

## Variables

Variables are containers for storing data values.

Variables should be:

- Any mix of letters, numbers and some special characters
- Must start with a letter
- Keep lowercase
- Use underscore where there are spaces

Example: `name = 'Alice', age = 28`

## Data Types

Strings: letters, numbers, phrases that are surrounded by quotes

Example: `"cat", "65", "smelly cat"`

Integer/Int: a whole number

Example: `1, 65, 100, -5`

Float: a decimal number

Example: `1.6, 0.65, -0.455`

Booleans: A data type that can either be True or False.

Syntax: `boolean_variable = True,`  
`boolean_variable = False`

None: the absence of a value

**Casting** - is when you convert a variable value from one type to another

Casting integers: `x = int(1)` #x will equal 1

Casting floats: `y = float(2)` #y will equal 2.0

Casting strings: `z = str(9)` #z will equal '9'

## Index

The position of a character. In Python, the count starts at 0 instead of 1

Example: `H e l l o`  
`[0] [1] [2] [3] [4]`

## Input

`input("question..?")` - allows a user to input data in the form of a string

`int(input())` - allows a user to input data in the form of an integer

## Escaping within strings

`\n` - inputs a new line

`\t` - indents the words

`\"` - will show a double quote

## Comments

To write a comment in Python, you start the line with a #

## Operators

`+` adds numbers as well as concatenates strings

`-` subtracts numbers

`*` multiplies number

`/` divides numbers

`%` modulo - gives the remainder after a division

`=` assigns a value

`**` exponent

## Order of Operations

Brackets, Exponent, Multiplication, Division, Addition, Subtraction

## Useful Commands

**Print:** print outs your script - Syntax: `print()`

Example: `print('Hello world')` #Hello world

**Concatenate:** merges strings.

Example: `"Greeting" + " " + "mate"` will print: 'Greeting mate' with the space in between

**Length:** will print the length of the string

Example: `print(len('word'))`

**Uppercase:** `.upper()` - will print your string in upper case

**Lowercase:** `.lower()` - will print your string in lower case

## Naming a Python Script:

`<what_the_script_does>.py`

## Running a Python Script:

`$ python <what_the_script_does>.py`

## CODING EXAMPLES

### SECTION A

```
1. print("Hello Planet")
   Hello Planet

2. name = "Alice"
   print(name)
   Alice

3. shopping_list = "Apples\nBread\nMilk\nEggs"
   print(shopping_list)
   Apples
   Bread
   Milk
   Eggs

4. favourite_food = "Pizza from \"Dough N' Sauce\""
   print(favourite_food)
   Pizza from "Dough N' Sauce"
```

### SECTION B

```
1. print(2 + 4)
   6

2. print(4 - 12)
   -8

3. print(5 * 11)
   55

4. print(169 / 13)
   13

5. print(100 % 99)
   1

6. print((6-5)+(4*10))
   41
```

### SECTION C

```
1. first_name = "Bob"
   last_name = "Jones"
   full_name = first_name + " " + last_name
   print("Hello " + first_name)
   print("Good morning, " + full_name)
   Hello Bob
   Good morning, Bob Jones

2. print(len("Birthday"))
   8

3. word = "hello"
   print(word[0])
   print(word[2])
   h
   l

4. print("HeLLo WorLd".upper())
   HELLO WORLD

5. x = int(1)
   print(x)
   1

6. y = float("6")
   print(y)
   6.0

7. z = str(8)
   print(z)
   "8"

8. age = 49
   age_as_string = str(age)
   print("They are " + age_as_string)
   They are 49

9. age = int(input("How old are you? "))
   age_10_years_ago = age - 10
   print(age_10_years_ago)

10. amount = float(input("What is the total amount in £?"))
    vat = 20
    vat_amount = (amount / 100) * vat
    print(vat_amount)
```

## QUESTIONS

### SECTION A

1. Write code that prints "Hello world"
2. Print the numbers 1 - 5 on a single line
3. Write a script where "Hello" and "World" are printed on two separate lines
4. Write a script that prints a list of names, tabbed on separate lines e.g.

**My list of names:**

Alice

Bob

Charlie

### SECTION B

1. Write code that prints the value of  $2 + 2$
2. Write code that prints the value of 5.7 subtracted from 3.4
3. Write code that prints the value of 8 multiplied by 7
4. Write code that prints the value of 144 divided by 12
5. Write code that prints the value of the remainder of 67 divided by 12
6. Write code that finds the value of  $(2 * 4) - (6 / 3) + 5$
7. Write code that finds the value of  $(48 / 12) * (67 - 24) - 11$

### SECTION C

1. Create and then print out a variable called 'has\_paid' that contains a boolean value
2. Create two variables that hold the width and height of a rectangle, work out and store the area in a third variable. Print out the string: 'Rectangle of width <x> and height <y> has an area of <area>'
3. Write code that prints the length of the string, 'python'
4. Print out the first and third letter of the word 'python'
5. Ask the user to enter their name, and print out "Hello, <name>"
6. Ask the user to enter their age, tell them how old they will be in 15 years time
7. Combine the two input statements above and print out the message "Hello, , you are currently years old. In 15 years time you will be <age\_in\_15\_years\_time>"
8. Ask the user to enter their hometown, print it out in uppercase letters