Khandesh College Education Society's

Institute of Management and Research, Jalgaon

Class: MCA -Ist **Sem: IInd** **Exam SeatNumber: ________________**

Subject: - CA Lav- VIII(B) Lab on Python programming

INDEX

Sr. No.	Contents	Date	Remark
1	Develop programs to understand the control structures of python.		
2	Develop programs to learn different types of structures (list, dictionary, tuples) in python.		
3	Develop programs to learn concept of functions scoping, recursion and list mutability.		
4	Develop programs to understand object oriented programming using python.		
5	Develop programs for data structure algorithms using python – searching, sorting and hash tables.		
6	Develop programs to learn regular expressions using python.		
7	Demonstrate implementation of the Anonymous Function Lambda.		
8	Demonstrate implementation functional programming tools such as filter and reduce.		
9	Demonstrate use of DataFrame method and use of .csv files.		
10	Develop programs to learn GUI programming using Tkinter.		
11	Demonstrate Database connectivity using MySql.		

Practical in-charge

Name : Nilesh Vijay Patil
Roll No. : 140
Practical No.: 01
Assignment Title: Develop programs to understand the control structures of python

---

Code:

1.1 Continue statement:

```
# Program to find out even and odd number in between given range using for loop:

for num in range(10):
   if num % 2 == 0:
      print(num, "is even number")
      continue
   print(num, "is odd number")
```

Output:

```
0 is even number

2 is even number

4 is even number

6 is even number

8 is even number
```

```
# program to print odd numbers from 1 to 10 using while loop:

num = 0
n = int(input("Enter a number in between 1 to 10: "))
if n > 10:
   print("please enter a number in between 1 to 10")
else:
   while num < n:
      num += 1
      if (num % 2) == 0:
         continue
      print(num)
```

Output:

```
Enter a number in between 1 to 10: 5

1

3

5
```

1.2 Break Statement:

```
# program to find first 5 multiples of 6

i = 1
n = int(input("Enter a number in between 1 to 10: "))
if n > 10:
   print("please enter a number in between 1 to 10")
else:
   while i <= 10:
      print('6 * ', (i), '=',6 * i)
      if i >= n:
         break
      i = i + 1
```

Output:

```
Enter a number in between 1 to 10: 5

6 *  1 = 6

6 *  2 = 12

6 *  3 = 18

6 *  4 = 24

6 *  5 = 30
```

1.3 Pass Statement:

```
#Program to find out odd number in given list

num = [1, 3, 6, 33, 76, 29, 17, 60, 47, 53, 88, 10, 2, 3, 100]

print('Odd numbers are: ')
for i in num:
   # check if the number is even
   if i % 2 == 0:
       # if even, then pass
       pass
   # print the odd numbers
   else:
       print (i)
```

Output:

```
1

3

33

29

17

47

53

3
```

1.4 Conditional Statement (Chained if):

```
#program to find out Grade of student:

marks = int(input("Enter the marks: "))
if marks>100:
   print("Please enter proper marks!")
elif marks > 85 and marks <= 100:
   print("Congrats ! you scored grade A ...")
elif marks > 60 and marks <= 85:
   print("You scored grade B + ...")
elif marks > 40 and marks <= 60:
   print("You scored grade B ...")
elif (marks > 30 and marks <= 40):
   print("You scored grade C ...")
else:
   print("Sorry you are fail")
```

Output:

```
Enter the marks: 70

You scored grade B + ...
```

1.5 Nested Loop:

```
#program to print Multiplication table up to given number:

n = int(input("Enter any number up to 100:"))

# Iterating over numbers in the range 1 to n
for row in range(1,n+1):
   # Iterating over numbers in the range 1 to n
   for col in range(1,n+1):
      # Printing the product of row and col
      print(row*col, end="\t")
   print()
```

Output:

```
Enter any number up to 100: 10

1       2       3       4       5       6       7       8       9       10

2       4       6       8       10      12      14      16      18      20

3       6       9       12      15      18      21      24      27      30

4       8       12      16      20      24      28      32      36      40

5       10      15      20      25      30      35      40      45      50

6       12      18      24      30      36      42      48      54      60

7       14      21      28      35      42      49      56      63      70

8       16      24      32      40      48      56      64      72      80

9       18      27      36      45      54      63      72      81      90

10      20      30      40      50      60      70      80      90      100
```

1.6 Nested Condition:

```
a = int(input("Enter 1st number: "))
b = int(input("Enter 2nd number: "))
c = int(input("Enter 3rd number: "))
if(a>b):
   if(a>c):
     print("a is greater")

if(b>a):
   if(b>c):
     print("b is greatest")

if(c>a):
   if(c>b):
     print("c is greatest")

if(a == b and b == c):
   print("all are equal")
```

Output:

```
Enter 1st number: 10

Enter 2nd number: 20

Enter 3rd number: 30

c is greatest
```

Name :- Nilesh Vijay Patil
Roll No :- 140
Practical No :- 02(2.1)
Practical Title :- Develop program to learn different types of structures (list, dictionary, tuples)in python

---

Code:-
2.1 List:
2.1.1 Create and display list in python

```
Student_Name=["Nilesh","Prajwal","Dhiraj","Vishal","Nere","Vivek","Ketan"]
print(Student_Name)
for i in range(len(Student_Name)):
    print(Student_Name[i])
```

OUTPUT:-

```
['Nilesh', 'Prajwal', 'Dhiraj', 'Vishal', 'Nere', 'Vivek', 'Ketan']
Nilesh
Prajwal
Dhiraj
Vishal
Nere
Vivek
Ketan
```

2.1.2 List Slicing in python

```
#Print all items
print(Student_Name[:])
```

OUTPUT:-

```
['Nilesh', 'Prajwal', 'Dhiraj', 'Vishal', 'Nere', 'Vivek', 'Ketan']
```

```
#print certain range
print(Student_Name[3:5])
```

OUTPUT:-

```
['Vishal', 'Nere']
```

```
#Print from starting range
print(Student_Name[3:])
```

OUTPUT:-

```
['Vishal', 'Nere', 'Vivek', 'Ketan']
```

```
#print upto given range
print(Student_Name[:6])
```

OUTPUT:-

```
['Nilesh', 'Prajwal', 'Dhiraj', 'Vishal', 'Nere', 'Vivek']
```

2.1.3 List Slicing in python

1.copy:-

```
Copy_Student_Name=copy.copy(Student_Name)
for i in range(len(Copy_Student_Name)):
    print(Copy_Student_Name[i])
```

OUTPUT:-

```
Nilesh
Prajwal
Dhiraj
Vishal
Nere
Vivek
Ketan
```

2. deepcopy:-

```
Deep_Copy_Student_Name=copy.deepcopy(Student_Name)
for i in range(len(Deep_Copy_Student_Name)):
    print(Deep_Copy_Student_Name[i])
```

OUTPUT:-

```
Nilesh
Prajwal
Dhiraj
Vishal
Nere
Vivek
Ketan
```

3. clear:-

```
Student_Name.clear()
print(Student_Name)
```

OUTPUT:-

```
[]
```

4. extend:-

```
Student_Name=["Nilesh","Prajwal","Dhiraj","Vishal","Nere","Vivek","Ketan"]
Student_Name.extend(["Nilesh","Kiran","Kunal"])
for i in range(len(Student_Name)):
    print(Student_Name[i])
```

OUTPUT:-

```
Nilesh
Prajwal
Dhiraj
Vishal
Nere
Vivek
Ketan
Nilesh
Kiran
Kunal
```

5.index:-

```
print(Student_Name.index("Kiran"))
```

OUTPUT:-

```
8
```

2.1.4 List Membership in python

```
list1=[1,2,3,4,5]
list2=[6,7,8,9]
for item in list1:
    if item in list2:
        print("Overlapping")
    else:
        print("Not Overlapping")
```

