Lab#1&2

Submitted To

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(202101035) BSCE-7

Artificial Intelligence

(LAB)

Rubrics:

[CLO-01, PLO-02, P-3(Guided Response), Rubric (Coding)]

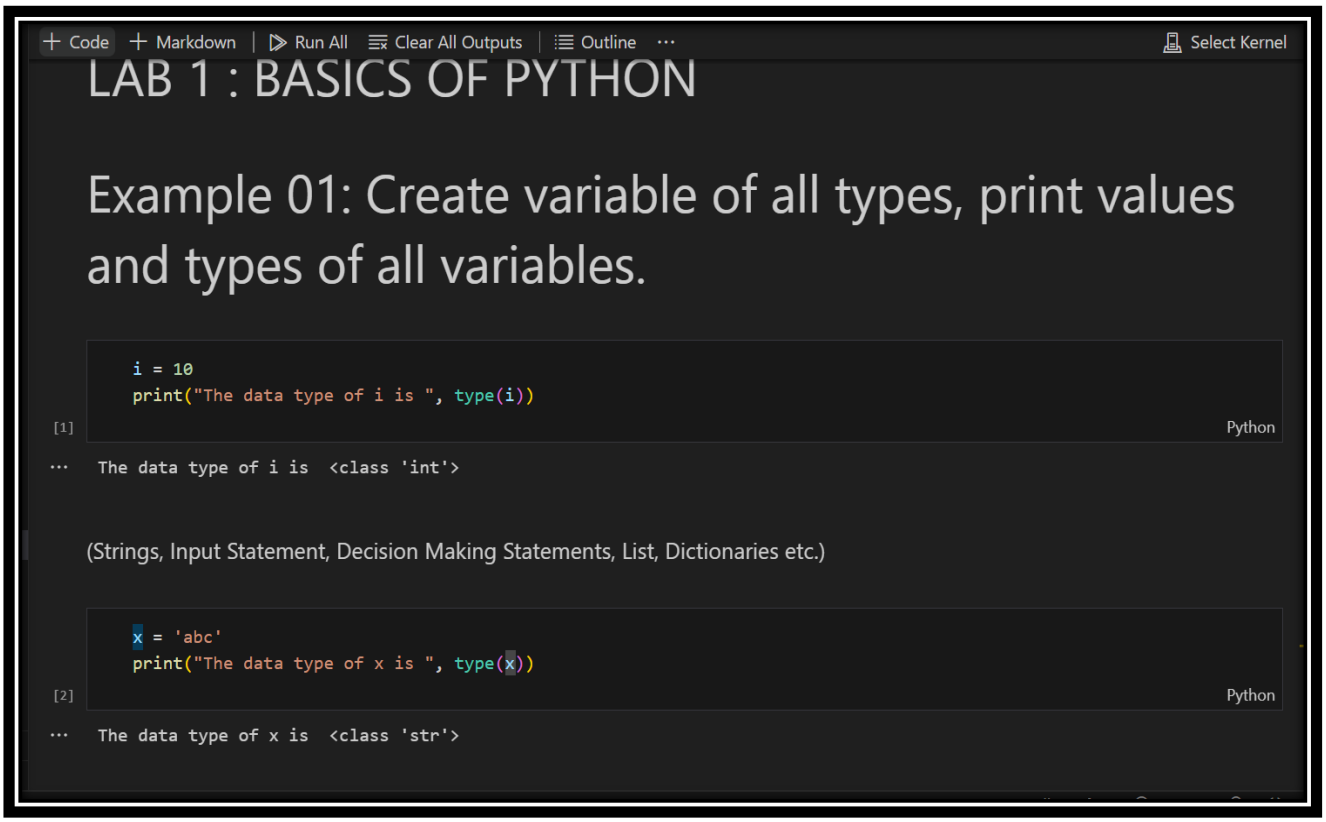
Marks	1	2	3	4
Coding	The code is not as per guidelines and requirements are not met	Some section of code is correct	Most section of code is correct and understands it well	The code is properly written, and have good understanding about it

