

Keywords

Algorithm – the series of steps to solve a problem or perform an action.

Flowchart – a diagram that shows the inputs, outputs and processes in an algorithms.

Process – an action that takes place.

Pseudocode – simplified programming code that is not language specific, used to design algorithms.

Algorithms

Producing Algorithms

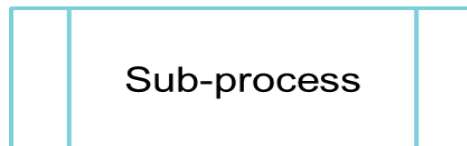
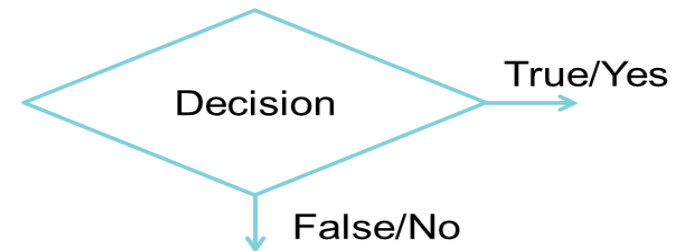
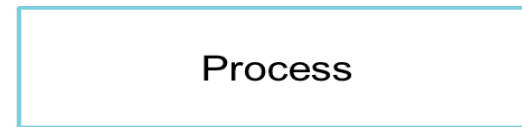
Flowchart

Objectives

ADVANCED:
Produce an algorithm using a flowchart.

EXPERT:
Produce an algorithm using pseudo code.

A flowchart can be used to represent an algorithm.
It shows the data that is input, and output.
It shows the processes (actions) that take place.
It shows the decisions and repetitions that take place.
Lines are used to show the flow of control.
Set shapes are used to represent different functions.

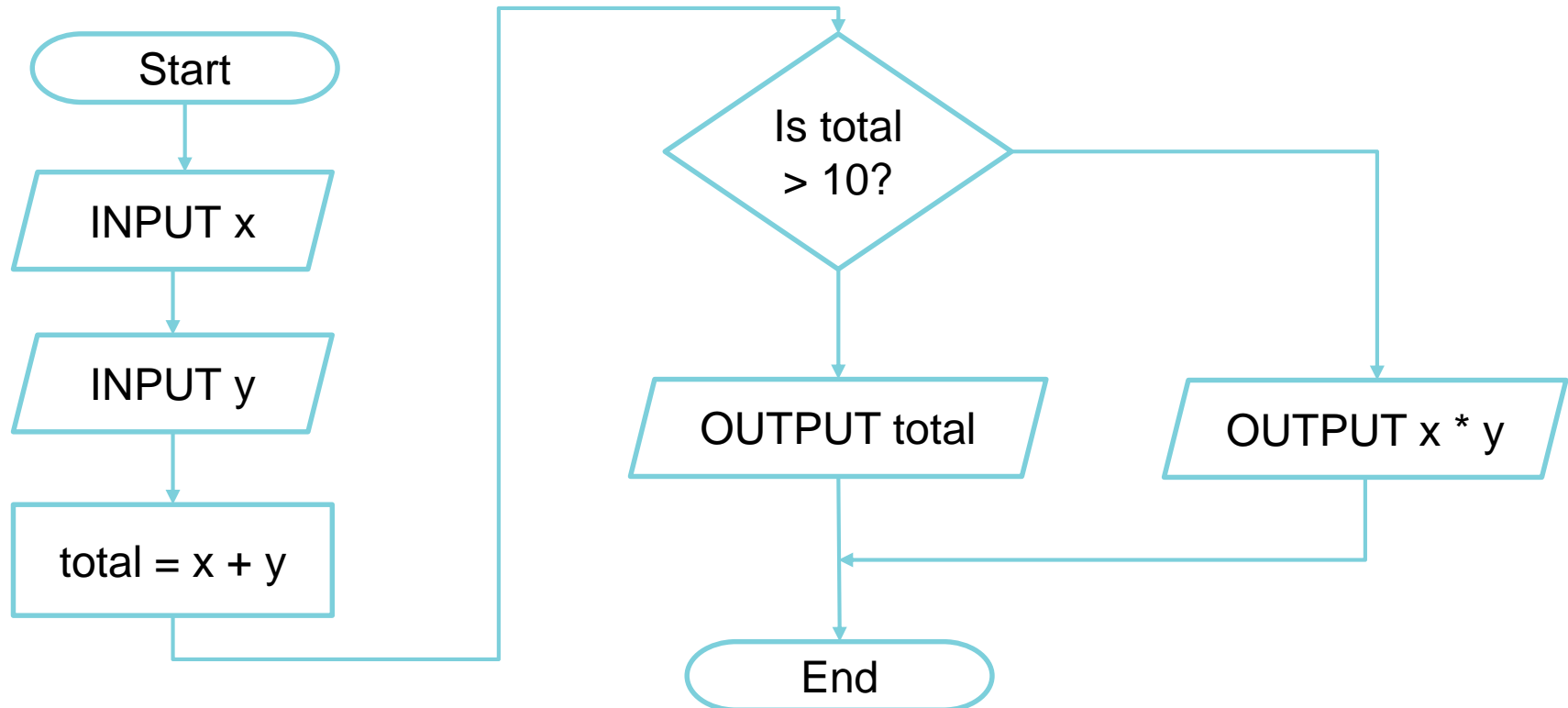


A decision has a 'Yes' and 'No' coming from it.