OUTPUT:-

```
Not Overlapping
Not Overlapping
Not Overlapping
Not Overlapping
Not Overlapping
```

OR

```
x=int(input("Enter a number:"))
list=[10,20,30,40,50]

if(x not in list):
    print(x,"is NOT present in given list")
else:
    print(x,"is present in given list")
```

OUTPUT:-

```
Enter a number:30

30 is present in given list
```

2.1.5 List Deletion in python

```
del Student_Name
print(Student_Name)
```

OUTPUT:-

```
Traceback (most recent call last):

  File "C:\Users\tanuj\PycharmProjects\secondpract\list.py", line 54, in <module>

    print(Student_Name)

          ^^^^^^^^^^^^

NameError: name 'Student_Name' is not defined. Did you mean: 'Copy_Student_Name'?
```

OR

```
Student_Name=["Nilesh","Prajwal","Dhiraj","Vishal","Nere","Vivek","Ketan"]
Student_Name.remove("Vivek")
for i in range(len(Student_Name)):
    print(Student_Name[i])
```

OUTPUT:-

```
Nilesh
Prajwal
Dhiraj
Vishal
Nere
Ketan
```

Name: Nilesh Vijay Patil
Roll No. :- 140
PRACTICAL NO: 02(2.2)
PRACTICAL Title: Develop programs to learn different types of structures (list, dictionary, tuples) in python

---

Code:

2.2 Tuples:

2.2.1 Create and display Tuples in python

```
Student_Name = ["Nilesh", "Dhiraj", "Pankaj", "Sanket", "Bhupendra", "Munish",
"Ketan"]

print(Student_Name)

for i in range(len(Student_Name)):
    print(Student_Name[i])
```

Output:

```
['Nilesh', 'Dhiraj', 'Pankaj', 'Sanket', 'Bhupendra', 'Munish', 'Ketan']

Nilesh

Dhiraj

Pankaj

Sanket

Bhupendra

Munish

Ketan
```

2.2.2 Tuples Slicing in python

```
        Student_Name = ["Nilesh", "Dhiraj", "Pankaj", "Sanket", "Bhupendra",
"Munish", "Ketan"]

print(Student_Name[3:6])
```

Output:

```
['Sanket', 'Bhupendra', 'Munish']
```

2.2.3 Copy Tuples in python

```
Student_Name = ("Nilesh", "Dhiraj", "Pankaj", "Sanket", "Bhupendra", "Munish",
"Ketan")

data = tuple(Student_Name)
print("Copy Student_Name",data)
```

Output:

```
('Nilesh', 'Dhiraj', 'Pankaj', 'Sanket', 'Bhupendra', 'Munish', 'Ketan')
```

2.2.4 Concatenation of Python Tuples

```
Student_Name = ("Nilesh", "Dhiraj", "Pankaj", "Sanket", "Bhupendra", "Munish",
"Ketan")
add=("Nilesh","prankaj","prajwal")
data=Student_Name+add;
print("Concatenation of Python Tuples",data)
```

Output:

```
Concatenation of Python Tuples ('Nilesh', 'Dhiraj', 'Pankaj', 'Sanket', 'Bhupendra',
'Munish', 'Ketan', 'Nilesh', 'prankaj', 'prajwal')
```

2.2.5 Nesting of Python Tuples

```
Student_Name = (("Nilesh", "Dhiraj", "Pankaj", "Sanket", "Bhupendra", "Munish",
"Ketan"))
print(Student_Name)
Student_Name = (("Nilesh", "Dhiraj", "Pankaj", "Sanket", "Bhupendra", "Munish",
"Ketan"),("Ajay MCA"),("pankaj BCA"),("yug LLB"))
print(Student_Name)
```

Output:

```
('Nilesh', 'Dhiraj', 'Pankaj', 'Sanket', 'Bhupendra', 'Munish', 'Ketan')
```

```
(('Nilesh', 'Dhiraj', 'Pankaj', 'Sanket', 'Bhupendra', 'Munish', 'Ketan'), 'Ajay MCA',
'pankaj BCA', 'yug LLB')
```

2.2.6 Immutable Python Tuples

```
Student_Name = (("Nilesh", "Dhiraj", "Pankaj", "Sanket", "Bhupendra", "Munish",
"Ketan"))
Student_Name[0]=999;
```

Output:

```
  Student_Name[0]=999;
  ~~~~~~~~~~~~~~^^^
TypeError: 'tuple' object does not support item assignment
```

2.2.7 Deleting a Tuple

```
Student_Name = (("Nilesh", "Dhiraj", "Pankaj", "Sanket", "Bhupendra", "Munish",
"Ketan"))
print(Student_Name)
del(Student_Name)
print("After Deletion")
print(Student_Name)
```

Output:

```
 File "F:\PRACTICAL2.2\PRACTICAL2.2.py", line 5, in <module>
  print(Student_Name)
        ^^^^^^^^^^^^
NameError: name 'Student_Name' is not defined
```

2.2.8 Converting list to a Tuple

```
def convert(list):
  return tuple(list)

# Driver function
list = [1, 2, 3, 4]
print(convert(list))
```

Output:

```
(1, 2, 3, 4)
```

2.2.9 Built in Functions of Tuples:

1. The len( ) Function

```
Student_Name = (("Nilesh", "Dhiraj", "Pankaj", "Sanket", "Bhupendra", "Munish",
"Ketan"))
print(len(Student_Name))
```

Output:

```
7
```

2. The count( ) Function

```
Student_Name = ["Sanket","Bhupendra","Munish","Ketan"]
print(Student_Name.count("Sanket"))
```

Output:

```
1
```

3. The index( ) Function

```
Student_Name = ["Sanket","Bhupendra","Munish","Ketan"]
print(Student_Name.index("Sanket"))
```

Output:

```
0
```

4. The sorted() function

```
std_Roll=(156,222,58,22,56,999)
print(sorted(std_Roll))
```

Output:

```
[22, 56, 58, 156, 222, 999]
```

5. The min(),max(),sum() function

```
std_Roll=(156,222,58,22,56,999)
print(min(std_Roll))
print((max(std_Roll)))
print((sum(std_Roll)))
```

Output:

```
22

999

1513
```

Name :- Nilesh Vijay Patil
Roll No :- 140
Assignment No:-02(2.3)
Assignment Title :-Develop program to learn different types of structures (list, dictionary, tuples)in python

---

Code:

2.3 Dictionary:

2.3.1 Create and display Dictionary in python

```python
# Creating an empty Dictionary
Dict = {}
print("Empty Dictionary: ")
print(Dict)
# Creating a Dictionary
# with dict() method
Student = dict({1: 'Dhiraj', 2: 'Nilesh', 3: 'Vishal', 4: 'Ketan'})
print("\nDictionary with the use of dict(): ")
print(Student)
#Creating Dictionary:
Student_List = {1: 'Dhiraj', 2: 'Nilesh', 3: 'Vishal', 4: 'Ketan', 5: 'Wani', 6: 'Kiran', 7: 'Kunal'}
print(Student_List)
```

Output:

```
Empty Dictionary:

{}

Dictionary with the use of dict():

{1: 'Dhiraj', 2: 'Nilesh', 3: 'Vishal', 4: 'Ketan'}

{1: 'Dhiraj', 2: 'Nilesh', 3: 'Vishal', 4: 'Ketan', 5: 'Wani', 6: 'Kiran', 7: 'Kunal'}
```

2.3.2 Adding dictionary values

```python
# Adding new item in Dictionary
Student_List = {1: 'Dhiraj', 2: 'Nilesh', 3: 'Vishal', 4: 'Ketan', 5: 'Wani', 6: 'Kiran', 7: 'Kunal'}
print(Student_List)
Student_List[8] = 'Hemangi'
print(Student_List)
```

Output:

```
{1: 'Dhiraj', 2: 'Nilesh', 3: 'Vishal', 4: 'Ketan', 5: 'Wani', 6: 'Kiran', 7: 'Kunal'}

{1: 'Dhiraj', 2: 'Nilesh', 3: 'Vishal', 4: 'Ketan', 5: 'Wani', 6: 'Kiran', 7: 'Kunal', 8: 'Hemangi'}
```

2.3.3 Accessing Values in Dictionary

```
#Accessing value in dictionary
Student = {'Name':'Dhiraj Patil','Age':21,'Roll_No':129}
print("Student['Name']:",Student['Name'])
print("Student['Roll_No']:",Student['Roll_No'])
```

Output:

```
Student['Name']: Dhiraj Patil

Student['Roll_No']: 129
```

2.3.4 Print Dictionary using Loop

```
#print dictionary using loop
Student = {'Name':'Dhiraj Patil','Age':21,'Roll_No':129}
for i,j in Student.items():
   print(i,":",j)
```

Output:

```
Name : Dhiraj Patil

Age : 21

Roll_No : 129
```

2.3.5 Nested Dictionary

```
#Nested Dictionary
Courses = { "BCA":{
                        "Years":"Three years course",
                        "Subjects":"c c++ web-design java....etc"
                      },
              "MCA":{
                        "Years":"Two years course",
                        "Subjects":"os web-programming AI python DS ML....etc"
                       }
             }
print(Courses)
print(Courses["BCA"]["Years"])
```

Output:

```
{'BCA': {'Years': 'Three years course', 'Subjects': 'c c++ web-design java....etc'}, 'MCA': {'Years':
'Two years course', 'Subjects': 'os web-programming AI python DS ML....etc'}}

Three years course
```

2.3.6 Updating Dictionary

```
#updating dictionary
Student = {'Name':'Dhiraj Patil','Age':21,'Roll_No':129}
print(Student)
Student['Age']=22
print(Student)
```

Output:

```
{'Name': 'Dhiraj Patil', 'Age': 21, 'Roll_No': 129}

{'Name': 'Dhiraj Patil', 'Age': 22, 'Roll_No': 129}
```

2.3.7 Delete Dictionary Elements

```
#delete dictionary
Student = {'Name':'Dhiraj Patil','Age':21,'Roll_No':129}
del Student['Name'] #remove entry with key 'Name'
print(Student)
del Student
print(Student)
```

Output:

```
{'Age': 21, 'Roll_No': 129}

Traceback (most recent call last):

  File "C:\Users\tanuj\PycharmProjects\secondpract\dictionary.py", line 55, in <module>

    print(Student)

          ^^^^^^^

NameError: name 'Student' is not defined
```

2.3.7 Built-in Dictionary methods / functions

1. **clear( ):-**

```
#clear()
Students = {1: 'Dhiraj', 2: 'Nilesh', 3: 'Vishal', 4: 'Ketan', 5: 'Wani', 6: 'Kiran', 7:
'Kunal'}
Students.clear()
print(Students)
```

Output:

```
{}
```

2. **len( ):-**

```
#len()
Student = {'Name':'Dhiraj Patil','Age':21,'Roll_No':129}
print(len(Student))
```

Output:

```
3
```

3. **pop( ):-**

```
#pop()
Students = {1: 'Dhiraj', 2: 'Nilesh', 3: 'Vishal', 4: 'Ketan', 5: 'Wani', 6: 'Kiran', 7:
'Kunal'}
item=Students.pop(1)
print(item)
print(Students)
```

Output:-

```
Dhiraj

{2: 'Nilesh', 3: 'Vishal', 4: 'Ketan', 5: 'Wani', 6: 'Kiran', 7: 'Kunal'}
```

4. **popitem( ):-**

```
#popitem()
Students = {1: 'Dhiraj', 2: 'Nilesh', 3: 'Vishal', 4: 'Ketan', 5: 'Wani', 6: 'Kiran', 7:
'Kunal'}
print(Students)
new_list=Students.popitem()
print(Students)
```

Output:

```
{1: 'Dhiraj', 2: 'Nilesh', 3: 'Vishal', 4: 'Ketan', 5: 'Wani', 6: 'Kiran', 7: 'Kunal'}

{1: 'Dhiraj', 2: 'Nilesh', 3: 'Vishal', 4: 'Ketan', 5: 'Wani', 6: 'Kiran'}
```

5. **keys():-**

```
#keys()
Students = {1: 'Dhiraj', 2: 'Nilesh', 3: 'Vishal', 4: 'Ketan', 5: 'Wani', 6: 'Kiran', 7:
'Kunal'}
print(Students)
print(Students.keys())
```

Output:

```
dict_keys([1, 2, 3, 4, 5, 6, 7])
```

6. **values():-**

```
#values()
Students = {1: 'Dhiraj', 2: 'Nilesh', 3: 'Vishal', 4: 'Ketan', 5: 'Wani', 6: 'Kiran', 7:
'Kunal'}
print(Students)
new_list = Students.values()
print(new_list)
```

Output:

```
{1: 'Dhiraj', 2: 'Nilesh', 3: 'Vishal', 4: 'Ketan', 5: 'Wani', 6: 'Kiran', 7: 'Kunal'}

dict_values(['Dhiraj', 'Nilesh', 'Vishal', 'Ketan', 'Wani', 'Kiran', 'Kunal'])
```

7. **items():-**

```
#items()
Students = {1: 'Dhiraj', 2: 'Nilesh', 3: 'Vishal', 4: 'Ketan', 5: 'Wani', 6: 'Kiran', 7:
'Kunal'}
print(Students)
print(Students.items())
```

Output:

```
{1: 'Dhiraj', 2: 'Nilesh', 3: 'Vishal', 4: 'Ketan', 5: 'Wani', 6: 'Kiran', 7: 'Kunal'}

dict_items([(1, 'Dhiraj'), (2, 'Nilesh'), (3, 'Vishal'), (4, 'Ketan'), (5, 'Wani'), (6,
'Kiran'), (7, 'Kunal')])
```

Name :- Nilesh Vijay Patil
Roll No :- 140
Assignment No :- 03(3.1 Concept of functions in python)
Assignment Title :- Develop programs to learn concept of functions scoping, recursion and list mutability.

Code:-

3.1 Functions in Python:

3.1.1 Define a function in python:

```
#define a function
def my_function():
    print("Hello from a function")
#calling a function
my_function()
```

Output:-

```
Hello from a function
```

or

```
def squeare_function(num):
    print(num*num)
n=int(input("Enter a number:"))
squeare_function(n)
```

Output:

```
Enter a number:10

100
```

3.1.2 Calling a function:

```
def a_function( string ):
    "This prints the value of length of string"
    return len(string)
str = input("Enter a string: ")
result = a_function( str )
# Calling the function we defined
print( "Length of the string Functions is: ", result)
```

Output:-

```
Enter a string: tanuja

Length of the string Functions is:  6
```

3.1.3 return Statement:

```
def square(num):
    return num ** 2

# Calling function and passing arguments.
print("With return statement")
print(square(52))
```

Output:-

```
With return statement

2704
```

3.1.4 The Anonymous Functions

```
Addition_fun = lambda argument1, argument2: argument1 + argument2;
# Calling the function and passing values
print( "Value of the function is : ", Addition_fun( 20, 30 ) )
print( "Value of the function is : ", Addition_fun( 40, 50 ) )
```

Output:-

```
Value of the function is :  50

Value of the function is :  90
```

3.1.5 Passing a List as an Argument

```
def my_function(fruits):
  for x in fruits:
    print(x)
fruits_List = ["apple", "banana", "cherry"]
my_function(fruits_List)
```

Output:-

