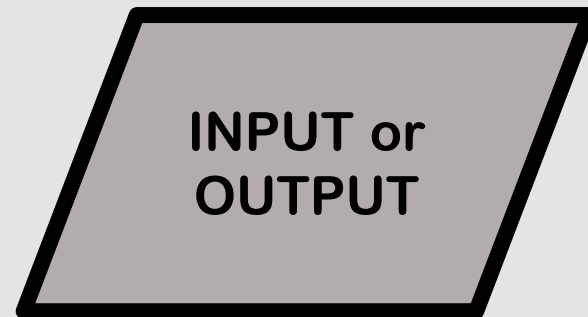
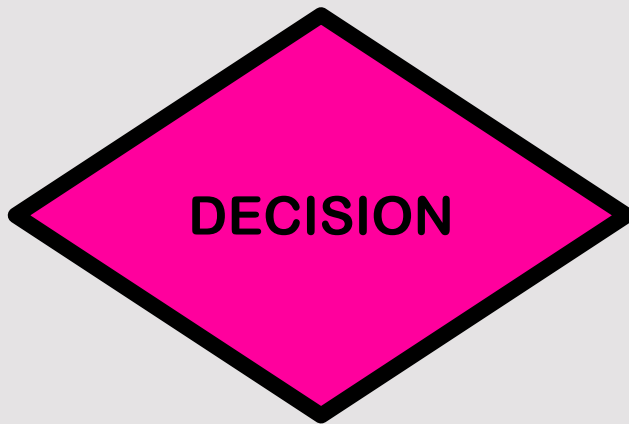
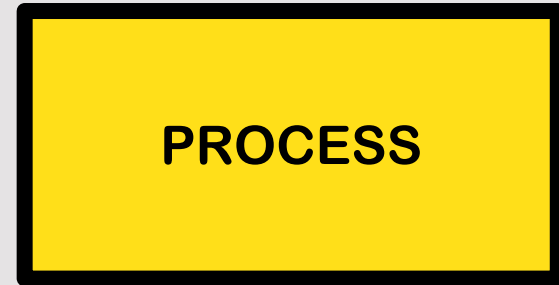


Learning Objective

To be able to...

- Understand flow chart symbols
- Complete and correct flow chart algorithms
- Create a program based on a flow chart

Symbols



What do they do?



TERMINATOR

The terminator is the start and end of any program.

The start symbol can only have one arrow leading away from it.

This is ALWAYS a rounded rectangle.

What do they do?



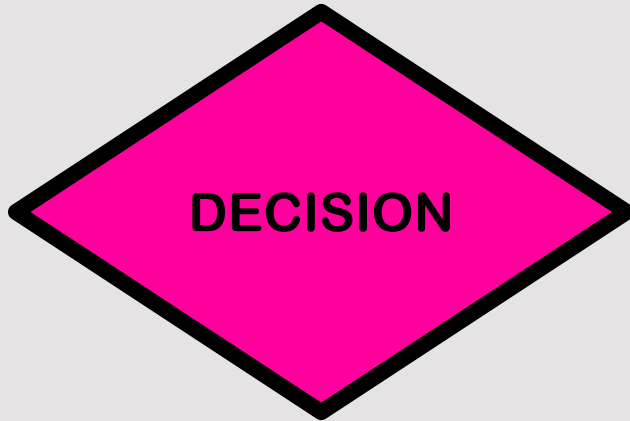
PROCESS

The process box is used when something happens, normally as a result of something in the program.

This symbol can only have one arrow leading away from it, but can have more than one going into it.

This is ALWAYS a rectangle.

What do they do?

