Programming Fundamentals

Lecture 05, 06 Choices and Decisions

Basic Constructs of an Algorithm

- Sequence
- Selection
- Iteration / repetition

Choices and Decisions

- To make a choice or decision we have to compare different values
- For example:
  - If traffic signal is red then stop the car
  - Here we are comparing the color of the signal and then making the decision of stopping the car

Comparing Data Values

- We can compare data values using some operators which are called "***Relational Operators*** "

< less than	**<=** less than or equal to
> greater than	**>=** greater than or equal to
== equal to	**!=** not equal to

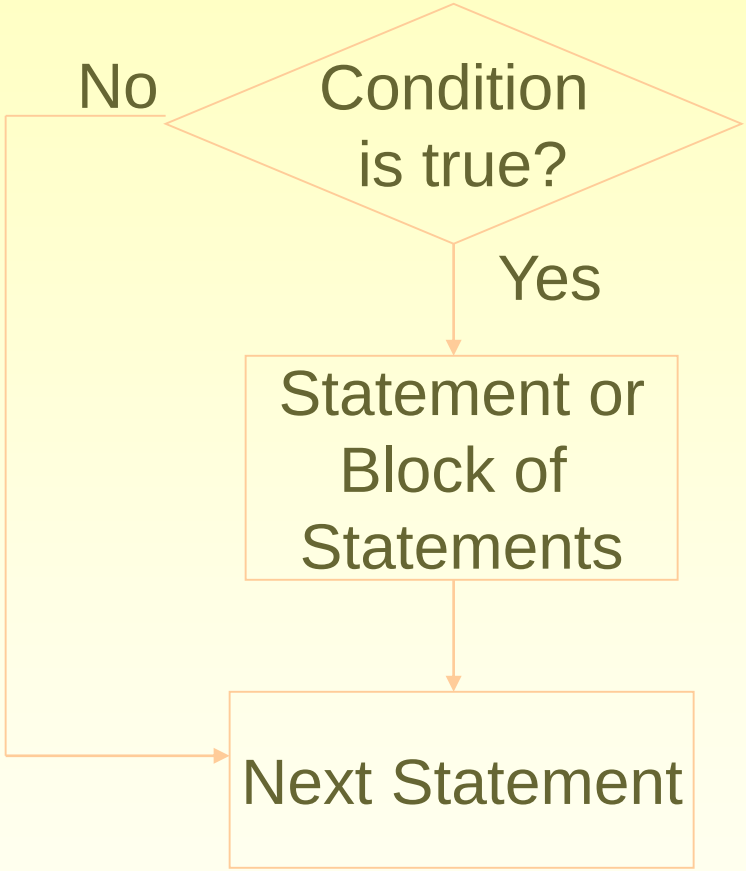
Comparing Data Values

- Each of these binary operators compare two values and in result produce **true** or **false**
- ***true*** and ***false*** are keywords in C++
- They are Boolean literals and their type is ***bool*** *(after George Bool- the father of boolean algebra)*
  - ***bool decision = i > j ;***

The *if* Statement

- In a basic if statement, a statement is executed and the condition is checked weather the result is true or false
- If the result is true then the block of statement(s) is executed otherwise it is not executed

The *if* Statement - Flow Chart



Exercise 01

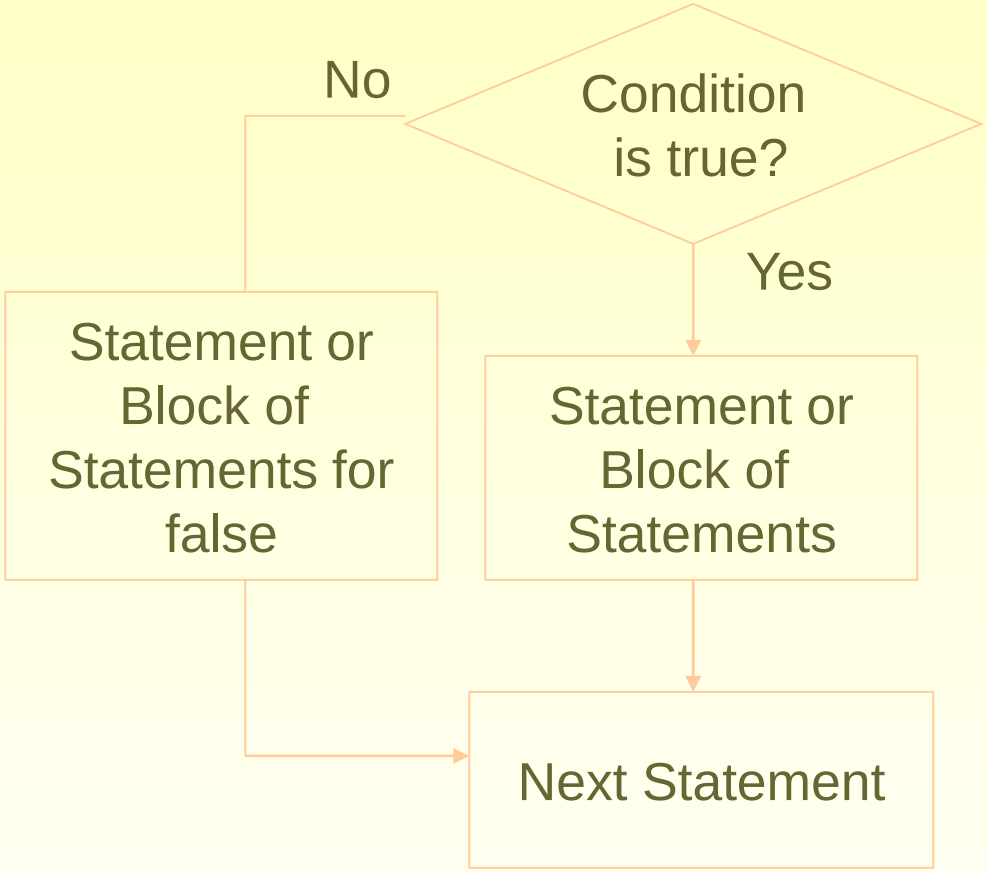
- Draw (1) **flow chart** and **(2)** write **program** that reads the marks of PF and ITC and tests whether marks in PF are greater than marks in ITC. If so display the marks of PF

The *if* Statement

- **If** – **else** statements
- Nested **if** statements
- Nested **if** – **else** statements

The Dangling Else Problem

The *if else* Statement



Exercise 02

- Draw **(1) flow chart** and write **(2) program** that reads the marks of PF & ITC and displays the greater of two

Nested *if* statements

- Statement that is to be executed when condition in an **if** statement is **true** can itself be an if statement
- The condition in the inner **if** is only tested if the condition for the outer **if** is true
- An **if** that is nested inside another can also contain a nested **if**
- We can continue nesting **if**s, one inside another to whatever level we want

Nested *if else* statements

- Like nested **if**, we can nest **if-else** statements within **if**s, **if**s within **if-else** statements, and of course, **if-else** statements within other **if-else** statement

Tasks

- Write a c++ program to check whether a given number enter by user is positive or negative.

Tasks

Write a c++ program to read the value of an integer m and display the value of n is 1 when m is larger than 0, 0 when m is 0 and -1 when m is less than 0.

Tasks

- Write a c++ program to accept a coordinate poi nt in a XY coordinate system and determine in which quadrant the coordinate point lies.