```
apple

banana

cherry
```

Name:- Nilesh Vijay Patil
Roll No. :- 140
PRACTICAL NO:- 03(3.2)(concept of Scoping in python)
PRACTICAL Title: Develop program to learn concept of function scoping ,recursion and list mutability.

Code:-

3.2 Function Scoping in python

3.2.1 Local Scope:

```
def cube(item):
    result=item**3
    def display():
        print("the cube is",result)
    display()

element = int(input("Enter thr numner"))
cube(element)
```

Output:

```
Enter thr numner5

the cube is 125
```

Now try to access the result outside the function

```
def cube(item):
    result=item**3
    def display():
        print("the cube is",result)
    display()

element = int(input("Enter thr numner"))
cube(element)
print(result)
```

output:

```
Enter thr numner5

the cube is 125

Traceback (most recent call last):

File "F:\PRACTICAL2.2\PRACTICAL2.2.py", line 9, in <module>

    print(result)
```

```
          ^^^^^^

NameError: name 'result' is not defined
```

3.2.2 Global Scope:

```
result = 0
def cube(item):
   print("the test result" , result )
   return item**3

def display_result():
    element = int(input("Enter thr number"))
    result = cube(element)
    print("the cube of given number is", result)
display_result()
```

Output:

```
Enter thr number5

the test result 0

the cube of given number is 125
```

Name:- Nilesh Vijay Patil
Roll No.:- 140
Practical No.:- 03 (3.3 Concept of Mutability and Immutability in Python)
Assignment Title: Develop programs to learn concept of functions scoping, recursion and list mutability.

Code:

3.3 Mutability and Immutability in Python:

3.3.1 Mutability of List:

```
my_lsit = ["Nilesh","ajay","pankaj"]
print(my_lsit)
my_lsit[0]="Darshan"
print(my_lsit)
```

Output:

```
['Nilesh', 'ajay', 'pankaj']

['Darshan', 'ajay', 'pankaj']
```

3.3.2 Mutability of Dictionary:

```
my_dect ={1:"Nilesh",
        2:"Ajay",
        3:"Bharat",
        4:"Vaibhav",
        5:"krunal"
        }
print("dictory before updateing",my_dect)
my_dect[1]="Ashavin"
print("dictory after updateing",my_dect)
```

Output:

```
dictory before updateing {1: 'Nilesh', 2: 'Ajay', 3: 'Bharat', 4: 'Vaibhav', 5: 'krunal'}

dictory after updateing {1: 'Ashavin', 2: 'Ajay', 3: 'Bharat', 4: 'Vaibhav', 5: 'krunal'}
```

3.3.3 Immutability of Tuples:

```
my_tuple=(1,2,3)
my_tuple[1]="Nilesh"
```

Output:

```
        my_tuple[1]="Nilesh"
    ~~~~~~~~~^^^
TypeError: 'tuple' object does not support item assignment
```

3.3.4 IMMUTABILITY OF NUMBER:

```
a=96
print(id(a))
a=96
print(id(a))
```

Output:

```
140722871467784
140722871467784
```

3.3.5 **IMMUTABILITY OF STRING:**

```
a="NILESH"
print(id(a))
a="PATIL"
print(id(a))
```

Output:

```
1982962398320

1982960913072
```

NAME: Nilesh Vijay Patil
ROLL NO.: 140
PRACTICAL NO . : - 04(4.1)
PRACTICAL TITLE : DEVELOP PROGRAMS TO UNDERSTAND OBJECT ORIENTED PROGRAMMING USING PYTHON. (CLASS AND OBJECT).

Code:-

4.1 Class and object in Python:

4.1.1 Creating class:

```
class Employee:
    def __init__(self,name,id):
        self.id=id
        self.name=name
    def display(self):
        print("ID:",self.id,"Name:",self.name)
```

4.1.2 Creating Object(Instance):

```
class Employee:
    def __init__(self,name,id):
        self.id=id
        self.name=name
    def display(self):
        print("ID:",self.id,"Name:",self.name)

emp1=Employee("Nilesh",45)
emp2=Employee("Ajay",95)

emp1.display()
emp2.display()
```

Output:

```
ID: 45 Name: Nilesh

ID: 95 Name: Ajay
```

NAME:- Nilesh Vijay Patil
ROLL NO. :- 140
PRACTICAL NO.: 04(4.2)
PRACTICAL TITLE: DEVELOP PROGRAMS TO UNDERSTAND OBJECT ORIENTED PROGRAMMING USING PYTHON (INHERITANCE).

Code:-

4.2 Inheritance in Python:

4.2.1 Single Inheritance:

```
class parent:
   def fun1(self):
      print("Hello parent")
class child(parent):
   def fun2(self):
      print("Hello child")
test = child()
test.fun1()
test.fun2()
```

Output:

```
Hello parent

Hello child
```

4.2.2: Multiple Inheritance:

```
class parent1:
   def fun1(self):
      print("Hello parent 1")
class parent2:
   def fun2(self):
      print("Hello parent 2")
class parent3:
   def fun3(self):
      print("Hello parent 3")
class child(parent1,parent2,parent3):
   def fun4(self):
      print("Hello child")
test = child()
test.fun1()
test.fun2()
test.fun3()
test.fun4()
print(child.__mro__)
```

Output:

```
Hello parent 1
Hello parent 2
Hello parent 3
Hello child
(<class '__main__.child'>, <class '__main__.parent1'>, <class '__main__.parent2'>, <class '__main__.parent3'>, <class 'object'>)
```

4.2.3: Multilevel Inheritance:

```
class grandparent:
    def func1(self):
        print("Hello Grandparent")
class parent(grandparent):
    def func2(self):
        print("Hello parent")
class child(parent):
    def func3(self):
        child().func1()
        child().func2()
        print("Hello child")


test=child()
test.func3()
```

Output:

```
Hello Grandparent
Hello parent
Hello child
```

4.2.4: Hierarchical Inheritance:

```
class parent1:
    def func1(self):
        print("Hello Parents")
class parent2:
    def fun2(self):
        print("Hello parents")
class child1(parent1):
    def func3(self):
        print("Hello Child 1")
class child2(child1,parent2):
    def func4(self):
        print("Hello Child2")
```

```
test1 = child1()
test2 = child2()
test1.func1()
test1.func3()

test2.func1()
test2.fun2()
test2.func3()
test2.func4()
```

Output:

```
Hello Parents

Hello Child 1

Hello Parents

Hello parents

Hello Child 1

Hello Child2
```

4.2.5: Hybrid Inheritance:

```
class parents:
    def func1(self):
        print("Hello parents")
class child1(parents):
    def func2(self):
        print("Hello Child 1")
class child2(parents):
    def func3(self):
        print("Hello Child 2")

test1 = child1()
test2 = child2()

test1.func1()
test1.func2()

test2.func1()
test2.func3()
```

Output:

```
Hello parents

Hello Child 1

Hello parents

Hello Child 2
```

Name: Nilesh Vijay Patil
Roll No.: 140
Assignment No.: 04(4.3)
Assignment Title: Develop programs to understand object oriented programming using python (Overloading).

Code:

4.3 Overloading in Python:

```
class areaClass:

    def area(self,a,b=None,c=None,d=None):

        #when a and c are passed as arguments

        if a!=None and b!=None and a!=b and a!=c:

            print("Area of the triangle",(0.5*a*b))

         #when a,b,c and d are passed as arguments

        elif(b!=None and c!=None and d!=None and a==b and a==c):

             print("Area of the square",(a*c))

        elif(b==None and c==None and d==None):

            print("Arear of Circle: ", (3.14*(a*a)))

        elif(a==None and b==None and c==None and d==None):

            print("Enter more numbers")

        else:

            if(a==c):

                print("Area of the rectangle",(a*b))

            else:

                print("Area of the rectangle",(a*c))


obj=areaClass()

obj.area(19,5,19)       #Triangle

obj.area(20,20,20,20)   #Square

obj.area(20,40,20,40)   #Rectangle

obj.area(6)             #Circle
```

Output:

```
Area of the rectangle 95

Area of the square 400

Area of the rectangle 800

Arear of Circle:  113.04
```

NAME:- Nilesh Vijay Patil
ROLL NO. :- 140
PRACTICAL NO.: 04(4.4)
PRACTICAL TITLE : DEVELOP PROGRAMS TO UNDERSTAND OBJECT ORIENTED PROGRAMMING USING PYTHON (OVERRIDING).

Code:-

4.2 Overriding in Python:

```
# Parent class
class Shape:
    # properties
    data1 = "abc"
    # function no_of_sides
    def no_of_sides(self):
        print("My sides need to be defined. I am from shape class.")

