Python in One Shot

This video has been made with a lot of love & I hope you guys have an amazing programming journey :)

Why to Use Python?
Python can be used for :

1. Programming (for Placements/online contests/DSA)
2. Development (using a backend framework called Django)
3. Machine Learning / Data Science / Artificial Intelligence

Websites built using Python include Google, Youtube, Instagram, Netflix, Uber & much more.

What to Install?

1. Python (https://www.python.org/)
2. PyScripter (https://rb.gy/bvnn69)
3. PyCharm (https://www.jetbrains.com/pycharm/)

Our First Python Program

```
print("Hello World")
```

A Key Point to know about Python

- It is a case sensitive language

Variables

Basic Types in Python - *numbers(integers, floating), boolean, strings*

Example 1 :

```
name = "shradha"
age = 22
print(name)
print(age)
```

Example 2 :

```
name = "shradha"
age = 22
```

```
name = "aman"
age = 24
print(name)
print(age)
```

Example 3 :

```
first_name = "shradha"
last_name = "khapra"
age = 19
is_adult = True

print(first_name + " " + last_name)
print(age)
print(is_adult)
```

> Exercise Solution

```
first_name = "Tony"
last_name = "Stark"
age = 52
is_genius = True
```

Taking Input

```
name = input("What is your name? ")
print("Hello " + name)
print("Welcome to our cool Python class")
```

> Exercise Solution

```
superhero = input("What is your superhero name? ")
print(superhero)
```

Type Conversion

```
old_age = input("Enter your age : ")
#new_age = old_age + 2
#print(new_age)

new_age = int(old_age) + 2
print(new_age)


#Useful converion functions
    # 1. float()
    # 2. bool()
    # 3. str()
    # 4. int()
```

> Code for Sum of 2 Numbers

```
first_number = input("Enter 1st number : ")
second_number = input("Enter 2nd number : ")
sum = float(first_number) + float(second_number)

print("the sum is : " + str(sum))
```

Strings

```
name = "Tony Stark"
print(name.upper())
print(name)

print(name.lower())
print(name)

print(name.find('y'))
print(name.find('Y'))
print(name.find("Stark"))
print(name.find("stark"))

print(name.replace("Tony Stark", "Ironman"))
print(name)

#to check if a character/string is part of the main string
print("Stark" in name)
print("S" in name)
print("s" in name)
```

Arithmetic Operators

```
print(5 + 2)
print(5 - 2)
print(5 * 2)
print(5 / 2)
print( 5 // 2)
print(5 % 2)
print(5 ** 2)

i = 5
i = i + 2
i += 2
i -= 2
i *= 2
```

Operator Precedence

```
result = 3 + 5 * 2 # 16 or 13 ?
print(result)
```

Operators	Meaning
`()`	Parentheses
`**`	Exponent
`+x`, `-x`, `~x`	Unary plus, Unary minus, Bitwise NOT
`*`, `/`, `//`, `%`	Multiplication, Division, Floor division, Modulus
`+`, `-`	Addition, Subtraction
`<<`, `>>`	Bitwise shift operators
`&`	Bitwise AND
`^`	Bitwise XOR
`|`	Bitwise OR
`==`, `!=`, `>`, `>=`, `<`, `<=`, `is`, `is not`, `in`, `not in`	Comparisons, Identity, Membership operators
`not`	Logical NOT
`and`	Logical AND
`or`	Logical OR

Comments

```
# This is a comment & useful for people reading your code
# This is another line
```

Comparison Operators

```
is_greater = 1 > 5
is_lesser = 1 < 5
# 1 <= 5
# 1 >= 5
is_not_equal = 1 != 5
is_equal = 1 == 5
```

Logical Operators

```
# or -> (atleast one is true)
# and -> (both are true)
# not -> (reverses any value)

number = 2
print(number > 3)
print(number < 3)
print(not number > 3)
print(not number < 3)

print(number > 3 and number > 1)
print(number > 3 or number > 1)
```

