The Python Bible

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Table of Contents

[What is IDLE 3](#_Toc61114879)

[Saving Python Files 3](#_Toc61114880)

[What is a Variable? 3](#_Toc61114881)

[Variable Quiz 3](#_Toc61114882)

[Arithmetic, Floats and Modulo 4](#_Toc61114883)

[Ordering Operations using Brackets 4](#_Toc61114884)

[Random Module 4](#_Toc61114885)

[Force a float to become an integer 4](#_Toc61114886)

[How to round numbers 4](#_Toc61114887)

[Python Number Quiz 4](#_Toc61114888)

[Storing Strings 5](#_Toc61114889)

[Python Comments 5](#_Toc61114890)

[Python Input Function 5](#_Toc61114891)

[How to stick strings together 5](#_Toc61114892)

[How to turn an integer into a string 5](#_Toc61114893)

[String Function 5](#_Toc61114894)

[Convert a string to Uppercase or Lower 6](#_Toc61114895)

[Capitalize the first letter 6](#_Toc61114896)

[Capitalize the first letter of every word 6](#_Toc61114897)

[Check if something is upper or lower case 6](#_Toc61114898)

[Check if everything is just letters 6](#_Toc61114899)

[Check if everything is just numbers 6](#_Toc61114900)

[Check if a piece of text is alpha numeric 6](#_Toc61114901)

[Search for a piece of text 6](#_Toc61114902)

[To strip everything from a string you don’t need 7](#_Toc61114903)

[To strip spaces from either side 7](#_Toc61114904)

[What is a Slice 7](#_Toc61114905)

[How to slice from a letter to the end 7](#_Toc61114906)

[How to reverse a string 7](#_Toc61114907)

[How to slice from the other end of the string 7](#_Toc61114908)

[How to slice 2 parts of a string 7](#_Toc61114909)

[Slices Quiz 8](#_Toc61114910)

[What are Booleans and Operators? 8](#_Toc61114911)

[Comparison Operators Quiz 8](#_Toc61114912)

[What are If statements 8](#_Toc61114913)

[Logical Operators 9](#_Toc61114914)

[Logic Operators Quiz 9](#_Toc61114915)

[What are lists? 9](#_Toc61114916)

[Inside Lists 9](#_Toc61114917)

[In Python keyword 10](#_Toc61114918)

[Delete items in the list 10](#_Toc61114919)

[Add people to a list 10](#_Toc61114920)

[Different ways to add to lists 10](#_Toc61114921)

[What are Tuples 10](#_Toc61114922)

[What are Dictionaries 11](#_Toc61114923)

[Add multiple Values to a dictionary key 11](#_Toc61114924)

[Pass keyword 11](#_Toc61114925)

# **What is IDLE**

* IDE – allows use to program in Python language
* Run commands and write scripts

# **Saving Python Files**

* Make sure when saving a file, it has the .py file extension

# **What is a Variable?**

* Variables can store values
* Numbers, words
* Can use a name to capture the data inside of the variable
* Number = 1
* Typing number in the shell will print out what is stored in the box
* Type(number) will print out what kind of data is stored in the variable

# **Variable Quiz**

* Python is dynamically types language what does this mean?
  + The variable type can change throughout your program
* Which of the following are some of the data types in Python?
  + Integers, Strings and Floats
* Why do we use variables?
  + To keep useful or important data for later
  + To make our code more organised
  + To make our code easier to change
* What does this python code mean? X = 2
  + Create a variable with the name x, and assign it the value of 2
* Which of these functions is used to see a variables type?
  + Type ()

# **Arithmetic, Floats and Modulo**

* Operators
  + + - \* /
* Float – decimal points – take more space than integers
* Modulo – % symbol – prints out the remainder of a sum

# **Ordering Operations using Brackets**

* BODMAS – Brackets, Order, Division, Multiplication, Addition, Subtraction
* 2 \* (5 – 1 ) = 8

# **Random Module**

* Usual done at the top of the script
* Import random
* Random.randint(1,50)

# **Force a float to become an integer**

* Potion\_health = int(random.randint(25, 50) / difficulty)

# **How to round numbers**

* Import math
* Round(1.5) – will round to 2
* To force the round down
* Math.floor(1.5) – Will round down to 1
* Math.ceil(2.1) – Will round up to 3

# **Python Number Quiz**

* What is an integer?
  + A whole number
* 2.5 is an example of…
  + A float
* What does modulo operator do?
  + Finds the remainder of a division
* How would I find the remainder of 3 divided by 2
  + 3 % 2
* What is the result of 5 % 2
  + 1
* Why do we use brackets when working with numbers?
  + Control the order in which mathematical operations are performed
* Which is the correct way to gain access to python random module?
  + Import random

# **Storing Strings**

* Name = “Ben”
* Broken string is when a string has been closed
* ‘John said to me “I will see you later”’
* When it’s a large paragraph and it keeps breaking use “””

# **Python Comments**

* Use the hash key #

# **Python Input Function**

* Python standard library
* S = Input(‘What is your name?”