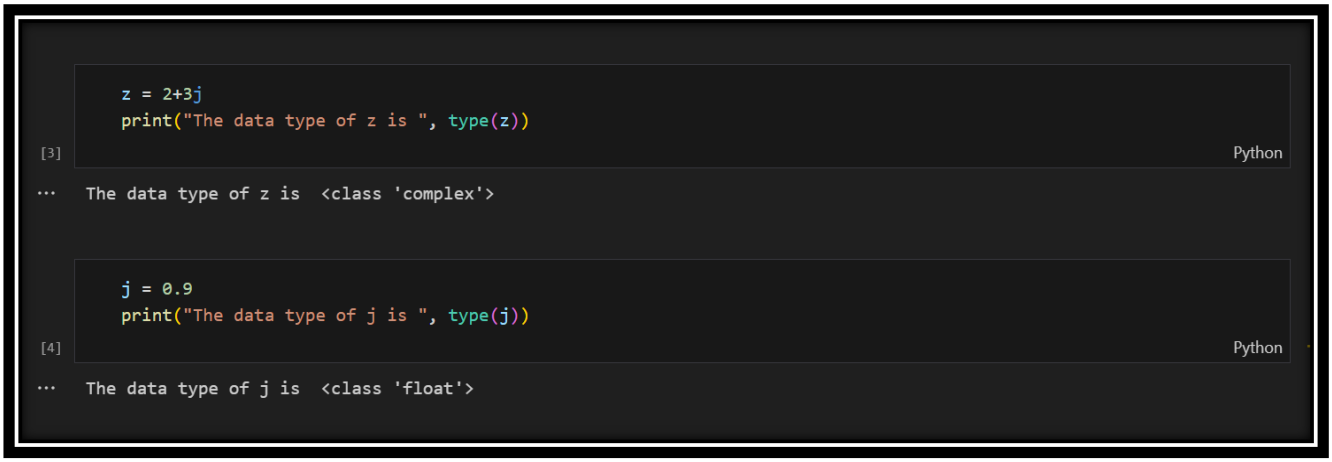
Department of Computer Science

Dr. A. Q. Khan Institute of Computer Science and Information Technology

Lab no1
Basics of python

Examples:





Example 02: Take input from user(two numbers) and perfrom all arithmetic and logical operations on it and print results.

```
[8]  num1 = input("Enter 1st Number = ")
     num1
```
Python

```
Enter 1st Number = 2
'2'
```

```
[9]  num1 = int(num1)
     num1
```
Python

```
2
```

```
[10] num2 = int(input("Enter 2nd Number = "))
     num2
```
Python

```
Enter 2nd Number = 3
3
```

Addition

```
[11] add = num1 + num2
     add
```
Python

```
5
```

Subtraction

```
[12] Sub = num1 - num2
     Sub
```
Python

```
-1
```

Multiplication

```
[13] Mul = num1 * num2
     Mul
```
Python

```
6
```

Division

```
Div = num1 / num2
Div
```

[15] Python

```
0.6666666666666666
```

Mod

```
Mod = num1%num2
Mod
```

[16] Python

```
2
```

Exponent

```
exp = num1**num2
exp
```

[17] Python

```
8
```

```
x1 = input('Enter 1st number = ')
y1 = input('Enter 2nd number = ')
x=int(x1)
y=int(y1)
add=x+y
sub=x-y
mul=x*y
div=x/y
mod=x%y
exp=x**y
a=x and y
b=x or y
c=not x
#print
print("The addition of numbers is ",add)
print("The subtraction of numbers is ", sub)
print("The multiplication of numbers is ",mul)
print("The division of numbers is ",div)
print("The modulus of numbers is ", mod)
print("The exponent of numbers is ",exp)
print("The AND of numbers is ",a)
print("The OR of numbers is ",b)
print("The NOT of numbers is ",c)
```

[18] Python

```
Enter 1st number = 5
Enter 2nd number = 4
The addition of numbers is  9
The subtraction of numbers is  1
The multiplication of numbers is  20
The division of numbers is  1.25
The modulus of numbers is  1
The exponent of numbers is  625
The AND of numbers is  4
The OR of numbers is  5
The NOT of numbers is  False
```

Example 03: Take a string (a long Statement) from user

.Find the length of the string

.Display the first and last character of the string

.Capitalize all alphabets

.Split string in to words (split using ' ')

