Problem Solving

FLOWCHART

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Chapter Description

- Aims
  - Describe what is meant by a program flow chart
  - Sketch and construct the symbols in flow chart
  - Apply the guidelines in drawing flow charts
  - Design the problem solving using flow charts
- Expected Outcomes
  - Use **flowchart** to develop the instruction for each module in the solution of a problem
- References
  - Sprankle, M., and Hubbard, J., (2012). Problem Solving and Programming Concepts : 9th Edition. Prentice Hall, 2012. ISBN : 0132492644

What is Flowchart?

***Flowchart* is a graphical (standard geometric symbols** and **connecting lines)**

Flowchart* is a *alternative method of representing algorithms

Easy to learn, intuitive method to know the flow of an algorithm

Why is Flowchart?

Know the flow & processing from the beginning to the end of a solution (in graphical)

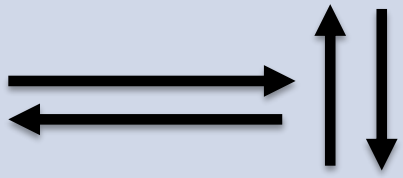
Shows the logic errors

A testing form of a set of data

Flowchart Symbols

FLOWLINES

Straight lines with arrows to show the direction of data flow



START/END/STOP/EXIT

Flattened ellipses indicate the start and the end of a module

PROCESSING

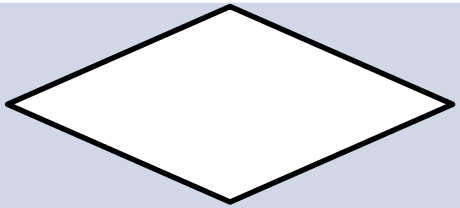
The rectangle shows a processing such as calculations etc.

I/O

The parallelogram shows input to and output from computer memory

DECISION

The diamond indicates a decision. It has one entrance and two exits from the block



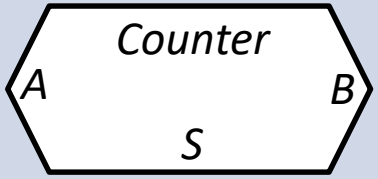
Flowchart Symbols

PROCESS MODULE

Rectangles with lines down each side shows the process of modules. One entrance & one only one exit

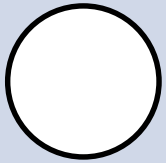
AUTOMATIC COUNTER LOOP

The polygon indicates a loop with a counter. The counter start with A, incremented by S until the counter is greater than B