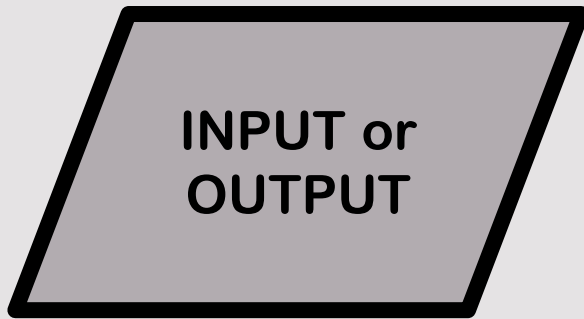


The decision box is used when a question can be asked in a program, such as an IF...ELSE statement.

This can have many arrows going into it, but only ever has TWO leaving – YES and NO (or TRUE and FALSE).

This is ALWAYS a diamond.

What do they do?

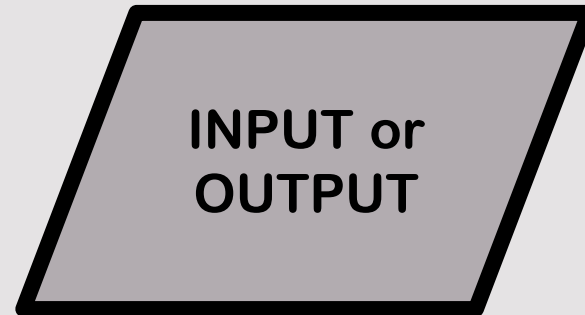
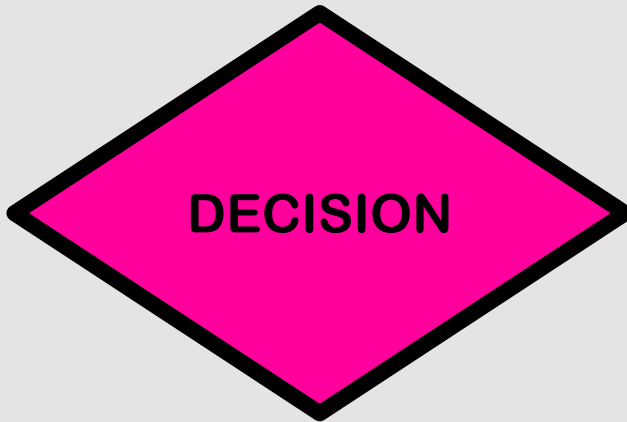


The I/O box is used when a question is asked to the user, or something is printed on the screen.

This can have many arrows going into it, but only ever has one leaving.

This is ALWAYS a parallelogram.

Symbols



These symbols together create any program or set of instructions for any task.

Let's write one together on the whiteboard for making toast.

Now it's your turn...



TERMINATOR



DECISION



PROCESS



INPUT or
OUTPUT

Use these symbols to create your own flowchart algorithm.

Your flowchart must ask the user their age. If they are under the age of 3, tell them they're a baby.
If they are between 3 and 18, tell them they're a child.
If they're over 18, call them an adult.

If you're finding that *tough* – just create a flowchart that calls them a baby or NOT a baby!

START

How old
are
you?

If age
< 3

Y

Print
"Baby"