An Input/Output and process has 1 arrow going in, and 1 arrow coming out.



Reading a Flowchart



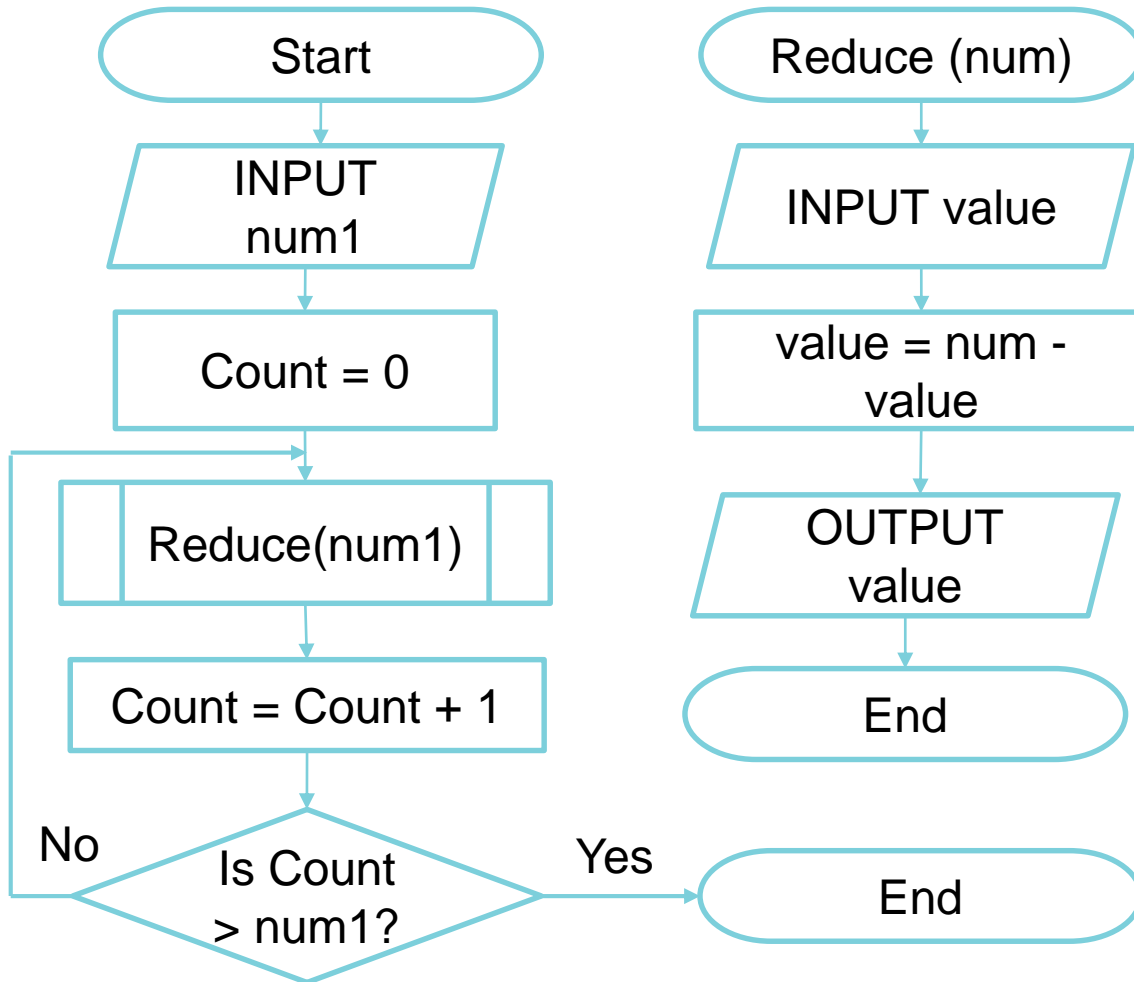
What will be the result if 2 and then 4 are input?

What will be the result if 5 and 8 are input?





Reading a Subroutine



What will be output if the following numbers are entered in this order:
3 1 2 4 1

What will be output if the following numbers are entered in this order:
5 3 4 1 2 5 4



Pseudo Code



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Objectives

ADVANCED:
Produce an algorithm using a flowchart.

EXPERT:
Produce an algorithm using pseudo code.

This means 'fake code'.

It's part way between English sentences, and programming code.

It is language neutral (it can be read by programmers who are able to use any language).

Output: `print("Hello")`

Input: `num = input("Enter a number")`

Selection: `if num == 2 then`
 `...`
 `elseif num < 4 then`
 `...`
 `endif`





Iteration Examples

Objectives

ADVANCED:
Produce an algorithm using a flowchart.

EXPERT:
Produce an algorithm using pseudo code.

```
for i = 1 to 10  
    ...  
next i
```

```
do  
    ...  
until i > 10
```

```
while (i != 11)  
    ...  
endwhile
```

Pseudo Code



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Objectives

ADVANCED:
Produce an algorithm using a flowchart.

EXPERT:
Produce an algorithm using pseudo code.

Write an algorithm that:

- takes a user's mark as input
- outputs "Pass" if they scored on, or over 50
- "Merit" if they scored on, or over 70
- "Distinction" if they scored on, or over 90
- or "Fail" if below 50

```
mark = input("Input mark")
If mark < 50 then
    print("Fail")
elseif mark < 70 then
    print ("Pass")
elseif mark < 90 then
    print ("Merit")
else
    print("Distinction")
endif
```