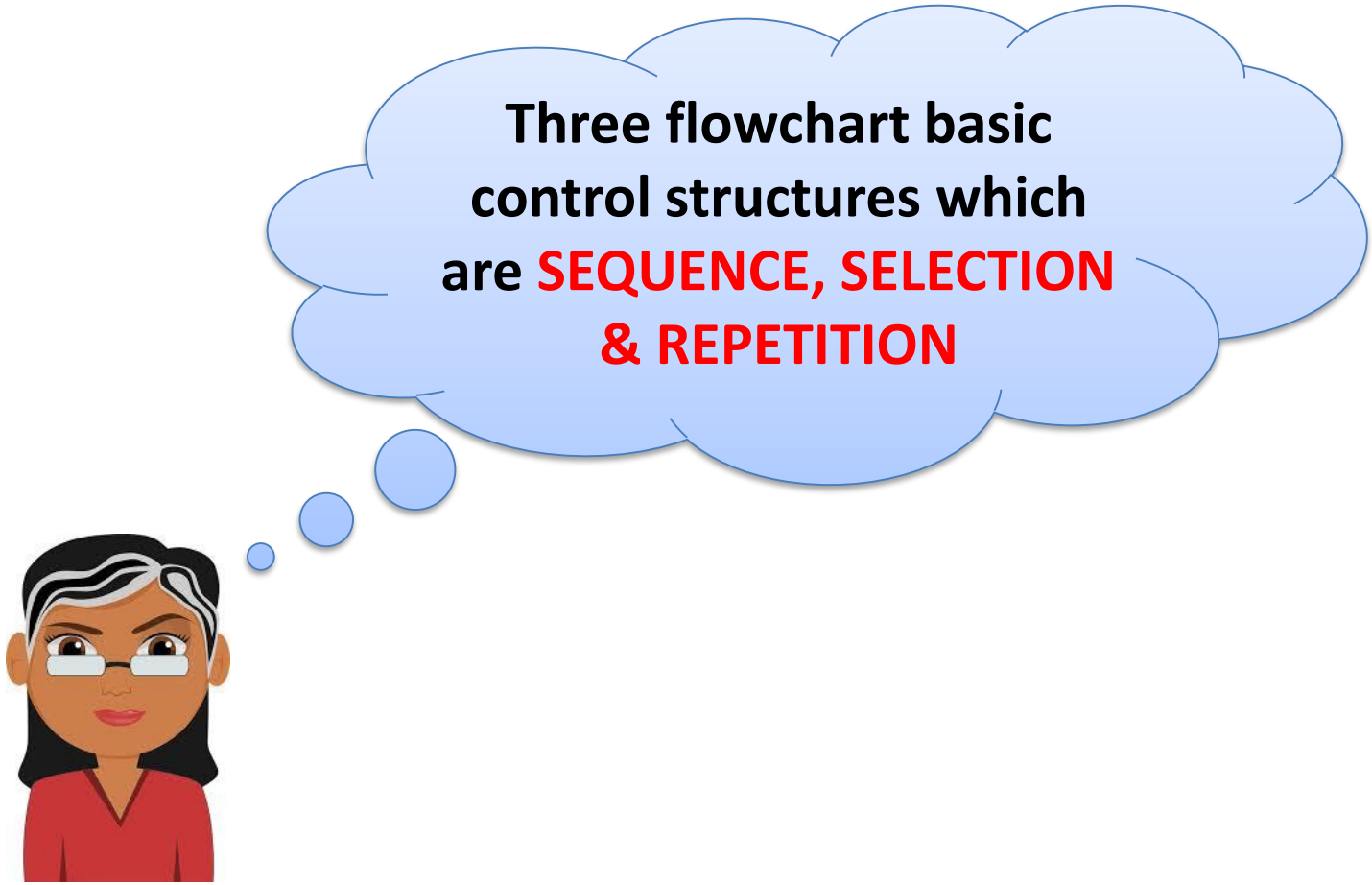


ONE PAGE CONNECTORS

The polygon indicates a loop with a counter. The counter start with A, incremented by S until the counter is greater than B



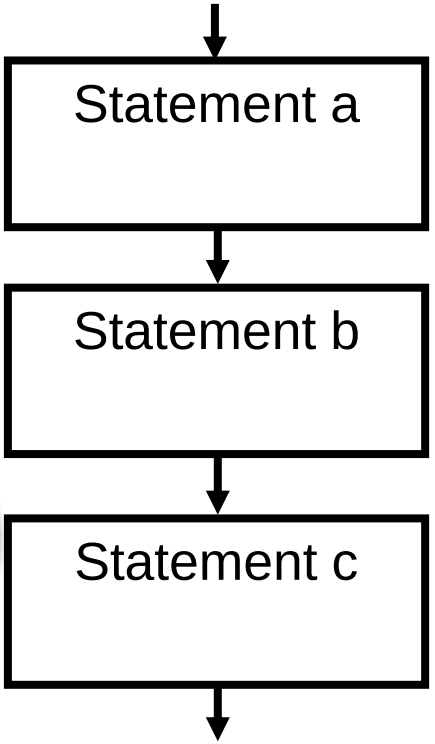
Flowchart Basic Control Structures



Flowchart - Sequence

Sequence is a straightforward execution (step by step)

Sequence used to represent basic computer operations (receive information, put out information, perform arithmetic and assign values)



