COMSATS University, Islamabad
Department of Computer Science
Assignment#1

Q1 Create an Encapsulated class Book with data members, author and chapterNames[5]

- Create two overloaded constructors, one with no argument and one with two arguments.
- Create a method compareAuthors that compares the author of two Books and returns true if both books have same author and false otherwise. (This method Must manipulate two Book objects)
- Create a method compareChapters that compares the chapters of two books and returns true if both books have same chapters and false otherwise. (This method Must manipulate two Book objects)
- Create a method compareChaptersLength that compares the chapters of two books and returns the books with larger chapters. (This method Must manipulate two Book objects)
  Note: All book objects will have five chapters

Q2 Create a Calculator class that has following methods:
- sum, multiply, divide, modulus , sin , cos , tan

The user should be able to call these methods without creating an object of Calculator class.

Q3 Convert the following class to immutable class: (I'll provide this code on teams too)

```java
public class Fraction {
    int numerator, denominator;
    public Fraction(int numerator, int denominator) {
        this.numerator = numerator;
        this.denominator = denominator;
    }
    public int getNumerator() {
        return numerator;
    }
    public void setNumerator(int numerator) {
        this.numerator = numerator;
    }
    public int getDenominator() {
        return denominator;
    }
    public void setDenominator(int denominator) {
        this.denominator = denominator;
    }
    public void add(Fraction other) {
    numerator = numerator * other.denominator
            + other.numerator * denominator;
    denominator = denominator * other.denominator;
    }
}
```

Q4 Create a class Geometric collection.
- Create arrays of circle and rectangle of length 10 as data members
- Create default and argument constructor.
- Create display function.
- Create method to find area of Geometric collection.

Q5 Implement the following given scenario:
- Create a class Address with data members, home, street, and city.
  - Create three constructors (default, argument and copy), set and get methods.
- Now create a class Person which contain "has-a" relation with Address class. It has data members : firstName and LastName.
  - Create constructors, set get methods and display function in Person Class.
  - Create a function in Person class that returns true if he lives in "Islamabad" and false otherwise.
- Create another class Book that contains an author of type Person. Other data members are bookName and publisher. Give constructors and a display function that prints all details of Book.
- Write a function in Book class that checks if the street number is less than 10. Return true or false.
- Test class Book in main. Modify the address of the author in runner class.