N

If age
< 18

Y

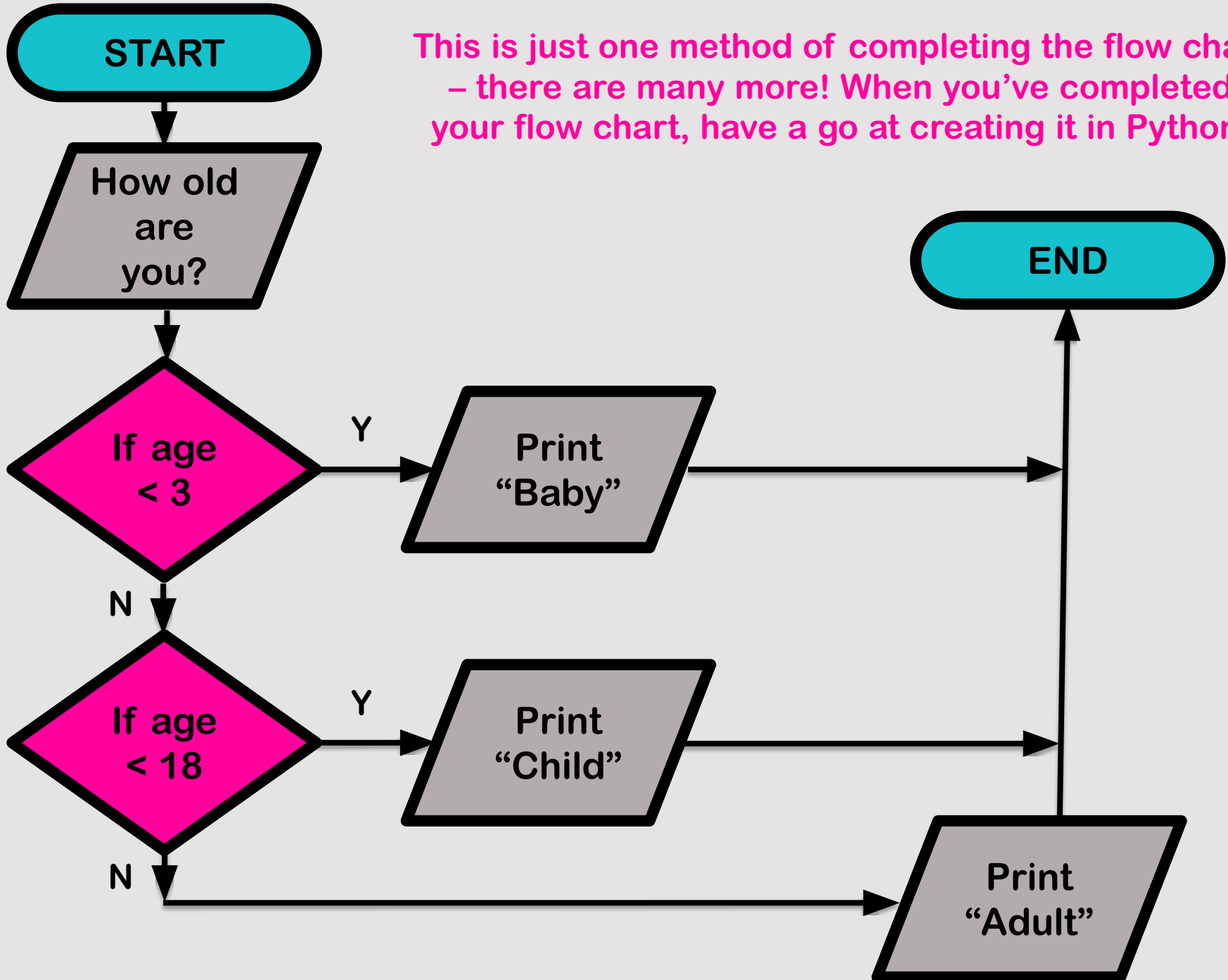
Print
"Child"

