UMKC

Python and Deep Learning

Lab Assignment:2

-Rakesh Reddy Pallepati

-16231311

Author: Rakesh Reddy Pallepati

Objective-

To implement the following programs using python predefined methods like
1.Lists
2.Dictionaries,
3.OOPS Concepts (Includes inheritance, Private Methods, Constructor, Instances)
4.Functions
5.Vectors
6.Sets

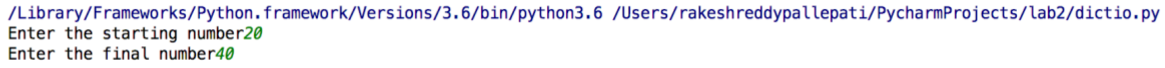
Features:

- These programs are developed using the basic functions.
- The programs will give the required outputs according to our requirements.
- These Can also be implemented in the real time applications if needed.
- One of the program has been implemented using the OOPS Concepts such as Inheritance, Constructors and private methods.
- One of the program used the vectors by importing numpy
- Multiple classes are used for making the user easy to access the details and to pass the information

Input & Output Screenshots:

1.Input:

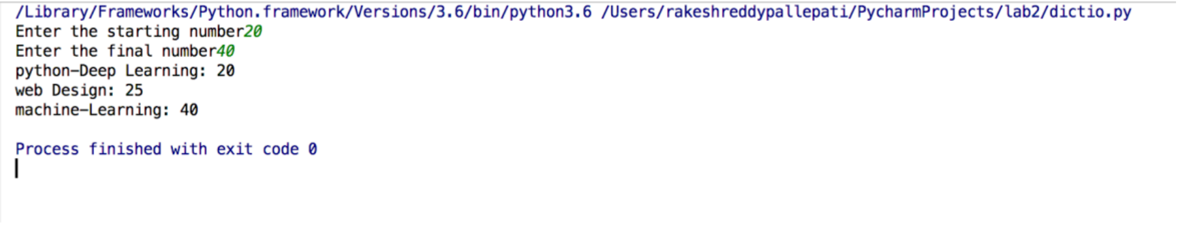
Here, I need to specify the starting value and ending value which will select the books in that range.



```
/Library/Frameworks/Python.framework/Versions/3.6/bin/python3.6 /Users/rakeshreddypallepati/PycharmProjects/lab2/dictio.py
Enter the starting number20
Enter the final number40
```

1.Output:

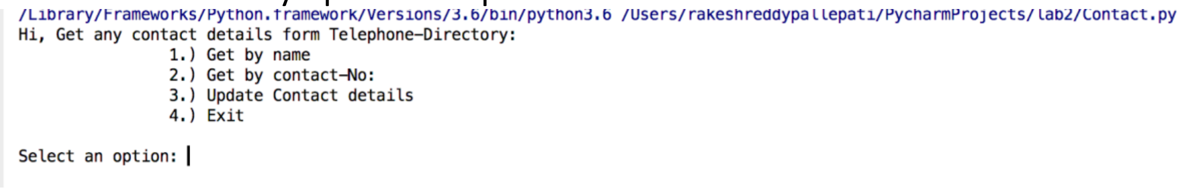
It need to verify all the above requirements.



```
/Library/Frameworks/Python.framework/Versions/3.6/bin/python3.6 /Users/rakeshreddypallepati/PycharmProjects/lab2/dictio.py
Enter the starting number20
Enter the final number40
python-Deep Learning: 20
web Design: 25
machine-Learning: 40

Process finished with exit code 0
```

2.Input :

