```java
package DataModel;

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


public class History {
    public String name;
    public int InitialNumberOfOperations;
    private int InitialNumberOfDataStructures;
    private int Operations[] [];
    private int DataStructures[] [];
    private int Dates[][];
    public int DiffDates[][];
    File file;
    private int counter=0;
    ArrayList names;
    public int idCounter=0;
    private String line,lastline;
    BufferedReader reader=null;
    public Report report;
    public History(File file,ArrayList names,int counter2){
        this.names=names;
        this.file=file;
        report=new Report(counter2);
        try{
            reader=new BufferedReader(new FileReader(file));
        }
        catch(FileNotFoundException e){
            System.err.print("error opening file");
        }
        try{
            line=reader.readLine();
            int counter=0;
            while (counter!=2){
                if(line==null){
                    counter++;
                    continue;
                }
                lastline=line;
                line=reader.readLine();
            }
            StringTokenizer st=new StringTokenizer(lastline,"line: ;");
            String token=st.nextToken();
            idCounter=Integer.parseInt(token);
            Operations=new int[idCounter] [3];
            DataStructures=new int[idCounter] [3];
            Dates=new int[idCounter][3];
            try{
                reader=new BufferedReader(new FileReader(this.file));
            }
            catch(FileNotFoundException e){
                System.err.print("error opening file");
            }
            try{
                name=reader.readLine();
                if(names.contains(name)){
                    System.out.println("Εχει καταχωρηθεί ήδη το αρχείο ιστορικού.");
                }
                else{
                    report.insertName(name);
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62                      line=reader.readLine();
63                      StringTokenizer stO=new StringTokenizer(line,"Initial Number of
  Operations;");
64                      InitialNumberOfOperations=Integer.parseInt(stO.nextToken());
65                      line=reader.readLine();
66                      StringTokenizer stDS=new StringTokenizer(line,"Initial Number of Data
  Structures;");
67                      InitialNumberOfDataStructures=Integer.parseInt(stDS.nextToken());
68                      line=reader.readLine();
69                      line=reader.readLine();
70                      line=reader.readLine();
71                      StringTokenizer stT=new StringTokenizer(line,"line: ; ");
72                      String date=null;
73                      String token2=stT.nextToken();
74                      for(int i=0;i<idCounter;i++){
75                          if(i!=0){
76                              token2=stT.nextToken();
77                          }
78                          date=stT.nextToken();
79                          stT=new StringTokenizer(date,"/");
80                          for(int j=0;j<3;j++){
81                              Dates[i][j]=Integer.parseInt(stT.nextToken());
82                          }
83                          stT=new StringTokenizer(line,"line: ; ");
84                          int idFirst=Integer.parseInt(stT.nextToken());
85                          date=stT.nextToken();
86                          for(int j=0;j<3;j++){
87                              Operations[i][j]=Integer.parseInt(stT.nextToken());
88                          }
89                          for(int j=0;j<3;j++){
90                              DataStructures[i][j]=Integer.parseInt(stT.nextToken());
91                          }
92                          line=reader.readLine();
93                          if(i!=idCounter-1){
94                              stT=new StringTokenizer(line,"line: ;");
95                          }
96                      }
97                  }
98              }
99              catch(IOException e){
100                 System.err.println("error reading line " + counter);
101             }
102         }
103         catch(IOException e){
104             System.err.println("error reading line " + counter);
105         }
106     }
107
108     public int returnNumberOfOperations(int n){
109         int numOfOper=InitialNumberOfOperations;
110         for(int i=0;i<n+1;i++){