.count the occurrence of an Alphabet (i.e : a)

.replace the second word of a string with 'Artificial'

.reverse the complete string

```
[19] longStr=input("Enter a long string : ")
     ✓ 24.9s                                                    Python

[20] longStr
     ✓ 0.0s                                                     Python
...  'My name is Sumayya Bashir and I am a student of ce7'

[21] print(f"The length of given string is {len(longStr)} includig spaces.")
     ✓ 0.0s                                                     Python
...  The length of given string is 51 includig spaces.

[22] print("The first character of the given string is ", longStr[0])
     ✓ 0.0s                                                     Python
...  The first character of the given string is  M
```

```
[23] print(f"The last character of the given string is {longStr[-1]}")
     ✓ 0.0s                                                     Python
...  The last character of the given string is 7

[24] print(f"The given string in upper case : \n {longStr.upper()}")
     ✓ 0.0s                                                     Python
...  The given string in upper case :
      MY NAME IS SUMAYYA BASHIR AND I AM A STUDENT OF CE7

[25] print(f"The splited string : \n {longStr.split(' ')}")
     ✓ 0.0s                                                     Python
...  The splited string :
      ['My', 'name', 'is', 'Sumayya', 'Bashir', 'and', 'I', 'am', 'a', 'student', 'of', 'ce7']

[26] print(f"In the given string 'a' has occured : {longStr.count('a')} ")
     ✓ 0.0s                                                     Python
...  In the given string 'a' has occured : 7
```

```
print(f"The reversed string is : {longStr[::-1]}")
```
[27] ✓ 0.0s Python

```
The reversed string is : 7ec fo tneduts a ma I dna rihsaB ayyamuS si eman yM
```

```
longStr
```
[28] ✓ 0.0s Python

```
'My name is Sumayya Bashir and I am a student of ce7'
```

```
longStr="Sumayya"
print("The replaced string is up: ",longStr.replace('Sumayya','S'))
```
[3] ✓ 0.0s Python

```
The replaced string is up:  S
```

Example 04:

Take three integer input from user in a single line and find the average

```
x, y, z=input('Enter three numbers with spaces to distinguish them = ').split(' ')
x1 = int(x)
x2 = int(y)
x3 = int(z)

avg=(x1+x2+x3)/3
print("The average of the numbers entered is = ", avg)
```
[30] Python

Example 05:

Create a list of 10 values

Display the elements of a list

Update the value of 3rd index

Reverse the list

Add 2 more elements in 2nd index and print list

Pop element of 1 index and display list

```
array=[1,2, 'A', 'Sumayya',3,4, 'y', 'Bashir', 'ali', 'umer']
array
```

[6] ✓ 0.0s Python

```
[1, 2, 'A', 'Sumayya', 3, 4, 'y', 'Bashir', 'ali', 'umer']
```

```
array[2]='S'

print("The updated list with element of 3rd index = ",array)
```

[5] ✓ 0.0s Python

```
The updated list with element of 3rd index =  [1, 2, 'S', 'Sumayya', 3, 4, 'y', 'Bashir', 'ali', 'umer']
```

```
print("The reversed list is :",array[::-1])
```

[7] ✓ 0.0s Python

```
The reversed list is : ['umer', 'ali', 'Bashir', 'y', 4, 3, 'Sumayya', 'A', 2, 1]
```

```
array.insert(1,45)

array.insert(1,66)

print("The list after inserting elements of 2nd index is :",array)
```

[9] ✓ 0.0s Python

```
The list after inserting elements of 2nd index is : [1, 66, 45, 2, 'S', 'Sumayya', 3, 4, 'y', 'Bashir', 'ali', 'umer']
```

```
array.pop(0)

print("The list after popping element of 1st index is :", array)
```

[10] ✓ 0.0s Python

```
The list after popping element of 1st index is : [66, 45, 2, 'S', 'Sumayya', 3, 4, 'y', 'Bashir', 'ali', 'umer']
```

Example 06: Dictionary

Create dictionary

Display dictionary

Print keys and value separately

Insert new key-value pair

Copy dictionary into new dictionary

```
mydict={ "Artifical" : "made or produced by human beings rather than occurring naturally, especially as a copy of s
        "Intelligence" : "the ability to acquire and apply knowledge and skills.",
        2021: "The current year"}
```