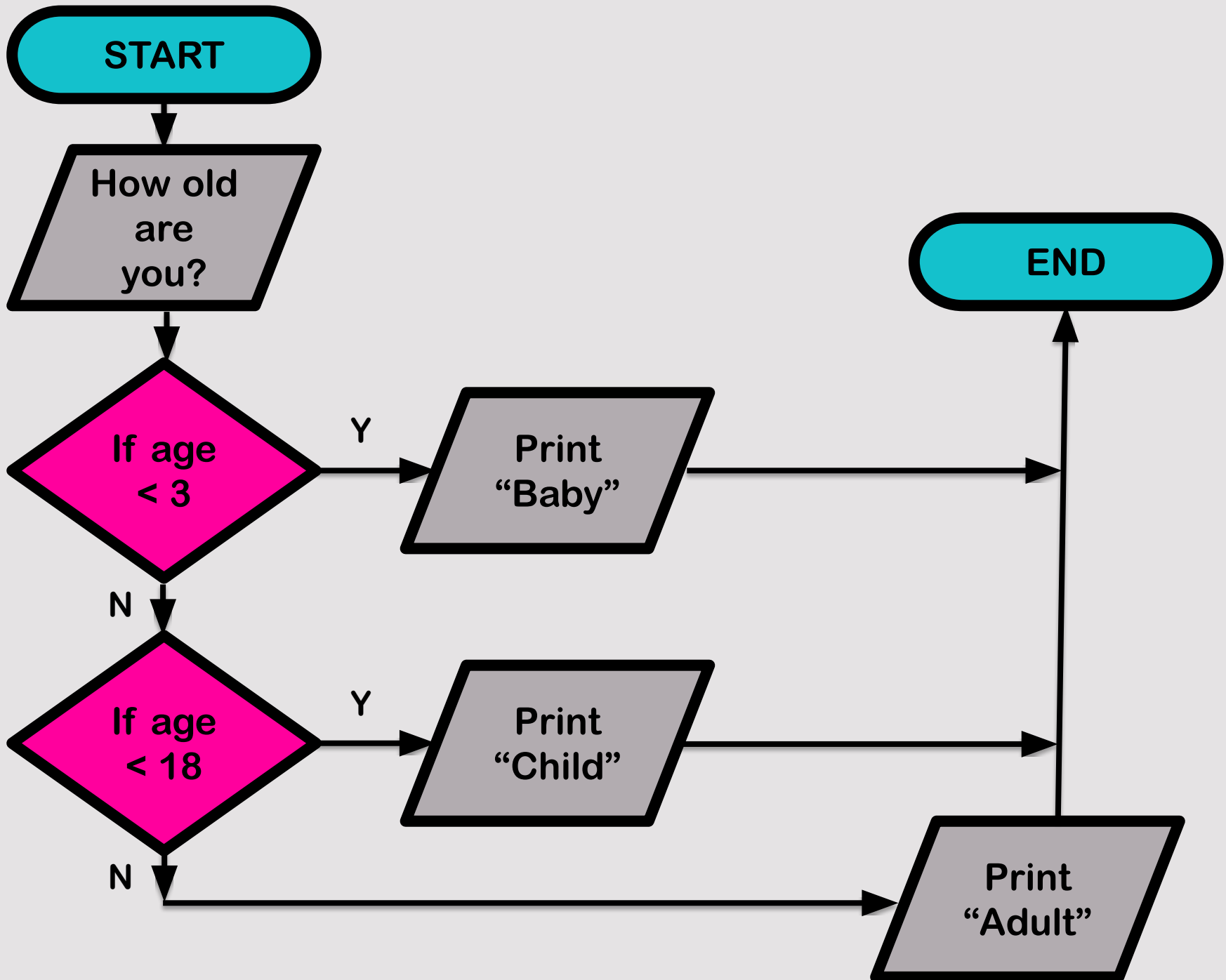
N

Print
"Adult"

END

This is just one method of completing the flow chart
– there are many more! When you've completed
your flow chart, have a go at creating it in Python!





What it could look like...

```
age = int(input("How old are you? "))

if (age < 3):
    print ("Baby")
elif (age < 18):
    print ("Child")
else:
    print ("Adult")
```

Extend this program so that if the user enters nothing for the age, or if they enter a letter, they receive an error message.

