

COMPUTER GUIDE



STUDENT BOOK



⇒ **Unit 1:**

<i>Chapter 1: Problem Solving.....</i>	<i>3</i>
<i>Chapter 2: Programming& Computer Memory.....</i>	<i>27</i>
<i>Chapter 3: Control</i>	<i>37</i>
<i>Chapter 4: Code Window</i>	<i>57</i>
<i>General Revisoin.....</i>	<i>67</i>

⇒ **Unit 2:**

<i>Chapter 1: Data</i>	<i>81</i>
<i>Chapter 2: Branching</i>	<i>101</i>
<i>Chapter 3: Loop& Timer.....</i>	<i>111</i>
<i>General Revision</i>	<i>134</i>

1 UNIT Chapter One



Problem Solving >>



General

Problem: is an objective or goal that we want to attain.

Problem Solving: The objective or the specific output that we want to attain through a sequence of steps, activities and specific input.



Problem Solving Stages

⇒ **First: Problem Definition:**

Identification or “define” of required outputs, available inputs, arithmetic and logical operations to be executed.

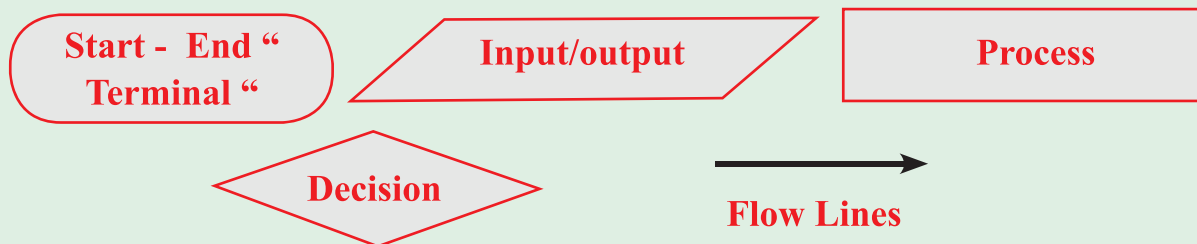
⇒ **Second: Algorithm:**

Logically arranged procedures to be executed to attain a goal or precise output of specific inputs. In other words it's performing step by step instructions to solve a Problem.

The diagram that uses standard graphical symbols to illustrate the sequence of steps required for solving a problems called flowchart.



The most commonly flowchart symbols are:



The advantages for the flowchart:

- a.** Facilitate the programmer writing program.
- b.** Useful in explaining the program to others.
- c.** Provide better documentation for the program.

⇒ **Third: Program design**

We have to translate this flowchart into one of the programming languages.

⇒ **Fourth: Program Testing**

During writing a program may be we make some mistakes; e.g. writing a minus

Chapter One: Problem Solving

sign (-) instead of (+). We can't detect errors unless we begin entering data to the program with previously known results; to compares the results of the current program to those of the well-known results; So we check the errors and debug them.

⇒ **So, testing program, use data with results known before and correcting error.**

⇒ **Fifth: Program Documentation**

All steps taken for solving the problem that include:

1. Given Input.
2. Output.
3. Plan for solving the problem drawn flowchart.
4. Programming language used for coding and instructions date.
5. People who contribute to the program development process.

⇒ **Documentation well be beneficial when more than one person participate in writing or modifying the program.**

I Simple Flowchart

Exercise



Draw flowchart to read two numbers and print the sum

⇒ **First: Define the problem**

Output : The sum of two numbers

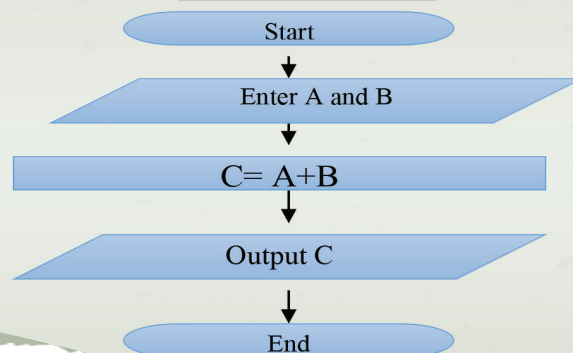
Input : The first number is " A " and second is " B "