Python

```
mydict
```

Python

```
{'Artifical': 'made or produced by human beings rather than occurring naturally, especially as a copy of something',
 'Intelligence': 'the ability to acquire and apply knowledge and skills.',
 2021: 'The current year'}
```

```
print(f"The keys in the given Dictionary are \n {mydict.keys()}")
```

Python

```
The keys in the given Dictionary are
 dict_keys(['Artifical', 'Intelligence', 2021])
```

```
print("The original dictionary is\n\n", mydict)

updatedict={"Ali": "Height/limit/shore/Remote/Farthest",
            "laboratory":"a room or building equipped for scientific experiments, research, or teaching, or for th

print("\n Inserting new key pair in dictionary \n\nUpdated Dictionary is \n")

mydict.update(updatedict)

print(mydict)
```

Python

```
The original dictionary is

 {'Artifical': 'made or produced by human beings rather than occurring naturally, especially as a copy of something',

 Inserting new key pair in dictionary

Updated Dictionary is

{'Artifical': 'made or produced by human beings rather than occurring naturally, especially as a copy of something', '
```

```
dictCopy = mydict.copy()

dictCopy
```

Python

```
{'Artifical': 'made or produced by human beings rather than occurring naturally, especially as a copy of something',
 'Intelligence': 'the ability to acquire and apply knowledge and skills.',
 2021: 'The current year',
 'Ali': 'Height/limit/shore/Remote/Farthest',
 'laboratory': 'a room or building equipped for scientific experiments, research, or teaching, or for the manufacture
```

Example 07: Decision Making Statements

Compare a and b and display weather a is greater than, less than or equal to b where a=5 and b=2

```python
a = 5
b = 2

if a > b:
    print("a is greater then b")
elif b > a:
    print("a is less then b")
else:
    print("a and b are equal")
```

Python

```
a is greater then b
```

```python
a = int(input("Enter value of a: "))
b = int(input("Enter value of b: "))

if a > b:
    print("a is greater then b")
elif b > a:
    print("a is less then b")
else:
    print("a and b are equal")
```

Python

```
Enter value of a: 10
Enter value of b: 4
a is greater then b
```

Example 08: For Loop

Implement for loop, remove newline, inserting character/symbol in between characters using print statement.

```python
print("Implementing for loop :")

for i in "PYTHON":
    print (i)

print("\n\nRemoving Newline from print statement : ")

for i in "PYTHON":
    print (i,end='')

print("\n\nAdding different characters/symbol in print statement: ")

for i in "PYTHON":
    print (i, end='*')
```

Python

```
Implementing for loop :
P
Y
T
H
O
N


Removing Newline from print statement :
PYTHON

Adding different characters/symbol in print statement:
P*Y*T*H*O*N*
```

```python
array= [1,2,3,4,5,6]

print("Implementing for loop :")

for i in array:
    print (i)

print("\n\nRemoving Newline from print statement : ")

for i in array:
    print (i,end='')

print("\n\nAdding different characters/symbol in print statement: ")

for i in array:
    print (i, end='*')
```

Python

```
Implementing for loop :
1
2
3
4
5
6


Removing Newline from print statement :
123456

Adding different characters/symbol in print statement:
1*2*3*4*5*6*
```

```python
for i in range(1, 11):
    print(i)

print("\nafter chnaging the step size to 2\n")

for i in range(1, 11, 2):
    print(i)
```

Python

```
1
2
3
4
5
6
7
8
9
10

after chnaging the step size to 2

1
3
5
7
9
```

```python
a = int(input("Enter the number for which you want to print table: "))

for i in range(1, 11):
    print(f"{a}  *  {i} =  {i*a}")
```

Python

```
Enter the number for which you want to print table: 3
3  *  1 =  3
3  *  2 =  6
3  *  3 =  9
3  *  4 =  12
3  *  5 =  15
3  *  6 =  18
3  *  7 =  21
3  *  8 =  24
3  *  9 =  27
3  *  10 =  30
```

```python
mydict={ "Artifical" : "made or produced by human beings rather than occurring naturally, especially as a copy of
        "Intelligence" : "the ability to acquire and apply knowledge and skills.",
        2021: "The current year"}

for i in mydict:
    print(i)
```

