**Lab Methods and Constructors**

1. Create a class Account class with balance, yearofOpening and CNIC as data member. Create :
   1. Default constructor
   2. One-argument Constructor (balance)
   3. Three- argument constructor
   4. setValues()
   5. display()
   6. withDraw()
   7. deposit()
   8. calculateAgeOfAccount()
2. Create a quadratic Equation Class with **a, b and c** as data members. Create
3. Default constructor
4. Three- argument constructor
5. Display()
6. setValues ()
7. getDiscriminant() //returns double
8. checkIfDescriminantIsGretaerThan100() //Boolean return
9. Create a class Rectangle with length and width as data members. Create
   1. Default constructor
   2. two- argument constructor
   3. Display()
   4. setValues ()
   5. calculateArea ()
   6. checkSquare () //Boolean return
10. Create a class Point class with x and y as data members. Create
    1. Default constructor
    2. two- argument constructor
    3. Display()
    4. setValues ()
    5. move ()
    6. checkOrigin () //Boolean return
11. Create a Book class with author and chapterNames[5] as data members. Create
    1. Default constructor
    2. two- argument constructor
    3. Display()
    4. setValues ()
    5. checkIfAuthorNameStartsWithA ()
    6. searchChapter () //Boolean return
12. Create a Student Class with name, Gpa, subjects[5] and email as data members. Create
    1. Default constructor
    2. four- argument constructor
    3. Display()
    4. setValues ()
    5. searchSubject ()
    6. checkProbStatus () //Boolean return
    7. validateEmail() //Boolean return
13. Create a class “University” having following characteristics:

**Data Members:**

* String uniName;
* String location;
* String rectorName;
* String departments[20]; // it’s a string array

**Constructors:**

* No argument
* Two argument (UniName and RectorName)
* A Constructor setting values of all parameters.

**Methods:**

* display
  + This methods displays all the data members of the class
* addADepartment
  + This method should add a new department the Departments [] array.
* checkIfLocatedInCapital
  + This method will return true if university is located in federal capital or provincial capital.
* searchDepartment
  + This method will return true if a certain department is found

**Runner class:**

Create a runner class such that all Constructors and methods are called at least once.

**Rules for method writing:**

1. A method should not have arguments if the working is solely dependent on class data members only. (example: area function in rectangle class)
2. If a method requires something other than the class data members, then that should be received as argument. (example: withdraw function in Account class. Amount to be withdrawn should be received in argument)
3. A computation function should return the result of computation.
4. Avoid the use of scanners in methods.
5. State modification methods must ensure valid state changes.
6. Apply validation checks in state modification methods.