

# Python Lab Assignment-2

Name: Saketh Garuda

ID: 16

## Objective:

The main objective for this lab assignment is to know the working of sets, dictionaries and ability to create back end web applications in python. By using the above methods we met the following objectives,

- To find the desired information in the given range using dictionaries
- Able to update and lookup dictionaries
- Usage of classes and OOPS concepts in python
- Using numpy library to find the most frequent item in the list

## Features:

The code snippets are executed and debugged for purpose of software environment. The code snippets are written in such way that they won't affect the performance of the system when they are executed in multiple environments.

## Configuration:

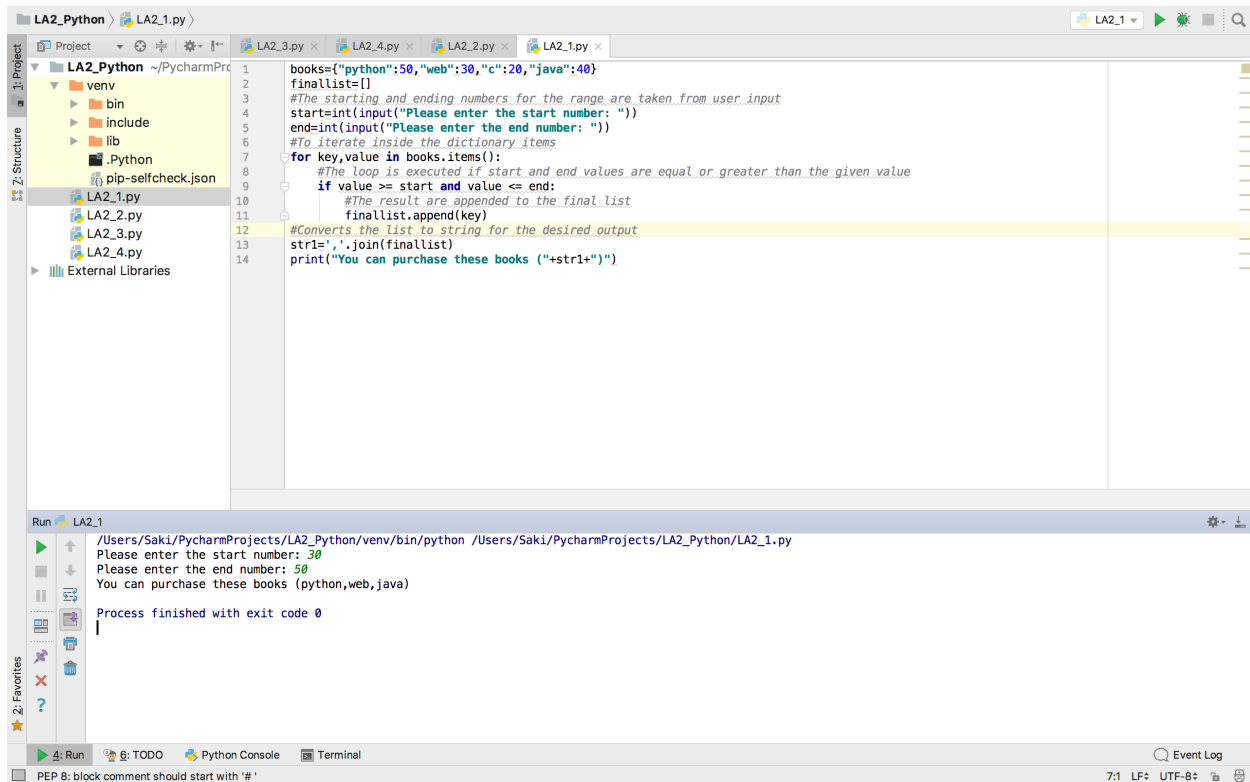
- PyCharm IDE
- Python 3.6.4

## Screenshots:

1) To find the books in the range given by the user

## Output:

- Books which are in the range are printed accordingly,



2) Create a list of contacts and prompt the user for following,

- Display contact by name
- Display contact by number
- Edit contact by name
- Exit