Python

```
Artifical
Intelligence
2021
```

```python
mydict={ "Artifical" : "made or produced by human beings rather than occurring naturally, especially as a copy of
        "Intelligence" : "the ability to acquire and apply knowledge and skills.",
        2021: "The current year"}

for i in mydict:
    print(mydict[i])
```

Python

```
made or produced by human beings rather than occurring naturally, especially as a copy of something
the ability to acquire and apply knowledge and skills.
The current year
```

```python
mydict={ "Artifical" : "made or produced by human beings rather than occurring naturally, especially as a copy of
        "Intelligence" : "the ability to acquire and apply knowledge and skills.",
        2021: "The current year"}

for i in mydict:
    print(i, ":", mydict[i])
```

Python

```
Artifical : made or produced by human beings rather than occurring naturally, especially as a copy of something
Intelligence : the ability to acquire and apply knowledge and skills.
2021 : The current year
```

```python
for i in range(1, 101):
    if i%2 == 0:
        print(i, end=",")
```

Python

```
2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38,40,42,44,46,48,50,52,54,56,58,60,62,64,66,68,70,72,74,76,78,80,82
```

```python
count = 0
for i in range(1, 101, 5):
    if i%2 == 0:
        print(i, end=",")
        count +=1
print("\nthe total number is ", count)
```

```
6,16,26,36,46,56,66,76,86,96,
the total number is  10
```

```python
##### lis = []

for i in range(1, 4):
    a = int(input("Enter the element: "))
    lis.append(a)
print(lis)
```

```
Enter the element: 123454
Enter the element: 3455
Enter the element: 55434
[333, 555, 777, 123454, 3455, 55434]
```

Example 09: While Loop

Print counting from 1 to 10 using while loop

```python
i = 0

while i < 10:
    print(i)
    i += 1
```

```
0
1
2
3
4
5
6
7
8
9
```

```python
i=0
j=1
lis = []
while (i<10):
    a=int (input("Enter the element : "))
    lis.append(a)

    i=i+1

print("The input list is \n", lis )

maxi=lis[0]

while (j<10):
    if(maxi<lis [j]):
        maxi=lis[j]
    j=j+1

print("The greatest number amongst the list is : ", maxi)
```

```
Enter the element : 100
Enter the element : 30
Enter the element : 20
Enter the element : 40
Enter the element : 50
Enter the element : 44
Enter the element : 55
Enter the element : 666
Enter the element : 556
Enter the element : 4432
The input list is
 [100, 30, 20, 40, 50, 44, 55, 666, 556, 4432]
The greatest number amongst the list is :  4432
```

Example 10: Functions

Implement a Simple Function

```python
def myFunc():
    print("This is my Function")
```

Python

```python
myFunc()
```

Python

```
This is my Function
```

```python
def addAB(a, b):
    sum = a + b
    return sum
```

Python

```python
sum = addAB(3, 5)
print(sum)
```

Python

```
8
```

```python
def addAB(a, b):
    return a+b
```

Python

```python
addAB(4, 3)
```

Python

```
7
```

```python
def addAB(a = 1, b = 1):
    return a + b
```

Python

```python
addAB(a=4)
```

Python

```
5
```

Example 11: Lambda Function

Certainly! A lambda function in Python is a small, anonymous function defined using the lambda keyword. Lambda functions are also known as anonymous functions or lambda expressions. They are used for creating small, one-time-use functions without a formal function definition.

lambda arguments: expression

arguments: These are the input arguments to the lambda function, similar to the arguments of a regular function.
expression: This is a single expression that gets evaluated and returned by the lambda function. Define a lambda function that adds two numbers

```python
add = lambda x, y: x + y

# Use the lambda function
result = add(5, 3)
print(result)
```

[ ] Python

```
8
```

```python
# Create a list of numbers
numbers = [1, 2, 3, 4, 5]

# Use map() with a lambda function to square each number
squared_numbers = list(map(lambda x: x**2, numbers))

print(squared_numbers)
```

