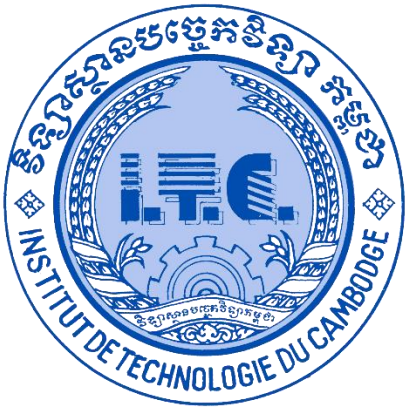


វិទ្យាស្ថានបច្ចេកវិទ្យាកម្ពុជា

Institute of Technology of Cambodia

TP-04

Decision Making

in C++

Academic Year: 2022 - 2023

1. The if Statement

The **if** statement to specify a block of C++ code to be executed if a condition is **true**.

Syntax

```
if (condition) {
  // block of code to be executed if the condition is true
}
```

Example

```
int x = 20;
int y = 18;
if (x > y) {
  cout << "x is greater than y";
}
```

2. The else Statement

The **else** statement to specify a block of code to be executed if the condition is **false**.

Syntax

```
if (condition) {
  // block of code to be executed if the condition is true
} else {
  // block of code to be executed if the condition is false
}
```

Example

```
int time = 20;
if (time < 18) {
  cout << "Good day.";
} else {
  cout << "Good evening.";
}
// Outputs "Good evening."
```

The **short-hand if else**, which is known as the **ternary operator** because it consists of three operands.

Syntax

```
variable = (condition) ? expressionTrue : expressionFalse;
```

Example

```
int time = 20;
string result = (time < 18) ? "Good day." : "Good evening.";
cout << result;
```

3. The else if Statement

Use the **else if** statement to specify a new condition if the first condition is **false**.

Syntax

```
if (condition1) {
  // block of code to be executed if condition1 is true
} else if (condition2) {
  // block of code to be executed if the condition1 is false and condition2 is true
} else {
  // block of code to be executed if the condition1 is false and condition2 is false
}
```

Example

```
int time = 22;
if (time < 10) {
  cout << "Good morning.";
} else if (time < 20) {
  cout << "Good day.";
} else {
  cout << "Good evening.";
}
// Outputs "Good evening."
```

4. C++ Switch Statements

Use the **switch** statement to select one of many code blocks to be executed.

Syntax

```
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.

Example

```
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;
}
// Outputs "Thursday" (day 4)
```

Problem1:

Write a C++ program to get a number from a user. The program checks and tell whether this input number is positive or negative number.

Problem2:

Write a C++ program to get a number from a user. The program checks and tell whether this input number is even or odd number.

Problem3:

Write a C++ program to ask a user for 7 numbers (7 variables). Find the minimum number and display on screen.

E.g
Input n1: 2
Input n2: 99
Input n3: 1
Input n4: 2
Input n5: 9
Input n6: -7
Input n7: 5

=> Output: The minimum number is -7.

Problem4:

Write a C++ program to solve the quadratic equation ax^2+bx+c=0 or $\mathbf{ax^2+bx+c = 0}$. Ask a user to inputs the coefficient a, b and c. The program calculate delta and find roots of the equation. Display the result (roots of the equation) on screen.

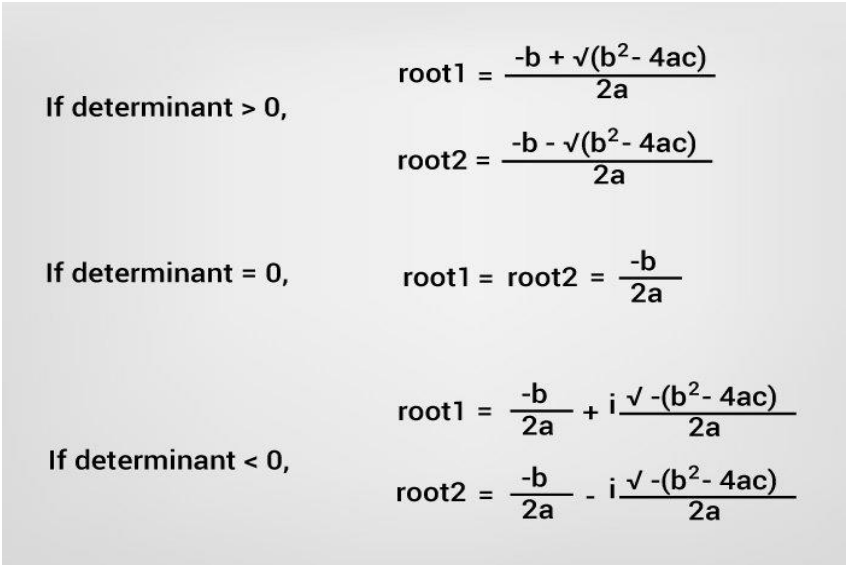
E.g:
Input a: 1
Input b: 4
Input c: 3

=> Output: The equation has roots: x1 = -1 and x2 = -3

Remark: Make sure you verify the result from program whether it is correct if we do it manually by hand.

discriminant = $\mathbf{b^2 - 4ac}$ is known as the discriminant of a quadratic equation. The discriminant tells the nature of the roots.

If discriminant is greater than 0, the roots are real and different.
If discriminant is equal to 0, the roots are real and equal.
If discriminant is less than 0, the roots are complex and different.



Problem5:

Write a C++ program to tell how much tax a person should pay based on his/her salary and gender. The program asks a user for gender, name, and salary (US dollar). The tax is based on the following rules:

-pay tax 10%, for male and salary is more than 300 USD.
-pay tax 5%, for male and salary is in between 200 USD and 300 USD.
-pay tax 5%, for female and salary is more than 300 USD.
-pay tax 3%, for female and salary is in between 250 USD and 300 USD.
-Otherwise, no need to pay tax.

E.g:
Input gender: F
Input name: Dara
Input salary (USD): 280

=> Output: Hi Dara, based on your given information, the tax salary that you need to pay is: 8.4 USD.