If statements

```
age = 13

if age >= 18:
    print("you are an adult")
    print("you can vote")
elif age < 3:
    print("you are a child")
else:
    print("you are in school")
print("thank you")
```

Let's build a Calculator

```
#Our Calculator

first = input("Enter first number : ")
second = input("Enter second number : ")
first = int(first)
```

```
second = int(second)
print("----press keys for operator (+,-,*,/,%)----------")
operator = input("Enter operator : ")

if operator == "+":
   print(first + second)
elif operator == "-":
   print(first - second)
elif operator == "*":
   print(first * second)
elif operator == "/":
   print(first / second)
elif operator == "%":
   print(first % second)
else:
   print("Invalid Operation")
```

Range in Python

range() function returns a range object that is a sequence of numbers.

```
numbers = range(5)
print(numbers)
```

For iteration (see For Loop section)

While Loop

```
i = 1
while(i <= 5):
   print(i)
   i = i + 1

i = 1
while(i <= 5):
   print(i * "*")
   i = i + 1

i = 5
while(i >= 1):
   print(i * "*")
   i = i - 1
```

For Loop (to iterate over a list)

```
for i in range(5):
   print(i)
```

```
    i = i + 1

for i in range(5):
    print(i * "*")
    i = i + 1
```

Lists

List is a complex type in Python.

```
friends = ["amar", "akbar", "anthony"]
print(friends[0])
print(friends[1])
print(friends[-1])
print(friends[-2])

friends[0] = "aman"
print(friends)

print(friends[0:2]) #returns a new list

for friend in friends:
    print(friend)
```

List Methods :

```
marks = ["english", 95, "chemistry", 98]
marks.append("physics")
marks.append(97)
print(marks)

marks.insert(0, "math")
marks.insert(1, 99)
print(marks)

print("math" in marks)

print(len(marks)/2)
marks.clear()
print(marks)

i = 0
while i < len(marks):
    print(marks[i])
    print(marks[i+1])
    i = i + 2
```

Break & Continue

```
students = ["ram", "shyam", "kishan", "radha", "radhika"]
```

```
for student in students:
    if(student == "radha"):
        break
    print(student)

for student in students:
    if(student == "kishan"):
        continue
    print(student)
```

Tuples

They are like lists (sequence of objects) but they are immutable i.e. once they have been defined we cannot change them.

Parenthesis in tuples are optional.

```
marks = (95, 98, 97, 97)
#marks[0] = 98

print(marks.count(97))
print(marks.index(97))
```

Sets

Sets are a collection of all unique elements.

Indexing is not supported in sets.

```
marks = {98, 97, 95, 95}
print(marks)

for score in marks:
    print(score)
```

Dictionary

Dictionary is an unordered collection of Items. Dictionary stores a (key, value) pair.

```
marks = {"math" : 99, "chemistry" : 98, "physics" : 97}
print(marks)
print(marks["chemistry"])

marks["english"] = 95
print(marks)

marks["math"] = 96
print(marks)
```

Functions in Python

Function is a piece of code that performs some task. (In a tv remote, each button performs a functions, so a function is like that button in code)
There are 3 types of functions in Java :

a. In-built functions

```
# int() str() float() min() range() max()
```

b. Module functions
   Module is a file that contains some functions & variables which can be imported for use in other files.
   Each module should contain some related tasks
   Example : math, random, string

```
import math
print(dir(math))

import random
print(dir(random))

import string
print(dir(string))

from math import sqrt
print(sqrt(4))
```

c. User-defined functions

```
def sum(a, b=4):
    print(a + b)

sum(1, 2)
sum(1)
```

For Machine Learning, refer : https://www.youtube.com/watch?v=1vsmaEfbnoE

Some additional Links :

- https://rb.gy/gjpmwg (A Python GUI)

  Some useful Modules

- https://github.com/Embarcadero/DelphiFMX4Python
- https://github.com/Embarcadero/DelphiVCL4Python