[1] ✓ 0.0s Python

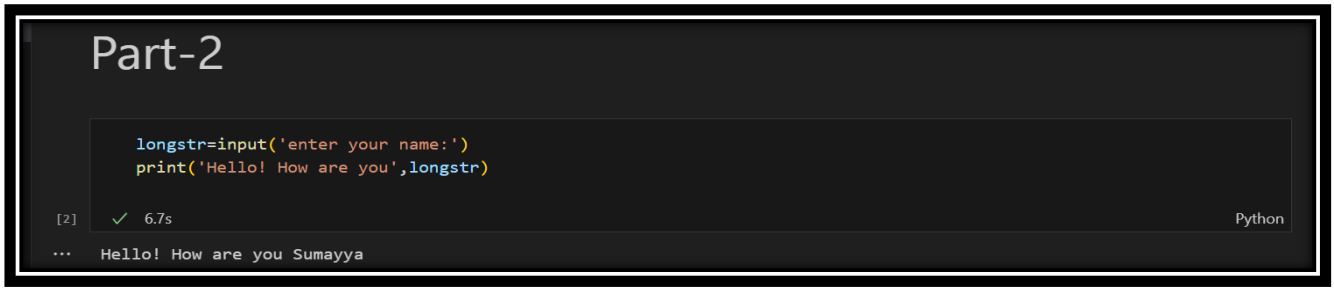
```
[1, 4, 9, 16, 25]
```

Lab no:2

Tasks

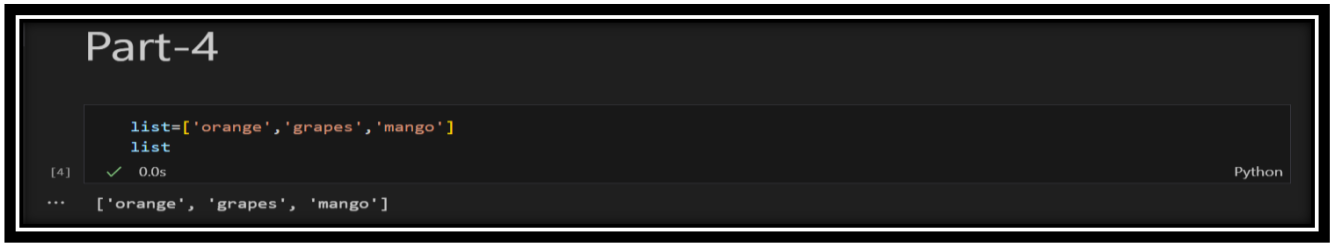
1. **Create three variables representing your name, age, and favorite color. Print a message using these variables.**

2.Ask the user for their name and then print a personalized greeting.

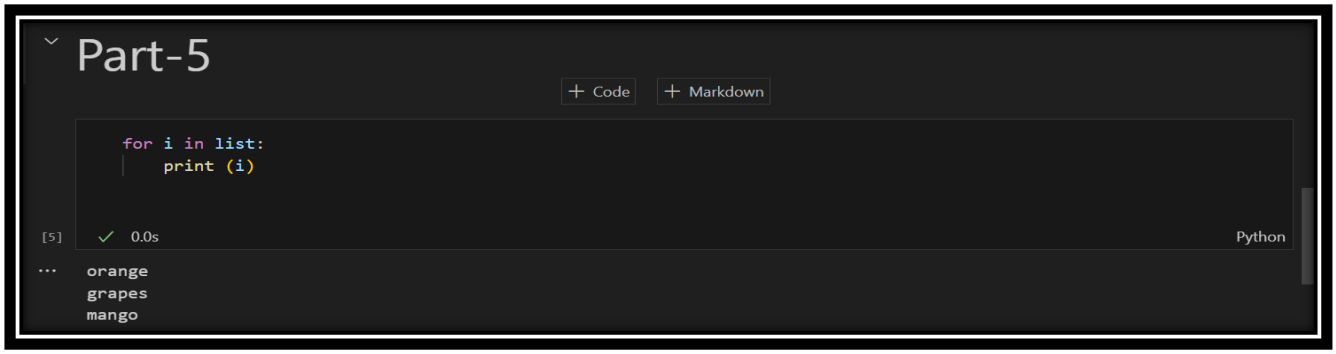


3.Create a string containing your favorite quote. Print the quote and its length.

4.Create a list of your favorite fruits. Print the list and the total number of fruits.



