Python Programming

LAB ASSIGNMENT 2

Namrata Dutta | Python | 16247052

OBJECTIVE

The objective of this assignment is to focus on the Python concepts like sets and dictionaries. Also, to be able to build classes and use concepts of object oriented programming such as, Inheritance, Polymorphism and Encapsulation. It also includes implementation and execution of numpy package.

FEATURES

The task consists of 4 questions which checks our programs for all kinds of features like searching for a book from a dictionary range. Then, creating a contact list and fetching records according to requirement. We have also created a library management system in which we have included classes, inherited classes, super calling of methods, init constructor usage etc. For the last task we have used the numpy package to generate random list of integers and fetching the most frequent integer from the list.

CONFIGURATION

OS: Windows 10

Python version: 3.4

IDE used: PyCharm

IMPLEMENTATION

1. Task 1- code snippet

Here, first we have declared the name of the books with the number in dictionary. Then we are checking the range condition and finally joining the index keys to get the result.

```
bookscategory={"Python":50,"Software Engg":30,"OOPS":20,"JAVA":40}
finallist=[]
start=int(input("Enter the start range: "))
end=int(input("Enter the end range: "))
for key,value in bookscategory.items():
    if value >= start and value <= end:
        finallist.append(key)
result=','.join(finallist)
print("These books can be purchased for mentioned range ("+result+")")
```

Output:

Enter the start range: 20

Enter the end range: 30

These books can be purchased for mentioned range (Software Engg,OOPS)

2. Task 2- code snippet

We are declaring two contacts in our list with their name, number and email. Then, the while loops starts for the 4 categories. According to the option chosen by the user which is stored in choice variable as a string, the conditions are executed. For the edit category, it is taking the index of "number" item and replacing the new number there. Finally, for option d, it comes out of loop and exits.

```
Contact_list=[{"name":"Namrata","number":"8167234564","email":"namratadut
ta4@gmail.com"},{"name":"Pujita","number":"1414244141","email":"pujitam21
2@gmail.com"}]
while True:
    print("a) Display contact by name")
    print("b) Display contact by number")
    print("c) Edit contact by name")
    print("d) Exit")

    choice=str(input("Enter your choice from above: "))

    if choice=='a':
        input1=(input("Enter the name: "))
        print(next(item for item in Contact_list if
item["name"]==input1))
    elif choice=='b':
        input2=(input("Enter the number: "))
        print(next(item for item in Contact_list if
item["number"]==input2))
    elif choice=='c':
        input3=input("Enter the contact name you want to edit: ")
        for item in Contact_list:
```

```
            if item["name"]==input3:
                item["number"]=input("Enter the new contact number: ")
        print(Contact_list)
    elif choice=='d':
        break
```

Output:

a) Display contact by name

b) Display contact by number

c) Edit contact by name

d) Exit

Enter your choice from above: a

Enter the name: Pujita

{'name': 'Pujita', 'number': '1414244141', 'email': 'pujitam212@gmail.com'}

a) Display contact by name

b) Display contact by number

c) Edit contact by name

d) Exit

Enter your choice from above: b

Enter the number: 8167234564

{'name': 'Namrata', 'number': '8167234564', 'email': 'namratadutta4@gmail.com'}

a) Display contact by name

b) Display contact by number

c) Edit contact by name

d) Exit

Enter your choice from above: c

Enter the contact name you want to edit: Namrata

Enter the new contact number: 9999999999

[{'name': 'Namrata', 'number': '9999999999', 'email': 'namratadutta4@gmail.com'}, {'name': 'Pujita', 'number': '1414244141', 'email': 'pujitam212@gmail.com'}]

