Assignment-2

1)
```
class Student <T> {
    String name;
    T rollNumber;
    int age;
    public Student (String name, T rollNumber, int age) {
        this. name = name;
        this . rollNumber = rollNumber;
        this. age = age;
    }
    public void display() {
        System.out. println ("Name :" + name);
        System. out. println ("Roll Number :" + rollNumber);
        System. out. println ("Age :" + age);
    }
}
public class Main {
    public static void main (String [] args) {
        Student <Integer> s1 = new Student<> ("Bob", 18, 19);
        Student <String> s2 = new Student < > ("John", "AWS", 23);
        System.out. println ("Details of Student 1:");
        s1. display ( );
        System.out.println ( );
        System. out. println ("Details of Student 2:");
        s2. display ( );
        System. out. println ( );
    }
}
```

Output
Details of Student1:
Name : Bob
Roll Number : 18
Age : 19

Details of Student 2:
Name : John
Roll Number : AWS
Age : 23

Name: Subhrashma Mishra
Regd. Number: 2241013183

a)
```
class Book {
    int bookId;
    String bookName;
    double price;
    public Book(int bookId, String bookName, double price) {
        this.bookId = bookId;
        this.bookName = bookName;
        this.price = price;
    }
    public String toString(){
        return "Book ID: "+bookId+", Book Name :"+bookName+"; Price : $"
                +price;
    }
    public boolean equals(Book other) {
        return this.price == other.price;
    }
}
public class Main {
    public static void main(String[] args) {
        Book book1 = new Book(1, "Java Programming", 50.0);
        Book book2 = new Book(2, "Python Programming", 40.0);
        if (book1.equals(book2)) {
            System.out.println("Both books have the same price");
        else {
            System.out.println("Both have different prices.");
        }
        System.out.println("Book 1 Details: ");
        System.out.println(book1);
        System.out.println("Book 2 Details:");
        System.out.println(book2);
    }
}
```

Output

Books have different prices.

Book 1 Details:

Book ID: 1, Book Name: Java Programming, Price: $50.0

Book 2 Details:

Book ID: 2, Book Name: Python Programming, Price: $40.0

Q3)

```
import java.util.*;
class Car implements Comparable<Car>{
    String model;
    String color;
    int speed;
    public Car(String model, String color, int speed){
        this.model = model;
        this.color = color;
        this.speed = speed;
    }
    public int compareTo(Car other){
        return Integer.compare(this.speed, other.speed);
    }
    public String toString(){
        return "Car: "+model+"("+color+"), Speed: "+speed+"km/h";
    }
}
public class Main {
    public static void main(String[] args) {
        Car car1 = new Car("Togota", "Blue", 100);
        Car car2 = new Car("Honda", "Red", 200);
        System.out.println(car1.compareTo(car2)<0 ? car2: car1);
    }
}
```

Output:-
Car: Honda (Red), Speed: 200 km/h

Q4)
```
import java.util.*;
class Student implements Comparable <Student> {
    String name;
    int rn;
    double totalMark;
    public Student (String name, int rn, double totalMark){
        this.name = name;
        this.rn = rn;
        this.totalMark = totalMark;
    }
    public int compareTo(Student other){
        return Double.compare (this.totalMark, other.totalMark);
    }
    public String toString(){
        return "Student{"+"name=' "+name+'\''+", rn = "+rn+
            ", totalMark = "+ totalMark + '}';
    }
}
public class Main{
    Public static void main (String[] args){
        Student [] students = { new Student ("Alice", 101, 85.5),
                                new Student ("Bob", 102, 78.0),
                                new Student ("Charlie", 103, 92.3) };
        Arrays.sort(students);
        double targetMark = 78.0;
        for (Student student : students){
            if (student.totalMark == targetMark) {
                System.out.println ("Found Student: " + student);
                break;
            }
        }
    }
}
```

Output:- Found student : Student{name='Bob', rn=102, totalMark=78.0}

Name:_____ Regd. Number:_____

Q5)
```
import java.util.*;
class Student implements Comparable<Student> {
    String name;
    int rn;
    int totalMark;
    public Student(String name, int rn, int totalMark) {
        this.name = name;
        this.rn = rn;
        this.totalMark = totalMark;
    }
    public int compareTo(Student other) {
        return Integer.compare(this.rn, other.rn);
    }
}
public class Main {
    public static void main(String[] args) {
        Student[] students = { new Student("Alice", 101, 85),
                               new Student("Bob", 102, 78),
                               new Student("Charlie", 103, 92);
                               new Student("David", 104, 70)};
        Arrays.sort(students);
        System.out.println("Sorted student array by roll number
                            (rn):");
        for(Student student: students) {
            System.out.println(student.getName() + "(RN:"
                               + student.getRn() + ")");
        }
    }
}
```

Output

Found student: Student {name = 'Bob', rn = 102, totalMark = 78.0}

```
(16) class Animal<T> {
        String name;
        String color;
        T type;
        public Animal(String name, String color, T type) {
                this.name = name;
                this.color = color;
                this.type = type;
        }
        public int hashCode(){
            return (name + color + type).hashCode();
        }
    }
    public class Main{
        public ~~class~~ static void main(String[]args){
            Animal<String> PetDog = new Animal<>("Buddy","Brown","Pet");
            Animal<String> wildTiger = new Animal<>("Simba","black","Wild");
            System.out.println("Pet Dog Hash Code:"+petDog.hashCode());
            System.out.println("Wild Tiger Hash Code:"+wildTiger.hashCode());
        }
    }
```

Output:-

Pet Dog Hash Code :- -954940209

Wild Tiger Hash Code : -1291108498