### Output:

- When option 'a' is entered the contacts by name are displayed,

```
1 Contact_list=[{"name":"Saketh","number":"1234","email":"sakethgaruda@gmail.com"}, {"name":"Sarat","number":"5678","email":"tracesarat@gmail.com"}]
2 #While loop is used to prompt the menu options until user exits program
3 while True:
4     print("a) Display contact by name")
5     print("b) Display contact by number")
6     print("c) Edit contact by name")
7     print("d) Exit")
8
9     userInput=str(input("Please enter your choice: "))
10    #If user enters option 'a' then the below loop is executed
11    if userInput=='a':
12        input1=input("Please enter the name: ")
13        #Compares the given user input to the dictionary keys for output
14        print(next(item for item in Contact_list if item["name"]==input1))
15    elif userInput=='b':
16        input2=input("Please enter the number: ")
17        # Compares the given user input to the dictionary keys for output
18        print(next(item for item in Contact_list if item["number"]==input2))
19    elif userInput=='c':
20        input3=input("Please enter the contact name you want to edit: ")
21        # Compares the given user input to the dictionary keys for output
22        for item in Contact_list:
23            if item["name"]==input3:
24                # The given dictionary is updated with the user input
25                item["number"]=input("Please enter the new contact number: ")
26        print(Contact_list)
27    elif userInput=='d':
28        break
29
```

Run LA2\_2

```
/Users/Saki/PycharmProjects/LA2_Python/venv/bin/python /Users/Saki/PycharmProjects/LA2_Python/LA2_2.py
a) Display contact by name
b) Display contact by number
c) Edit contact by name
d) Exit
Please enter your choice: a
Please enter the name: Saketh
{'name': 'Saketh', 'number': '1234', 'email': 'sakethgaruda@gmail.com'}
a) Display contact by name
b) Display contact by number
c) Edit contact by name
d) Exit
Please enter your choice:
```

- When option 'b' is entered the contacts by numbers are displayed,

```
1 Contact_list=[{"name":"Saketh","number":"1234","email":"sakethgaruda@gmail.com"}, {"name":"Sarat","number":"5678","email":"tracesarat@gmail.com"}]
2 #While loop is used to prompt the menu options until user exits program
3 while True:
4     print("a) Display contact by name")
5     print("b) Display contact by number")
6     print("c) Edit contact by name")
7     print("d) Exit")
8
9     userInput=str(input("Please enter your choice: "))
10    #If user enters option 'a' then the below loop is executed
11    if userInput=='a':
12        input1=input("Please enter the name: ")
13        #Compares the given user input to the dictionary keys for output
14        print(next(item for item in Contact_list if item["name"]==input1))
15    elif userInput=='b':
16        input2=input("Please enter the number: ")
17        # Compares the given user input to the dictionary keys for output
18        print(next(item for item in Contact_list if item["number"]==input2))
19    elif userInput=='c':
20        input3=input("Please enter the contact name you want to edit: ")
21        # Compares the given user input to the dictionary keys for output
22        for item in Contact_list:
23            if item["name"]==input3:
24                # The given dictionary is updated with the user input
25                item["number"]=input("Please enter the new contact number: ")
26        print(Contact_list)
27    elif userInput=='d':
28        break
29
```

Run LA2\_2

```
/Users/Saki/PycharmProjects/LA2_Python/venv/bin/python /Users/Saki/PycharmProjects/LA2_Python/LA2_2.py
a) Display contact by name
b) Display contact by number
c) Edit contact by name
d) Exit
Please enter your choice: b
Please enter the number: 5678
{'name': 'Sarat', 'number': '5678', 'email': 'tracesarat@gmail.com'}
a) Display contact by name
b) Display contact by number
c) Edit contact by name
d) Exit
Please enter your choice:
```

- When option 'c' is entered the user is prompted for contact name and to enter the new number for desired contact

```

1 Contact_list=[{"name":"Saketh","number":"1234","email":"sakethgaruda@gmail.com"}, {"name":"Sarat","number":"5678","email":"tracesarat@gmail.com"}]
2 #While loop is used to prompt the menu options until user exits program
3 while True:
4     print("a) Display contact by name")
5     print("b) Display contact by number")
6     print("c) Edit contact by name")
7     print("d) Exit")
8
9     userInput=str(input("Please enter your choice: "))
10    #If user enters option 'a' then the below loop is executed
11    if userInput=='a':
12        input1=input("Please enter the name: ")
13        #Compares the given user input to the dictionary keys for output
14        print(next(item for item in Contact_list if item["name"]==input1))
15    elif userInput=='b':
16        input2=input("Please enter the number: ")
17        # Compares the given user input to the dictionary keys for output
18        print(next(item for item in Contact_list if item["number"]==input2))
19    elif userInput=='c':
20        input3=input("Please enter the contact name you want to edit: ")
21        # Compares the given user input to the dictionary keys for output
22        for item in Contact_list:
23            if item["name"]==input3:
24                # The given dictionary is updated with the user input
25                item["number"]=input("Please enter the new contact number: ")
26                print(Contact_list)
27            elif userInput=='d':
28                break
29
30 while True
  