    # function two_dimensional
    def two_dimensional(self):
        print("I am a 2D object. I am from shape class")

class Square (Shape):
    data2 = "XYZ"

    def no_of_sides (self):
        print("I have 4 sides. I am from Square class")

    def color(self):
        print("I have teal color. I am from Square class.")

# Create an object of Square class
sq = Square()
# Override the no_of_sides of parent class
sq.no_of_sides()
# Will inherit this method from the parent class
sq.two_dimensional()
# It's own method color
sq.color()
```

Output:

```
I have 4 sides. I am from Square class

I am a 2D object. I am from shape class

I have teal color. I am from Square class.
```

Name:-Nilesh Vijay Patil
Roll No.: 140
Assignment No.: 05(5.1)
Assignment Title: Develop programs for data structure algorithms using python – searching, sorting and hash tables.(Sorting)

Code:

5.1 Sorting in Python:

5.1.1 Bubble Sort:

```
# Python3 program for Bubble Sort Algorithm Implementation
def bubbleSort(arr):
   n = len(arr)

   # For loop to traverse through all
   # element in an array
   for i in range(n):
      for j in range(0, n - i - 1):

         # Range of the array is from 0 to n-i-1
         # Swap the elements if the element found
         # is greater than the adjacent element
         if arr[j] > arr[j + 1]:
            arr[j], arr[j + 1] = arr[j + 1], arr[j]


# Driver code

# Example to test the above code
arr = [2, 1, 100, 23, 25, 50]

bubbleSort(arr)

print("Sorted array is:")
for i in range(len(arr)):
   print("%d" % arr[i])
```

Output:

```
Sorted array is:
1
```

```
2

23

25

50

100
```

5.1.2 Selection Sort:

```
def selectionSort(array, size):
    for step in range(size):
        min_idx = step

        for i in range(step + 1, size):
            if array[i] < array[min_idx]:
                min_idx = i
        (array[step], array[min_idx]) = (array[min_idx], array[step])


# Initializing list1
list1 = []
n = int(input("Enter size: "))
for i in range(0, n):
    print("Enter Element: ")
    ele = int(input())
    # adding the element
    list1.append(ele)

# Function Call
selectionSort(list1, n)
print('Sorted Array in Ascending Order:')
print(list1)
```

Output:

```
Enter size: 5
Enter Element:
10
Enter Element:
20
Enter Element:
30
```

```
Enter Element:
50
Enter Element:
40
Sorted Array in Ascending Order:
[10, 20, 30, 40, 50]
```

5.1.2 Insertion Sort:

```
def insertionSort(array):
    for step in range(1, len(array)):
        key = array[step]
        j = step - 1

        while j >= 0 and key < array[j]:
            array[j + 1] = array[j]
            j = j - 1

        array[j + 1] = key


# Initializing list1
list1 = []
n = int(input("Enter size: "))
for i in range(0, n):
    print("Enter Element: ")
    ele = int(input())
    # adding the element
    list1.append(ele)

# Function call
insertionSort(list1)
print('Sorted Array in Ascending Order:')
print(list1)
```

Output:

```
Enter size: 5

Enter Element:

10

Enter Element:

30

Enter Element:
```

```
20

Enter Element:

50

Enter Element:

40

Sorted Array in Ascending Order:

[10, 20, 30, 40, 50]
```

Name:-Nilesh Vijay Patil
Roll No.: 140
Assignment No.: 05(5.2)
Assignment Title: Develop programs for data structure algorithms using python – searching, sorting and hash tables. (Searching)

Code:-

5.2 Searching in Python:

5.2.1 Linear Search:

```
def linear_Search(list1, n, key):
   # Searching list1 sequentially
   for i in range(0, n):
      if (list1[i] == key):
         return i+1
   return -1


list1 = []
n = int(input("Enter size: "))
for i in range(0, n):
   print("Enter Element: ")
   ele = int(input())
   # adding the element
   list1.append(ele)

Key = int(input("Enter Key: "))
item = linear_Search(list1, n, Key)
if(item != -1):
   print("Item is at: ", item)
else:
   print("Item is Not found")
```

Output:

```
Enter size: 3
Enter Element:
10
Enter Element:
50
Enter Element:
42
Enter Key: 50
Item is at:  2
```

5.2.2 Binary Search:

```
def binary_search(list1, n):
   low = 0
   high = len(list1) - 1
   mid = 0

   while low <= high:
      # for get integer result
      mid = (high + low) // 2

      # Check if n is present at mid
      if list1[mid] < n:
         low = mid + 1

         # If n is greater, compare to the right of mid
      elif list1[mid] > n:
         high = mid - 1

         # If n is smaller, compared to the left of mid
      else:
         return mid

         # element was not present in the list, return -1
   return -1


# Initializing list1
list1 = []
n = int(input("Enter size: "))
for i in range(0, n):
   print("Enter Element: ")
   ele = int(input())
   # adding the element
   list1.append(ele)
n = int(input("Enter item: "))


# Sorting list
for i in range(len(list1) - 1):
   for j in range(0, len(list1) - i - 1):
      if list1[j] > list1[j + 1]:
         temp = list1[j]
         list1[j] = list1[j + 1]
         list1[j + 1] = temp

print("sorted list:  ", list1)
```

```
# Function call
result = binary_search(list1, n)

# Results
if result != -1:
    print("Element is present at index: ", str(result))
else:
    print("Element is not present in list1")
```

Output:

```
Enter size: 4
Enter Element:
10
Enter Element:
30
Enter Element:
50
Enter Element:
40
Enter item: 10
sorted list:   [10, 30, 40, 50]
Element is present at index:  0
```

Name:- Nilesh Vijay Patil

Roll No:- 140

Practical No:- 06

Practical Name:- Develop programs to learn regular expressions using python.

Code:-

```
import re
s = 'GeeksforGeeks: A computer science portal for geeks'
match = re.search(r'portal', s)
print('Start Index:', match.start())
print('End Index:', match.end())
```

OutPut:-

```
Start Index: 34
End Index: 40
```

\ – Backslash:-

```
import re

s = 'geeks.forgeeks'

# without using \
match = re.search(r'.', s)
print(match)
```

```
# using \
match = re.search(r'\.', s)
print(match)
```

OutPut:-

```
<re.Match object; span=(0, 1), match='g'>
<re.Match object; span=(5, 6), match='.'>
-----------------------------------------------------------------------------------------------------
```

[] – Square Brackets:-

```
import re

string = "The quick brown fox jumps over the lazy dog"
pattern = "[a-m]"
result = re.findall(pattern, string)

print(result)
```

Output:-

```
['h', 'e', 'i', 'c', 'k', 'b', 'f', 'j', 'm', 'e', 'h', 'e', 'l', 'a', 'd', 'g'
-----------------------------------------------------------------------------------------------------
```

^ – Caret:-

```
import re

# Match strings starting with "The"
```

```
regex = r'^The'
strings = ['The quick brown fox', 'The lazy dog', 'A quick brown fox']
for string in strings:
    if re.match(regex, string):
        print(f'Matched: {string}')
    else:
        print(f'Not matched: {string}')
```

Output:-