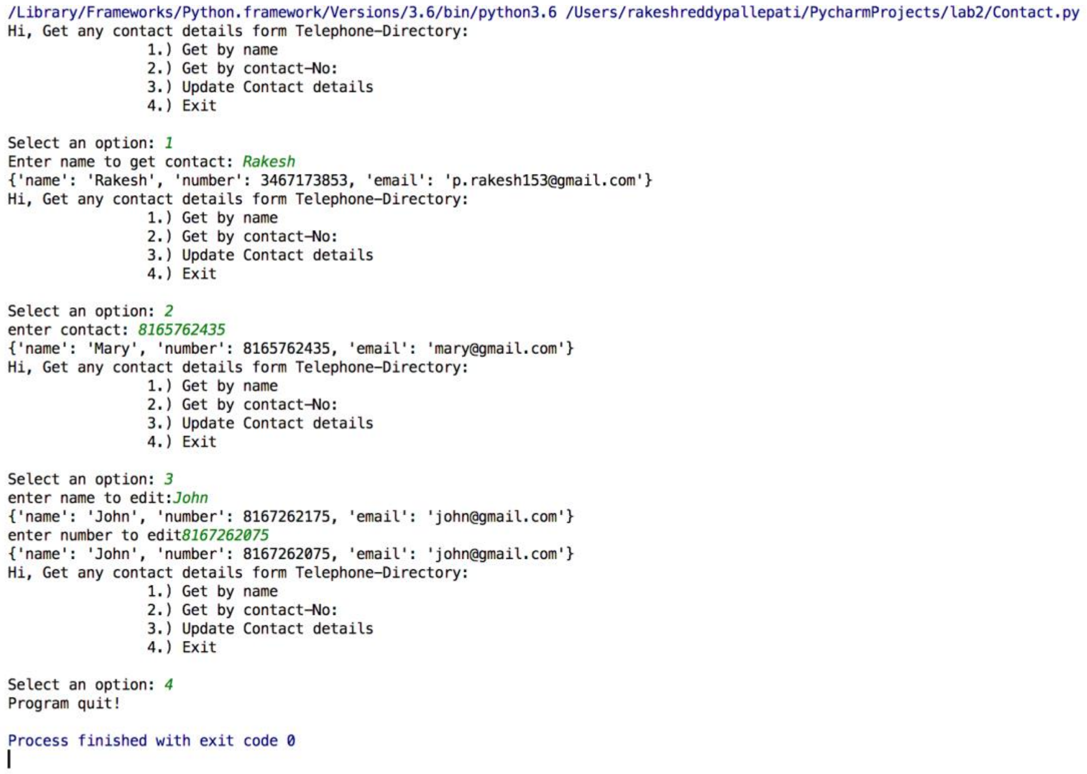
I need to select any option as input from the menu shown below:



```
/Library/Frameworks/Python.framework/Versions/3.6/bin/python3.6 /Users/rakeshreddypallepati/PycharmProjects/lab2/Contact.py
Hi, Get any contact details form Telephone-Directory:
                1.) Get by name
                2.) Get by contact-No:
                3.) Update Contact details
                4.) Exit

Select an option: 
```

2.Output:

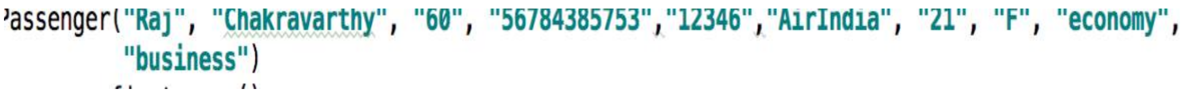
Here, It will give the contact details by name, number and also the user can update the details of the phone number in his telephone directory .Here I have used the iterative loops for search in the list and its directory elements.



```
/Library/Frameworks/Python.framework/Versions/3.6/bin/python3.6 /Users/rakeshreddypallepati/PycharmProjects/lab2/Contact.py
Hi, Get any contact details form Telephone-Directory:
                1.) Get by name
                2.) Get by contact-No:
                3.) Update Contact details
                4.) Exit

Select an option: 1
Enter name to get contact: Rakesh
{'name': 'Rakesh', 'number': 3467173853, 'email': 'p.rakesh153@gmail.com'}
Hi, Get any contact details form Telephone-Directory:
                1.) Get by name
                2.) Get by contact-No:
                3.) Update Contact details
                4.) Exit

Select an option: 2
enter contact: 8165762435
{'name': 'Mary', 'number': 8165762435, 'email': 'mary@gmail.com'}
Hi, Get any contact details form Telephone-Directory:
                1.) Get by name
                2.) Get by contact-No:
                3.) Update Contact details
                4.) Exit

Select an option: 3
enter name to edit:John
{'name': 'John', 'number': 8167262175, 'email': 'john@gmail.com'}
enter number to edit8167262075
{'name': 'John', 'number': 8167262075, 'email': 'john@gmail.com'}
Hi, Get any contact details form Telephone-Directory:
                1.) Get by name
                2.) Get by contact-No:
                3.) Update Contact details
                4.) Exit

Select an option: 4
Program quit!

Process finished with exit code 0
```