PseudoCode

What is pseudocode?

```
INPUT num1
INPUT num2
IF num1 > num2 THEN
    OUTPUT "Yes"
ELSE
    OUTPUT "No"
```

This algorithm is written in **pseudocode**:

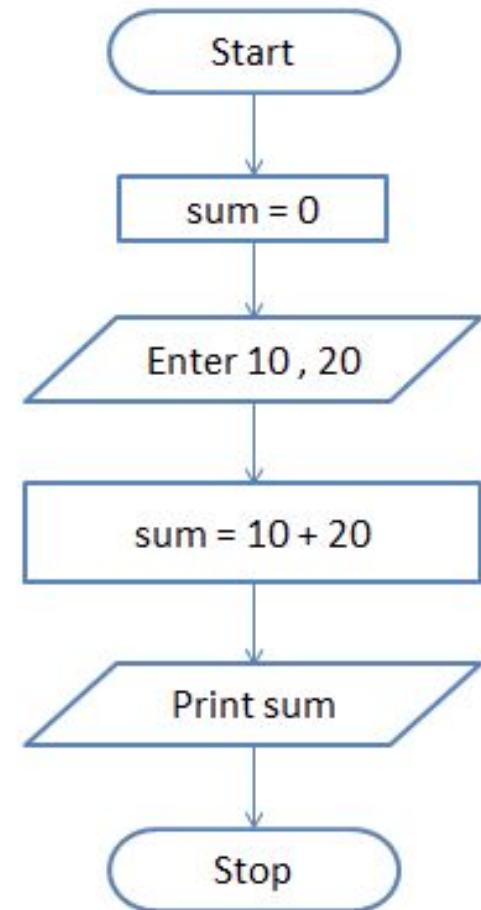
- Pseudocode is a way to write out algorithms using **code-like** statements
- It is **not** an actual programming language
- There is **no "correct" way** to write it
- It is used to **plan algorithms**, focussing on the **logic** and **steps** rather than language-specific **syntax**

Example: Add 10 and 20

Pseudocode

- Initialize sum = 0 (PROCESS)
- Enter the numbers (I/O)
- Add them and store the result in sum (PROCESS)
- Print sum (I/O)

