



Flowchart & Pseudocode

Asmaa Abd El-Nasser



Agenda

- Problem Solving
- What's Algorithms?
- Flowchart
- Pseudocode
- Examples



Problem Solving



Steps to solve problem:

- ✓ We first clearly define the problem.
- ✓ Break it into small tasks.
- ✓ Think of possible solutions.
- ✓ Select the one that we think is the best under the prevailing circumstances.
- ✓ Think how to apply that solution.



“%Score” Problem:

We need to calculate the percentage of student score,
How we can solve it?!



What's Algorithms?

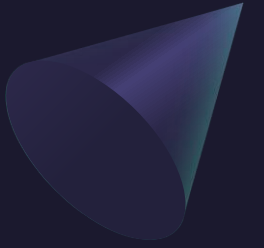
A sequence of steps for carrying out a task.

Qualities of Good Algorithms:

- ✓ Input and output should be defined precisely.
- ✓ Each step in the algorithm should be clear and unambiguous.
- ✓ Algorithms should be most effective among different many ways to solve a problem.
- ✓ An algorithm shouldn't include computer code. Instead, the algorithm should be written in such a way that it can be used in different programming languages.



Types of Control Structures



SEQUENCE

In the sequence structure, statements are placed one after the other and the execution takes place starting from up to down.

BRANCHING (SELECTION)

In branch control, there is a condition and according to a condition, a decision of either TRUE or FALSE is achieved

LOOP (REPETITION)

The Loop or Repetition allows a statement(s) to be executed repeatedly based on certain loop condition



“%Score” Algorithm:

1- start.

2- read student score and total score.

3- calculate the percentage of student score by:

$$p = \text{score} / \text{total} * 100.$$

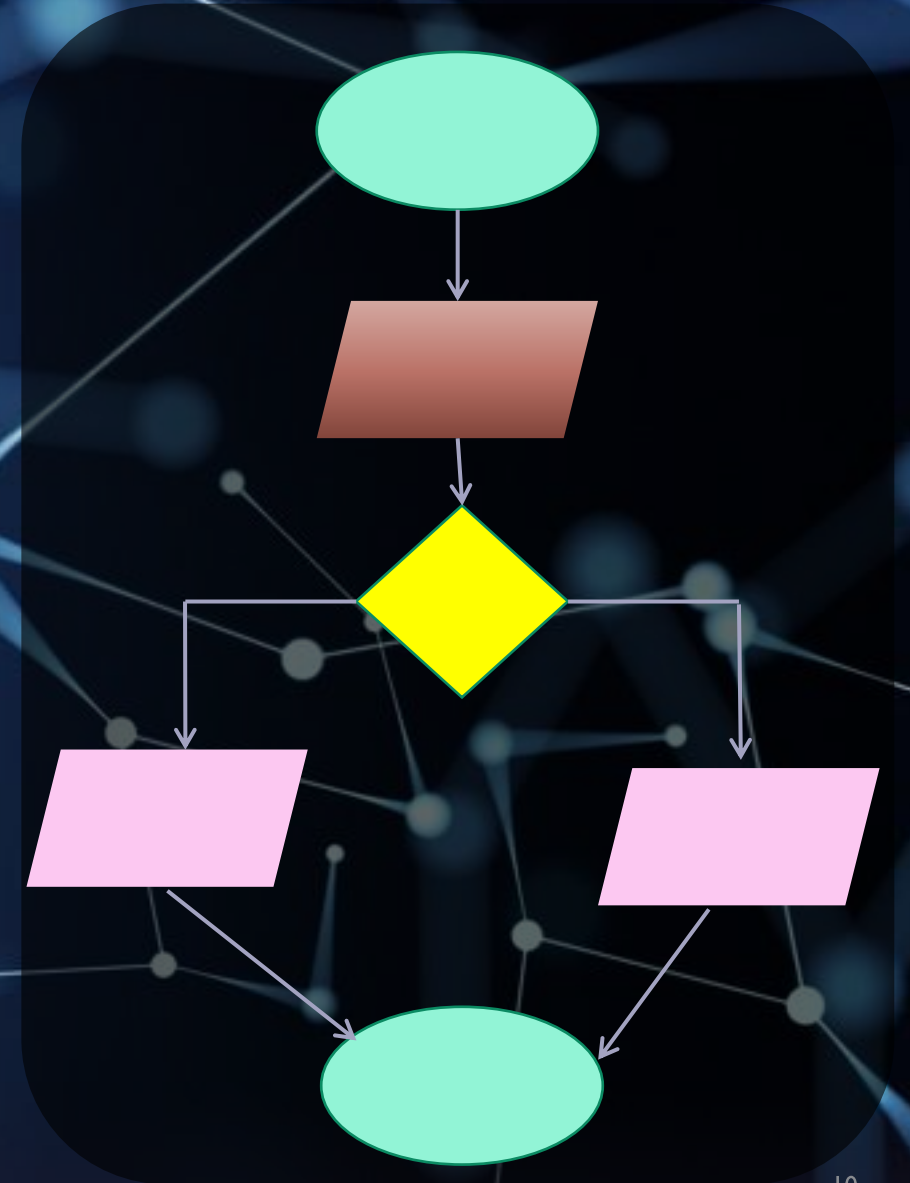
4- print the percentage of student score.