3.Input:

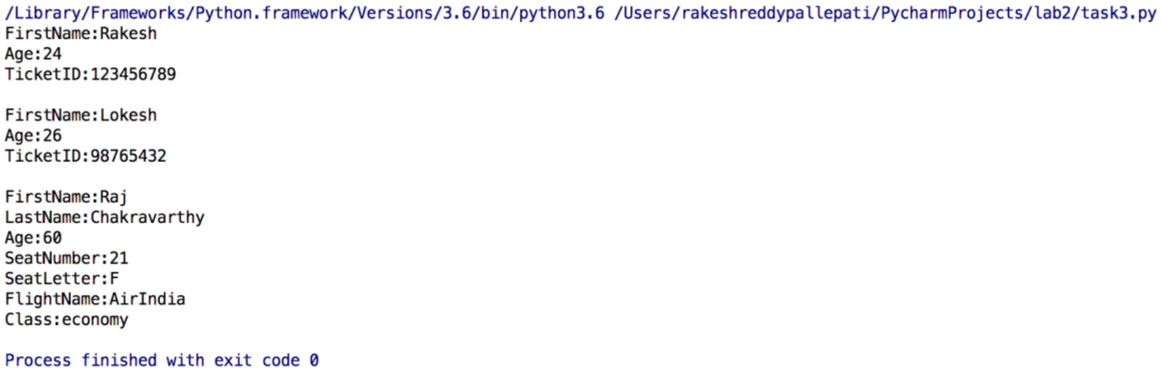
I need to give the sample list which need to have the all the details about the user and this will call all the classes and their methods to show this results in the output



```
'assenger("Raj", "Chakravarthy", "60", "56784385753","12346","AirIndia", "21", "F", "economy",
          "business")
```

3.Output:

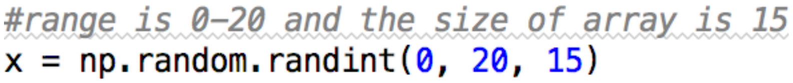
Here, It gives the summary of all three passengers and the final passenger shows that it has used the multiple inheritance from all classes



```
/Library/Frameworks/Python.framework/Versions/3.6/bin/python3.6 /Users/rakeshreddypallepati/PycharmProjects/lab2/task3.py
FirstName:Rakesh
Age:24
TicketID:123456789

FirstName:Lokesh
Age:26
TicketID:98765432

FirstName:Raj
LastName:Chakravarthy
Age:60
SeatNumber:21
SeatLetter:F
FlightName:AirIndia
Class:economy

Process finished with exit code 0
```

4.Input:

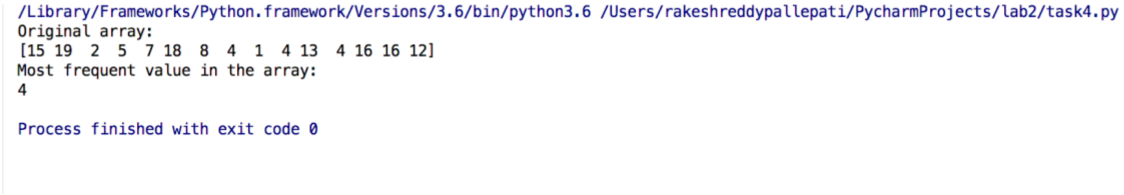
Here I used the numpy to implement the vectors for array size of 15 with the numbers 0-20. It will generate the random numbers



```
#range is 0-20 and the size of array is 15
x = np.random.randint(0, 20, 15)
```

4.Output:

The output clearly shows that these numbers are random. I have retrieved the most frequent number in the array



```
/Library/Frameworks/Python.framework/Versions/3.6/bin/python3.6 /Users/rakeshreddypallepati/PycharmProjects/lab2/task4.py
Original array:
[15 19  2  5  7 18  8  4  1  4 13  4 16 16 12]
Most frequent value in the array:
4

Process finished with exit code 0
```

Implementation:

1. Umkc-Bookstore:

I have used the dictionary with key value pairs showing the book name and its value as its price and later I accessed it using the iterative for loops. Here range predeined method is used to retrieve the results in given range.

```
#Umkc-Directory listing its prices for every course
price_book={"python-Deep-Learning" : "20", "web Design" : "25",
         "machine-Learning" : "40", "network-Architecture" : "50"}
print(price_book)
#For the Range from start to end
x=int(input("Enter the starting number"))

y=int(input("Enter the final number"))

#Passing every book and its price
for book,cost in price_book.items():
   if int(cost) in range(x,y+1):
      print('%s: %s' %(book,cost))
```

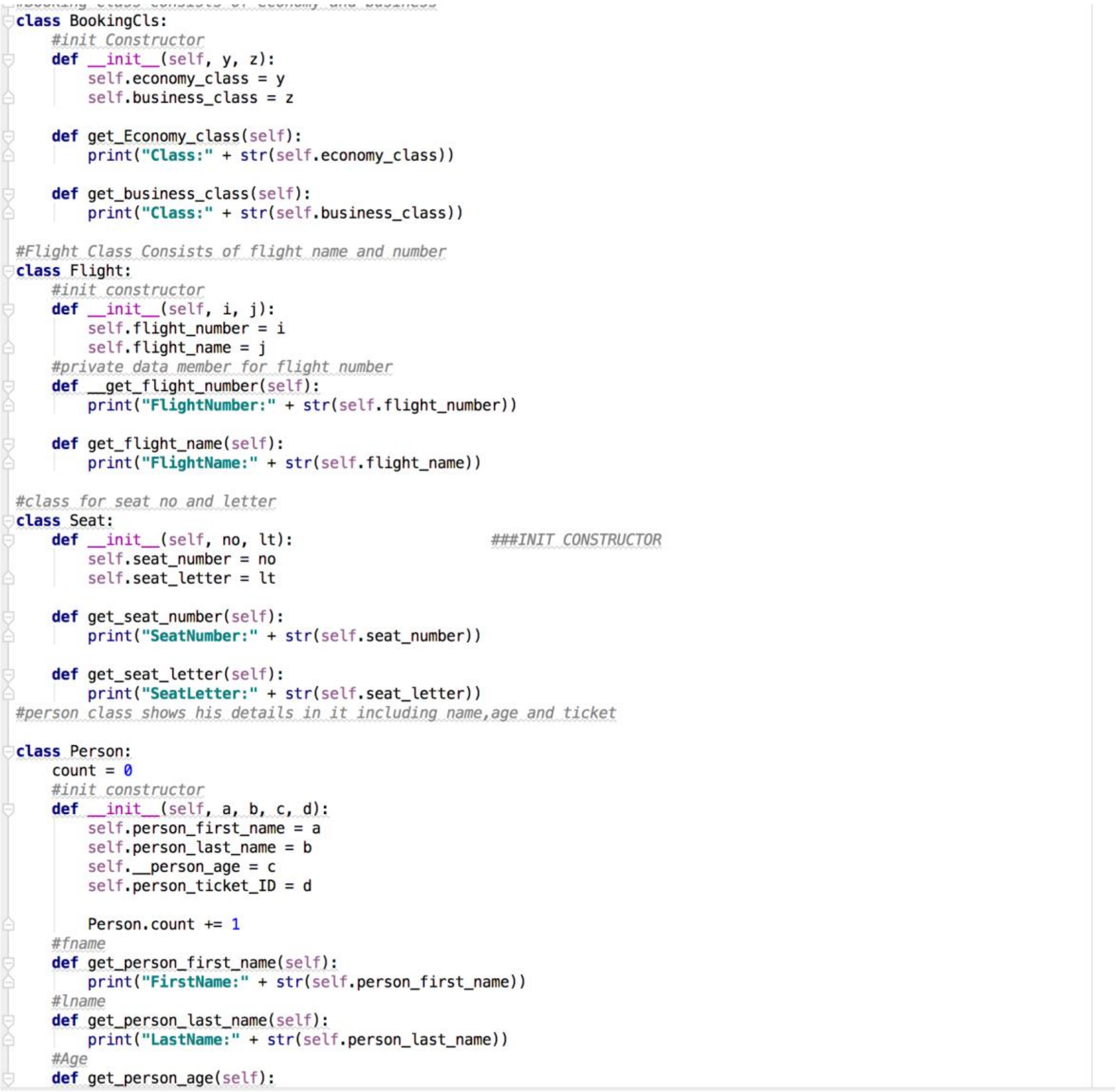
2.Telephone-Directory:

I have given the contact details first and later showed a menu that gives the options to user select according to the requirement. Here, Iterative llops will move into list and then process in its values in the Directory

```
#List of Contacts in the user contact list stored in list with each contact in directory
cntct_list = [{"name":'Rakesh', "number":3467173853, "email":"p.rakesh153@gmail.com"},
                {"name":"John", "number":8167262175, "email":"john@gmail.com"},
                {"name":"Mary","number":8165762435,"email":"mary@gmail.com"}]


#forming a switch statement indirectly for giving an options to the user
while True:
    #User need to Select an Input from list
    print('''Hi, Get any contact details form Telephone-Directory:
                1.) Get by name
                2.) Get by contact-No:
                3.) Update Contact details
                4.) Exit
                ''')
    choice = input("Select an option: ")
    #Extracting the contact details by prompting name given by user
    if choice == "1":
        nm = input("Enter name to get contact: ")
        for i in cntct_list:
            if nm in i.values():
                print(i)
    # Extracting the contact details by prompting phone number given by user
    elif choice == "2":
        num = int(input("enter contact: "))
        for j in cntct_list:
            if num in j.values():
                print(j)
    # Updating the contact details by prompting name given by user
    elif choice == "3":
        nme = input("enter name to edit:")
        for k in cntct_list:
            if nme in k.values():
                print(k)
                newnum = int(input("enter number to edit"))
                #inserting new number given by user
                k["number"] = newnum
                print(k)
    elif choice == "4":
        #to exit from the loop
        print("Program quit!")
        break
    else:
        #invalid Inputs for string or other nos
        print("Invalid Input! Try again.")
        break
```

3.Booking of Flight tickets:

Here I have implemented 5 classes named as BookingCls, seat, person, passenger, flight. These classes inputs are given and the methods are called to display their details. The fifth class named passenger used to show that it has taken multi -inheritance from all four classes and shown the summary of his flight booking details. Init constructors are used in all classes and all the requirements for the question have been given in comments describing them This is done using the multiple iterative loops.



```
#Booking class consists of economy and business
class BookingCls:
    #init Constructor
    def __init__(self, y, z):
        self.economy_class = y
        self.business_class = z

    def get_Economy_class(self):
        print("Class:" + str(self.economy_class))

    def get_business_class(self):
        print("Class:" + str(self.business_class))

#Flight Class Consists of flight name and number
class Flight:
    #init constructor
    def __init__(self, i, j):
        self.flight_number = i
        self.flight_name = j
    #private data member for flight number
    def __get_flight_number(self):
        print("FlightNumber:" + str(self.flight_number))

    def get_flight_name(self):
        print("FlightName:" + str(self.flight_name))

#class for seat no and letter
class Seat:
    def __init__(self, no, lt):                        ###INIT CONSTRUCTOR
        self.seat_number = no
        self.seat_letter = lt

    def get_seat_number(self):
        print("SeatNumber:" + str(self.seat_number))

    def get_seat_letter(self):
        print("SeatLetter:" + str(self.seat_letter))
#person class shows his details in it including name,age and ticket

class Person:
    count = 0
    #init constructor
    def __init__(self, a, b, c, d):
        self.person_first_name = a
        self.person_last_name = b
        self.__person_age = c
        self.person_ticket_ID = d

        Person.count += 1
    #fname
    def get_person_first_name(self):
        print("FirstName:" + str(self.person_first_name))
    #lname
    def get_person_last_name(self):
        print("LastName:" + str(self.person_last_name))
    #Age
    def get_person_age(self):
```

4.Students Classification:

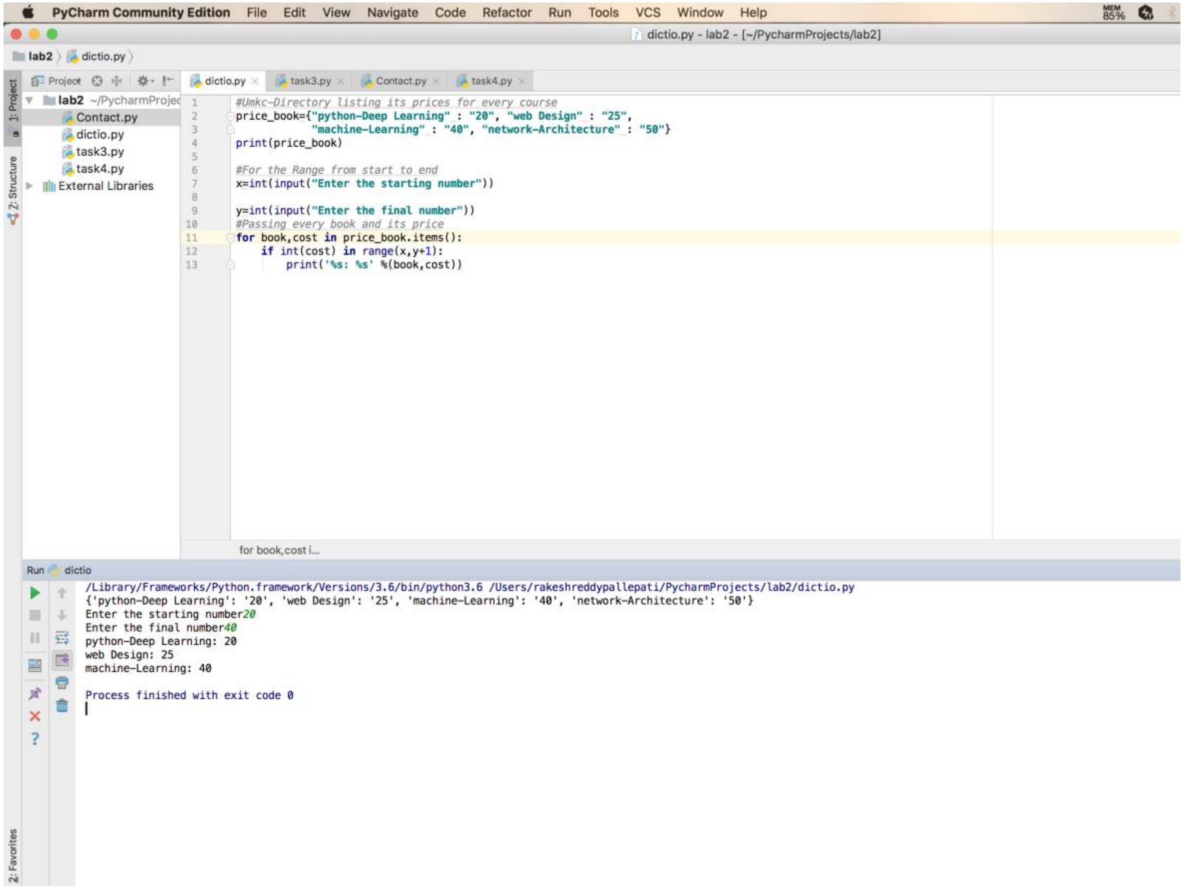
This is done by importing the numpy and generating the random vector and finding the most repeated value in the array using the argmax function with bincount.

```
#importing numpy

import numpy as np

#range is 0-20 and the size of array is 15

z1 = np.random.randint(0, 20, 15)
```

```
print("Generated Random Array:")
print(z1)
#Using Argmax we can get the most repeated value in array
print("Most Repeated value in the array:")
print(np.bincount(z1).argmax())
```

