Chapter1

Contents: Values can't be changed. (هي القيمة التي لا تتكرر)

Variables: storage locations are given name. (هي مكان بالذاكرة يغطى اسم)

Rules for Naming and Using Variables:

1. Name a variable according to what it represents.

   (1. قم بتسمية متغير وفقًا لما يمثله)

2. Do not use spaces.

   (ان لا يحمل مسافة)

3. Start a variable name with a letter.

   (البداية بالأحرف)

4. Do not use a dash or any other symbol that is used as a mathematical operator.

   (عدم استعمال العلاقات الرياضية)

5. Consistent usage of variable name.

   (الاستخدام المتسق لاسم المتغير)

6. Consistent use of upper, lowercase characters in variable names

   (استخدام الاحرف الكبيرة والاحرف الصغيرة)

7. Use naming convention specified by your company

   (استخدم اصطلاح التسمية المحدد من قبل شركتك)

Math Operators:

Operator	Computer Symbol	Example	
Mathematical		Operation	Resultant
Addition	+	3.0 + 5.2	8.2
Subtraction	–	7.5 – 4.0	3.5
Multiplication	*	8.0 * 5.0	40.0
Division	/	9.0/4.0	2.25
Integer division	\	9\4	2
Modulo division	MOD	9 MOD 4	1
Power	^	3 ^ 2	9
Relational			
Equal to	=	5 = 7	*False*
Less than	<	5 < 7	*True*
Greater than	>	5 > 7	*False*
Less than or equal to	<= (two key strokes)	5 <= 7	*True*
Greater than or equal to	>= (two key strokes)	5 >= 7	*False*
Not equal to	<> (two key strokes)	5 <> 7	*True*
Logical			
Not	NOT	NOT *True*	*False*
And	AND	*True* AND *True*	*True*
Or	OR	*True* OR *False*	*True*

Chapter 2

Problem Solving:

1. Identify the problem.
2. Understand the problem.
3. Identify alternative ways to solve problem.
4. Select best alternative.
5. List solution steps for alternative chosen.
6. Evaluate solution.

Type of problem:

Algorithm solution: step by step to solution. (تعتمد على ترتيب الخطوات)

Heuristic solution: Depends on past experiences. (تعتمد على الخبرات السابقة)

Combination: algorithm and heuristic.

Tools to Solve Problems on the Computer:

- **Problem Analysis Chart (PAC):** shows a beginning analysis of the problem;
- **Structure chart (interactivity chart):** shows the overall layout or structure of the solution;
- **IPO chart:** shows the input, the processing, and the output;
- **Algorithms:** show the sequence of instructions comprising the solution;
- **Flowcharts:** graphic representations of the algorithms
- P**seudocode:** which represents a language like solution.

Difficulties with Problem Solving:

- Lack of problem-solving experience
- Inadequate solution steps
- Incorrect problem definition
- Alternatives chosen incorrectly
- Invalid logic
- Incorrect solution evaluation

Chapter3

Flowchart:

- The steps to be taken to solve a problem.

  (الخطوات الواجب اتخاذها لحل مشكلة ما)
- The order or the sequence of these steps.

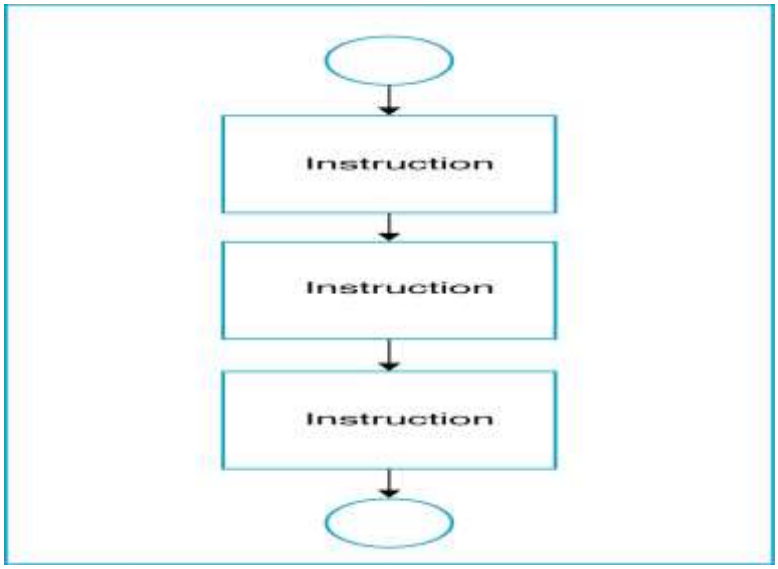
  (ترتيب أو تسلسل هذه الخطوات)