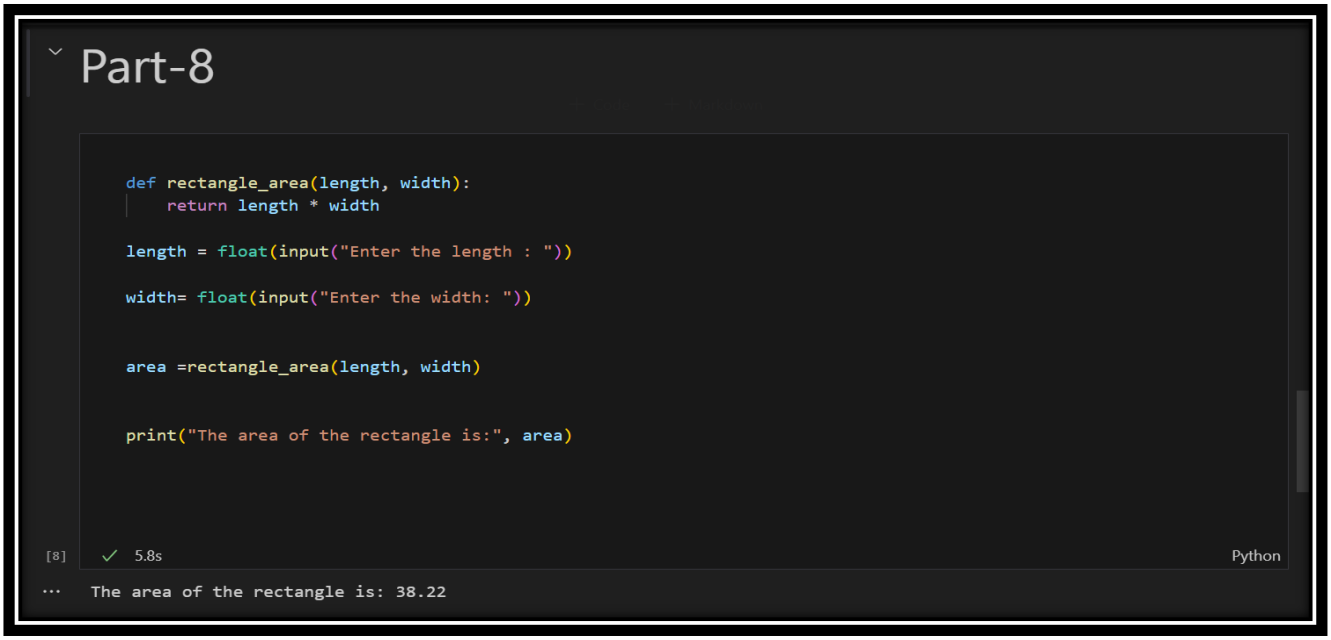
5. Create a list of your favorite fruits. Print the list and the total number of fruits.



6.Create a dictionary representing a person's information (name, age, and city). Print the dictionary.

7. Ask the user for their age and check if they are eligible to vote (age 18 or older). Print the eligibility status.

8. Create a function that calculates the area of a rectangle given its length and width. Ask the user for the values and print the area.



9. Ask the user to guess a number between 1 and 10. Keep prompting them until they guess correctly.

```
I'm thinking of a number. Can you guess it?
Try a higher number.
Try a higher number.
Congratulations! You've guessed the number 9.
```

