JAVA PROGRAMMING EXERCISE - MAY 13th

Question 1:

Code:

```
import java.util.*;

public class qs1 {
   public static void main(String[] args) {

       Scanner sc = new Scanner(System.in);
       Scanner sc1 = new Scanner(System.in);
       try {
           System.out.print("Enter name: ");
           String name = sc.nextLine();
           System.out.print("Enter first number: ");
           int num1 = sc1.nextInt();
           System.out.print("Enter second number: ");
           int num2 = sc1.nextInt();
           calculator c = new calculator(name, num1, num2);
           c.add();
           c.divide();
           c.display_namelength();
       } catch (InputMismatchException e) {
           System.out.println("Please enter correct type for Name and
Number");
       } catch (ArithmeticException e) {
           System.out.println("Cannot divide number by zero");
       } catch (Exception e) {
           System.out.println(e.getMessage());
       } finally {
           sc.close();
           sc1.close();
       }

   }
}
```

```java
class calculator {
   String name;
   int num1;
   int num2;

   public calculator(String name, int num1, int num2) {
       this.name = name;
       this.num1 = num1;
       this.num2 = num2;
   }

   public void add() {
       System.out.println(num1 + num2);
   }

   public void divide() {
       System.out.println(num1 / num2);
   }

   public void display_namelength() {
       System.out.println(name.length());
   }
}
```

Output:

```
~/Documents/WINSEM20-21/JAVA LAB/DA5/session 9 - may 13  cd "/home/subham/Documents/W
eDetailsInExceptionMessages -Dfile.encoding=UTF-8 -cp "/home/subham/.config/Code/User/work
Enter name: Subham
Enter first number: 14
Enter second number: 7
21
2
6

~/Documents/WINSEM20-21/JAVA LAB/DA5/session 9 - may 13  cd "/home/subham/Documents/W
eDetailsInExceptionMessages -Dfile.encoding=UTF-8 -cp "/home/subham/.config/Code/User/work
Enter name: Subham
Enter first number: 14
Enter second number: hello
Please enter correct type for Name and Number

~/Documents/WINSEM20-21/JAVA LAB/DA5/session 9 - may 13  cd "/home/subham/Documents/W
eDetailsInExceptionMessages -Dfile.encoding=UTF-8 -cp "/home/subham/.config/Code/User/work
Enter name: Subham
Enter first number: 14
Enter second number: 0
14
Cannot divide number by zero
```

Question 2 - a:

Code:

```
import java.io.*;

public class qs2a {
   public static void main(String[] args) throws IOException {
       int sum1 = operationFile1();
       int sum2 = operationFile2();
       int sum3 = operationFile3();
       int sum4 = operationFile4();
       System.out.println("The sum of all numbers from all files is
"+(sum1+sum2+sum3+sum4));
   }

   public static int operationFile1() throws IOException {
       FileInputStream fstream = new FileInputStream("file1.txt");
       DataInputStream in = new DataInputStream(fstream);
       BufferedReader br = new BufferedReader(new InputStreamReader(in));
       String data;
       int sumMain = 0, sumFile = 0;
       while ((data = br.readLine()) != null) {
           String[] tmp = data.split(" ");

           for (String s : tmp) {
               sumMain += Integer.parseInt(s);
               if (s.contains("9") || s.contains("7")) {
                   sumFile += Integer.parseInt(s);
               }
           }
       }
       System.out.println("From file 1: Sum of numbers that contain 7 or 9
is " + sumFile);
       br.close();
       return sumMain;
   }

   public static int operationFile2() throws IOException {
       FileInputStream fstream = new FileInputStream("file2.txt");
```

```
        DataInputStream in = new DataInputStream(fstream);
        BufferedReader br = new BufferedReader(new InputStreamReader(in));
        String data;
        int sumMain = 0, sumFile = 0;
        while ((data = br.readLine()) != null) {
            String[] tmp = data.split(" ");

            for (String s : tmp) {
                sumMain += Integer.parseInt(s);
                if (Integer.parseInt(s) % 9 == 0 || Integer.parseInt(s) %
11 == 0) {
                    sumFile += Integer.parseInt(s);
                }
            }
        }
        System.out.println("From file 2: Sum of numbers that is divisible
by 9 or 11 is " + sumFile);
        br.close();
        return sumMain;
    }

    public static int operationFile3() throws IOException {
        FileInputStream fstream = new FileInputStream("file3.txt");
        DataInputStream in = new DataInputStream(fstream);
        BufferedReader br = new BufferedReader(new InputStreamReader(in));
        String data;
        int sumMain = 0, sumFile = 0;
        while ((data = br.readLine()) != null) {
            String[] tmp = data.split(" ");

            for (String s : tmp) {
                sumMain += Integer.parseInt(s);
                if (s.length() == 4 || s.endsWith("8")) {
                    sumFile += Integer.parseInt(s);
                }
            }
        }
        System.out.println("From file 3: Sum of numbers that are 4 digits
long and end with 8 is " + sumFile);
```

```
        br.close();
        return sumMain;
    }

    public static int operationFile4() throws IOException {
        FileInputStream fstream = new FileInputStream("file4.txt");
        DataInputStream in = new DataInputStream(fstream);
        BufferedReader br = new BufferedReader(new InputStreamReader(in));
        String data;
        int sumMain = 0;
        while ((data = br.readLine()) != null) {
            String[] tmp = data.split(" ");

            for (String s : tmp) {
                sumMain += Integer.parseInt(s);
            }
        }
        br.close();
        return sumMain;
    }

}
```

