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Flow-Chart Components

1- What is a Flowchart?

Flowchart is a graphical representation of an algorithm. Programmers often use it as a program-planning tool to solve a problem. It makes use of symbols which are connected among them to indicate the flow of information and processing.
The process of drawing a flowchart for an algorithm is known as “flowcharting”.

2-we have 5 main components.

1-Terminal: The oval symbol indicates Start, Stop and Halt in a program’s logic flow.

2-Input/Output: A parallelogram denotes any function of input/output type.

3-Processing: A box represents arithmetic instructions. All arithmetic processes such as adding, subtracting, multiplication and division are indicated by action or process symbol.

4-Decision: Diamond symbol represents a decision point. Decision based operations such as yes/no question or true/false are indicated by diamond in flowchart.

5-Connectors: Whenever flowchart becomes complex or it spreads over more than one page, it is useful to use connectors to avoid any confusions. It is represented by a circle.

Terminal

We must draw terminal symbol in every flow-Chart twice.

1-First time at first of our program with “Start.”

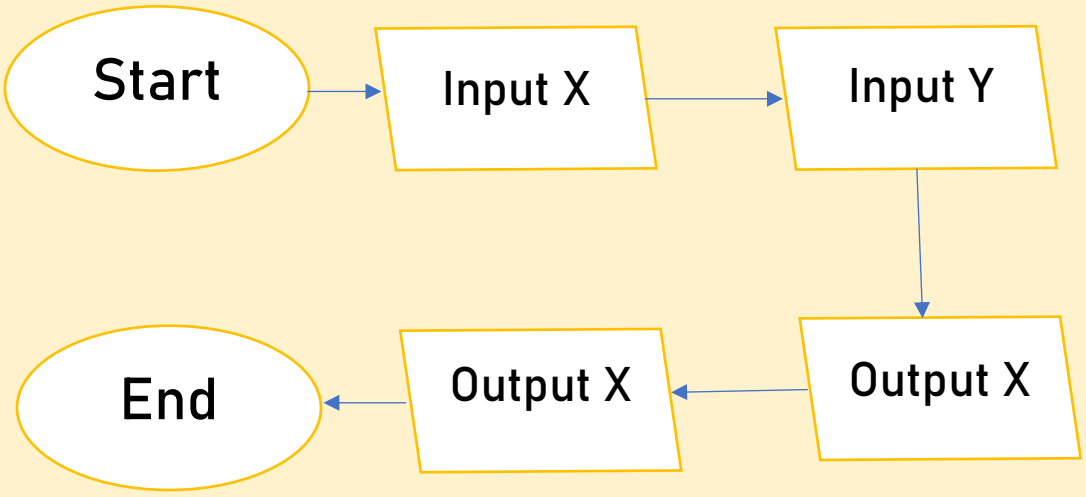
Its mean my code/flow chart / algorithm starts from here.

2- second time at end of our program with “End.”

Its mean my code/flow chart / algorithm ends here.

Input/Output

Each time we need to input/output data we draw parallelogram.
So, if I have variable X and Y and I need to input X and Y and print those variables.



Processing

we use rectangle to make a process like assign / sum / sub / multiplication / division.
Just you write the process/arithmetic operation.

If I need assign X with Y its mean X will equal Y (X = Y)

```
X = Y
```

If I need increase X by 8 (X = X+8)

```
X = X + 8
```

I need to make a variable Sum that takes X + Y value.

```
Sum = X + Y
```

if I need the mod of X % Y

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D = X % Y
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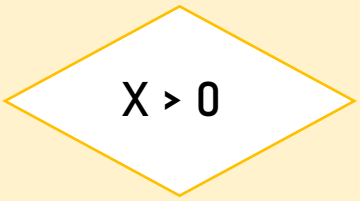
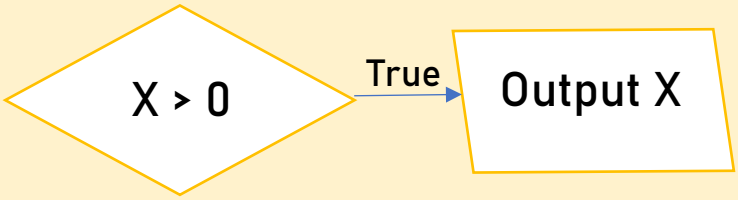
Decision

We use Diamond shape to represent the condition/ Loops “Decisions”.

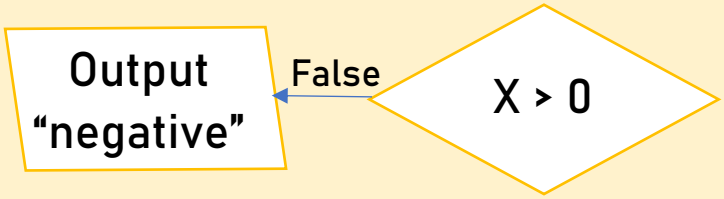
The decision depended on 3 process.
1- set the condition.