Example: Flowchart - Sequence

Problem: Find volume of a box

Begin

Enter length

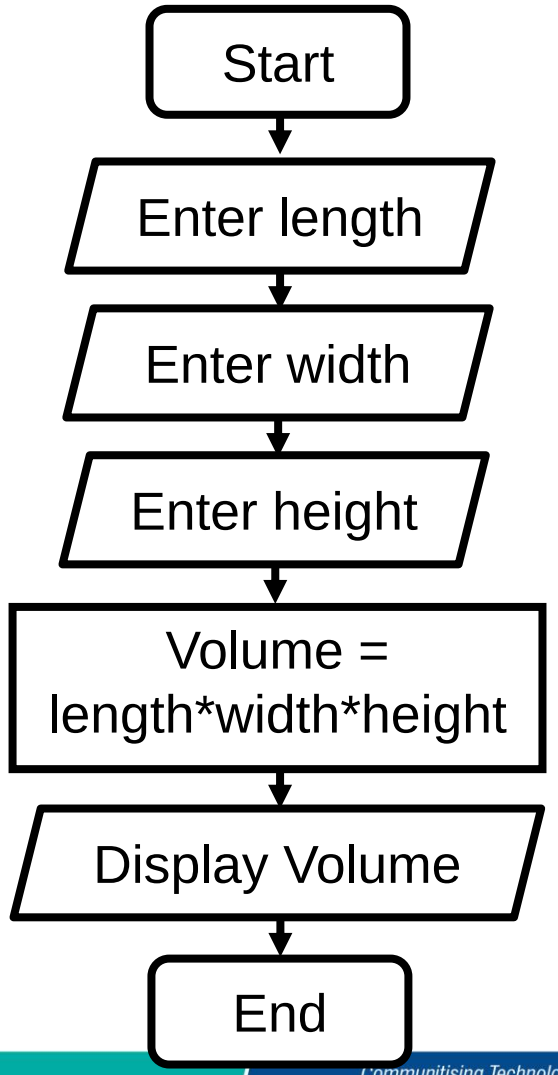
Enter width

Enter height

Volume = length * width * height

Display answer

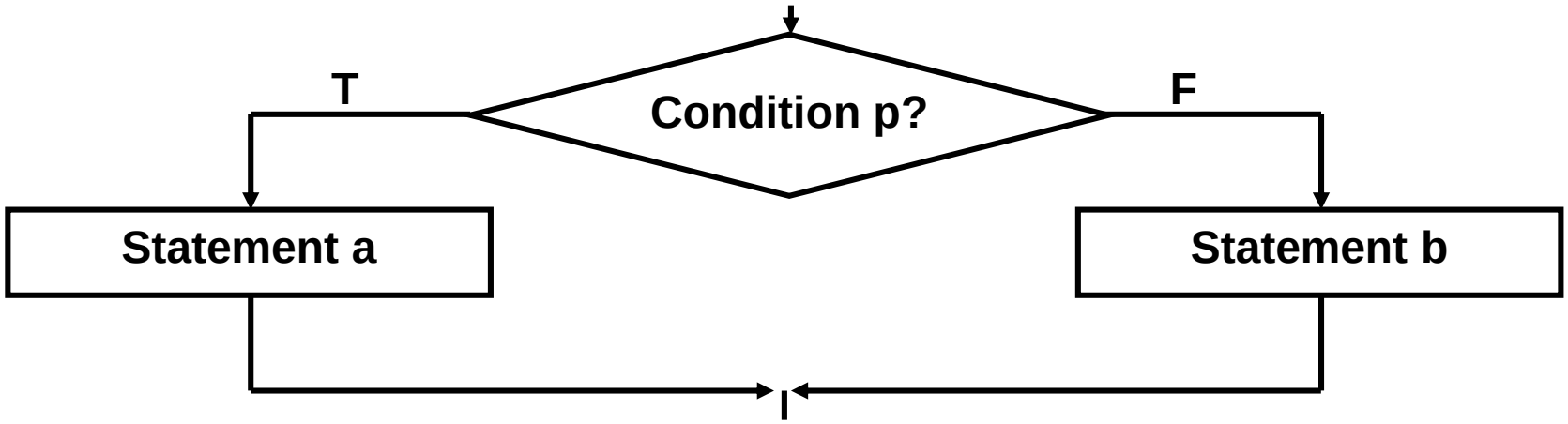
End



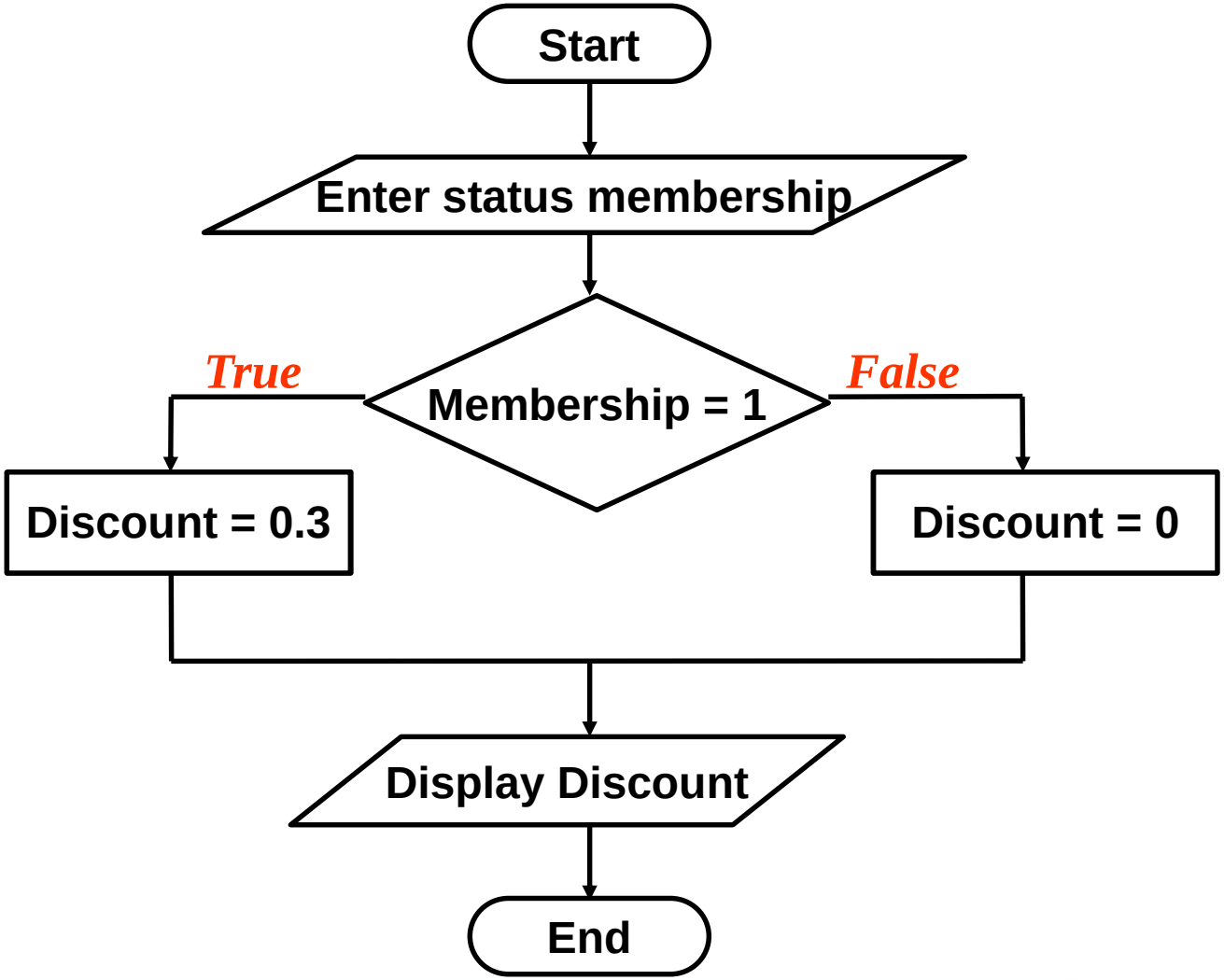
Flowchart - Selection

Selection is a presentation of a condition / decision-making abilities

Actions is depending on condition either true or false



Example 1: Flowchart - Selection



Example 2: Flowchart - Selection

Draw the flowchart to determine the price of ticket according to customer age:

> = 60 years old: RM6

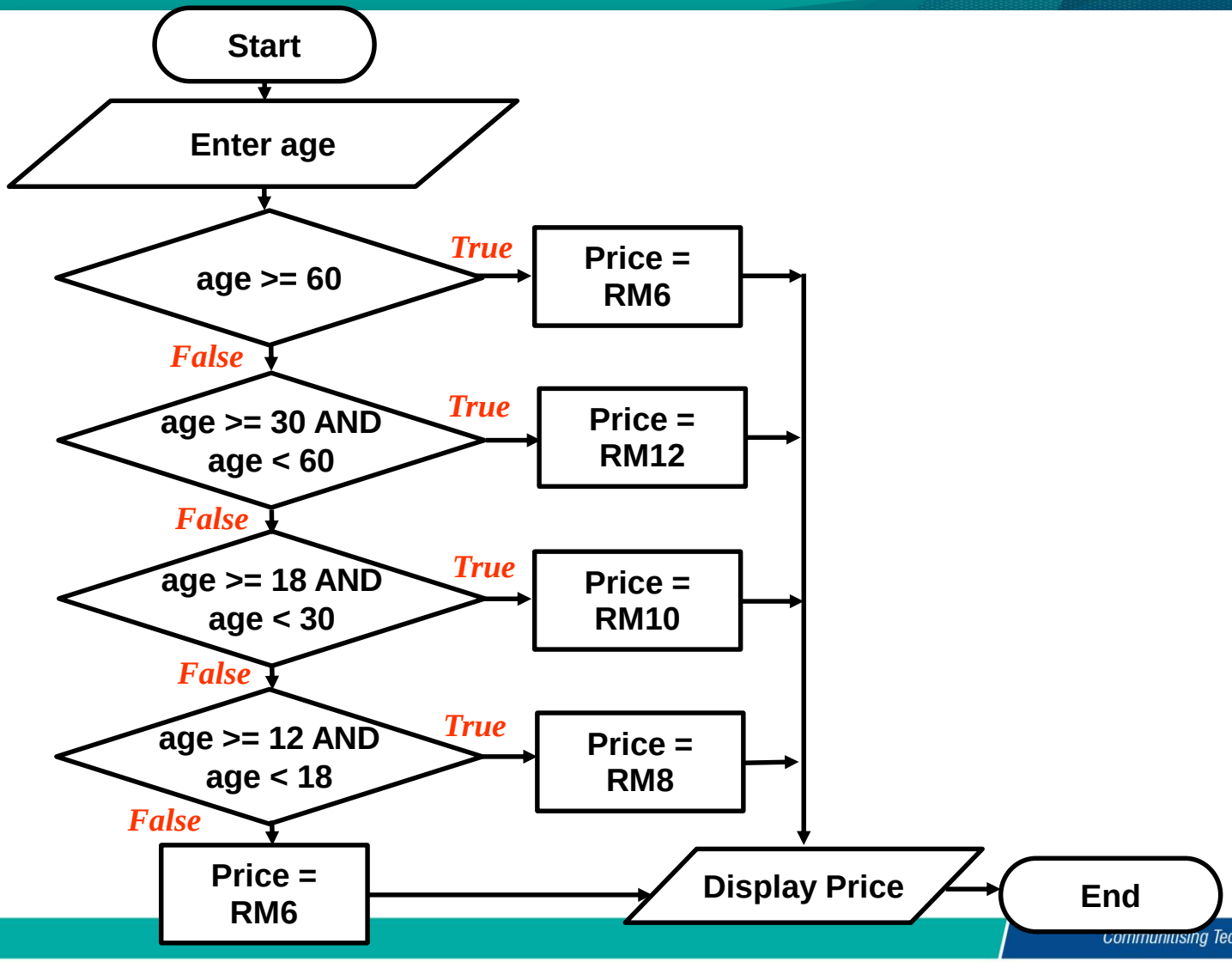
30 – 59 years old: RM12

18 – 29: RM10

12 – 17: RM8

Below 12: RM6

Example 2: Flowchart - Selection

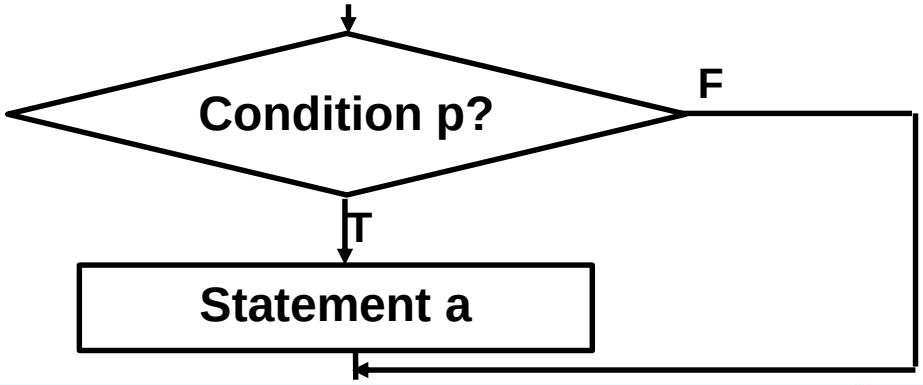


Flowchart - Selection

Used when a task is performed only condition true

Null ELSE construct has no processing in the false path

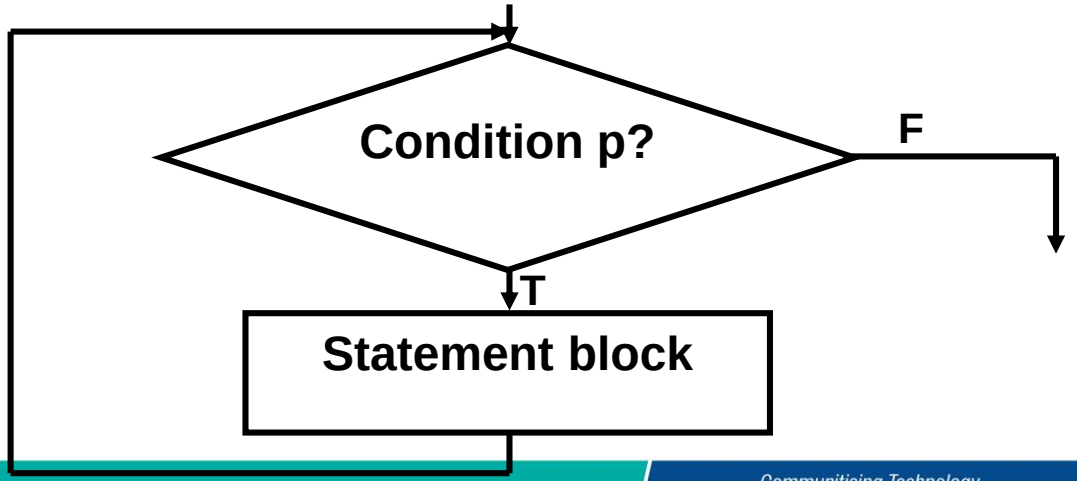
THE NULL ELSE STRUCTURE



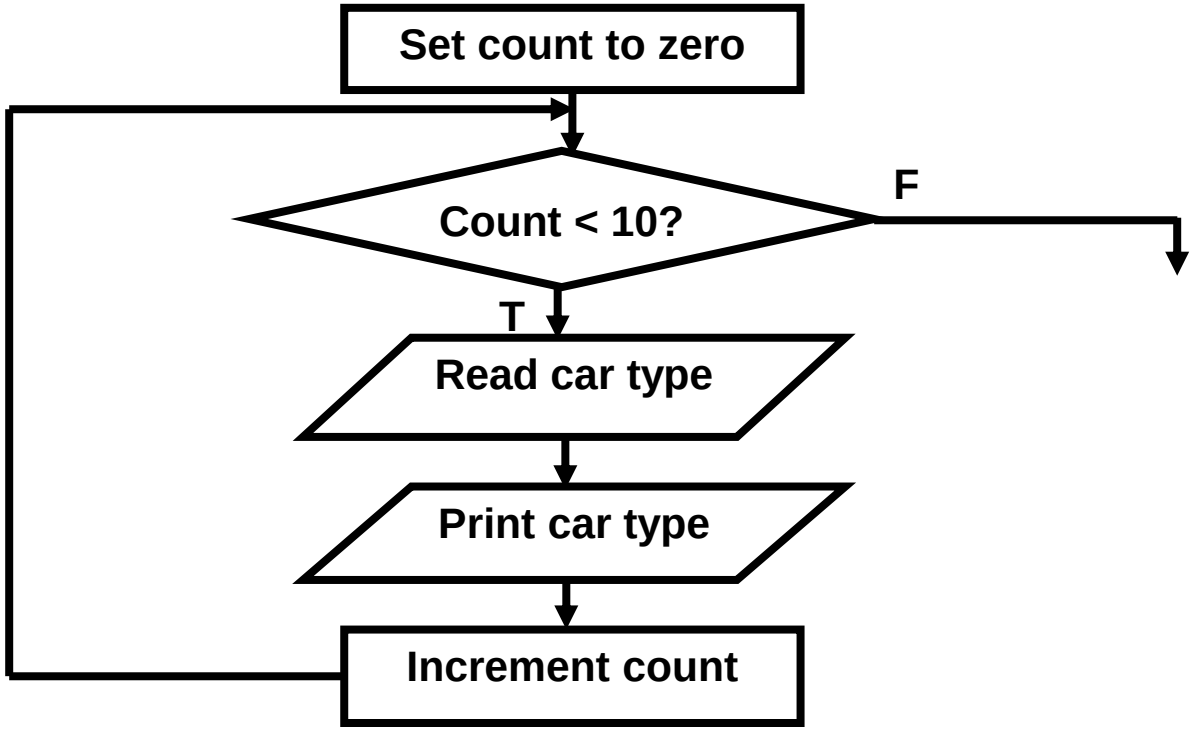
Flowchart - Repetition

Repetition is a set of instructions to be performed repeatedly, as long as a condition is **true**

When condition p is false, control will pass out of the repetition structure down the false path



Flowchart in 3 basic control structures



Test your understanding by answer Tutorial 5

Conclusion / What we have learn today?

- Flow chart function, symbols
- Flowchart Basic Control Structure (Sequential, Decision Repetition)

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