a) Display contact by name

b) Display contact by number

c) Edit contact by name

d) Exit

Enter your choice from above: d

Process finished with exit code 0

3. Task 3-code snippet

Here, we have made a library management system with 5 classes- Person, Student, Librarian, Book and Borrow_Book. Init constructor is used for every class where the objects are created as parameters. So in each class we have created unique objects and printing each details first. Student and Librarian classes are taking Person as their parent class, hence it is an inherited class.

```
#class 1
class Person:

    #init constructor used
    def __init__(self,name,email):
        self.name = name
        self.email = email
    def display(self):
        print("Name: ", self.name)
        print("Email: ", self.email)

#class 2(inherited)
class Student(Person):
    StudentCount = 0
    def __init__(self,name,email,student_id):
        Person.__init__(self,name,email)
        self.student_id = student_id
        Student.StudentCount +=1
    def displayCount(self):
        print("Total Students:", Student.StudentCount)
    def display(self):
        print("Student Details:")
        Person.display(self)
        print("Student Id: ",self.student_id)

#class 3 (inherited)
class Librarian(Person):
    StudentCount = 0
    def __init__(self,name,email,employee_id):
        #super call
```

```
            super().__init__(name,email)
            self.employee_id = employee_id
        def display(self):
            print("Librarian Details:")
            Person.display(self)
            print("Employee Id is: ",self.employee_id)

    #class 4
    class Book():
        def __init__(self, bookname, author, book_id):
            self.book_name = bookname
            self.author = author
            self.book_id = book_id
        def display(self):
            print("Details about the book")
            print("Book_Name: ", self.book_name)
            print("Author: ", self.author)
            print("Book_ID: ", self.book_id)

    #class 5
    class Borrow_Book(Student,Book):
        def __init__(self, name, email, student_id, bookname, author, book_id):
            Student.__init__(self,name,email,student_id)
            Book.__init__(self, bookname, author, book_id)
        def display(self):
            print("Details of the borrowed book:")
            Student.display(self)
            Book.display(self)
    Libdetails= []
    Libdetails.append(Student('Namrata', 'namdutta@gmail.com', 1234))
    Libdetails.append(Student('Pujita', 'pujitam@gmail.com', 4567))
    Libdetails.append(Librarian('Librarian1', 'libemp1@gmail.com', 7777))
    Libdetails.append(Librarian('Librarian2', 'libemp2@gmail.com', 4353))
    Libdetails.append(Book('Python', 'Author1', 12311))
    Libdetails.append(Book('Software Engg', 'Author2', 12312))
    Libdetails.append(Borrow_Book('Namrata', 'namdutta@gmail.com', 1234,
    'Python', 'Author1', 12311))
    for obj, item in enumerate(Libdetails):
        item.display()
        print("\n")
        if obj == len(Libdetails)-1:
```

Output:

Student Details:

Name: Namrata

Email: namdutta@gmail.com

Student Id: 1234

Student Details:

Name: Pujita

Email: pujitam@gmail.com

Student Id: 4567

Librarian Details:

Name: Librarian1

Email: libemp1@gmail.com

Employee Id is: 7777

Librarian Details:

Name: Librarian2

Email: libemp2@gmail.com

Employee Id is: 4353

Details about the book

Book_Name: Python

Author: Author1

Book_ID: 12311

Details about the book

Book_Name: Software Engg

Author: Author2

Book_ID: 12312

Details of the borrowed book:

Student Details:

Name: Namrata

Email: namdutta@gmail.com

Student Id: 1234

Details about the book

Book_Name: Python

Author: Author1

Book_ID: 12311

Total Students: 3

4. Task 4-code snippet

Here, we have used the numpy package for generating a random list of integers. Then used bincount method to count the items and argmax method for getting the frequency of each element.