```
Matched: The quick brown fox
Matched: The lazy dog
Not matched: A quick brown fox
```

$ – Dollar:-

```
import re

string = "Hello World!"
pattern = r"World!$"

match = re.search(pattern, string)
if match:
    print("Match found!")
else:
    print("Match not found.")
```

Output:-

```
Match found!
```

. – Dot:-

```
import re


string = "The quick brown fox jumps over the lazy dog."
pattern = r"brown.fox"


match = re.search(pattern, string)
if match:
    print("Match found!")
else:
    print("Match not found.")
```

Output:-

```
Match found!
```

NAME:-Nilesh VijayPatil
ROLLNO:-140
PRACTICAL NO:-07
PRATICAL NAME:- Demonstrate implementation of the Anonymous Function Lambda.

Code:-

9.Anonymous Function Lambda in Python:

```
def sum(num1, num2):
    return(num1+num2)
sum_lambda = lambda num1,num2:num1+num2
num1=int(input("enter 1st number for addition"))
num2=int(input("enter 2nd number foraddition"))
print(sum(num1,num2))
print(sum_lambda(num1,num2))
```

output:-

```
enter 1st number for addition10
enter 2nd number foraddition27
37
37
```

NAME :- Nilesh Vijay Patil
ROLLNO:-140
PRACTICL NO : 08
PRACTICAL TITLE:-DEMONSTRATE IMPLEMENTATION FUNCTIONAL PROGRAMMING TOOL SUCH AS FILTER AND REDUCE

Code:-

10.1.Filter()function in python:

```
nums = (10,3,192,55,20,77,91)
#creating a function that return true if the number is Divisible by 5
#%here is the modules operator to check the reminder when divided by5
def divisible(i):
    return True if i%5==0 else False
#creating the filter function
divisible_by_5= filter(divisible, nums)
#to print the class of returned objejt
print(type(divisible_by_5))
#print the list of filter numbers
print(tuple(divisible_by_5))
```

output:

```
<class 'filter'>
(10, 55, 20)
```

Simple for loop Vs. Filter Function:

```
#making an empty list to store valid ages
valid_ages=[]
#gives list of ages
ages=[12,21,18,23,9,55,82,69,14]
#defing function to test if enterd age is above 18 or not
def eligible(i):
    for age in i:
        if age>= 18:
            valid_ages.append(age)
#calling the function on ages
eligible(ages)
#print results
print(valid_ages)
```

output:

```
[21, 18, 23, 55, 82, 69]
```

10.2.Reduce()Function in python:

```
from functools import reduce
nums =[1,2,3,4]
ans= reduce(lambda x,y:x+y,nums)
print(ans)
```

output:-

```
10
```

10.3.map()function in python:

```
import math

#our transformation function

def square_root(n):

    return math.sqrt(n)

#we calc square root of all number using map()

numbers =[16,36,100,4]

result=map(square_root,numbers)#get the mao object

#print()

#print(result)#we will get our maop object

converted_result=list(result)

print(converted_result)
```

output:

```
[4.0, 6.0, 10.0, 2.0]
```

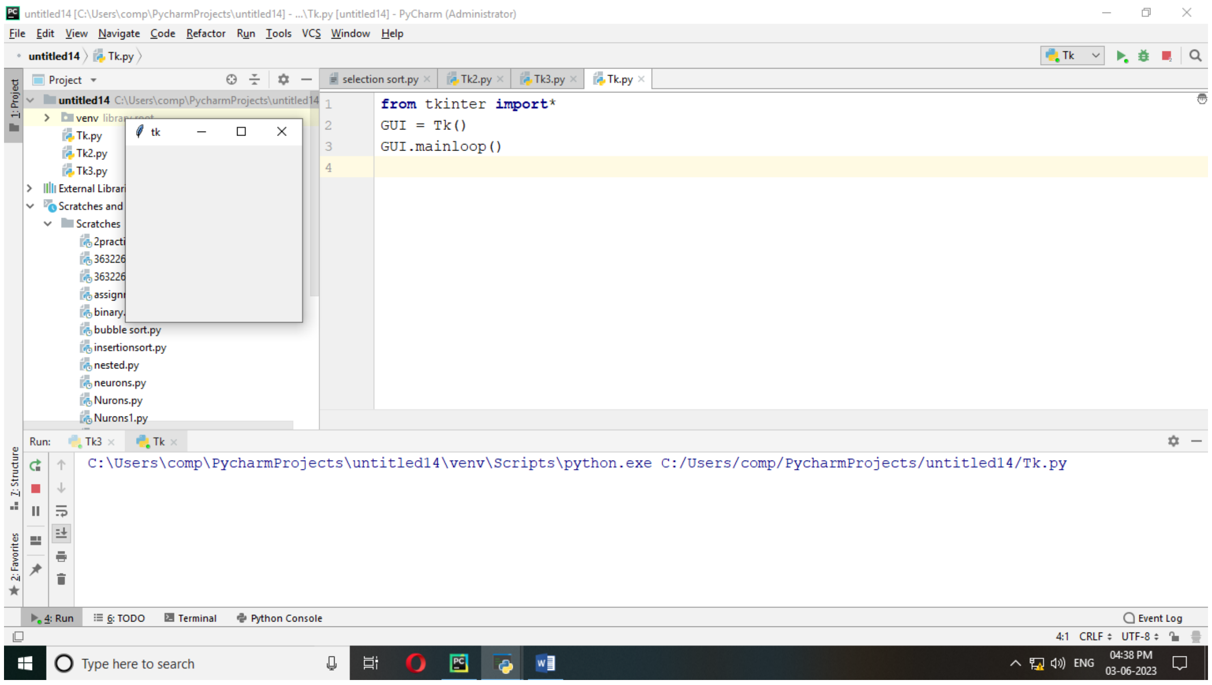
Name:- Nilesh Vijay Patil
Roll No.:- 140
Practical No:- 10
Practical Name: Develop programs to learn GUI programming using Tkinter.

Code:-

Create simple Application Window

```
from tkinter import *
GUI = Tk()
GUI.mainloop()
```

Output:



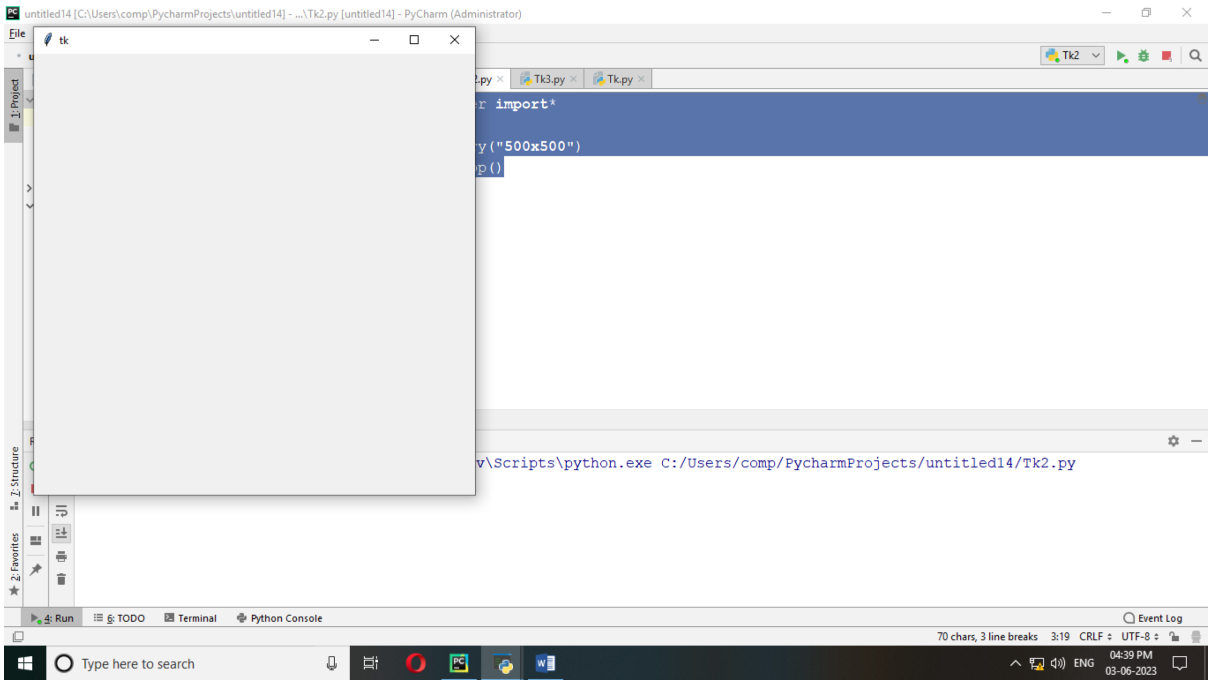
```
from tkinter import*
GUI = Tk()
GUI.mainloop()
```

