

Year Eight Programming: Python

- In programming, putting writing code to put text on the screen is called **output**. In Python, we use the `print` command.
- The red text beginning with `#` is called a comment and is ignored by the computer. It is a message to programmers to let them know what the code does.

```
# print puts text on the screen
print("Welcome")
```

- The program asks a question and waits for the user to type. We call this **input**.

```
print("What is your password?")
# input() waits for the user to type
# What they type is given the label 'pwd' for later use
# This is called a variable
pwd = input()
```

- **Selection** is when the program takes a different path depending on the state of variables.
- A **Boolean expression** is a statement that can be **true** or **false**.
- `len(pwd) < 8` is the Boolean expression in this code.

```
# The program checks the number of characters in pwd
# If it is less than 8...
if len(pwd) < 8:
    print("Please enter a longer password")
# If not...
else:
    print("Password length OK")
```

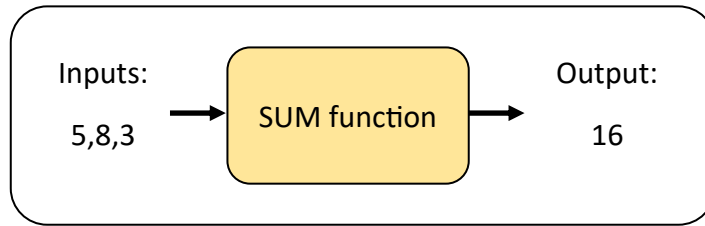
- Repeating instructions is known as **iteration**.
- The indented code is repeated why the expression is still true.
- The un-indented code is not repeated.

```
# You can repeat this until 8 characters are entered
while len(pwd) < 8:
    print("Password not long enough")
    print("Pease enter again")
    pwd = input()
print("Password length OK")
```

Computing: Spreadsheet software for data analysis

A range of **functions** can be used to analyse data.

A function can be thought of as a machine that takes in some data and converts it into something else.



	A	B
1	Name	Grade
2	Student 1	6
3	Student 2	8
4	Student 3	8
5	Student 4	3
6	Student 5	8
7	Student 6	6
8	Student 7	5
9	Student 8	8
10	Student 9	9
11	Student 10	9
12	Student 11	7
13	Student 12	7
14	Student 13	8
15	Student 14	7

Here is a list of students and their grades. There are 205 students in the list. The last name is in cell A206. Their grade is in B206.

Functions with a single input

These functions take either a single cell, or range of cells as the input:

- `=AVERAGE(B2: B206)` would find the *mean* grade.
- `=MODE(B2: B206)` would find the most common grade.
- `=MIN(B2: B206)` and `=MAX(B2: B206)` find the lowest and highest grades.
- `=COUNT(B2: B206)` tells you how many cells have numbers in; useful for finding missing data.

Functions with more than one input

These functions have their inputs separated by a comma:

- `=COUNTIF(B2: B206, ">6")` would find the number of grades that met specified criteria. In this case, all grades higher than 6.
- `=IF(B2>3, "Target met", "Target not met")` would check whether the value in C2 is greater than 3. This is a Boolean expression. If the result is *true*, "Target met" is output. If the value is *false*, "Target not met" is output.
- `=VLOOKUP(B2, D2: E5, 2)` would look in range D2:E5 for student 1's grade and return a value from the second column. B2 is between 4 and 7, so Pass is returned.

	A	B	C	D	E
1	Name	Grade		Grade	Description
2	Student 1	<u>6</u>		0	Fail
3	Student 2	8		4	Pass
4	Student 3	8		7	Merit
5	Student 4	3		9	Distinction