Solution : $C = A + B$

⇒ **Second: Algorithm**

1. Start
2. Enter number A and B
3. Using equation $C = A + B$
4. Print C
5. End

Third : Flowchart



Remarks:

- 1- Left side of any equation "C" should contain only one variable; the value of this variable will be the (output) BUT.
- 2- The right side of the equation "A+B" may contain values or arithmetic expressions that have one or more variables (inputs). Variable means: data that can be changed.
- 3- The equation $C = A + B$ means: sum of value A and value B then put the result in value C.

2 Exercise

Draw flowchart to compute the average and product of three numbers.

⇒ **First: Define the problem**

Output : The average of three numbers

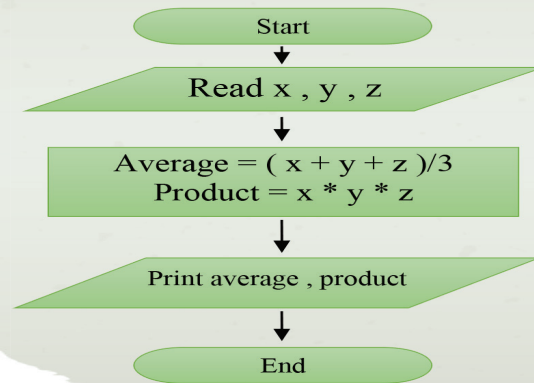
Input : First number is " X " second is " Y ",and third is " Z"

Solution: Average = $(x+y+z)/3$, Product = $x*y*z$

⇒ **Second: Algorithm**

- 1- Start
- 2- Read value of x, y, z
- 3- Average = $(x+y+z)/3$,
Product = $x*y*z$
- 4- Print average and product
- 5-End

Third : Flowchart



3 Exercise

Solving the first degree equation $Y = 3x+2$

⇒ **First: Define the problem**

Output : The value of " Y "

Input : Input " X "

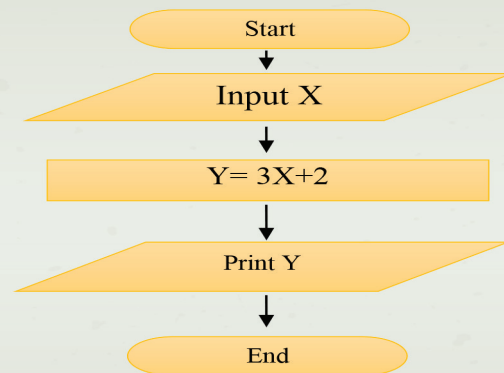
Solution: Compute the value of " Y "

from the equation $Y=3x+2$

⇒ **Second: Algorithm**

- 1- Start
- 2- Inter value " X "
- 3- Calculate $Y=3x+2$
- 4- Output value " Y "
- 5-End

Third : Flowchart



1

Activity

Compute the area and the perimeter of a rectangle, the equation is: $\text{Area} = L * W$, $\text{Perimeter} = 2 * (L + W)$.

⇒ **First: Define the problem**

Output : The value of " Area ", " Perimeter "

Input : Input " Length ", " Width "

Solution: Compute the $\text{Area} = L * W$,

$\text{Perimeter} = 2(L + W)$

⇒ **Second: Algorithm**

1- Start

2- Inter value " Length " and Width

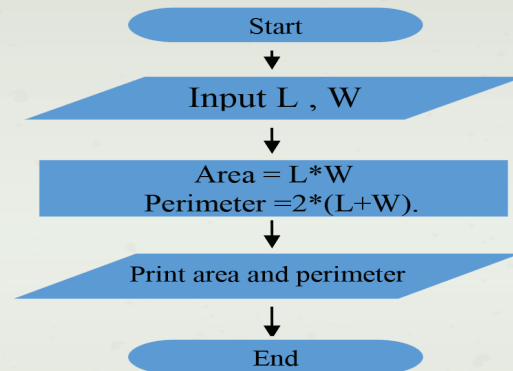
3- Calculate $\text{Area} = L * W$,

$\text{Perimeter} = 2(L + W)$

4- Output value " Area ", " Perimeter "

5- End

Third: Flowchart



2

Activity

Calculate the area of a circle whose radius "R" is known, the equation of the area is: $\text{Area} = 3.14 * R * R$.