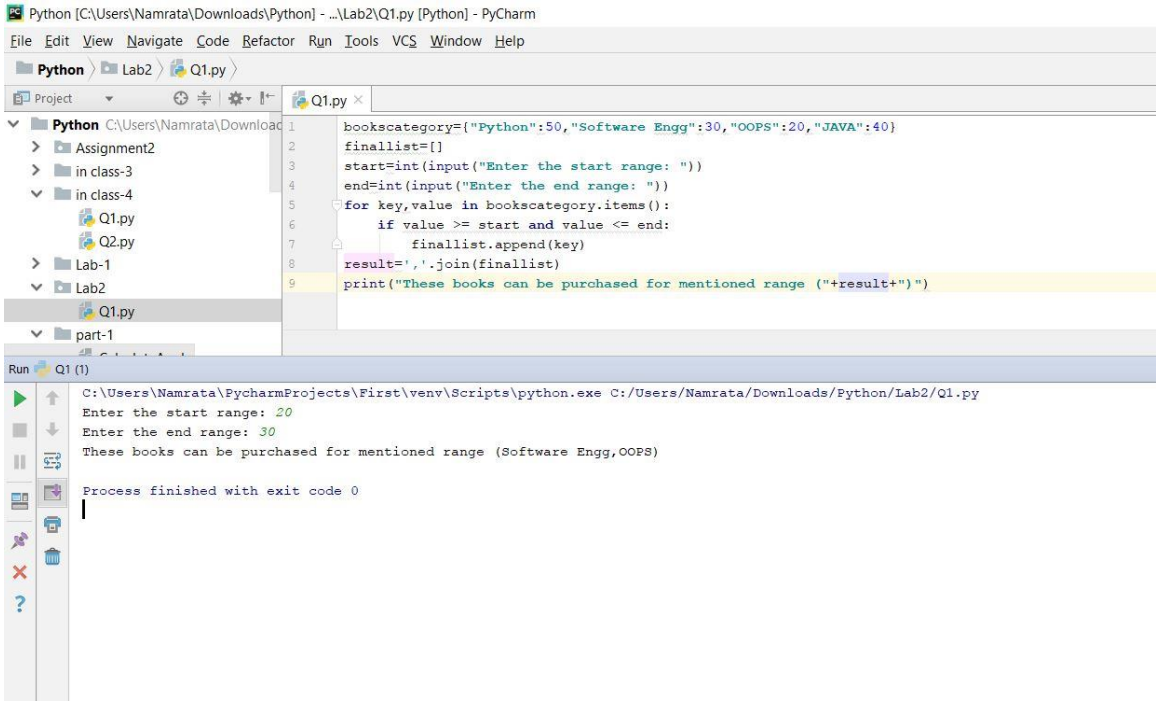
```
import numpy as np

#Creates a list of array of size 15 and range in between 0 to 20
vectorlist = np.random.randint(low=0, high=20, size=15)
print("The list of Random Vector is :", vectorlist)
#bincount - calculates the required integer count depending on the occurence
Frequent_item = np.bincount(vectorlist)
#argmax gives the most frequently occured item from the list
print("Frequent Item :", np.argmax(Frequent_item))
```

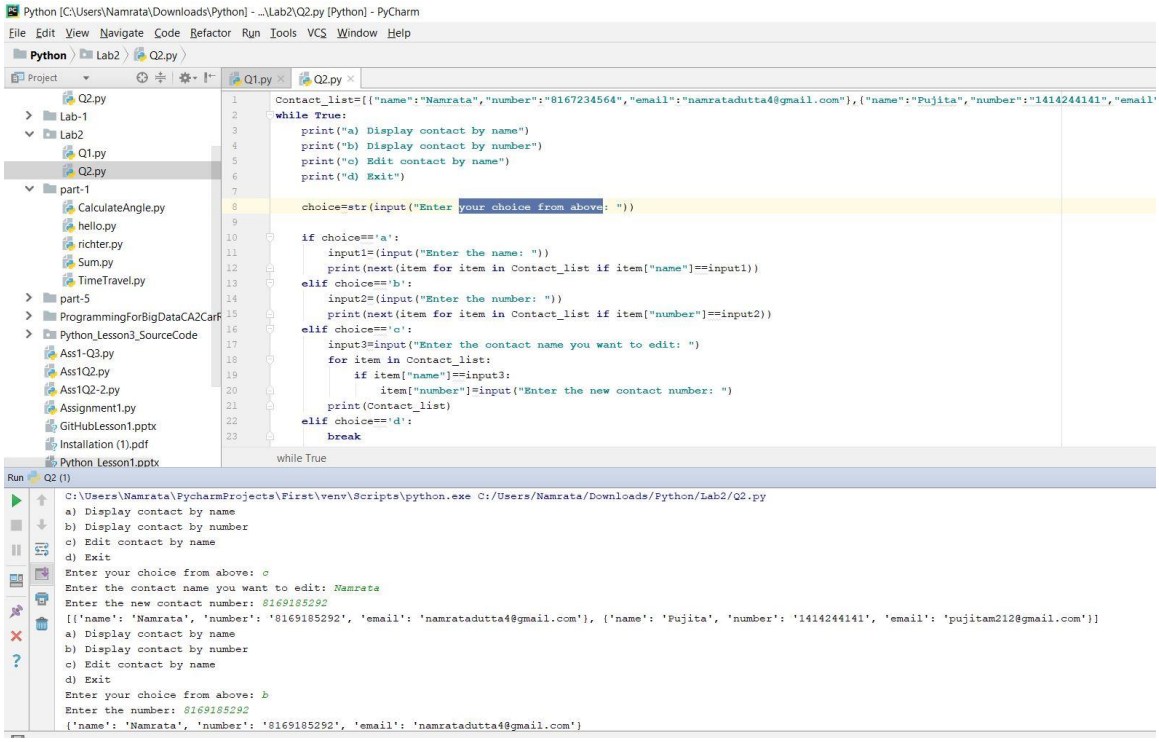
```
Output :
The list of Random Vector is : [ 1  5  8  3 18 18 11  6 19  3 19  8 14  0 16]
Frequent Item : 3
```