5-end.



Flowchart

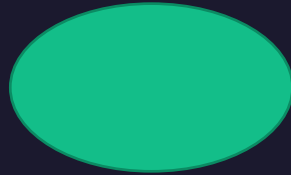
A graphical representation of a process (e.g., an algorithm)



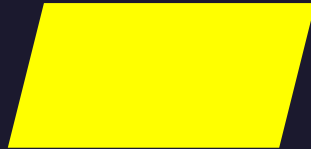
Flowchart Symbols



➤ Lines represent the flow of the sequence and direction of a process



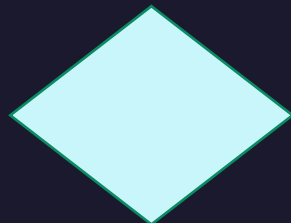
➤ Terminator symbol represents the starting or ending point of the system.



➤ Input or output operation.



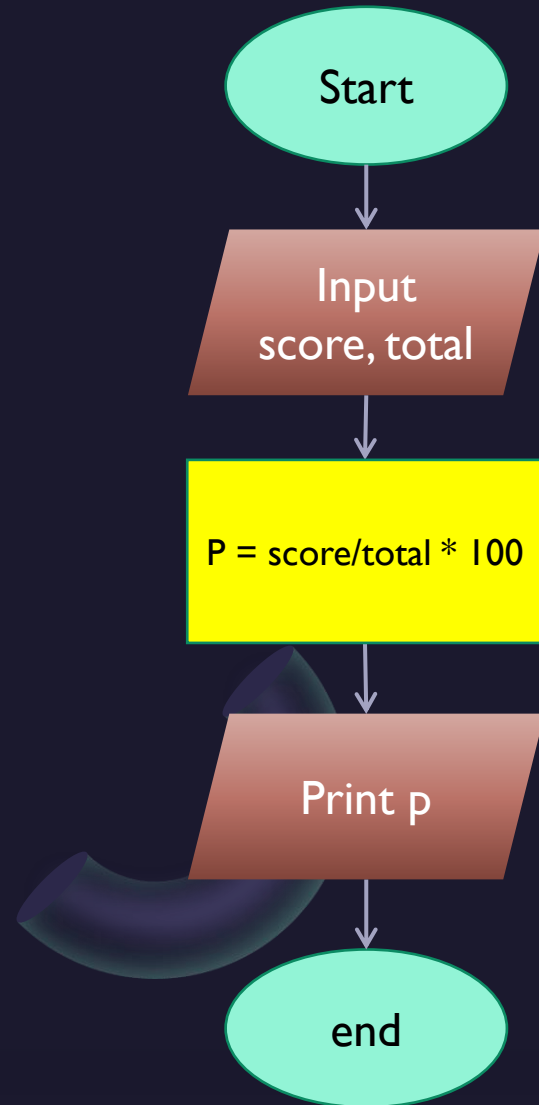
➤ Data or some step / process. (action).



➤ Decision or branching point.



“%Score” Flowchart:



Pseudocode

The way of expressing a program or code so that it could be easily understood by programmers of every programming languages out there. It represents the algorithm of the program in natural language and mathematical notations (Print ,While , IF then , Else)

“%Score” Pseudocode:

1- Begin.

2- numeric score, total, p.

3- input score, total.

3- $p = \text{score} / \text{total} * 100.$

4- print p.

5-end.





Let's Practice

Λ Λ
—



Examples:

- ❑ Check if input number is odd or not.
- ❑ Take 3 degrees of subjects then calculate the average, if the average is greater than 50 print "success" otherwise, print "you failed".
- ❑ Write a program that allows users to calculate the area of a rectangle (and checking if the width and height are greater than zero).
- ❑ print all number between 1 and 10



Lab Assignment

- ❑ Write a program that allows users to take a temperature in Celsius then converted to Fahrenheit.
- ❑ Print all even numbers between 1 to 50.
- ❑ Division of 2 numbers and checking if the denominator equals to zero otherwise repeat.
- ❑ Write a program that allows users to swap two numbers (bonus).

Websites to practice:

- <https://app.diagrams.net/>
- <https://www.lucidchart.com/pages/>

Thank You

AsmaaAbdElNasserGad@gmail.com

