

Variables

Variables can be seen as containers for storing data values.

Variables should:

- Be a mix of letters, numbers and some special characters
- Start with a letter
- Be lowercase
- Use underscores instead of spaces

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

Data Types

Strings - letters, numbers or 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("A 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 input 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

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 - will print your string in upper case. Example - `variable.upper()`

Lowercase - will print your string in lower case. Example - `variable.lower()`

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.

Example:

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 20 for equation $4 - 2 * 6 / 3 * 5$.
- (Hint - you might need brackets)

SECTION C

1. Create two variables, one that holds the width and one that holds the height of a rectangle, then, 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>.'
2. Write code that prints the length of the string, 'python'.
3. Print out the first and third letter of the word 'python'.
4. Ask the user to enter their name, and print out "Hello, <name>".
5. Ask the user to enter their age, tell them how old they will be in 15 years time.
6. Combine the two input statements above and print out the message "Hello, <name>, you are currently <age> years old. In 15 years time you will be <age_in_15_years_time>".
7. Ask the user to enter their hometown, print it out in uppercase letters.