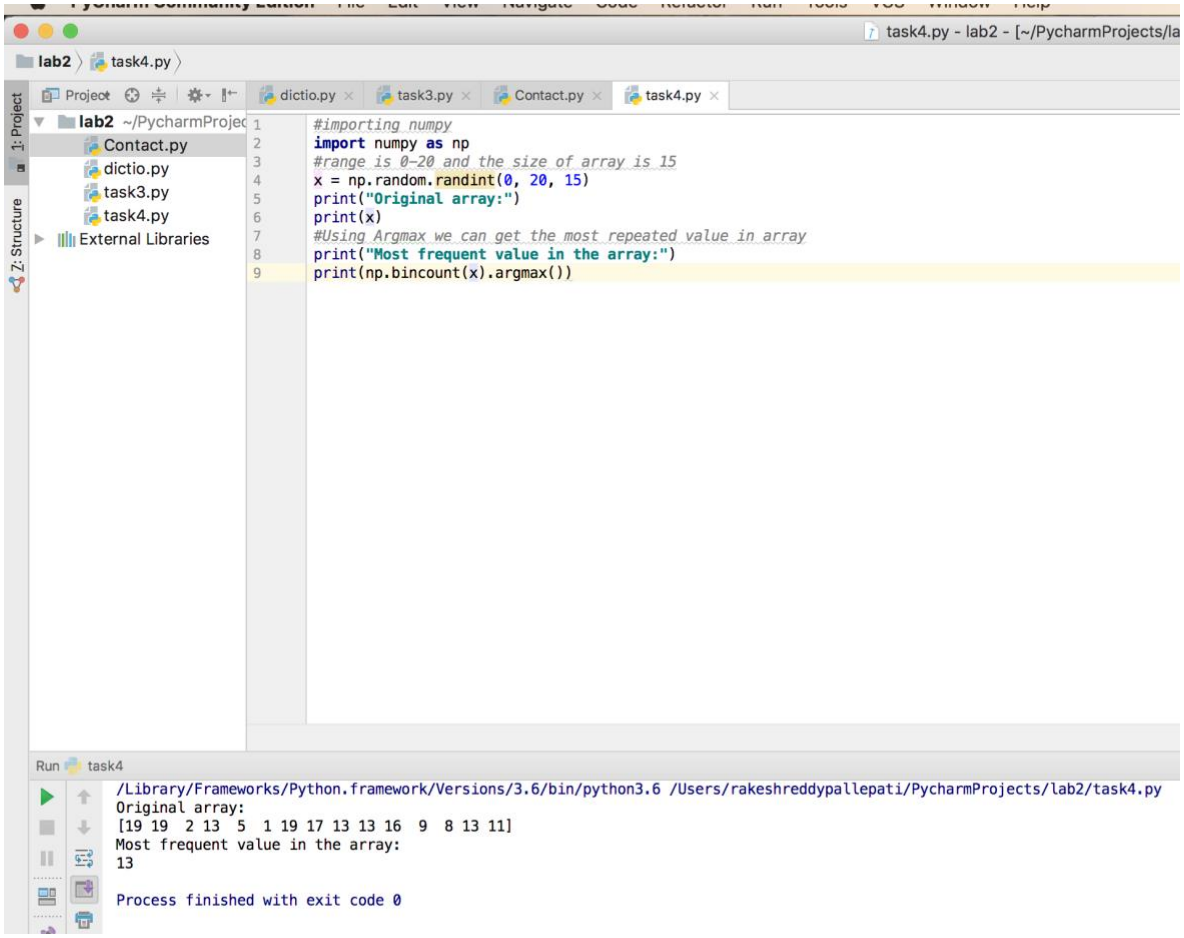
Deployment Tool :