# **How to stick strings together**

* Use the + operator

# **How to turn an integer into a string**

* A = “part”
* B = 1
* A + str(B)
* Python format function
  + “{} – {}”.format(A,B)
  + “{1} – {0}”.format(A,B)

# **String Function**

* String methods
* String.method()
* “Hello”.count(e)
* This will count how many e’s are in hello

# **Convert a string to Uppercase or Lower**

* X = “Happy Birthday}
* X.lower()
* “happy birthday”
* Likewise for uppercase
* Strings are an immutable type so they cannot be changed only overwritten

# **Capitalize the first letter**

* X.capitalize()

# **Capitalize the first letter of every word**

* X.title()

# **Check if something is upper or lower case**

* X.islower()
* Will return true or false

# **Check if everything is just letters**

* X.isalpha()

# **Check if everything is just numbers**

* X.isdigit()

# **Check if a piece of text is alpha numeric**

* X.isalnum()

# **Search for a piece of text**

* X = “Happy Birthday”
* X.index(“Birthday”
* 6
* Index’s start counting from 0
* If it does not exist it will give an error
* You can use x.find(“ihiuh”)
* This will give -1 and will not crash
* This is case sensitive

# **To strip everything from a string you don’t need**

* X = “00000Happy Birthday00000”
* X.strip(“0”)
* You can strip just the one side of the string
* X.lstrip(“0”)
* X.rstrip(“0”)

# **To strip spaces from either side**

* X.strip()
* Without putting anything in the ()
* Name = input(“What is your name? “).strip()
* This will remove any spaces from the side of a name

# **What is a Slice**

* Strings are itterable meaning you can go step by step until you get to the end which are called elements
* Each element has a number
  + Word = “Hello”
  + Word[0]
  + H
* To take a slice out of a string you start with a variable[start:end:steps]
* To end you need to go to the letter you want to end at and include it
* Word[0:4:1]
* Hell

# **How to slice from a letter to the end**

* Word[5:] this will go from the 5th letter to the end
* Word[5::2] will go from the 5th letter in intervals of 2
* Word[:7] will include everything up until the 7th letter

# **How to reverse a string**

* Word[::-1]

# **How to slice from the other end of the string**

* Word[-2] will give u

# **How to slice 2 parts of a string**

* Word[word.index(“cali”):word.index(“fragi”)]
* Index only returns the first instance

# **Slices Quiz**

* A string is an iterable data type
  + True
* The basic slice format is:
  + Variable[start:end:step]
* If you have string = “happy birthday” how can we pull out the word happy using a slice?
  + String[ : string.index(“\_”)]

# **What are Booleans and Operators?**

* Can only have 2 values True or False
* 2 > 3 = false
* < less than
* > greater than
* == equality operator
* != not equal to each other
* 4 >= 3 greater than or equal to
* 4 <= 3 less than or equal to

# **Comparison Operators Quiz**

* 2 > 3
  + False
* 3 = 3 is
  + Invalid
* 3 <= 3 is
  + True
* 4 < 3
  + False
* 2 == 2 is
  + True
* 5 != 3 is
  + True
* 7 >=9 is
  + False

# **What are If statements**

* Can execute a piece of code only if a condition is true
* If num1 > num2:
* Elif num2 > num1:
* Else

# **Logical Operators**

* Combine and modify the conditions to make bigger conditions
* Not 2 < 3 false
* And – both need to be true else will be false
* If 3 == 3 and 4 < 5 print”it worked”
* Can combine not and ands together
* If not ( 10 > 10 and 5 > 1 ): print ”it worked”
* Or operator will give us true if either A or B Is true

# **Logic Operators Quiz**

* Not True is
  + False
* Not False is
  + True
* True and False is
  + False
* False or True is
  + True
* True or True is
  + True
* (True or False) and (False or True) is
  + True
* (True and False) or (not True and True)
  + False

