EEM 480 Algorithms and Complexity HW 2

In this Homework you are required to design a FaceBook-like environment and program using linked list database structure. Your program will work on command line where the commands are given in one line as:

I <Name> - Creates a person with the name given in the line. If <Name> has been created before, increase the HitCount of the person.

F <Name1> <Name2> If Name1 and Name2 are the valid persons in data base, the person with Name2 will be added to the linkedlist FriendList of Person with Name1. Otherwise informs the user as Name1 or Name2 or both are not in database

D <Name> - Deletes the record of <Name> from the structure if Name is not in the FriendList of other persons. Otherwise informs the user as <Name> is in the list of <Namei>, <Namej>,…

P<Name> - Lists the friends of the person <Name>. If the <Name> is not found it prints "<Name> is not in the list".

W – Shows the most popular person in database. (Here propose your own method to calculate the most popular person and discuss in your report)

O – List all the names in database with their corresponding hitcount

R </DIR/Filename.txt> - Opens a file with the given name. In this file, it is supposed that each line contains a command of the program as given in Figure 1:.

X – Exit the program.

In the Report:

- **Explain your database structure**
- **Explain the complexity of each function**
- **Don't mention about purpose of the program**
- **Don't use sentence "First of all" in your report**

Data Structure:

Define a Person class as given below

```
Public class Friends {
    private String Name;
    private Friends next;
}


public class Person extends Friends{
    private String Name;
    private Integer HitCount;
    public Friend FriendList;


    public Person(String n){
        Name = n;
        HitCount = 1;
        FriendList = null;
    }
        public void ContentOut(){
        System.out.println("Name :" + Name);
        System.out.println("Hitcount  " + HitCount);
    }
    public void SetName(String nName){
        Name = nName;
    }


    public void IncreaseHit(){
        HitCount++;
    }
    public String GetName(){
        return Name;
    }
    public Integer GetHitCount(){
        return HitCount;
    }
}
```

You cannot use Java libraries. You have to implement every detail of data structure you use

Build Class DataBase implementing DataBaseInterface Interface given below

```
public interface DataBaseInterface {

    public Person SearchName(String tName); // Will return the Person object if Name is found

    public void OutputList(); // Prints Names with Hitcount

    public boolean AddPerson(Person tNewPerson); // Add new person into tail of the link list

    public bool DeletePerson(String pName); //The Person will be deleted if it is in the list

    public String toString(); // Print Elements in the link list. No order

    public boolean AddFriend(String Name1, String, Name2) // If Name1 and Name2 are the valid

                    // persons in data base, the person with Name2 will be added to linked
                    // list FriendList of Person Name1

}
```

```
I Ali
I Veli
I Lutfullah
I Cevziye
I Ali
I Cevziye
O
D Ali
I Hulki
I Hulki
I Hulki
O
F Ali Hulki
F Cevziye Lutfullah
F Cevziye Lutfullah
F Veli Lutfullah
F Veli Cevziye
D Cevziye
D Lutfullah
F Hulki Cevziye
W
P Ali
P Lutfullah
P Veli
X
```

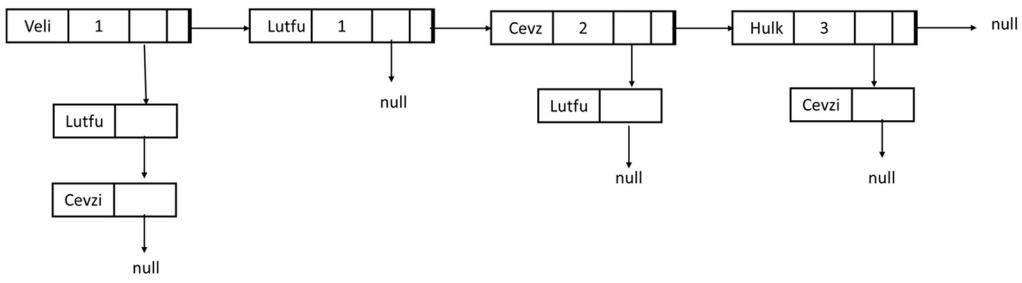
Figure 1. Input.txt file

The Output :

```
Ali Hitcount 2
Veli Hitcount1
Lutfullah Hitcount 1
Cevziye Hitount 2
Ali is deleted
Veli Hitcount1
Lutfullah Hitcount 1
Cevziye Hitcount 2
Hulki Hitcount 3
Ali is not in database they can’t be friend
Lutfullah is friend of Cevziye
No need to add
Lutfullah is friend of Veli
Cevziye is friend of Veli
Cevziye can’t be deleted Cevziye is Friend of Veli
Lutfullah can’t be deleted Lutfullah is Friend of
Veli Cevziye
Most popular person is Veli
Ali is not in Database
Lutfullah has no friend
Veli friends are Lutfullah Cevziye
```

Figure 2. Possible Output

The possible database is given below



Rules for HW Submission

. You have to write your HW in NetBeans environment.
. **Report will be 20% of your project**.
. You have to write a report with name "Report_HW4.pdf" explaining your HW (purpose, how did you solve it, what complexity you have, etc.) and what environment you used (NetBeans, for example). The person who read your report can easily use the class you have written.
. Submission should be in the form of a zip. When extracted, the result should be a single folder with the name "HW2".
. Don't forget to put your report into the zip file.
. The name of your project will be "**Name_Surame_HW2**. e.g. *Lutfullah_Arici_HW2*. If you do not obey the rule I will not grade your homework.
. You have to bundle your whole project folder into your HW2.zip file.
. If I extract your project file, then import to my environment and if it doesn't work, you will be graded on 30 not 80. (Double check. It saves life)
. Do HW by yourself. Be honest.