

## Composition

Create a class "**Lab**" having data members **labName** and **capacity**. Define parameterized constructor , getter and setter for data members.

Create a class "**LectureRoom**" having data members **roomName** , **roomNo** and **capacity**. Define parameterized constructor , getter and setter for data members.

Create a class "**Building**" having a pointer to an array of **lab** and **lectureRoom** as data members. Now define the function **showAllLabs()** to show all labs info and **showAllLectureRoom()** to show all lecture rooms on the console. **insertLab()** to insert new lab in the list, **deleteLab()** to delete lab, **insertLectureRoom()** to insert new Lecture Room and **deleteLectureRoom()** to delete the Lecture Room.

In **main** function first create a dynamic array of Lab named as 'labs' and LectureRoom named as 'lectureRooms' and allocate them some memory and then create a Building class object named as 'building' and initialize the array of lab to labs and lectureRoom to lectureRooms. Use the methods of Building Class for various purposes to show working. Also define the function generate report in main.

Write a full program to implement the relationship of the classes. The program should produce an output to external file (**report.txt**) as shown below:

```
Welcome to N28 Building
```

```
Show all labs:
```

```
Lab MPK1    60 Capacity
Lab MPK2    60 Capacity
Lab MPK3    50 Capacity
Lab MPK4    50 Capacity
```

```
Show all lecturers room:
```

```
Hafiz 102   3 Capacity
Shafie 105   3 Capacity
Aisyah 202   3 Capacity
Rahim 208    3 Capacity
```

## Aggregation

**“A student has an address”**. A student has many pieces of information such as **name**, **roll no**, **email**, etc.

It also contains one more important data member named **“address”** that contains information such as **city**, **state**, **country**, **zip code**.

Create a class **“Student”** having data members **name**, **rollNo** , **emailId** and pointer **address**. Define a parameterized and getter and setter for data members.

Create a class **“Address”** having data members **city**, **state**, **country** and **zipCode**. Define a parameterized and getter and setter for data members. Also define a function that will return a full address in string form (string **getaddress()** ).

**In main** function first create a dynamic array of **Student** named as 'students' and allocate them some memory. Then create some dummy students and then print students data on the console. Also create the function **studentData** to store data in the file named as **“Student.txt”**.

Write a full program to implement the relationship of the classes. The program should produce an output to external file (**Student.txt**) as shown below:

Student Data			
Name	Roll No	Email Id	Address
Ali	2	ali@pucit.edu.pk	Lahore, Punjab, Pakistan (40050)
Ahmed	3	ahmed@pucit.edu.pk	Lahore, Punjab, Pakistan (40050)