Symbol	Description
	TERMINAL - To start or end a flowchart
	INPUT / OUTPUT - Used with Read, Input, Print and other I/O commands.
	PROCESSING - Used for operations done inside the computer. Such as calculations, storing and moving of data.
	DECISION - Used to ask a question in programming. Questions are Yes/No format (Used with the If Statement).
	DIRECTION FLOW - Used to connect symbols and to represent the direction of flow. Lines should not cross each other. Arrowheads should be placed at the end close to the symbol.
	Connector - or joining of two parts of program in the same page

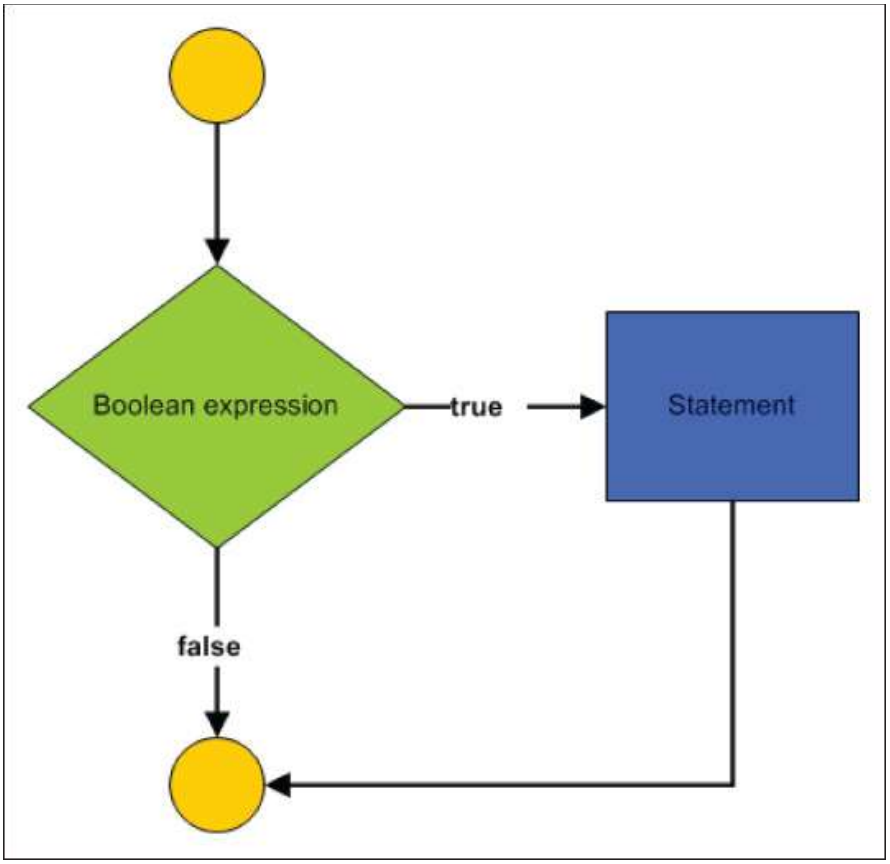
Symbol	Description
	Of PAGE CONNECTOR-Connection of flowchart from page to page.
	PROCESS OF MODULES- Rectangles with lines down each side indicate the process of modules. They have one entrance and only one exit.
	AUTOMATIC-COUNTER LOOP - The polygon indicates a loop with a counter. The counter starts with A (the beginning value) and is incremented by S (the incrementor value) until the counter is greater than B (the ending value). Counter is a variable. A, B, and S may be constants, variables, or expressions.