```

Run LA2\_2

```

/Users/Saki/PycharmProjects/LA2_Python/venv/bin/python /Users/Saki/PycharmProjects/LA2_Python/LA2_2.py
a) Display contact by name
b) Display contact by number
c) Edit contact by name
d) Exit
Please enter your choice: c
Please enter the contact name you want to edit: Saketh
Please enter the new contact number: 9999
[{'name': 'Saketh', 'number': '9999', 'email': 'sakethgaruda@gmail.com'}, {'name': 'Sarat', 'number': '5678', 'email': 'tracesarat@gmail.com'}]
a) Display contact by name
b) Display contact by number
c) Edit contact by name
d) Exit
Please enter your choice:
  
```

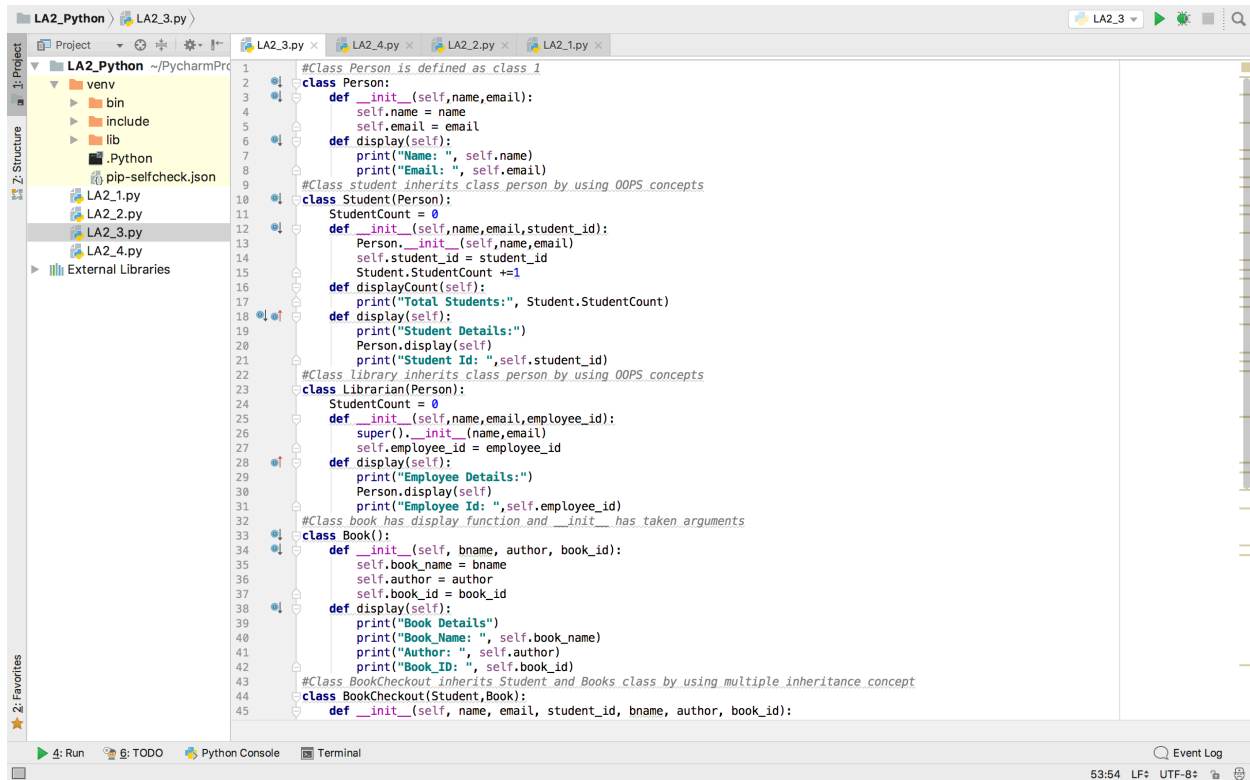
14:1 LF UTF-8

3) Write a python program to create any one of the following management systems. You can also pick one of your own.

