z))/(x-4*z))+3 ;
  - cout << w << endl ;

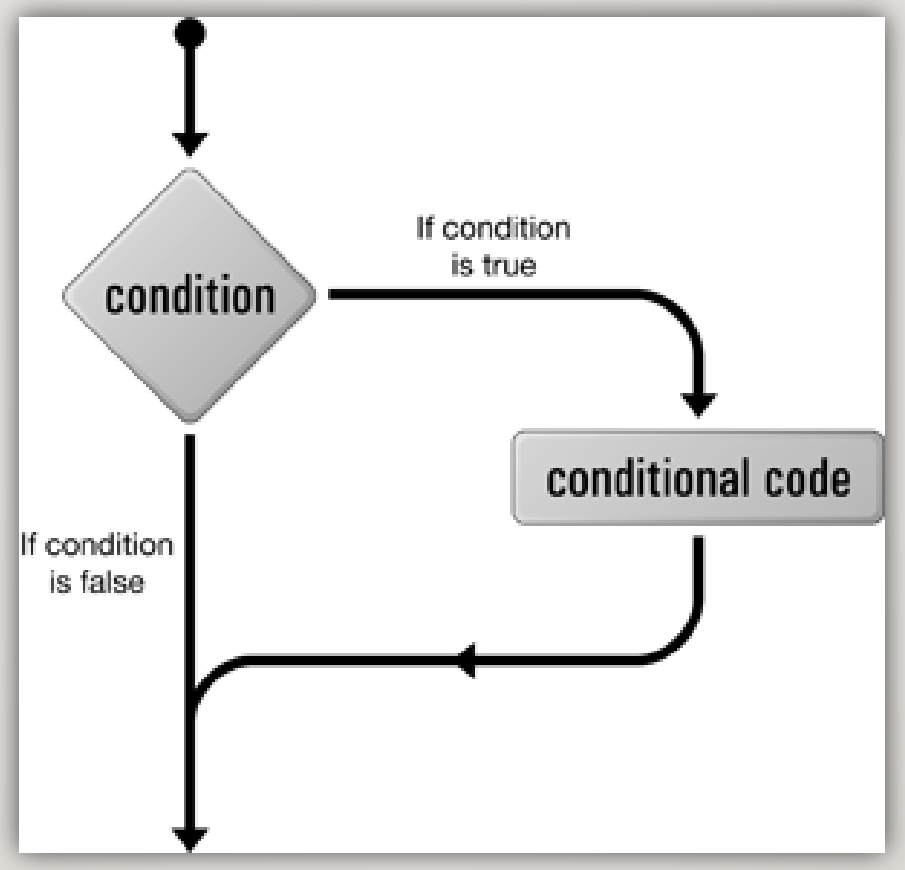
CONDITION STATEMENT

8 IF STATEMENT

- Syntax:

```
if (condition)
{
        // statements written here are executed only when the condition is true
}
```