# **What are lists?**

* How to create a list
* Our\_list = [27, 46, -5, 17, 99]
* Lists can contain numbers, Booleans and strings
* Itterable data type so can be broken up into elements which start at 0
* Jackson[4]
* Can save elements of the list into its own variables
* X = Jackson[6]
* Can slice different parts out of the lists
* Jackson[start:end:step]
* Jackson[0:3]

# **Inside Lists**

* Lists can have other lists inside them
* Our\_list = [1, 2, [3, 4, 5], 6, 7, 8]
* Can get a whole list from our\_list[2] that will get the 3, 4, 5
* We can then get the elements inside that list
* Our\_list[2][0]
* We can then get a slice out of the index
* Our\_list[2][1:] – will print out 4, 5

# **In Python keyword**

* In keyword will look to see if an item is in the list

# **Delete items in the list**

* Example [1, 2, 3, 4, 5]
* Del.Example[2]
* Can take slices out of list
* Del.example[0:2]

# **Add people to a list**

* Append will add a item to a list
* Know\_users.append(name)

# **Different ways to add to lists**

* Can have a normal list and do A = A + [1] to add 1 to the list
* A = A + [“BCD”] will add that as a while [ 1, 2, 3, 4, “BCD”]
* A = A +list(“BCD”) will do [1, 2, 3, 4, B, C, D]
* Can convert numbers into a list string
* A = A + list(str(1, 2, 3))
* Add a whole element
* B = B + [[1, 2, 3, 4]]
* B.append([5, 6, 7, 8])
* To insert a number between others
* B.insert(2, 100)
* Can insert lists using insert
* B.insert(2,[1, 2, 3])
* How to change a element in a list
* B[0] = 5

# **What are Tuples**

* Data type that’s similar to a list
* Tuples cannot be changed – immutable data type, itterable data type
* Our\_tuple = (1, 2, 3, “A”, “B”, “C”)
* Good for storing data that you don’t want to change
* You can change data types to become a tuple
* A = tuple(A)
* Can define multiple variables in one go
* (A, B, C) = 1, 2, 3

# **What are Dictionaries**

* Look up a key and get back a value
* {} are used to create dictionaries
* Student = {“Alice”:25…..}
* 25 – item
* Alice – key
* To add people to the dictionary
* Students[“Fred”] = 25
* Changing the age of a student
* Student[“Alice”] = 26
* How to delete a key from a dictionary
* Del student[“Fred”]
* Making a list of keys and values
* Student.keys, student.values()
* Need to create a list to use them
* A – list(student.values())
* Print all of the items which are In the dictionary
* Student.items()

# **Add multiple Values to a dictionary key**

* “Alice”: [“ID0001”, 26, “A”]
* Print(second\_student[“Claire”])
* To print just one part of the list – [“Claire”][0]
* Can create IDs within dictionaries
* “Alice”: {“ID”: “ID0001”,…
* Print(student[“Chloe”][“Age”]

# **Pass keyword**

* Will let python just pass over the code
* Pass

# **What is a while loop**

* Piece of code that will repeat something over and over while some condition is true
* While condition: some code
* If number is divisable by 2
* If numbers % 2 == 0
* Will print out 2, 4, 5,
* If numbers % 2 != 0
* Will print out 1, 3, 5,

# **For loops**

* Made up of a variable
* Each round of the for loop becomes the next value
* Range() creates an itterable of numbers
* For number in range(1,11) print number

# **List Comprehensions**

* Shortcut method to combine variales, for loops and if statements
* Even\_numbers = [x for in range(1,101) if x % 2 == 0]

# **Split each word of a sentence**

* Words = original.split()
* Will create a list of all the words in the sentence

# **Joining strings back together**

* “ “.join(new\_Words)

# **What are functions**

* Functions allow you to break up your program into little reusable pieces
* Keeping code more organised
* Performs and action
* Need to define a function using def
* Def add(x, y): return x + y
* To get our function to run we need to call it
* Add(5, 10)
* Returning values is not the same as printing

# **What are variable scopes**

* Keeps certain parts of the program from interfering with others
* Global – can be seen anywhere in the program
* Local – can only been seen in the specific local scope
* Loops and if statements create global
* Functions create local scopes
* Cant change global variables inside of functions automatically
* You can overwrite global by using the global keyword in the function

# **Function parameters**

* Parameter is what goes inside the () – name, age, likes
* Arguments what we call – jack, 23, python
* Both match to each other
* You can give the arguments keywords name = “Jack” etc
* Default parameters must go at the end name, age, likes = “python”