DEPLOYMENT

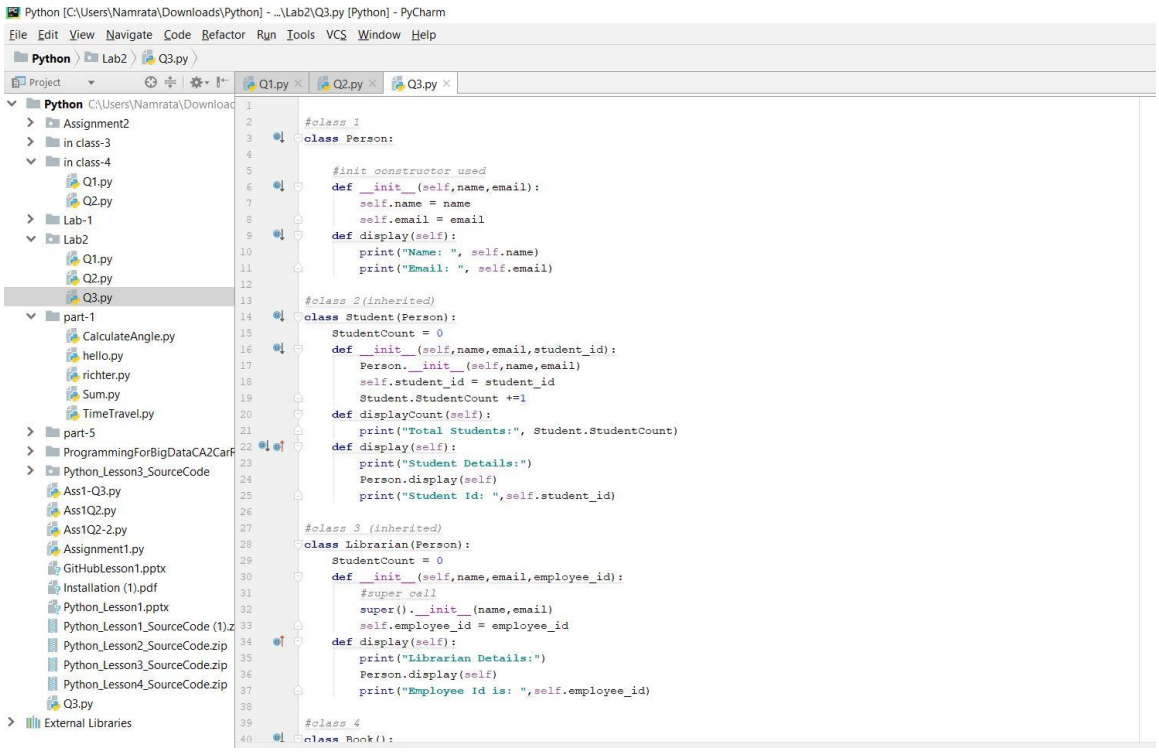
TASK 1:

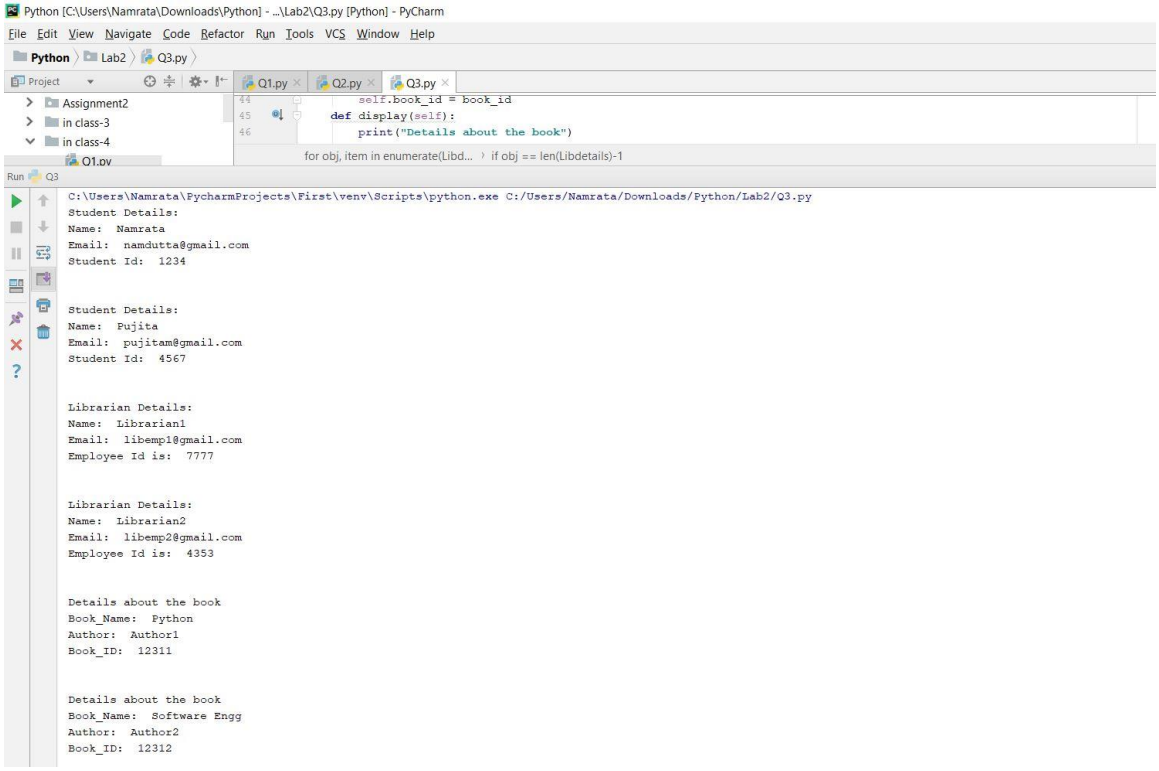


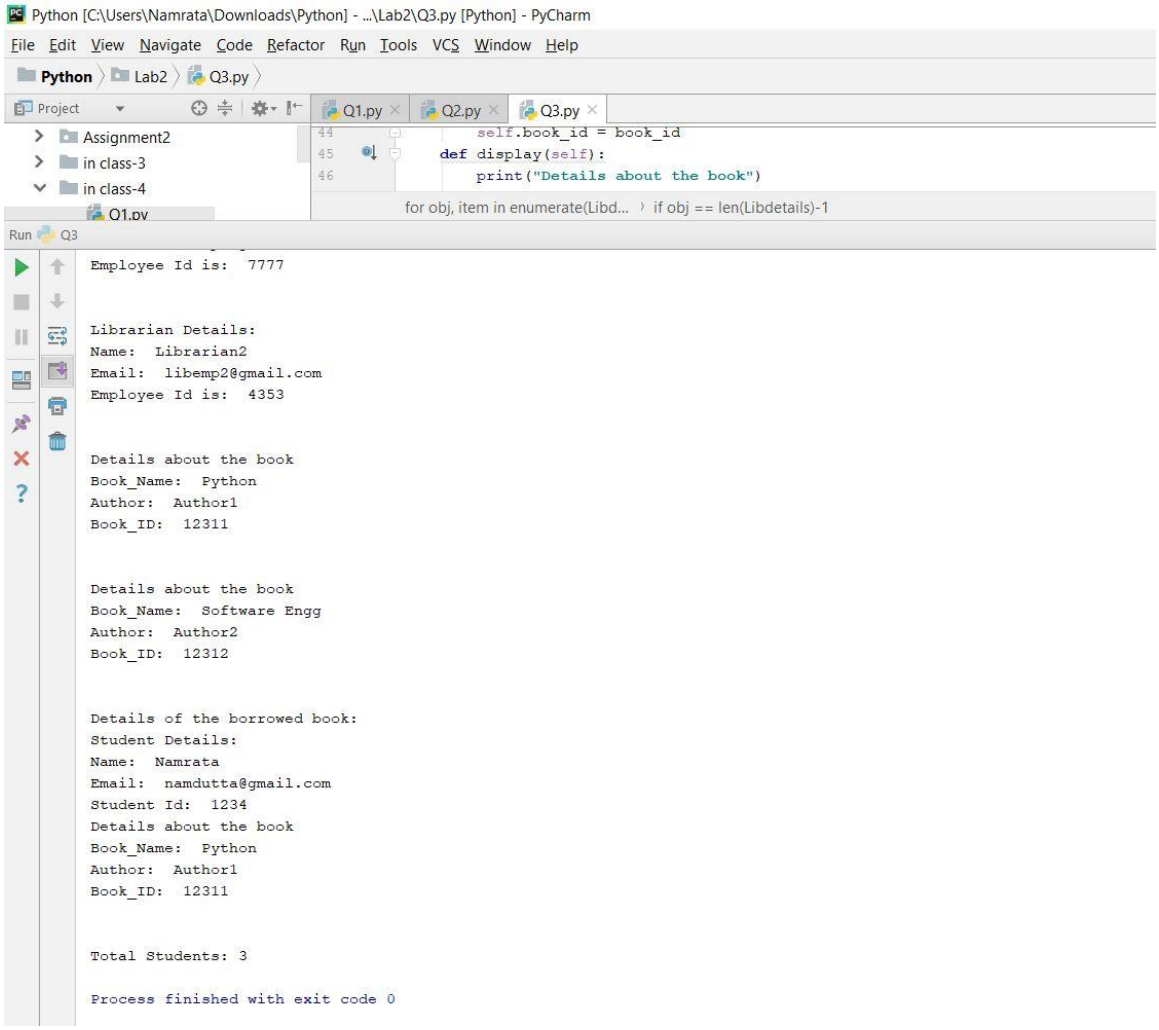
TASK 2


Python [C:\Users\Namrata\Downloads\Python] - ...\Lab2\Q2.py [Python] - PyCharm
File Edit View Navigate Code Refactor Run Tools VCS Window Help
Python Lab2 Q2.py
Project
Q1.py
Q2.py
Contact_list=[{"name":"Namrata","number":"8167234564","email":"namratadutta4@gmail.com"},{"name":"Pujita","number":"1414244141","email'
while True:
print("a) Display contact by name")
print("b) Display contact by number")
print("c) Edit contact by name")
print("d) Exit")
choice=str(input("Enter your choice from above: "))
if choice=='a':
input1=(input("Enter the name: "))
print(next(item for item in Contact_list if item["name"]==input1))
elif choice=='b':
input2=(input("Enter the number: "))
print(next(item for item in Contact_list if item["number"]==input2))
elif choice=='c':
input3=input("Enter the contact name you want to edit: ")
for item in Contact_list:
if item["name"]==input3:
item["number"]=input("Enter the new contact number: ")
print(Contact_list)
elif choice=='d':
break
while True
Run Q2 (1)
C:\Users\Namrata\PycharmProjects\First\venv\Scripts\python.exe C:/Users/Namrata/Downloads/Python/Lab2/Q2.py
a) Display contact by name
b) Display contact by number
c) Edit contact by name
d) Exit
Enter your choice from above: c
Enter the contact name you want to edit: Namrata
Enter the new contact number: 8169185292
[{'name': 'Namrata', 'number': '8169185292', 'email': 'namratadutta4@gmail.com'}, {'name': 'Pujita', 'number': '1414244141', 'email': 'pujitam212@gmail.com'}]
a) Display contact by name
b) Display contact by number
c) Edit contact by name
d) Exit
Enter your choice from above: b
Enter the number: 8169185292
{'name': 'Namrata', 'number': '8169185292', 'email': 'namratadutta4@gmail.com'}