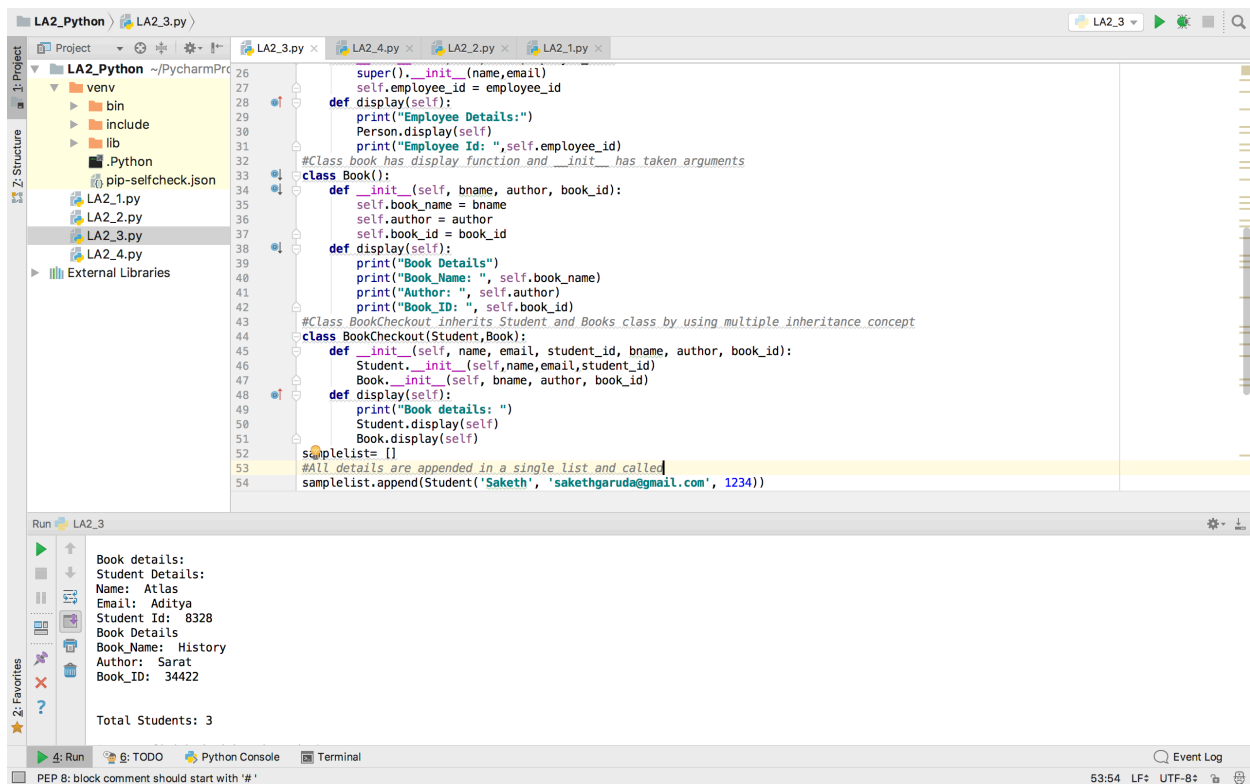
- a. Library Management System (should have classes for Person, Student, Librarian, Book etc.)
- b. Airline Booking Reservation System (classes for Flight, Person, Employee, Passenger etc.)
- c. Hotel Reservation System (classes for Room, Occupants, Employee etc.)
- d. Student Enrollment System (classes for Student, System, Grades etc.)
- e. Expense Tracker System (classes for Expense, Transaction Category etc.)

## Output:

- Library Management system is implemented.



```
1 #Class Person is defined as class 1
2 class Person:
3     def __init__(self, name, email):
4         self.name = name
5         self.email = email
6     def display(self):
7         print("Name: ", self.name)
8         print("Email: ", self.email)
9
10 #Class student inherits class person by using OOPS concepts
11 class Student(Person):
12     StudentCount = 0
13     def __init__(self, name, email, student_id):
14         Person.__init__(self, name, email)
15         self.student_id = student_id
16         Student.StudentCount += 1
17     def displayCount(self):
18         print("Total Students:", Student.StudentCount)
19     def display(self):
20         print("Student Details:")
21         Person.display(self)
22         print("Student Id: ", self.student_id)
23
24 #Class Librarian inherits class person by using OOPS concepts
25 class Librarian(Person):
26     LibrarianCount = 0
27     def __init__(self, name, email, employee_id):
28         super().__init__(name, email)
29         self.employee_id = employee_id
30     def display(self):
31         print("Employee Details:")
32         Person.display(self)
33         print("Employee Id: ", self.employee_id)
34
35 #Class book has display function and __init__ has taken arguments
36 class Book():
37     def __init__(self, bname, author, book_id):
38         self.book_name = bname
39         self.author = author
40         self.book_id = book_id
41     def display(self):
42         print("Book Details")
43         print("Book Name: ", self.book_name)
44         print("Author: ", self.author)
45         print("Book ID: ", self.book_id)
46
47 #Class BookCheckout inherits Student and Books class by using multiple inheritance concept
48 class BookCheckout(Student, Book):
49     def __init__(self, name, email, student_id, bname, author, book_id):
```



4) Using Numpy create random vector of size 15 having only Integers in the range 0 -20. Write a program to find the most frequent item/value in the vector list.