```
C:\Users\comp\PycharmProjects\untitled14\venv\Scripts\python.exe C:/Users/comp/PycharmProjects/untitled14/Tk.py
```

Application Window with size

```
from tkinter import *
GUI = Tk()

# If you want to provide size of the window
GUI.geometry("500x500")


GUI.mainloop()
```

Output:



untitled14 [C:\Users\comp\PycharmProjects\untitled14] - ...\Tk2.py [untitled14] - PyCharm (Administrator)

```
r import*

y("500x500")
p()
```

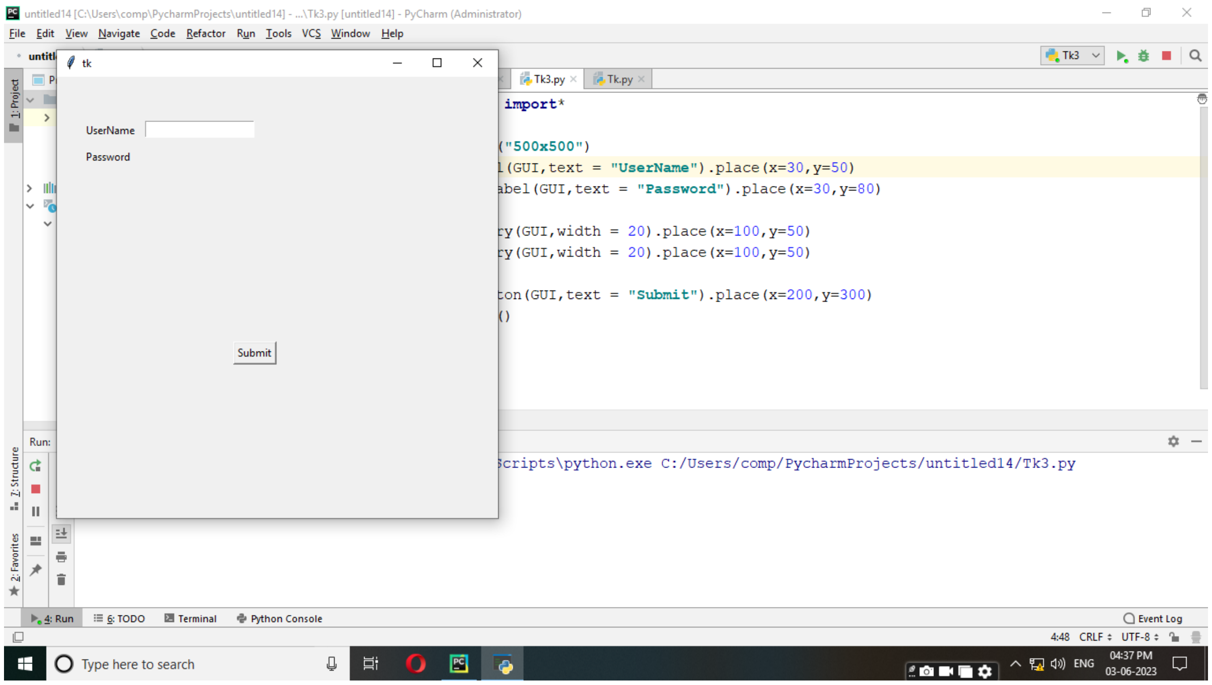
```
v\Scripts\python.exe C:/Users/comp/PycharmProjects/untitled14/Tk2.py
```

Application Window to get information from user

```
from tkinter import *
GUI = Tk()

# If you want to provide size of the window
GUI.geometry("500x500")

# If you want to add labels
uname = Label(GUI, text = "Username").place(x = 30, y = 50)
password = Label(GUI, text = "Password").place(x = 30, y = 80)


# Add Textbox
txtbx1 = Entry(GUI, width = 20).place(x = 100, y = 50)
txtbx2 = Entry(GUI, width = 20).place(x = 100, y = 80)

# Add Button on window
sbmitbtn = Button(GUI, text = "Submit").place(x = 220, y = 300)
```

```
GUI.mainloop()
```

Output:


untitled14 [C:\Users\comp\PycharmProjects\untitled14] - ...\Tk3.py [untitled14] - PyCharm (Administrator)
File Edit View Navigate Code Refactor Run Tools VCS Window Help
tk
UserName
Password
Submit
Tk3.py
Tk.py
Run:
4: Run
6: TODO
Terminal
Python Console
Event Log
4:48 CRLF UTF-8
Type here to search
04:37 PM
03-06-2023

```
 import*

("500x500")
l(GUI,text = "UserName").place(x=30,y=50)
abel(GUI,text = "Password").place(x=30,y=80)

ry(GUI,width = 20).place(x=100,y=50)
ry(GUI,width = 20).place(x=100,y=50)

ton(GUI,text = "Submit").place(x=200,y=300)
()
```

```
Scripts\python.exe C:/Users/comp/PycharmProjects/untitled14/Tk3.py
```

Name:-Nilesh Vijay Patil
Roll No:-140
Practical N0:-11
Assignment Name:-Demonstrate database connectivity using MySql

---

Create connection with mysql Workbench

```
import mysql.connector
conn =
mysql.connector.Connect(host="localhost",username="root",password="Tanuja@29",database="test_pycharm")

my_cur = conn.cursor()
conn.commit()
conn.close()
print("Connected")
```

Output:-

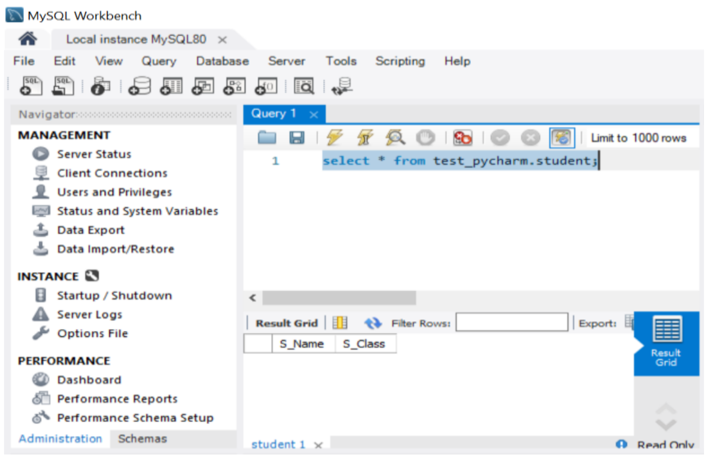
```
Connected
```

Create table in pycharm with mysql:-