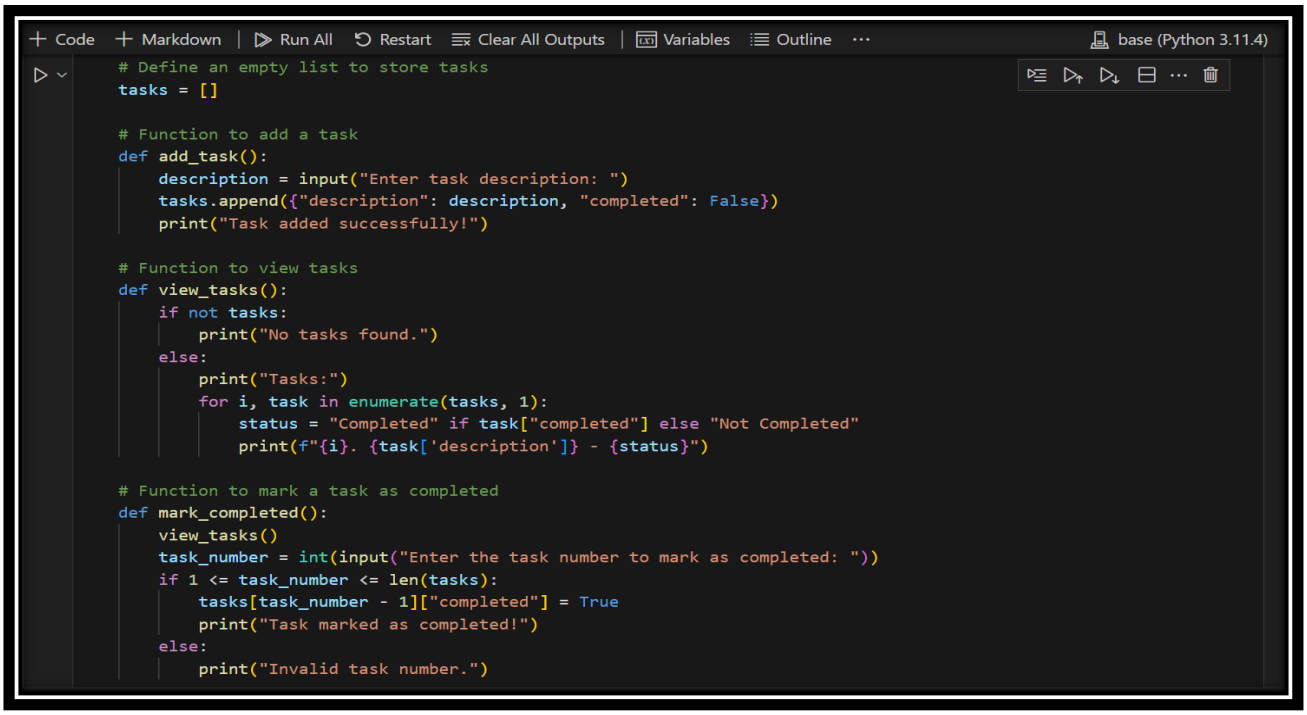
10. Create a command-line To-Do List application that allows users to add tasks, view tasks, mark tasks as completed, and delete tasks.

Requirements:

Allow users to add tasks with descriptions.

Display a list of tasks with their statuses (completed or not completed). iii. Allow users to mark tasks as completed. iv. Allow users to delete tasks.

v. Provide a menu for users to choose actions (add, view, mark, delete, exit).



```python
# Function to delete a task
def delete_task():
    view_tasks()
    task_number = int(input("Enter the task number to delete: "))
    if 1 <= task_number <= len(tasks):
        deleted_task = tasks.pop(task_number - 1)
        print(f"Task '{deleted_task['description']}' deleted!")
    else:
        print("Invalid task number.")

# Main menu loop
while True:
    print("\nMenu:")
    print("1. Add Task")
    print("2. View Tasks")
    print("3. Mark Task as Completed")
    print("4. Delete Task")
    print("5. Exit")

    choice = input("Enter your choice: ")

    if choice == '1':
        add_task()
    elif choice == '2':
        view_tasks()
    elif choice == '3':
        mark_completed()
    elif choice == '4':
```

```python
        elif choice == '4':
            delete_task()
        elif choice == '5':
            print("Exiting the To-Do List application. Goodbye!")
            break
        else:
            print("Invalid choice. Please try again.")
```

[1] ✓ 1m 30.8s Python

```
...
    Menu:
    1. Add Task
    2. View Tasks
    3. Mark Task as Completed
    4. Delete Task
    5. Exit
    Task added successfully!

    Menu:
    1. Add Task
    2. View Tasks
    3. Mark Task as Completed
    4. Delete Task
    5. Exit
    Tasks:
    1. calculate marks - Not Completed
    Task 'calculate marks' deleted!
```

```
Menu:
1. Add Task
2. View Tasks
3. Mark Task as Completed
4. Delete Task
5. Exit
Exiting the To-Do List application. Goodbye!
```