9 IF STATEMENT

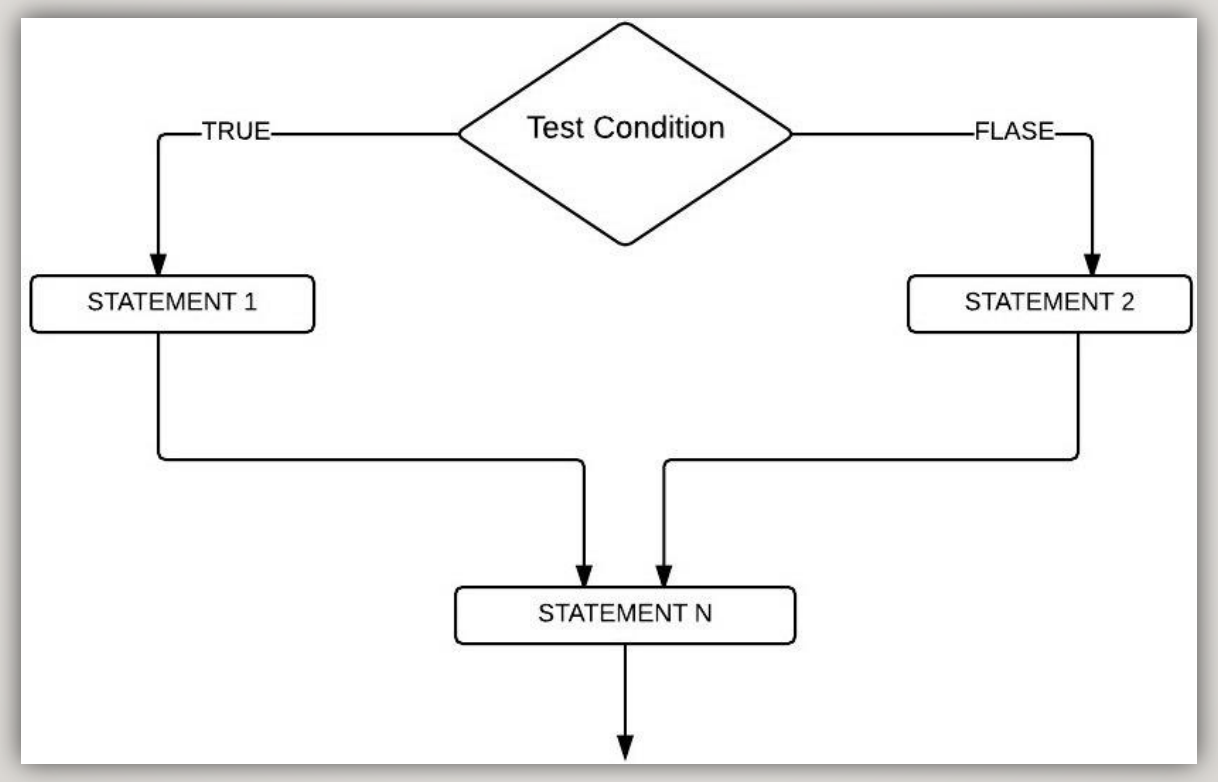


10 IF – ELSE STATEMENT

- Syntax:

```
if (condition)
{
        // statements written here are executed only when the condition is true
}
else
{
        // statements written here are executed only when condition is false
}
```

IF – ELSE STATEMENT



EXAMPLE 1

- Question:
  - Write program that reads integer number from the user, that represents a mark. The program should determine if the user (student) pass the course.

EXAMPLE 1 SOLUTION

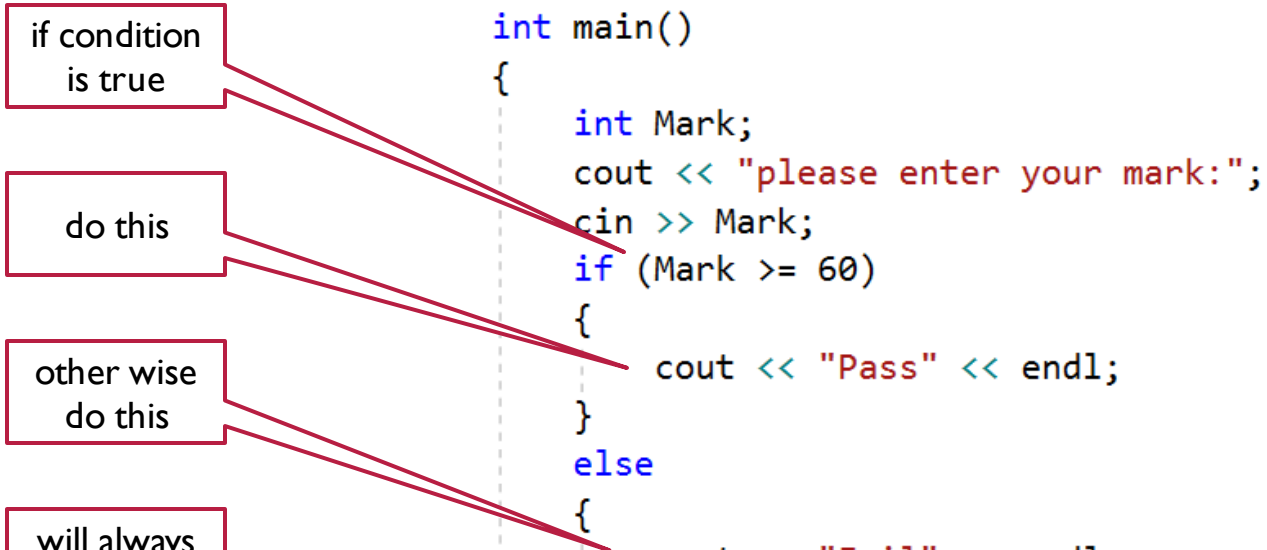
```
#include <iostream>
using namespace std;
int main()
{
    int Mark;
    cout << "please enter your mark:";
    cin >> Mark;
    if (Mark >= 60)
    {
        cout << "Pass" << endl;
    }
    cout << "Bye" << endl;
}
```

will always execute

EXAMPLE 2

- Question:
  - Write program that reads integer number from the user, that represents a mark. The program should determine if the user (student) pass the course or not.

EXAMPLE 2 SOLUTION




```
#include <iostream>
using namespace std;
int main()
{
    int Mark;
    cout << "please enter your mark:";
    cin >> Mark;
    if (Mark >= 60)
    {
        cout << "Pass" << endl;
    }
    else
    {
        cout << "Fail" << endl;
    }
    cout << "Bye" << endl;
}
```

EXAMPLE 3

- Question:
  - Write a program that should determine whether a number is even or odd.

EXAMPLE 3 SOLUTION

```cpp
#include <iostream>
using namespace std;
int main()
{
    int number;
    number = 30;
    if (number % 2 == 0)
    {
        cout << "Even" << endl;
    }
    else
    {
        cout << "Odd" << endl;
    }
}
```

Assign (=)

Equal (==)

HOMEWORK

HOMEWORK 1

- Problem:
  - Write an algorithm to solve a quadratic equation of the form:Ax2+Bx+C = 0
- Variables:
  - Variables to hold the input (unprocessed) data:A, B , C
  - Variables to hold the (output) processed data: X1 , X2
- Calculation:
  - delta equation: $\Delta = B^2 - 4AC$
  - Calculate x1 and x2 using the following two equations:

$$x_1 = \frac{-B + \sqrt{\Delta}}{2A} \qquad x_2 = \frac{-B - \sqrt{\Delta}}{2A}$$

HOMEWORK 2

- Problem:
  - Write an algorithm that reads three numbers that represent the length of triangle sides, the program should figure out if these lines can form triangle or not.