## Output:

- The most frequent item in the vector list is printed using argmax method.

LA2\_Python > LA2\_4.py

Project | LA2\_Python | ~\PycharmProjects\LA2\_Python

- venv
  - bin
  - include
  - lib
  - .Python
  - pip-selfcheck.json
- LA2\_3.py
- LA2\_4.py
- External Libraries

```
1 import numpy as np
2 #Creates a list of array wit size 15 and range in between 0 to 20
3 random = np.random.randint(low=0,high=20,size=15)
4 print("The random vector is",random)
5 #Total count of each integer are calculated using bincount method
6 totalcount = np.bincount(random)
7 #Most occurences of an integer i.e. highest count is returned using argmax method
8 print("Most frequent item in the List is",np.argmax(totalcount))
```

Run LA2\_4

/Users/Saki/PycharmProjects/LA2\_Python/venv/bin/python /Users/Saki/PycharmProjects/LA2\_Python/LA2\_4.py

The random vector is [ 3 19 4 0 5 3 14 3 6 11 7 7 6 11 7]

Most frequent item in the list is 3

Process finished with exit code 0

Python Console | Terminal | Run | TODO | Event Log

Packages installed successfully: Installed packages: 'numpy' (18 minutes ago)

6:1 n/a UTF-8



## Code Snippets:

### Code Snippet 1:

```
books={"python":50,"web":30,"c":20,"java":40}
finallist=[]
#The starting and ending numbers for the range are taken from user input
start=int(input("Please enter the start number: "))
end=int(input("Please enter the end number: "))
#To iterate inside the dictionary items
for key,value in books.items():
    #The loop is executed if start and end values are equal or greater than the given value
    if value >= start and value <= end:
        #The result are appended to the final list
        finallist.append(key)
#Converts the list to string for the desired output
str1=', '.join(finallist)
print("You can purchase these books (" +str1+"")
```

### Code Snippet 2:

```
Contact_list=[{"name":"Saketh","number":"1234","email":"sakethgaruda@gmail.com"}, {"name":"Sarat","number":
"5678","email":"tracesarat@gmail.com"}]
#While loop is used to prompt the menu options until user exits program
while True:
    print("a) Display contact by name")
    print("b) Display contact by number")
    print("c) Edit contact by name")
    print("d) Exit")

    userinput=str(input("Please enter your choice: "))
    #If user enters option 'a' then the below loop is executed
    if userinput=='a':
        input1=(input("Please enter the name: "))
        #Compares the given user input to the dictionary keys for output
        print(next(item for item in Contact_list if item["name"]==input1))
    elif userinput=='b':
        input2=(input("Please enter the number: "))
        # Compares the given user input to the dictionary keys for output
        print(next(item for item in Contact_list if item["number"]==input2))
    elif userinput=='c':
        input3=input("Please enter the contact name you want to edit: ")
        # Compares the given user input to the dictionary keys for output
        for item in Contact_list:
            if item["name"]==input3:
                # The given dictionary is updated with the user input
                item["number"]=input("Please enter the new contact number: ")
        print(Contact_list)
    elif userinput=='d':
        break
```

### Code Snippet 3:

### Code Snippet 4:

```
import numpy as np
#Creates a list of array wit size 15 and range in between 0 to 20
random = np.random.randint(low=0,high=20,size=15)
print("The random vector is",random)
#Total count of each integer are calculated using bincount method
totalcount = np.bincount(random)
#Most occurences of an integer i.e. highest count is returned using argmax method
print("Most frequent item in the list is",np.argmax(totalcount))
```

### Deployment:

The code snippets are written using Python IDE and executed with the help of python 3.6.4 interpreter. Outputs are shown in the Python IDE console.

### Limitations:

The given code snippets doesn't have any limitations as they have met all rules and conditions.

### References:

- <https://docs.scipy.org/doc/numpy/reference/generated/numpy.random.randint.html>
- <https://stackoverflow.com/questions/26823451/prompt-user-for-positive-number-and-continues-to-prompt-the-user-until-they-ent>
- <https://stackoverflow.com/questions/743164/emulate-a-do-while-loop-in-python>
- <https://wiki.python.org/moin/SortingListsOfDictionaries>