```
import mysql.connector
conn = mysql.connector.Connect(host="localhost",username="root",password="Tanuja@29",
database="test_pycharm")
my_cur = conn.cursor()

my_cur.execute("CREATE TABLE Student (S_Name VARCHAR(255), S_Class VARCHAR(255))")

conn.commit()
conn.close()
print("Connected")
```

Output:-

```
Connected
```



```
select * from test_pycharm.student;
```

S_Name	S_Class

Show tables in current database:-

```
import mysql.connector

conn = mysql.connector.Connect(host="localhost",username="root",password="Tanuja@29",
database="test_pycharm")
my_cur = conn.cursor()

my_cur.execute("SHOW TABLES")

for x in my_cur:
    print(x)

conn.close()
```

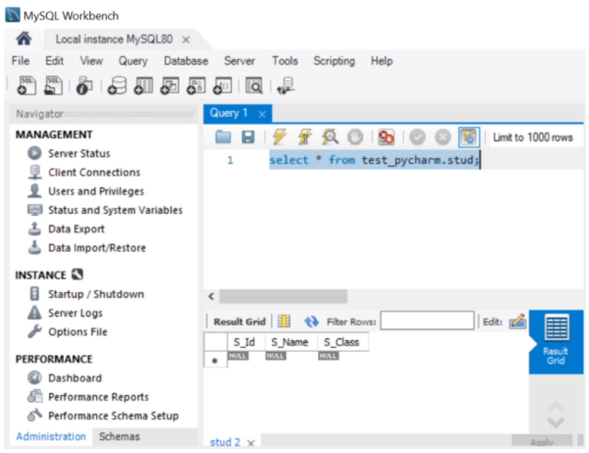
Output:-

```
('student',)
```

Apply Primary Key:-

```
import mysql.connector

conn = mysql.connector.Connect(host="localhost",username="root",password="Tanuja@29",
database="test_pycharm")
my_cur = conn.cursor()

my_cur.execute("CREATE TABLE Stud(S_Id int AUTO_INCREMENT primary key,S_Name
VARCHAR(255),S_Class VARCHAR(255))")

conn.close()
```

Output:-



```
select * from test_pycharm.stud;
```

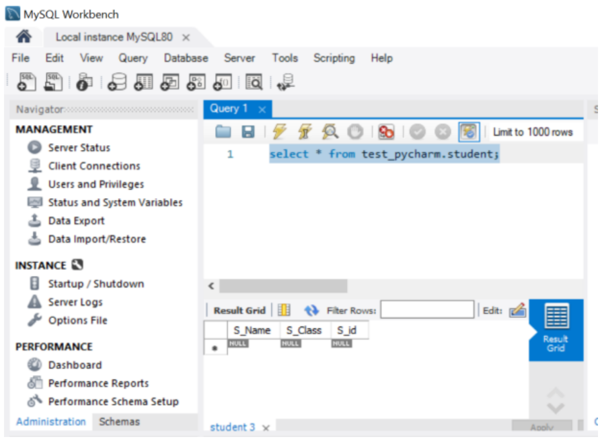
S_Id	S_Name	S_Class
NULL	NULL	NULL

Alter table:-

```
import mysql.connector
conn = mysql.connector.Connect(host="localhost",username="root",password="Tanuja@29",
database="test_pycharm")
my_cur = conn.cursor()

my_cur.execute("ALTER TABLE student ADD COLUMN S_id INT AUTO_INCREMENT PRIMARY
KEY")
print("Table Altered")
conn.close()
```

Output:-

```
Table Altered
```



```
select * from test_pycharm.student;
```

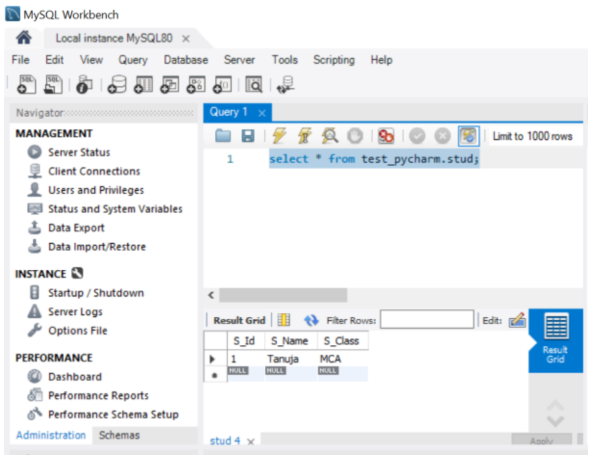
S_Name	S_Class	S_id
NULL	NULL	NULL

Insert records:-

```
import mysql.connector

conn = mysql.connector.Connect(host="localhost",username="root",password="Tanuja@29",
database="test_pycharm")
my_cur = conn.cursor()

sql = "INSERT INTO stud(S_id,S_Name,S_Class) VALUES (%s,%s, %s)"
val =("1","Tanuja", "MCA")
my_cur.execute(sql, val)
conn.commit()
print("Done")
conn.close()
```

Output:-

```
Done
```



```
select * from test_pycharm.stud;
```

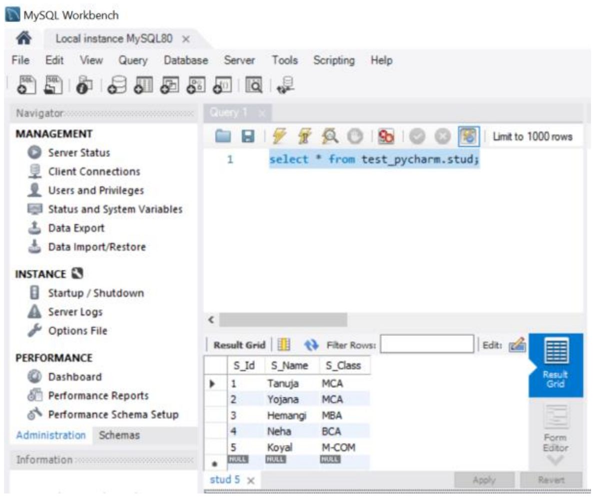
S_Id	S_Name	S_Class
1	Tanuja	MCA
NULL	NULL	NULL

Insert multiple records:-

```
import mysql.connector
conn = mysql.connector.Connect(host="localhost",username="root",password="Tanuja@29",
database="test_pycharm")
my_cur = conn.cursor()

sql = "INSERT INTO stud(S_id,S_Name,S_Class) VALUES (%s,%s, %s)"
val = [
   ("2","Yojana","MCA"),
   ("3","Hemangi", "MBA"),
   ("4","Neha", "BCA"),
   ("5","Koyal","M-COM")
   ]
my_cur.executemany(sql, val)
conn.commit()
print("Done")
conn.close()
```

Output:-

```
Done
```



```
select * from test_pycharm.stud;
```

S_Id	S_Name	S_Class
1	Tanuja	MCA
2	Yojana	MCA
3	Hemangi	MBA
4	Neha	BCA
5	Koyal	M-COM
NULL	NULL	NULL

Select statement (show records)

```
import mysql.connector

conn = mysql.connector.Connect(host="localhost",username="root",password="Tanuja@29",
database="test_pycharm")
my_cur = conn.cursor()

my_cur.execute("SELECT * FROM test_pycharm.stud;")

Records = my_cur.fetchall()
for x in Records:
  print(x)

conn.close()
```

Output:-
s

```
(1, 'Tanuja', 'MCA')
(2, 'Yojana', 'MCA')
(3, 'Hemangi', 'MBA')
(4, 'Neha', 'BCA')
(5, 'Koyal', 'M-COM')
```

Using where statement:-

```
import mysql.connector

conn = mysql.connector.Connect(host="localhost",username="root",password="Tanuja@29",
database="test_pycharm")
my_cur = conn.cursor()

Query = "SELECT * FROM stud WHERE S_id =1"

my_cur.execute(Query)

records = my_cur.fetchall()
for x in records:
  print(x)
conn.close()
```

Output:-

```
(1, 'Tanuja', 'MCA')
```