Variables

Variables are objects that are held in the computer memory during the operation of a program

Variables are created by assigning a value to a named object.

a = 4

the value of 4 is assigned to a variable called a.

The equals sign = is the assignment operator. Whatever is on the right hand side is evaluated and assigned to the variable named on the left hand side.

firstName = “Jon”

Variables have types. A type describes what type of data this is and its properties.

Common types in Python

String
Integer (numbers)
Lists
Tuples
Dictionaries.

Variables can be **mutable** (can be changed after creation) or **immutable** (can never be changed during the lifetime of a program.

Lists

Lists are variables that hold lists of data usually with some common connection. They can then be referenced by the position they were defined to retrieve the data.

Lists are created with []

a = ["Monday","Tuesday","Wednesday","Thursday","Friday"]

create a list called “a” with the list of weekdays

Add the weekend days in

a.append(“Saturday”)
a.append(“Sunday”)

Lists are a mutable variable type

You retrieve the data by asking for the entry in the list by its position.

a[1]

‘Tuesday’

In python the first position is always referenced by 0

Tuples

Tuples are similar to lists in that they are ordered sequences of values. However, the key difference is that tuples are immutable and can't be changed once created.

Tuples are created with ()

daysOfWeek = ("Monday","Tuesday","Wednesday","Thursday","Friday","Saturday","Sunday")

Even though a Tuple is created with () they are referenced by []

daysOfWeek[2]

'Wednesday'

Dictionaries

Dictionaries are lists of key/pair values

Dictionaries are a mutable structure.

Create a dictionary with curly braces {} and reference with []

Person = {“firstName”: “Jon”, “lastName”: “Farmer”}

Person[“firstName”]

‘Jon’

You can add a new key/value pair to an existing dictionary

Person[“age”] = 99

Multi-Level Lists, Tuples.

You can assign other lists, tuples and dictionaries as entries to a list or tuple.

Create a new list

a = []

add the Person dictionary to the list.

a.append(Person)

add an integer to the list

a.append(2)

add a string to the list

a.append(“3”)

Refer to the dictionary in position 1 in the list and return the firstName key.

a[0][“firstName”]

‘Jon’

Homework

1. Create a list to hold the colours of the rainbow. Experiment with retrieving the colours from the list

2. Create 3 dictionaries that hold the forename, surname, age and occupation of 3 people. Assign these 3 dictionaries each as an entry to a list and experiment with retrieving the keys of forename, surname, age and occupation for each position in the list.