

Unit 1 & 2 Summary

Definitions

Coding: Coding is writing instructions for a computer to perform a task. Code is the language of computers.

Algorithm: An algorithm is a list of steps you give to computers to solve a problem or get something done.

Decomposition: is when we break a problem down into smaller parts to make it easier to solve.

Flowchart: A flowchart is a diagram that represents a set of instructions.

Python: Python is a programming language that you type.

Syntax: Refers to the spelling and grammar of a programming language.

Syntax Error: A syntax error is when you try to run a program and it will not run due to the syntax not being correct. Programmers also call these 'bugs'.

Debugging: Finding the problems in code and fixing them is known as debugging.

String: In programming, we call text a string. A string is a series of characters.

Variable: Variables are used to store data that you might need saving or to refer to later in a program. A variable is like a box that you can save information inside. You can give a variable any name as long as it does not contain a space

Inputs: The most common input is asking the user to type something into the program.

Output: When the computer sends back data for example displays something on the screen, this is known as an output.

Integer: is a whole number such as 5.

Float: is a decimal number such as 0.8.





Example of algorithm

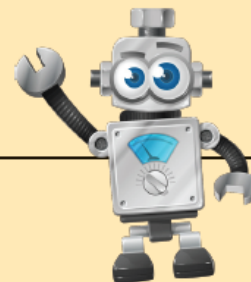
Here is an algorithm for making a cup of coffee:

1. Get a cup
2. Add 1 teaspoon of coffee to the cup
3. Add water to the kettle
4. Boil the water
5. Add the boiling water to the cup within 2cm of the top
6. Get milk from the fridge
7. Add 1cm depth of milk to the top
8. Stir the coffee
9. Put milk back in fridge



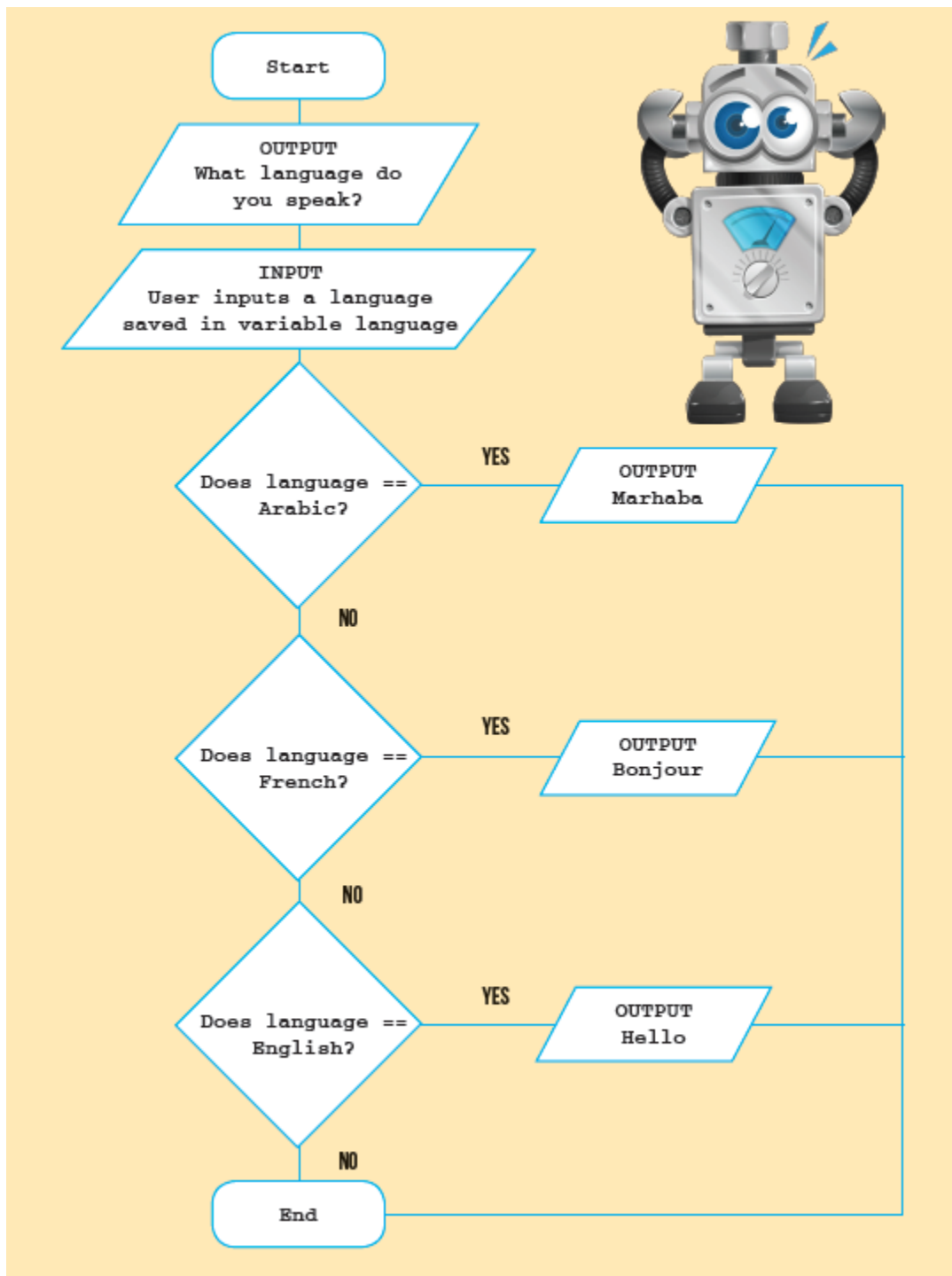
Flowchart Symbols:

NAME	SYMBOL	USAGE
Start or Stop		The beginning and end points in the sequence.
Input or Output		An input is data received by a computer. An output is a signal or data from a computer.
Decision		A decision, either yes or no.
Direction of flow		Connects the symbols. The arrow shows the direction of flow of instructions.



Flowchart Example:

The computer asks the user: What language do you speak?



Examples of simple python code:

Code	Output
<code>print ("Hello World")</code>	Hello World
<code>print ("5+5")</code>	5+5
<code>print (5+5)</code>	10
<code>print ("5+5=",5+5)</code>	5+5=10
<code>print ("111 divided by 4 = ", 111/4)</code>	111 divided by 4 = 27.75

Operators:

OPERATOR	NAME	EXAMPLE	ANSWER
*	Multiply	2*3	6
/	Divide (normal)	20/8	2.5
//	Divide (whole number)	20//8	2
%	Modulus	20%8	4
+	Add	2+3	5
-	Subtract	7-3	4

Variables:

```
falcons = 4
flownAway = 1
falconsLeft = falcons - flownAway
print ("There are ", falconsLeft, " falcons only")
```

What you will see on the screen:

There are 3 falcons only

Getting user input & Joining Strings Together

```
firstName = input ("What is your first name?")
lastName = input ("What is your last name?")
fullName=firstName+lastName
print("Welcome ", fullName)
```

What you will see on the screen:

What is your first name? Khulood
What is your last name? Alnuaimi
Welcome Khulood Alnuaimi

Combining numbers and strings

```
name=input("What is your name?")
print("Hello", name)
year=input("What year was you born?")
age=2017-int(year)
print("You are ",age," years old.")
city=input("Where were you born?")
print("You were born in ",city," that is a very cool place!")
```

What you will see on the screen:

What is your name? Khulood
Hello Khulood
What year was you born? 2005
You are 12 years old.
Where were you born? Dubai
You were born in Dubai that is a very cool place!

Use int to convert string to integer

Here is another way of doing it:

```
year=int(input("What year was you born?"))
age=2017-year
```

How you can change the way text looks?

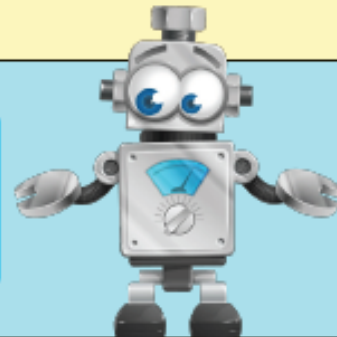
We can use methods in Python to change the way the text looks, for example we might want all CAPTIAL LETTERS. The below tables shows the actions we can perform on text entered.

METHOD	OUTPUT
upper()	ALL LETTERS ARE CAPTIALS.
title()	The First Character Of Each Word Is Capitalised.
swapcase()	tHIS wILL sWAP THE INPUT OF THE tEXT gIVEN.
capitalize()	Just the first word is capitalised.
lower()	all of the letters are lower case letters.

There are a few ways to do this have a look at the different ways below.

```
firstName = input ("What is your first name?")
print (firstName.upper ())
```

This way keeps the variable as whatever the user types and changes the display to be capitalised upper().



```
firstName = input ("What is your first name?")
firstName = firstName.upper ()
print (firstName.upper ())
```

The way converts the string and saves in the variable in the new format. It means you can't go back to what the user did after.

This way converts the input as the user types and saves it in the variable. It is very similar to the second way but saves a line of code.

```
firstName = input ("What is your first name?").upper ()
print (firstName)
```