⇒ **First: Define the problem**

Output : The value of " Y "

Input : Input " X "

Solution: Compute the value of " Y "

from the equation $Y = 3x + 2$

⇒ **Second: Algorithm**

1- Start

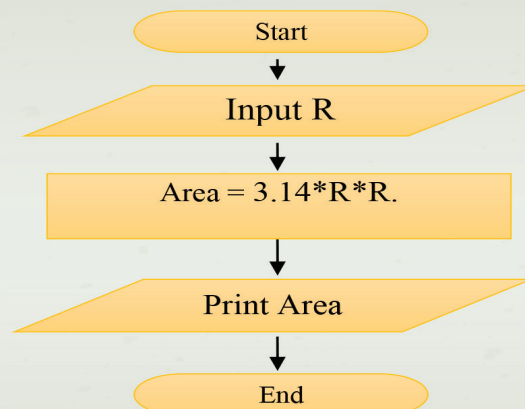
2- Inter value " X "

3- Calculate $Y = 3x + 2$

4- Output value " Y "

5- End

Third: Flowchart



3
Activity

Calculate the number of years, bearing in mind that the number of months is known.

⇒ **First: Define the problem**

Output : The number of years

Input : Input the number of month

Solution: Compute the number of year =
number of month / 12

⇒ **Second: Algorithm**

1- Start

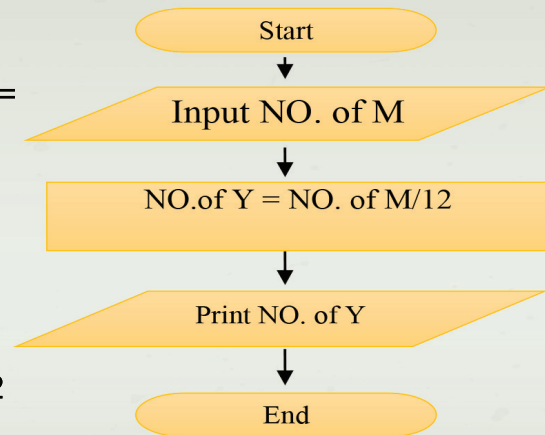
2-Enter number of month

3-Calculate the
number of year = number of month / 12

4-Output number of year

5-End

Third : Flowchart

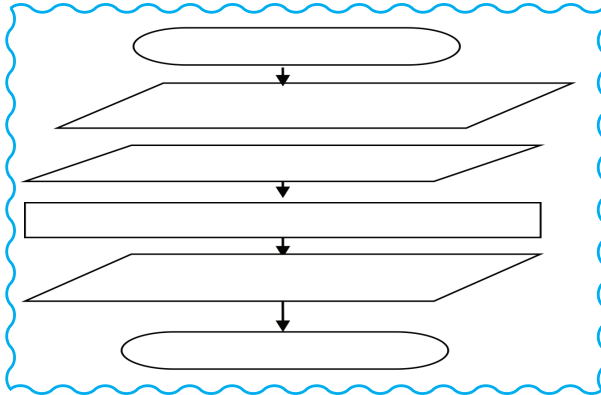


Book Questions

Question 1: Put (✓) or (X):

1. Flowcharts use symbols and lines with arrows to represent an Algorithm. ()
2. You can use any Geometric shape to represent Algorithms when drawing flowcharts. ()
3. Flowcharts can be drawn using software only and can't be drawn on paper. ()
4. The rectangle symbol represents only one processing operation. ()
5. The flow of steps will always be from top to bottom or from left to right. ()
6. Two paths (lines) should come out from the diamond.symbol. ()
7. The line with an arrow (flow line) should be from left to right or from top to bottom. ()
- 8.8. The (Algorithm) is the first stage of Problem Solving. ()

