Python Programming Learn sheet

1: Key Words

Algorithm: A set of instructions or code used to solve a problem.

Syntax: The rules of the programming language that need to be followed in order for it to work.

Variables: Data that is stored in memory that is likely to change.

Program: Code compiled together to perform a specific function.

2: Printing

To **print** out a statement or a **variable** we use the code below:

Printing a new message:
print("Hello World");

Printing the value of a variable:
print(x);

Printing a message with variables included:
print("Hello",name,"your are",age,"years old today");

3: Variables

Variables are simply a place on the computer's memory that is given a name in order for it to remember it.

In Python you create a variable by writing the name of the variable followed by an =.

Examples:
name = "Spongebob";
age = 14;

4: Data Types

String: A Variable data type that can store a combination of letters, characters and numbers.

Integer: A Variable data type that can store whole numbers.

Float: A Variable data type that can store decimal numbers.

Boolean: A Variable data type that stores either TRUE or FALSE.

5: Selection

Selection is used to allow the program to make a choice and take a different path.

The keywords used in Python are:
/Tasks

if - checks if the **condition** is true, if so the program runs the indented code below it.

elif - if the first if fails then this elif condition is checked, there can be multiple of these.

code indented below else will run.

Example:

```
colour - input("Enter your favourite colour");
if colour == "Red":
    print("Reminds me of tomatoes");
elif colour == "Blue":
    print("Reminds me of the sea!");
else:
    print("If it ain't Red or Blue then I ain't interested");
```

6: Inputs

To allow your Python program to get information from the user you will need to use the **input** command. Make sure you use the correct command for what you are asking for.

String inputs (such as a name):
input("Enter your name");

Integer Inputs (for whole number responses):
int(input("What is your age?"));

Float Inputs (for decimal number responses):
float(input("What is your shoe size?"));

What is a Python?

Python is a **text based programming language** that can be used to create small programs, web applications, games and even search engines like Google and YouTube!

Python is easy to learn and is a great beginner language.

Input statements

Using **var = input ()** we can ask a user to input some information.

We can then **print** this back to the console window.

```
userName = input("what is your name?")
print ("Welcome ", userName)
```

userName is a **variable.** This means we can change the information stored. We can also name it whatever we want.

Variables

A variable is something that can be **used to store information**. The information that is stored can be changed.

Data types

Different types of data are stored in variables as different **data types**. There are **three** main data types:
String, Integer & Float

String
A type of variable for storing **text** "strings" **e.g.** "Hello World"

```
string = str("This is a string")
```

Integer
A type of variable for storing **whole numbers**
e.g. 10, 182, -44

```
integer = int("This is an integer")
```

Float
A type of variable for storing **decimal numbers**. Also known as a **real** number
e.g. 2.5, 5.05, 3.14

```
decimal = float("This is a decimal")
```

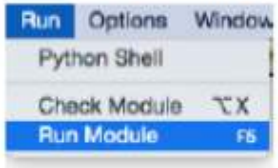
IF statements

IF statements can be used to select different options in a program depending on a condition. Also known as **selection.**

```
question = input("Are you revising?")
if question == "yes":
    print ("Well done!")
elif question == "no":
    print("Oh dear!")
else:
    print("I don't understand")
```

Executing a program

In order to run or test a program written in Python the user needs to go to **Run** and then **Run Module.**



Alternatively, you could press the **F5** button on the keyboard.

Syntax

Syntax is what we call the format that the code needs to be in, in order to be processed correctly.
If it is not in the correct format then the code will not work.

```
Traceback (most recent call last):
  File "C:/Python33/a.py", line 2, in <module>
    prin (greeting)
NameError: name 'prin' is not defined
>>>
```

Python tells us where the error is and what type it is.
Here it says the line the error is on
Here it says what type of error.

Print statements

In order to display text in the **shell** you need to use a **Print** statement.

```
print ("Hello World")
print ("I am a programmer")
```

This is the output:

```
Hello World
I am a programmer
```

Addition example code

```
number1 = int(input("Input the first number :"))
number2 = int(input("Input the second number :"))
answer = number1 + number2
print("The answer is " + str(answer))
```

The code above takes two number inputs and stores them as variables called number1 and number2. It then adds these together and saves them in a variable called answer. The final line prints the answer out in a sentence.

Write your first program

- At the prompt, type in the following:

```
>>> print("Hello")
```

- When you hit the Enter key what happens?
- What does the word "*print*" do?

```
>>> print("Hello")
Hello
>>>
```

Make sure you use a lower case "p" for print or it will not work.

RULES FOR VARIABLE NAMES

DO'S	DON'TS
Do give your variable a sensible name so it is easy to remember	Don't use words that Python already uses e.g. "print"
Do keep your variable names short	Don't use spaces in variable names
Do use two words together with no spaces e.g. FirstName	Don't use mathematical symbols in variable names
Do begin variable names with a letter or underscore "_"	Don't use uppercases for every letter in a variable

Data types

Data Type	*This indicates how the data will be stored. The most common data types are integer, string, and float/real.*	Casting code
String	A combination of letters, numbers or characters. (eg, Hello, WR10 1XA)	`str(x)`
Integer	A whole number. (eg. 1, 189)	`int(x)`
Float/Real	A decimal number, not a whole number. (eg. 3.14, -26.9)	`float(x)`
Boolean	1 of 2 values. (eg. True, False, Yes, No)	`bool(x)`
Char	A single character	`char(x)`

Comparative operators

==	Equal to
!=	Not equal to (or different to)
>	Greater than
<	Less than
>=	Greater than or equal to
<=	Less than or equal to

Arithmetic operators

Operation	Symbol	Example	Output
Addition	+	2 + 10	12
Subtraction	-	9 – 6	3
Multiplication	*	5 * 4	20
Division	/	5 / 2	2.5
Floor Division	//	7 // 2	3
Remainder	%	7 % 3	1