Control Structures:

- **Sequence** – follow instructions from one line to the next without skipping over any lines.



- **Decision** (Repetition)- if the answer to a question is “Yes” then one group of instructions is executed. If the answer is “No,” then another is executed.

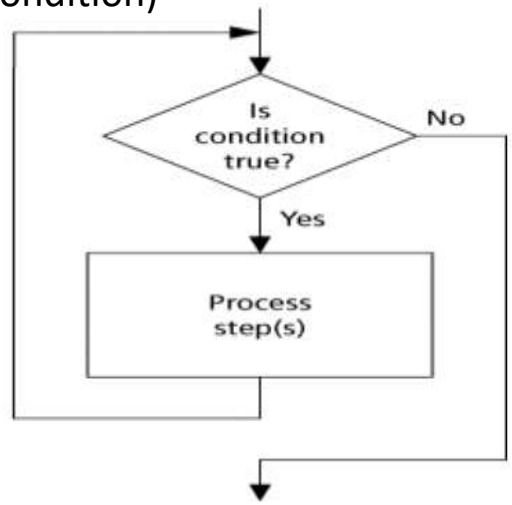


- **Looping (**Repetition**)** – a series of instructions are executed over and over.

Loop types:

1) While loop (this has a continues condition)
أي يملك شرط لإيقاف عملية التكرار.

Pseudocode:
Repeat while (condition)
Statement
End



2) Do while loop (this has a stopped condition)
أي ان الشرط للتوقف ويتم عمل التكرار مرة واحدة على الأقل

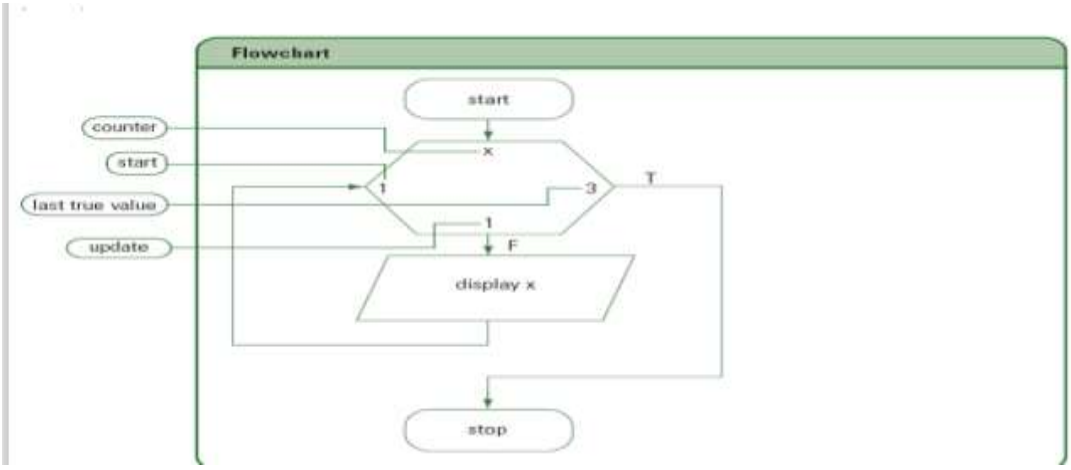
Pseudocode:
Do
Statement

While(condition)

3) For loop (this has a counter)
يحتوي على عداد

Pseudocode:
Repeat for x = 1 to 3
Display x

End



Chapter4

Global variable: are defined outside of the individual modules.

Local variable: are defined within a module.

Parameters: are local variables that are passed or sent from one module to another.

Chapter5

Array: an array is a data structure that consists of multiple sub-units,

each of which is of the same type.

Type of array:

One dimensional array: Single or One Dimensional array is used to represent and store data in a linear form.

Melty dimensional array:

Myarray [] = {} → طريقة كتابة المصفوفة برمجياً

ملاحظة : هناك طرق لكتابة الخوارزميات تكمن في معرفة البداية و النهاية لاي خوارزمية سواء التكرار او الشرط او غيرها اما المصفوفة فلها هيكلية معينة في الذاكرة ة هي موجودة في الصفحة ال5 في ملف المصفوفة