111             numOfOper=numOfOper+Operations[i][0]-Operations[i][1];
112         }
113         return numOfOper;
114     }
115
116     public int returnGrowthOperations(int current){
117         if(current==0){
118             return 0;
119         }
120         return Operations[current][0]-Operations[current][1];
```

```
121     }
122
123     public int returnOperationChanges(int n){
124         return Operations[n][0]+Operations[n][1]+Operations[n][2];
125     }
126
127     public int returnDataStructuresChanges(int n){
128         return DataStructures[n][0]+DataStructures[n][1]+DataStructures[n][2];
129     }
130
131     public double returnComplexityO(int n){
132         double numDAndU=0,numA=0;
133         numA=numA+Operations[n][0];
134         numDAndU=numDAndU+Operations[n][1]+Operations[n][2];
135         if(numA==0 || numDAndU==0){
136             return 0;
137         }
138         else{
139             return numDAndU/numA;
140         }
141     }
142
143     public double returnEmploymentRateO(int current){
144         double numDAndUAndA=Operations[current][0]+Operations[current]
    [1]+Operations[current][2];
145         if(current==0){
146             return 0;
147         }
148         else{
149             int year=Dates[current][2]-Dates[current-1][2];
150             int months=year*12;
151             months=months+Dates[current][1]-Dates[current-1][1];
152             int days=months*30;
153             days=days+Dates[current][0]-Dates[current-1][0];
154             return numDAndUAndA/days;
155         }
156     }
157
158     public int[][] retrunNumberOfOpPerYear(){
159         int c=0;
160         for(int i=0;i<Dates.length;i++){
161             if(i==Dates.length-1){
162                 if(Dates[i][2]!=Dates[i-1][2]){
163                     c++;
164                 }
165                 break;
166             }
167             if(Dates[i][2]!=Dates[i+1][2]){
168                 c++;
169             }
170         }
171         DiffDates=new int[c][2];
172         int s=0;
173         for(int i=0;i<Dates.length;i++){
174             if(i==Dates.length-1){
175                 if(Dates[i][2]!=Dates[i-1][2]){
176                     DiffDates[s][0]=Dates[i][2];
177                 }
178                 break;
179             }
180             if(Dates[i][2]!=Dates[i+1][2]){
```

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181                 DiffDates[s++][0]=Dates[i][2];
182             }
183         }
184         int times=0;
185         for(int i=0;i<DiffDates.length;i++){
186             for(int j=0;j<Dates.length;j++){
187                 if(DiffDates[i][0]==Dates[j][2]){
188                     times++;
189                 }
190             }
191             DiffDates[i][1]=times;
192             times=0;
193         }
194         return DiffDates;
195     }
196 
197     public int returnNumberOfDataStructures(int n){
198         int numOfDataSt=InitialNumberOfDataStructures;
199         for(int i=0;i<n+1;i++){
200             numOfDataSt=numOfDataSt+DataStructures[i][0]-DataStructures[i][1];
201         }
202         return numOfDataSt;
203     }
204 
205     public int returnGrowthDataStructures(int current){
206         if(current==0){
207             return 0;
208         }
209         return DataStructures[current][0]-DataStructures[current][1];
210     }
211 
212     public double returnComplexityDS(int n){
213         double numDAndU=0,numA=0;
214         numA=numA+DataStructures[n][0];
215         numDAndU=numDAndU+DataStructures[n][1]+DataStructures[n][2];
216         if(numA==0 || numDAndU==0){
217             return 0;
218         }
219         else{
220             return numDAndU/numA;
221         }
222     }
223 
224     public int returnMaintenance(int n){
225         return Operations[n][1]+Operations[n][2]+DataStructures[n][1]+DataStructures[n][2];
226     }
227 
228    public double returnEmploymentRateDS(int current){
229        double numDAndUAndA=DataStructures[current][0]+DataStructures[current]
    [1]+DataStructures[current][2];
230         if(current==0){
231             return 0;
232         }
233         else{
234             int year=Dates[current][2]-Dates[current-1][2];
235             int months=year*12;
236             months=months+Dates[current][1]-Dates[current-1][1];
237             int days=months*30;
238             days=days+Dates[current][0]-Dates[current-1][0];
239             return numDAndUAndA/days;
240         }
```

```
241    }
242 }
```