Flowchart

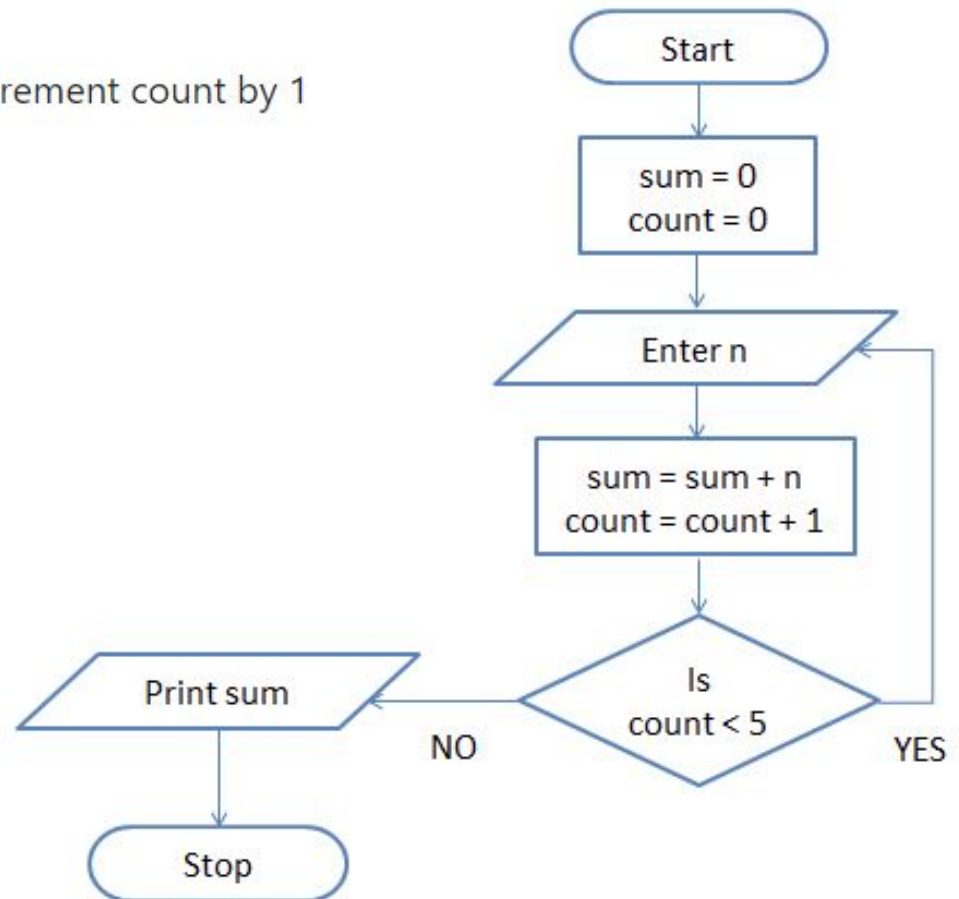


Example: Find the sum of 5 numbers

Pseudocode

1. Initialize $\text{sum} = 0$ and $\text{count} = 0$ (PROCESS)
2. Enter n (I/O)
3. Find $\text{sum} + n$ and assign it to sum and then increment count by 1 (PROCESS)
4. Is $\text{count} < 5$ (DECISION)
5. if YES go to step 2
else
Print sum (I/O)

Flowchart

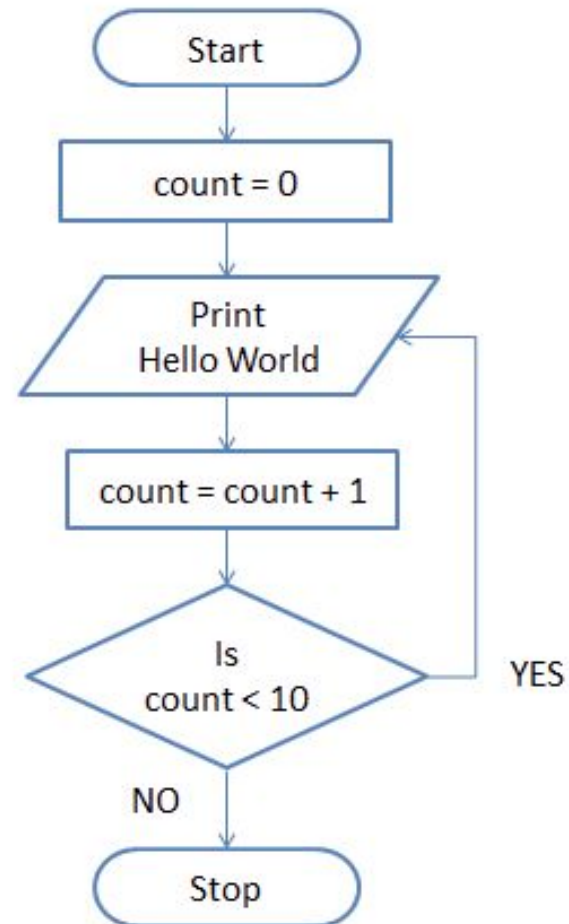


Example: Print “Hello World” ten times

Pseudocode

1. Initialize count = 0 (PROCESS)
2. Print Hello World (I/O)
3. Increment count by 1 (PROCESS)
4. Is count < 10 (DECISION)
5. if YES go to step 2
else Stop

