Python Notebook tutorials

1st tutroiral

Basics of python

1-my first line

01_My first program

In [1]:
```python
print("I Am Muhammad Shahzeb")

print(2+3)
print("I Am Muhammad Shahzeb")
```

```
I Am Muhammad Shahzeb
5
I Am Muhammad Shahzeb
```

02_Operators

In [2]:
```python
# operators
print(9/2)
print(9*2)
print(9+2)
print(9-2)

#in case we dont want value in points
print(9//2)

#power
print(9**2)

# all operation in single equation
print(9**2/8/3+4-9)
# python follow the PEMDAS sequence instead of PEDMAS
```

```
4.5
18
11
7
4
81
-1.625
```

03_Strings

In [3]:
```python
# Anything written between the single ,double or tripple qoutation marks are called Strin
print("I Am Muhammad Shahzeb")
print('Test for single qoutaion ')
print("Test for double qoutaion ")
print('''Test for tripple qoutaion''')
print("what's up")
```

```
I Am Muhammad Shahzeb
Test for single qoutaion
Test for double qoutaion
Test for tripple qoutaion
what's up
```

04_Comments

In [4]:
```python
# anything which cant be proeceed by interpretor and programmers used for thier info is c
# comments are single line and multi line
# can be commentize anyline by pressing Ctrl+/
# comments are started with Ctrl

# print("hi")
```

05_Variables

In [5]:
```python
# variables are the objests containing specific value

x=7 #numeric Integer type variable
print(x)

y="I Am Muhammad Shahzeb" #string type variable
print(y)

x=x+12  #updating the variable by adding in same variable
print(x)

x=900   #updating value of a variable
print(x)

# checking the type of a variable
# Python automatically detect the variable type
print(type(x))
print(type(y))

#Rules to assign a variable
#1- Variable should contain  letetrs,  numbers, or underscores
#2- Do not start with numbers
#3- Spaces are not allowed
#4- Do not use keywords
#5-Short and precise descriptive
#6-Case sensitivity (Lowercase, uppercase letters , lower case letters are reccommended)

# some practice
no_of_fruits=8
fruit_basket="Mangoes ,Oranges"
print(type(fruit_basket))
print(fruit_basket)
print(type(no_of_fruits))
print(no_of_fruits)
```

```
7
I Am Muhammad Shahzeb
19
900
<class 'int'>
<class 'str'>
<class 'str'>
```

```
Mangoes ,Oranges
<class 'int'>
8
```

06_Input Variables

In [6]:

```python
# Plz comment out the rest of the code while working on one topic

fruit_basket="Mangoes"
print(fruit_basket)

#input function
fruit_basket=input("which is your fsvourite fruit? ")
print(fruit_basket)

# stage 2 input function
name =input("what is your name? ")
greetings="Asslam O Alaykum "
print(greetings,name)

# 2nd method of stage 2 function
print("Hello", name)

# stage 3 input function
name=input("What is your name? ")
age=input("How old are you? ")
greetings="Hello!"

print(greetings,name,",You are still young!")
```

```
Mangoes
which is your fsvourite fruit? Mango
Mango
what is your name? Shaibi
Asslam O Alaykum  Shaibi
Hello Shaibi
What is your name? Shaibi
How old are you? 22
Hello! Shaibi ,You are still young!
```

07_Conditional Logics

In [7]:

```python
# logical operators are either "yes" or "no", "true" or "false" or "0 or 1"
# eequal to                       ==
# not equal to                    !=
# less than                       <
# greater than                    >
# less than and eqaul to          <=
# greater than and equal to       >=

# is 4 equal to 4
print(4==4)  #will print true or false based on condtion  ||true
# is 4 greater than and equal to 6
print(4>=6)  #          ||false
# 4 is not equal to 4
print(4!=4)  #          ||false


## application of logical operators
# hamid_age=12
```

```python
# age_at_school=5
# print(hamid_age>=age_at_school)

# input function and logical operator together
hamid_age=int(input("what is your age? "))   #putting age into integer function so we can
age_at_school=5
print(hamid_age>=age_at_school)
```

```
True
False
False
what is your age? 22
True
```

08_type conversion

In [8]:
```python
x=10
y=10.2
z="Hello"
# type() is used check the variable datatypes i.e int,float,str
print(type(x))
print(type(y))
print(type(z))

# Implicit type conversion
x=x*y  #it will automatically convert into float as integere multiply/devide/add/subtract
print(x)
print(type(x))

# explicit type conversion
age=input("what is your age? ")
age=float(age)
print(age, type(age))
# if we put age in an float datatype it will give invalid output

name=input("what is your name? ")
name=str(name)
print(name,type(name))
# Note: amy number is also considered as string if its data type is not converted into in
# Imp point : we have to design our programs according to the requiements for examole if
#
```

```
<class 'int'>
<class 'float'>
<class 'str'>
102.0
<class 'float'>
what is your age? 22
22.0 <class 'float'>
what is your name? Muhammad Shahzeb
Muhammad Shahzeb <class 'str'>
```