2- if condition is True what will done?



3- if condition is False what will done?



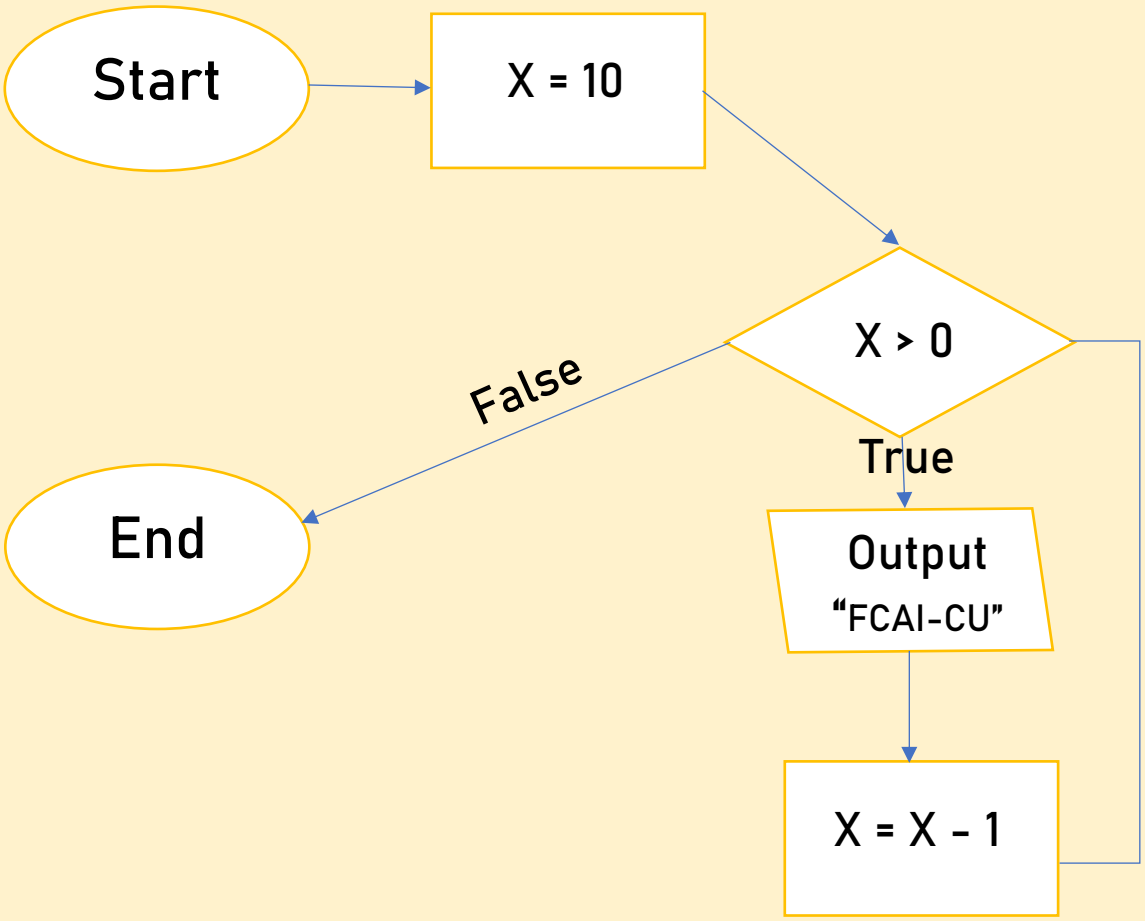
Arithmetic operations in Decisions

1- > < less than and bigger than
2- == to check if they are equal return True otherwise return False.
3- && its used if you need to make to conditions in same Diamond.
4- || its used if you need one of two conditions is true (at least one condition is true).

Loops

Loops are Decisions and the true side return to the same condition while the condition is true!

Program to print “FCAI-CU” 10 times.



Here the true side is going to print “FCAI-CU” and decrease X by one and check the condition if return true its mean that print more “FCAI-CU” else will end the program.

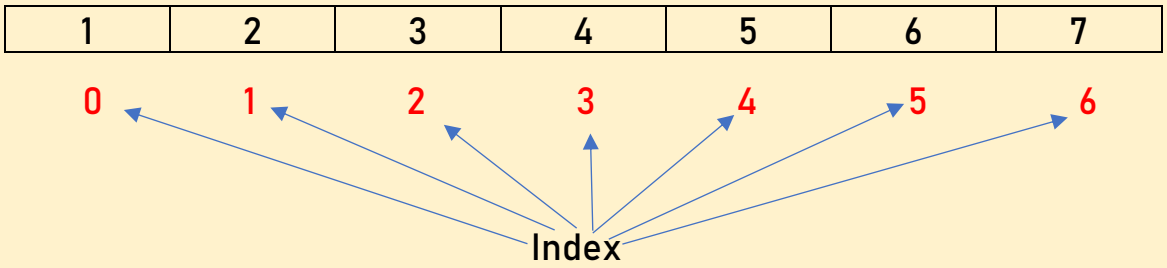
Arrays

If I need to make 20 grades for my grades and get summation of them, I will make 20 variables?!