Flowchart

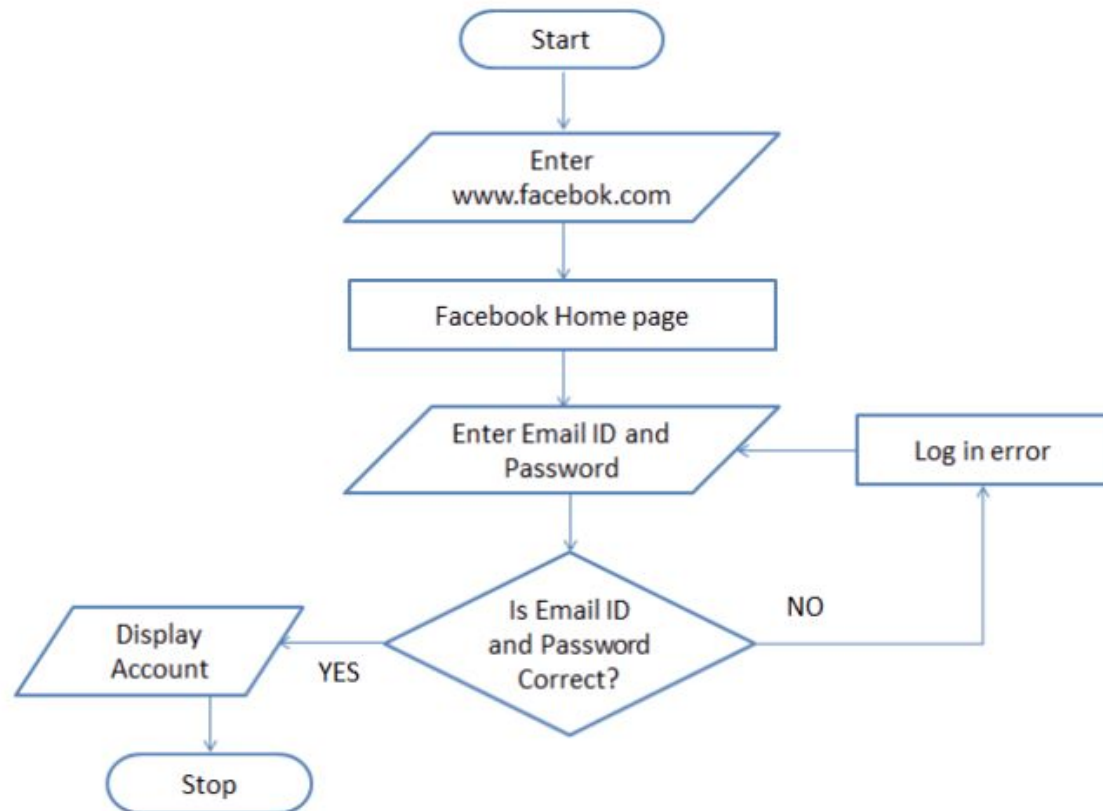


Example: Logging into a facebook account

Pseudocode

1. Enter www.facebook.com in your browser. (I/O)
2. facebook Home page loads (PROCESS)
3. Enter your Email ID and Password (I/O)
4. Is Email ID and Password Valid (DECISION)
 - if NO then
 - Log in error (PROCESS)
 - go to step 3
 - else
 - Display facebook Account (I/O)
 - Stop