Pycharm Community Edition tool used to deploy the code for compilation, debugging and to run the code.In the terminal we will be giving the input and it will generate the output by compiling it as follows:



```
#Umkc-Directory listing its prices for every course
price_book={"python-Deep Learning" : "20", "web Design" : "25",
            "machine-Learning" : "40", "network-Architecture" : "50"}
print(price_book)

#For the Range from start to end
x=int(input("Enter the starting number"))

y=int(input("Enter the final number"))
#Passing every book and its price
for book,cost in price_book.items():
    if int(cost) in range(x,y+1):
        print('%s: %s' %(book,cost))
```

```
/Library/Frameworks/Python.framework/Versions/3.6/bin/python3.6 /Users/rakeshreddypallepati/PycharmProjects/lab2/dictio.py
{'python-Deep Learning': '20', 'web Design': '25', 'machine-Learning': '40', 'network-Architecture': '50'}
Enter the starting number20
Enter the final number40
python-Deep Learning: 20
web Design: 25
machine-Learning: 40

Process finished with exit code 0
```



```python
#importing numpy
import numpy as np
#range is 0-20 and the size of array is 15
x = np.random.randint(0, 20, 15)
print("Original array:")
print(x)
#Using Argmax we can get the most repeated value in array
print("Most frequent value in the array:")
print(np.bincount(x).argmax())
```

```
/Library/Frameworks/Python.framework/Versions/3.6/bin/python3.6 /Users/rakeshreddypallepati/PycharmProjects/lab2/task4.py
Original array:
[19 19  2 13  5  1 19 17 13 13 16  9  8 13 11]
Most frequent value in the array:
13

Process finished with exit code 0
```

Limitation:

1.The above programs will be delivering the output ideally but if I give any abnormal inputs to the system then there is a chance of unexpected outputs or errors

2.For Prog1: The user needs to enter only integers not the float values, strings.

3.For Prog2: User need to enter 10-digit number while updating the contact details

3.For Prog3: Private data members are not accessed out of its class. So, only confidential details need to be given as private data.In this programme, I couldn’t access the flight number for passenger because I have given it as private data member in it.

References:

1. https://www.w3resource.com/python-exercises/dictionary/python-data-type-dictionary-exercise-7.php
2. https://stackoverflow.com/questions/60208/replacements-for-switch-statement-in-python
3. https://stackoverflow.com/questions/3277367/how-does-pythons-super-work-with-multiple-inheritance
4. https://stackoverflow.com/questions/15451958/simple-way-to-create-matrix-of-random-numbers