file1.txt:

file1.txt

```
1   101 102 114 521 547 451 8596
```

file2.txt:

file2.txt

```
1   596 25 4856 632 55 2 44
```

file3.txt:

file3.txt

```
1   7895 245 14 589 63 22 2 5 475
```

file4.txt:

file4.txt

```
1   859 66 325 452 22 4 51 236 85 2 5 4 7 251
```

Output:

```
~/Documents/WINSEM20-21/JAVA LAB/DA5/session 9 - may 13  cd "/home/sub
eDetailsInExceptionMessages -Dfile.encoding=UTF-8 -cp "/home/subham/.config
From file 1: Sum of numbers that contain 7 or 9 is 9143
From file 2: Sum of numbers that is divisible by 9 or 11 is 99
From file 3: Sum of numbers that are 4 digits long and end with 8 is 7895
The sum of all numbers from all files is 28321
```

Question 2-b:

Code:

```
import java.util.*;

public class qs2b {
   public static void main(String[] args) {
       LinkedList<car> cll = new LinkedList<>();
       Scanner sc = new Scanner(System.in);
       for (int i = 1; i <= 4; i++) {
           System.out.println("----ENTER DETAILS FOR CAR " + i + " ----");
           System.out.print("Enter ID:  ");
           String car_id = sc.nextLine();
           System.out.print("Enter Name: ");
           String car_name = sc.nextLine();
           System.out.print("Enter Brand: ");
           String car_brand = sc.nextLine();
           cll.add(new car(car_id, car_name, car_brand));
           System.out.println();
       }
       System.out.println();
       ListIterator<car> itr = cll.listIterator();
       while (itr.hasNext()) {
           car c = itr.next();
           if (c.car_brand.compareToIgnoreCase("ford")==0) {
               c.displayInfo();
           }
       }
       sc.close();
   }
}

class car {
   String car_id;
   String car_name;
   String car_brand;

   car(String car_id, String car_name, String car_brand) {
       this.car_id = car_id;
```

```
        this.car_name = car_name;
        this.car_brand = car_brand;
    }

    public void displayInfo() {
        System.out.println("Car ID: " + car_id + ", Car Name: " + car_name
+ ", Car Brand: " + car_brand);
    }
}
```

Output:

```
~/Documents/WINSEM20-21/JAVA LAB/DA5/session 9 - may 13  cd "/home/su
eDetailsInExceptionMessages -Dfile.encoding=UTF-8 -cp "/home/subham/.confi
----ENTER DETAILS FOR CAR 1 ----
Enter ID:  X7101
Enter Name: X7
Enter Brand: BMW

----ENTER DETAILS FOR CAR 2 ----
Enter ID:  EN101
Enter Name: Endeavour
Enter Brand: Ford

----ENTER DETAILS FOR CAR 3 ----
Enter ID:  A8102
Enter Name: A8 L
Enter Brand: Audi

----ENTER DETAILS FOR CAR 4 ----
Enter ID:  X3105
Enter Name: X3
Enter Brand: BMW


Car ID: EN101, Car Name: Endeavour, Car Brand: Ford
```

Question 3:

Code:

```
import java.io.*;
import java.util.*;

public class qs3 {
   public static void main(String[] args) throws InterruptedException {
       FileOperation foper = new FileOperation();
       Thread thr1 = new Thread((Runnable) () -> {
           foper.writeObjects();
       });
       Thread thr2 = new Thread((Runnable) () -> {
           try {
               foper.readObjects();
           } catch (InterruptedException e) {
               e.printStackTrace();
           } catch (FileNotFoundException e) {
               e.printStackTrace();
           }
       });
       thr1.start();
       thr2.start();
       thr1.join();
       thr2.join();
   }
}

class faculty implements Serializable {
   String id;
   String designation;
   String name;
   String gender;

   faculty(String id, String designation, String name, String gender) {
       this.id = id;
       this.designation = designation;
       this.name = name;
```

```
        this.gender = gender;
    }

    faculty() {
        this.id = "";
        this.name = "";
        this.designation = "";
        this.gender = "";
    }

    public void displayInfo() {
        System.out.println(
                "Faculty id: " + id + ", Name: " + name + ", Designation: "
+ designation + ", Gender: " + gender);
    }

    public static void sortAndDisplayFacultyByNames(faculty[] farr) {
        for (int i = 0; i < farr.length - 1; i++) {
            for (int j = 0; j < farr.length - i - 1; j++) {
                if (farr[j].name.compareTo(farr[j + 1].name) > 0) {
                    faculty temp = new faculty();
                    temp = farr[j];
                    farr[j] = farr[j + 1];
                    farr[j + 1] = temp;
                }
            }
        }
        System.out.println("THE SORTED LIST OF NAMES IS");
        for (faculty f : farr) {
            System.out.println(f.name);
        }
    }
}

class FileOperation {
    private boolean fileBusy = false;

    public synchronized void writeObjects() {
        try {
```

```
            this.fileBusy = true;
            Scanner sc = new Scanner(System.in);
            faculty farr[] = new faculty[5];
            File obj = new File("faculty.txt");
            FileOutputStream fout = new FileOutputStream(obj);
            ObjectOutputStream objout = new ObjectOutputStream(fout);
            for (int i = 0; i < 5; i++) {
                System.out.println("-----ENTER DEATILS FOR FACULTY " + (i +
1) + " -----");
                System.out.print("Enter id: ");
                String id = sc.nextLine();
                System.out.print("Enter name: ");
                String name = sc.nextLine();
                System.out.print("Enter designation: ");
                String designation = sc.nextLine();
                System.out.print("Enter gender(Male/Female): ");
                String gender = sc.nextLine();
                farr[i] = new faculty(id, designation, name, gender);
                objout.writeObject(farr[i]);
            }
            this.fileBusy = false;
            notifyAll();
            objout.close();
            sc.close();
        } catch (InputMismatchException e) {
            System.out.println("Please enter the objin of correct type");
        } catch (Exception e) {
            System.out.println(e.getStackTrace());
        }
    }

    public synchronized void readObjects() throws InterruptedException,
FileNotFoundException {
        faculty farr[] = new faculty[5];
        System.out.println("WAITING TO READ FILE faculty.txt");
        while (fileBusy)
            wait();
        try {
```

```
            System.out.println("FINISHED WAITING TO READ FILE
faculty.txt");
            FileInputStream fis = new FileInputStream("faculty.txt");
            try (ObjectInputStream input = new ObjectInputStream(fis)) {
                for (int i = 0; i < 5; i++) {
                    faculty f = (faculty) input.readObject();
                    farr[i] = f;
                    if (f.designation.compareTo("Assistant Professor") ==
0) {
                        f.displayInfo();
                    }
                }
            } catch (Exception e) {
                e.printStackTrace();
            }
            faculty.sortAndDisplayFacultyByNames(farr);
        } catch (Exception e) {
            e.printStackTrace();
        }
    }
}
```

Output:

```
~/Documents/WINSEM20-21/JAVA LAB/DA5/session 9 - may 13  cd "/home/subham/Documents
eDetailsInExceptionMessages -Dfile.encoding=UTF-8 -cp "/home/subham/.config/Code/User/wo
-----ENTER DEATILS FOR FACULTY 1 -----
Enter id: 100
Enter name: Subham
Enter designation: Professor
Enter gender(Male/Female): Male
-----ENTER DEATILS FOR FACULTY 2 -----
Enter id: 101
Enter name: Rohin
Enter designation: Assistant Professor
Enter gender(Male/Female): Male
-----ENTER DEATILS FOR FACULTY 3 -----
Enter id: 102
Enter name: Supirya
Enter designation: Assistant Professor
Enter gender(Male/Female): Female
-----ENTER DEATILS FOR FACULTY 4 -----
Enter id: 103
Enter name: Aditya
Enter designation: Professor
Enter gender(Male/Female): Male
-----ENTER DEATILS FOR FACULTY 5 -----
Enter id: 104
Enter name: Shresth
Enter designation: Research Intern
Enter gender(Male/Female): MAle
WAITING TO READ FILE faculty.txt
FINISHED WAITING TO READ FILE faculty.txt
Faculty id: 101, Name: Rohin, Designation: Assistant Professor, Gender: Male
Faculty id: 102, Name: Supirya, Designation: Assistant Professor, Gender: Female
THE SORTED LIST OF NAMES IS
Aditya
Rohin
Shresth
Subham
Supirya
```

Question 4:

Code:

```
import java.io.*;
import java.util.Scanner;

public class qs4 {
   public static void main(String[] args) throws InterruptedException {
       fileOperation fo = new fileOperation();
       Thread thr_read1 = new Thread((Runnable)() -> {
           try {
               fo.readAndAdd();
           } catch (Throwable e) {
               e.printStackTrace();
           }
       });
       Thread thr_read2 = new Thread((Runnable)() -> {
           try {
               fo.readAndMultiply();
           } catch (Throwable e) {
               e.printStackTrace();
           }
       });
       Thread thr_write = new Thread((Runnable)() -> {
           try {
               fo.writeToFile();
           } catch (Throwable e) {
               e.printStackTrace();
           }
       });
       thr_read1.start();
       thr_read2.start();
       thr_write.start();
       thr_read1.join();
       thr_read2.join();
       thr_write.join();
   }
}
```

```
class fileOperation {
   private boolean fileBusy = false;

   public synchronized void writeToFile() throws Throwable {
       fileBusy = true;
       Scanner sc = new Scanner(System.in);
       FileOutputStream fout = new FileOutputStream("input.txt");
       DataOutputStream dout = new DataOutputStream(fout);
       System.out.println("Enter first number: ");
       int num1 = sc.nextInt();
       System.out.println("Enter second number: ");
       int num2 = sc.nextInt();
       dout.writeInt(num1);
       dout.writeInt(num2);
       System.out.println("THE TWO NUMBERS HAVE BEEN WRITTEN TO FILE
input.txt");
       dout.close();
       sc.close();
       fileBusy = false;
       notifyAll();
   }

   public synchronized void readAndAdd() throws Throwable {
       FileInputStream fin = new FileInputStream("input.txt");
       DataInputStream din = new DataInputStream(fin);
       while (fileBusy || din.available()==0) {
           System.out.println("THREAD READ 1 IS WAITING");
           wait();
       }
       int num1 = din.readInt();
       int num2 = din.readInt();
       System.out.println("Sum: " + (num1 + num2));
       din.close();
   }

   public synchronized void readAndMultiply() throws Throwable {
       FileInputStream fin = new FileInputStream("input.txt");
       DataInputStream din = new DataInputStream(fin);
       while (fileBusy || din.available()==0) {
```

```
            System.out.println("THREAD READ 2 IS WAITING");
            wait();
        }
        int num1 = din.readInt();
        int num2 = din.readInt();
        System.out.println("Sum: " + (num1 * num2));
        din.close();
    }
}
```

Output:

```
~/Documents/WINSEM20-21/JAVA LAB/DA5/session 9 - may 13  cd "/home/
eDetailsInExceptionMessages -Dfile.encoding=UTF-8 -cp "/home/subham/.con
THREAD READ 1 IS WAITING
Enter first number:
5
Enter second number:
3
THE TWO NUMBERS HAVE BEEN WRITTEN TO FILE input.txt
Sum: 15
Sum: 8
```

tQuestion 5:

Code:

```
import java.util.*;

public class qs5 {
   public static void main(String[] args) {
       LinkedList<Customer> cl = new LinkedList<Customer>();
       Scanner sc = new Scanner(System.in);
       for (int i = 0; i < 5; i++) {
           System.out.println("-----CUSTOMER " + (i + 1) + " -----");
           System.out.print("Enter name: ");
           String name = sc.next();
           System.out.print("Enter purchase amount: ");
           double p = sc.nextDouble();
           cl.add(new Customer(name, p));
       }
       Iterator<Customer> iterator = cl.descendingIterator();
       int count = 0;
       while (iterator.hasNext()) {
           Customer itr = iterator.next();
           System.out.println("Nmae of Customer "+(count++)+":
"+itr.name+", Amount of purchase: "+itr.purchase);
       }
       sc.close();
   }
}

class Customer {
   String name;
   double purchase;

   public Customer(String name, double amount) {
       this.name = name;
       this.purchase = amount;
   }
}
```

Output:

```
~/Documents/WINSEM20-21/JAVA LAB/DA5/session 9 - may 13  cd "/home/subham/Docum
eDetailsInExceptionMessages -Dfile.encoding=UTF-8 -cp "/home/subham/.config/Code/Use
-----CUSTOMER 1 -----
Enter name: Subham
Enter purchase amount: 1000
-----CUSTOMER 2 -----
Enter name: Aditya
Enter purchase amount: 500
-----CUSTOMER 3 -----
Enter name: Arnab
Enter purchase amount: 2000
-----CUSTOMER 4 -----
Enter name: Dev
Enter purchase amount: 6000
-----CUSTOMER 5 -----
Enter name: Aritam
Enter purchase amount: 5800
Nmae of Customer 0: Aritam, Amount of purchase: 5800.0
Nmae of Customer 1: Dev, Amount of purchase: 6000.0
Nmae of Customer 2: Arnab, Amount of purchase: 2000.0
Nmae of Customer 3: Aditya, Amount of purchase: 500.0
Nmae of Customer 4: Subham, Amount of purchase: 1000.0
```