09_if else & elif

In [9]:
```python
# Statement are used to make decisions or for selections etc.
required_age_at_school=5
hamid_age= int(input("What is your age"))

# question : can hamid go to school
```

```python
# use of if ,elif and else
if hamid_age==required_age_at_school:
    print("Congratulations! you are admitted to school ")
# we can adda ny number of elif its basically other than if else statement for some speci
elif hamid_age==2:
    print("Babies just need to play! ")
elif hamid_age==20:
    print("You should be in university ! ")
elif hamid_age > required_age_at_school:
    print("You are over age you should join secondary school")

else:
    print("Sorry! you are under age ")

# Imp point: order of statment is also matter in python as it is inteprator based progeam
```

```
What is your age22
You are over age you should join secondary school
```

10_Functions

In [10]:
```python
#  for reusbailty of code make code easy

# # print is also a function
# print("hi i am Muhammad Sxhahzeb")
# print("hi i am Muhammad Shxahzeb")
# print("hi i am Muhammad Shxahzeb")
# print("hi i am Muhammad 2 xShahzeb")
# print("hi i am Muhammad Shxahzeb")
# print("hi i am Muhammad Shxahzeb")
# if we want to print a line several times we will write it again and again and if ,mista
# so to avoid this we use function than we only have to change something in function and


# method 1 defining function
# def name():
#     print("hi i am Muhammad Shahzeb")
#     print("hi i am Muhammad Shahzeb")
#     print("hi i am Muhammad Shahzeb")

# name()

# method 2
# def name():
#     text="hi i am Muhammad Shahzeb from FUSST"
#     print(text)
#     print(text)
#     print(text)

# name()

# method 3
# def name(text):
#     print(text)
#     print(text)
#     print(text)

# name("HI im Shaibi")
```

```python
# defining a function with if,else,elif

def school_age_calc(age):
    if age==5:
        print("Congratulations! you are admitted to school ")
    elif age==2:
        print("Babies just need to play! ")
    elif age >5:
        print("You are over age you should join secondary school")
    else:
        print("Sorry! you are under age ")

# we just need to enter age as a passing parameter to call age calclation function
school_age_calc(23)
school_age_calc(2)
school_age_calc(5)

def future_age(age):
    new_age=age+10
    return new_age
    print(new_age)

age_predictor=future_age(33)
print(age_predictor)
```

```
You are over age you should join secondary school
Babies just need to play!
Congratulations! you are admitted to school
43
```

11_Loops

In [11]:

```python
# highly used in python

# python have while loops and for loops

# while loops

x=0
while(x<=5):    #will print upto 5
    print(x)
    x=x+1  #we havw to add one so we can increment value to process loop othwrwise it wil
# Imp Point : indexing in prorammming is start with 0.


# for loops
for x in range(5,10):
    print(x)

# Imp Point:
# difference between for and while loop
# for loop:in for loop the number of iterations to be done is already known and is used t
# while loop:in while loop the command runs until a certain condition is reached and the

# application for for loops
week=["Monday","Tuesday","Wednesday","Thusday","Friday","Sunday"]
for d in week:
    # if d=="Wednesday":break  #loop stops
    if d=="Wednesday":continue   #loop skip that value
    print(d)
```

```
# Imp point
# break:to stop the loop at specific point
# continue: to skip value from loop
```

```
0
1
2
3
4
5
5
6
7
8
9
Monday
Tuesday
Thusday
Friday
Sunday
```

12_Import libraries

In [12]:
```
# to used the already built in function or open source funtions for this purpose we use l

# to print the value of the pi
import math  # for using mathematical functions
pie=math.pi
print(pie)

import statistics
x=[23,5,56,7,6,12,34,45]
# x=statistics.mean(x)
# print(x)

print(statistics.mean(x))  # will print the mean of x
print(statistics.mode(x))

# some important libraries
# Numpy
# Pandas
```

```
3.141592653589793
23.5
23
```

13_Troubleshooting

In [13]:
```
# process of identifying problem in a system/program
# to find the solution of errors

# 1(syntax)
# print(i am Muhammad Shahzeb)
# Syntax error : grammitical error forgetting the rules of writng program like commas qou

# 2(runtime)
# print(25/0)
# runtime error
# ZeroDivisionError: division by zero
```

```python
# 3(semantics) difficult to find ...bcs program can run but output will be wrong.
name="Shahzeb"
# print("Hello name")
print("hello", name)
```

hello Shahzeb