It is impossible if I can make 20 variables, can I make 100, 200, 1000000.

So, we will learn the Arrays.

We have two important things of array (index, value)
If I need print X I will call X and print it, if I need Y I just write Y what about arrays?
I will use index instead of names and each index have a value.



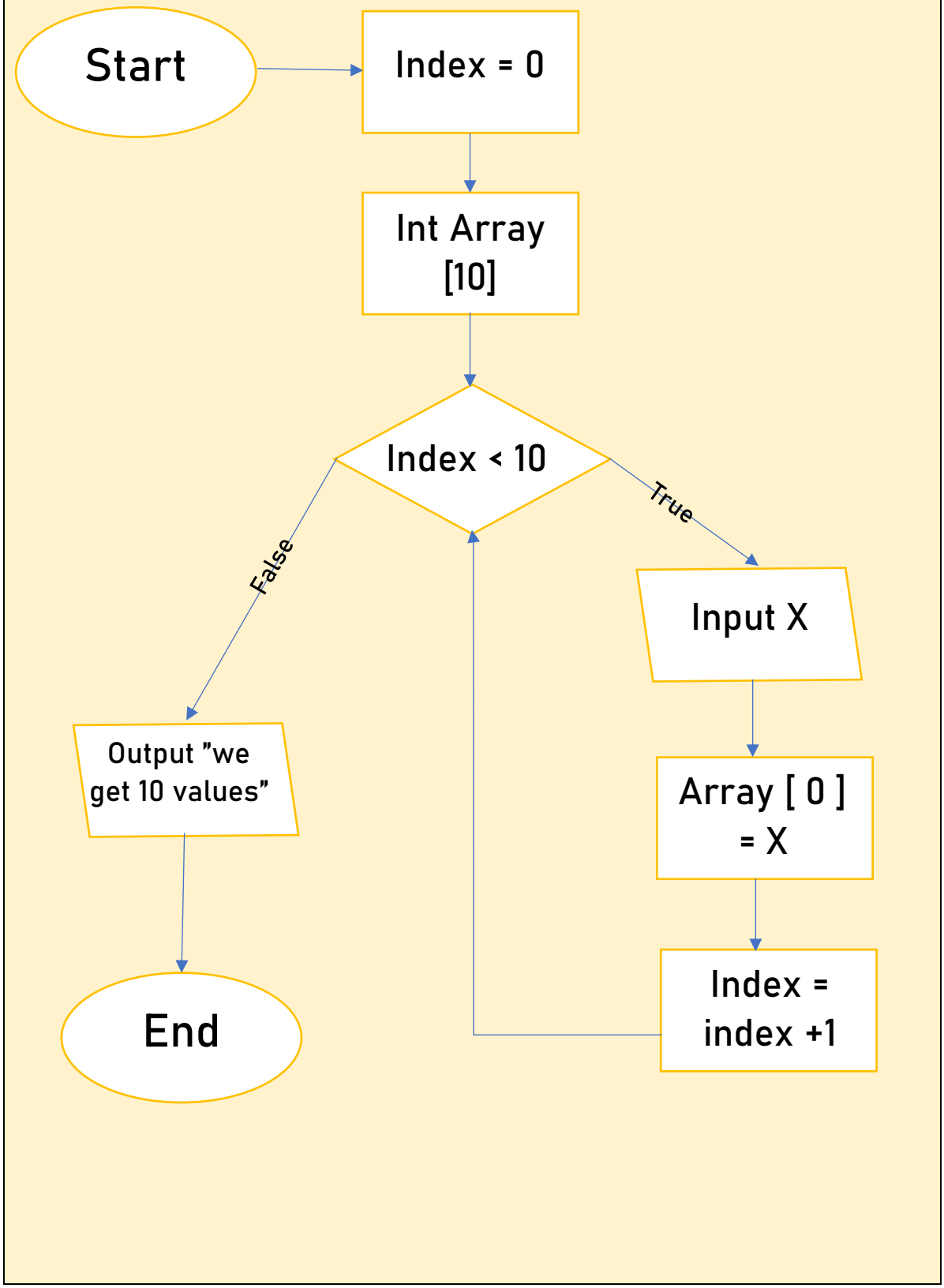
If I need first element its mean I need index [0]
If I need second element its mean I need index [1]
If I need Nth element its mean I need index [N-1]

To make array you MUST know:
1-the size of array before declaring the array.
2- datatype of array (char, int, double…).

```
Int Array
[10]
```

Its mean I make array with size 10 and to store integer values.

To take all values use loops.



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