⇒ Complete the following flowchart to read two numbers



Algorithm

- 1- Read N1
- 2- Read N2
- 3- Result $N1+N2$
- 4- Print Result
- 5- End

Question 3:

Complete the following flowchart and write the algorithm to input two numbers and print the sum:

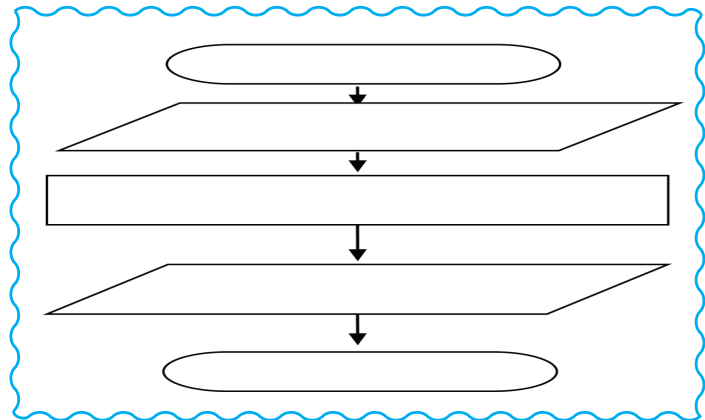
Algorithm

.....

.....

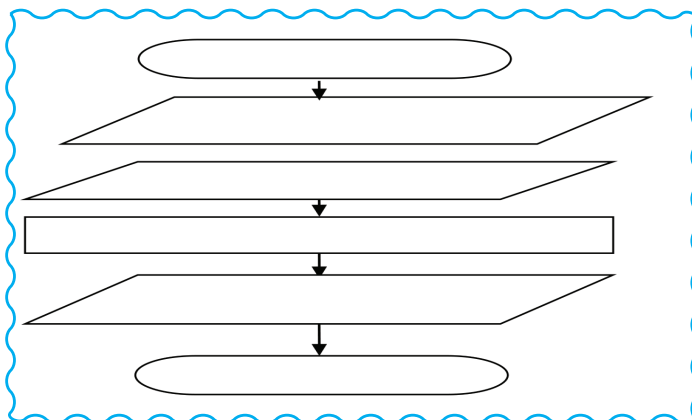
.....

.....



Question 4:

Complete the following flowchart to input two numbers and print the multiplication:



Algorithm

- 1- Read N1
- 2- Read N2
- 2- Result $N1 \times N2$
- 3- Print Result
- 4- End

Test yourself

Question 1: Choose the correct answer:

- The Flowchart for resolving the problem of printing the numbers from 1 to 11 contain
a- Sequential b-Branching c- Looping
- View steps to resolve the problem of agreed forms of geometry called
a- Flowchart b- Algorithm c- Interface
- Means a store the computer memory that has a certain title and its value changes during program.
a- Assignment Statement b-Variable c-Algorithm)
- The last step of problem solving program
a- Design b- Testing c- Documentation
- The first step in problem solving is Dakahlia 2013.
a-Flowchart b- Algorithm c- Problem definition

Question 6: Put (√) or (X):

- The flow of steps in flowcharts is always from bottom to top. ()
- The Flow line should be from top to bottom or from left to right. ()
- In the formula $C = A + B$; C represents a variable. ()
- Testing program and correcting errors is the last stage of solving the problem. ()
- Any geometric shape can be used to represent the solution steps in flowcharts. ()

II-Branching “Decision “Flowchart “

Remarks:

- 1- Problems may contain decision point means the answer may be YES or NO
So the result depend on these decision points.
- 2- The decision flowchart has two branches each one represent one of possible answer

4 Exercise

Draw the flowchart for program that well obtain exam scores from the user. weather the score is $\geq 50\%$ the message will display “ناجح”