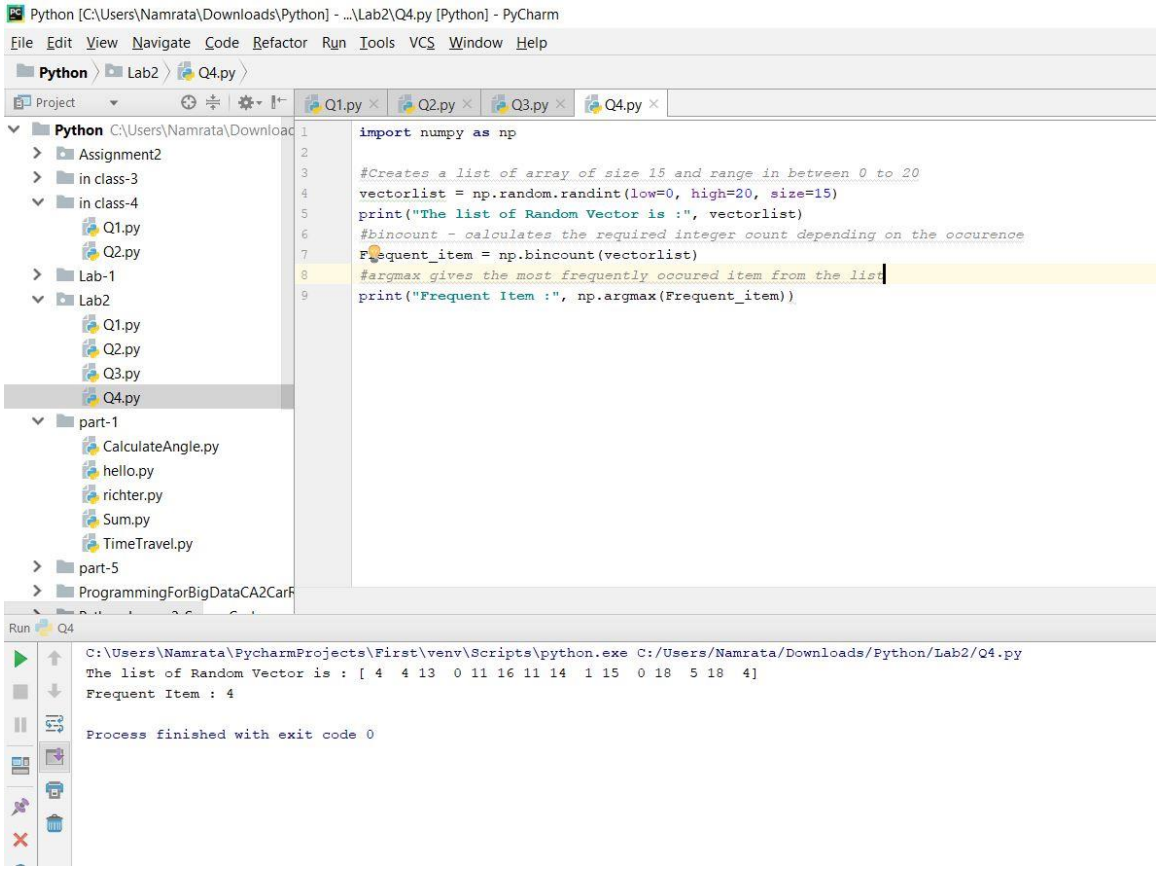
TASK 3


Python [C:\Users\Namrata\Downloads\Python] - ...\Lab2\Q3.py [Python] - PyCharm
File Edit View Navigate Code Refactor Run Tools VCS Window Help
Python Lab2 Q3.py
Project
Q1.py
Q2.py
Q3.py
#class 1
class Person:
#init constructor used
def __init__(self,name,email):
self.name = name
self.email = email
def display(self):
print("Name: ", self.name)
print("Email: ", self.email)
#class 2(inherited)
class Student(Person):
StudentCount = 0
def __init__(self,name,email,student_id):
Person.__init__(self,name,email)
self.student_id = student_id
Student.StudentCount +=1
def displayCount(self):
print("Total Students:", Student.StudentCount)
def display(self):
print("Student Details:")
Person.display(self)
print("Student Id: ",self.student_id)
#class 3 (inherited)
class Librarian(Person):
StudentCount = 0
def __init__(self,name,email,employee_id):
#super call
super().__init__(name,email)
self.employee_id = employee_id
def display(self):
print("Librarian Details:")
Person.display(self)
print("Employee Id is: ",self.employee_id)
#class 4
class Book():
External Libraries


Python [C:\Users\Namrata\Downloads\Python] - ...\Lab2\Q3.py [Python] - PyCharm
File Edit View Navigate Code Refactor Run Tools VCS Window Help
Python Lab2 Q3.py
Project
Q1.py Q2.py Q3.py
Assignment2
in class-3
in class-4
Q1.py
self.book_id = book_id
def display(self):
print("Details about the book")
for obj, item in enumerate(Libd... if obj == len(Libdetails)-1
Run Q3
C:\Users\Namrata\PycharmProjects\First\venv\Scripts\python.exe C:/Users/Namrata/Downloads/Python/Lab2/Q3.py