Flowchart



Flowchart to
determine if a pH is
acid, base or neutral

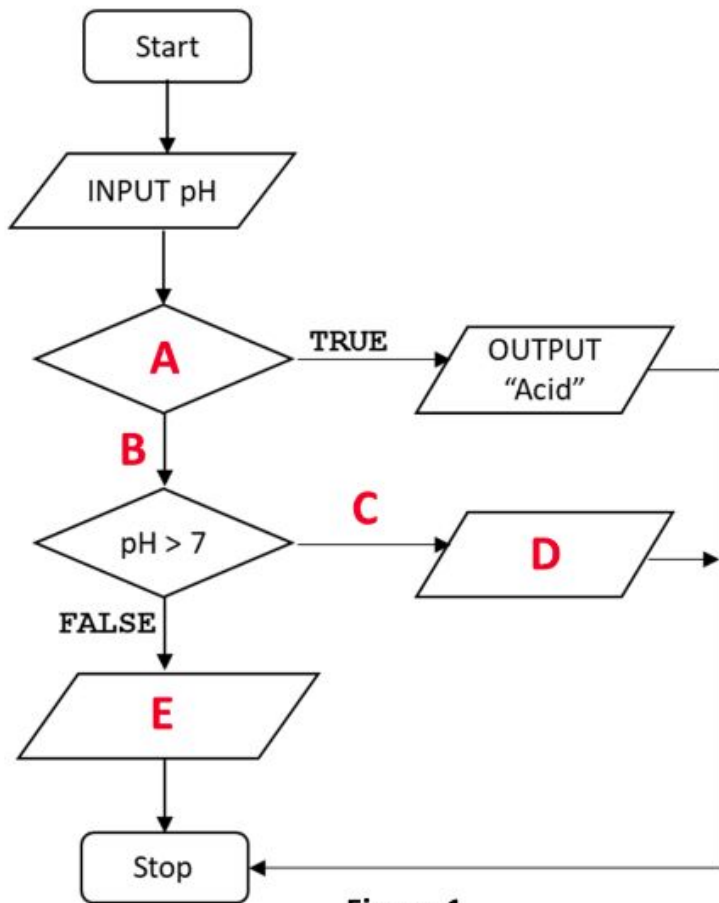
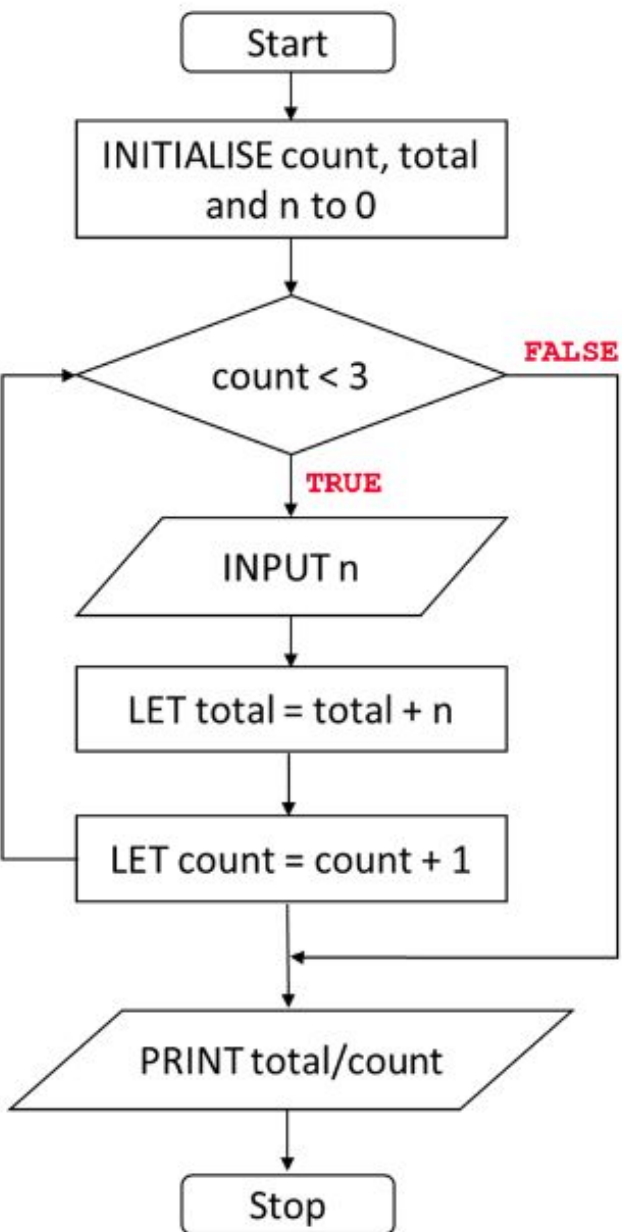


Figure 1

Letter	Missing Text
A	
B	
C	
D	
E	



- (a) Using inputs of 7, 3 and 8 for n , complete the trace table showing the execution of the algorithm.

n	total	count
0	0	0
7		
3		
8		

- (b) What output does the algorithm display?