⇒ **First: Define the problem**

Output : Print the word ناجح

Input : Input the score X

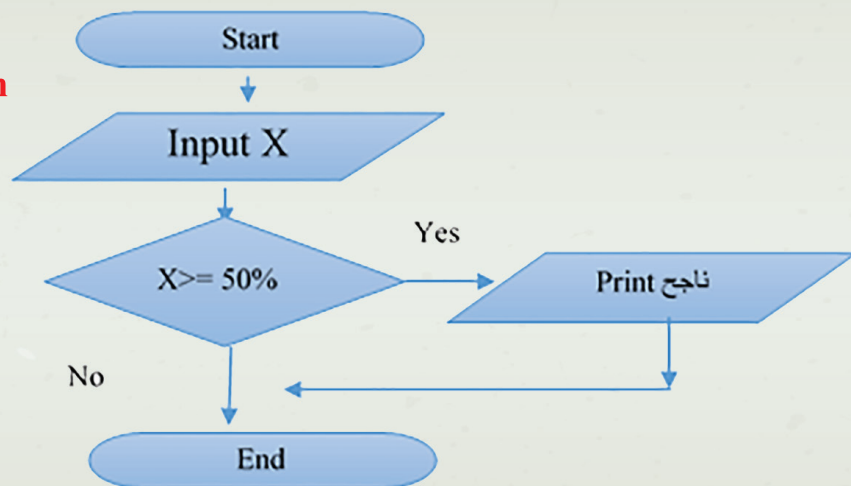
Solution: If the score $\geq 50\%$ the word ناجح

will be printed

⇒ **Second: Algorithm**

- 1- Start
- 2- Inter the value X
- 3- If $X \geq 50\%$
 - 3-1— Print ناجح
- 4- End

Third Flowchart



Explanatory Program “Not for studying “

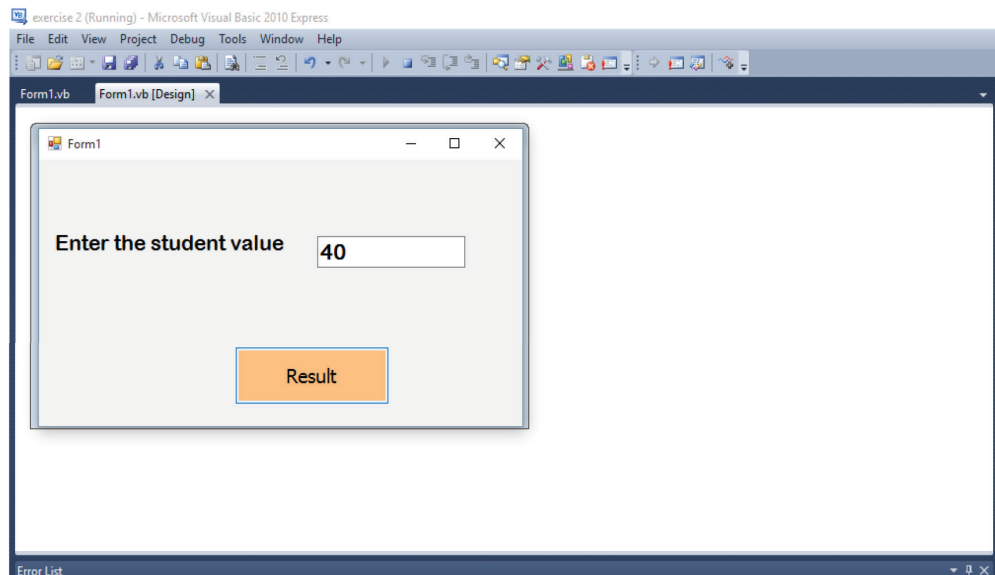
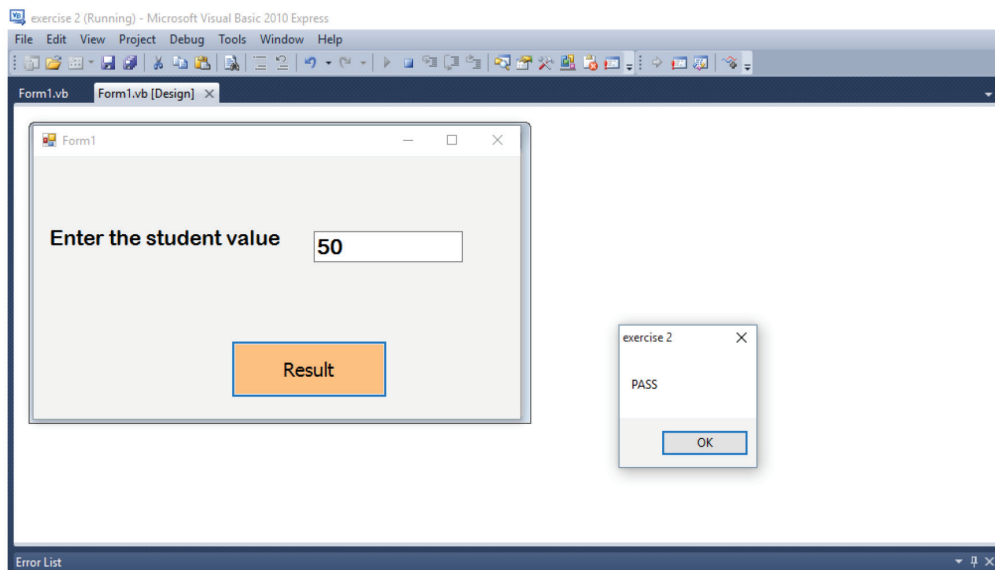
Remarks:

The following program illustrate the previous flowchart:

A – If we enter value equal or greater than 50% the result is “ PASS “

B- If we enter value less than 50% nothing happened.

C- The high score is 100



Chapter One: Problem Solving

5 Exercise

Draw the flowchart for program that will calculate the result of two numbers and IF the divisor is equal zero, display message "غير معرف"

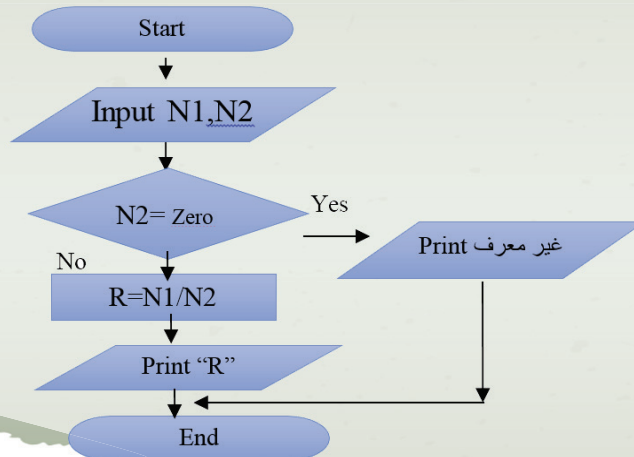
⇒ First: Define the problem

Output : Print the result of dividing two numbers "R" or print the word "غير معرف". Input: The dividend is "num1", and the divisor is "num2".

Solution: If num2=0 then print "غير معرف", otherwise print the result of the division "R".

⇒ Second: Algorithm

- 1- Start
- 2- Enter the dividend num1
- 3- Enter the divisor num2
- 4- If num2 =0 then
 - 4-1 Print غير معرف
 - 4-2 Go to step 7
- 5- $R = \text{num1} / \text{num2}$
- 6- Print R
- 7- End



6 Exercise

Draw the flowchart for program that obtain a number from the user, determine the number type (even or odd) and print the result.

⇒ First: Define the problem

Output : Print the number type (even or odd)

Input : Input number N

Solution: The even number determined if the number divisible by 2 without remainder otherwise the number is odd

⇒ Second: Algorithm

- 1 Start
- 2 Enter N
- 3 If N is divisible by 2 without remainder then
 - 3-1 Print الرقم زوجي
- 4 Else
 - 4-1 Print الرقم فردي
- 5 End