Student Details:
Name: Namrata
Email: namdutta@gmail.com
Student Id: 1234
Student Details:
Name: Pujita
Email: pujitam@gmail.com
Student Id: 4567
Librarian Details:
Name: Librarian1
Email: libemp1@gmail.com
Employee Id is: 7777
Librarian Details:
Name: Librarian2
Email: libemp2@gmail.com
Employee Id is: 4353
Details about the book
Book_Name: Python
Author: Author1
Book_ID: 12311
Details about the book
Book_Name: Software Engg
Author: Author2
Book_ID: 12312


Python [C:\Users\Namrata\Downloads\Python] - ...\Lab2\Q3.py [Python] - PyCharm
File Edit View Navigate Code Refactor Run Tools VCS Window Help
Python Lab2 Q3.py
Project
Q1.py Q2.py Q3.py
Assignment2
in class-3
in class-4
Q1.py
self.book_id = book_id
def display(self):
print("Details about the book")
for obj, item in enumerate(Libd... if obj == len(Libdetails)-1
Run Q3
Employee Id is: 7777
Librarian Details:
Name: Librarian2
Email: libemp2@gmail.com
Employee Id is: 4353
Details about the book
Book_Name: Python
Author: Author1
Book_ID: 12311
Details about the book
Book_Name: Software Engg
Author: Author2
Book_ID: 12312
Details of the borrowed book:
Student Details:
Name: Namrata
Email: namdutta@gmail.com
Student Id: 1234
Details about the book
Book_Name: Python
Author: Author1
Book_ID: 12311
Total Students: 3
Process finished with exit code 0

TASK 4



GITHUB LINK

HTTPS://GITHUB.COM/NAMRATADUTTA/PYTHON-LAB-ASSIGNMENTS/WIKI/LAB-2

LIMITATION

NONE

REFERENCES

https://stackoverflow.com/

https://www.geeksforgeeks.org/

https://www.wikipedia.org/