CS 46B

Introduction to Data Structures

Summer Semester 2015

Department of Computer Science
San José State University
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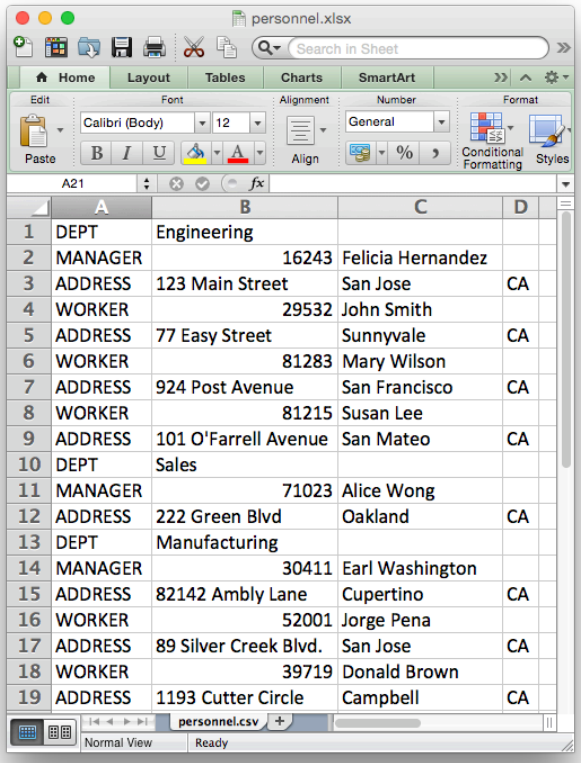
Homework #4

Generate a Personnel Report from a CSV File

Assigned:	Tuesday, June 16
Draft due:	Thursday, June 18 at 11:59 PM
Codecheck URL:	http://codecheck.it/codecheck/files/1506161025v35hsxjohx9p5kstpwzzcrui
Canvas:	Homework 4 Draft
Points:	6 points max
Final due:	Monday, June 22 at 11:59 PM
Codecheck URL:	http://codecheck.it/codecheck/files/15061610396cizpfg4jtpj27n5lnnq7w5qo
Canvas:	Homework 4 Final
Points:	18 points max

This assignment will give you more practice reading a CSV file, and also practice with "is a" and "has a" relationships between classes.

Here's the Excel spreadsheet **personnel.xlsx** that is the source of our input CSV file **personnel.csv**:



	A	B	C	D
1	DEPT	Engineering		
2	MANAGER	16243	Felicia Hernandez	
3	ADDRESS	123 Main Street	San Jose	CA
4	WORKER	29532	John Smith	
5	ADDRESS	77 Easy Street	Sunnyvale	CA
6	WORKER	81283	Mary Wilson	
7	ADDRESS	924 Post Avenue	San Francisco	CA
8	WORKER	81215	Susan Lee	
9	ADDRESS	101 O'Farrell Avenue	San Mateo	CA
10	DEPT	Sales		
11	MANAGER	71023	Alice Wong	
12	ADDRESS	222 Green Blvd	Oakland	CA
13	DEPT	Manufacturing		
14	MANAGER	30411	Earl Washington	
15	ADDRESS	82142 Ambly Lane	Cupertino	CA
16	WORKER	52001	Jorge Pena	
17	ADDRESS	89 Silver Creek Blvd.	San Jose	CA
18	WORKER	39719	Donald Brown	
19	ADDRESS	1193 Cutter Circle	Campbell	CA

Column A contains row tags DEPT, MANAGER, WORKER, or ADDRESS. Each DEPT row has the department name in column B. Each MANAGER or a WORKER row has the employee id in column B and the employee name in column C.

Each employee's row is followed by that employee's home ADDRESS: street in column B, city in column C, and state in column D. Each manager is followed by his or her workers.

Here's the CSV text file **personnel.csv** saved from the spreadsheet:

```
DEPT,Engineering,,
MANAGER,16243,Felicia Hernandez,
ADDRESS,123 Main Street,San Jose,CA
WORKER,29532,John Smith,
ADDRESS,77 Easy Street,Sunnyvale,CA
WORKER,81283,Mary Wilson,
ADDRESS,924 Post Avenue,San Francisco,CA
WORKER,81215,Susan Lee,
ADDRESS,101 O'Farrell Avenue,San Mateo,CA
DEPT,Sales,,
MANAGER,71023,Alice Wong,
ADDRESS,222 Green Blvd,Oakland,CA
DEPT,Manufacturing,,
MANAGER,30411,Earl Washington,
ADDRESS,82142 Ambly Lane,Cupertino,CA
WORKER,52001,Jorge Pena,
ADDRESS,89 Silver Creek Blvd.,San Jose,CA
WORKER,39719,Donald Brown,
ADDRESS,1193 Cutter Circle,Campbell,CA
```

personnel.xlsx: http://www.cs.sjsu.edu/~mak/CS46B/assignments/4/personnel.xlsx
personnel.csv: http://www.cs.sjsu.edu/~mak/CS46B/assignments/4/personnel.csv

Draft

Create classes **`Department`**, **`Employee`**, **`Manager`**, **`Worker`**, and **`Address`**. Each class should have private instance variables, and each instance variable should have a public accessor method. If necessary, each instance variable should also have a public mutator method.

Override each class's **`toString()`** method to return the name of the class followed by each instance variable's value in the form **`[variable=value]`**. For example:

```
Address[street=123 Main Street][city=San Jose][state=CA]
```

Append **`:Manager`** or **`:Worker`** to indicate whether an employee is a manager or a worker**.** Examples:

```
Employee[id=16243][name=Felicia Hernandez]:Manager
```

```
Employee[id=29532][name=John Smith]:Worker
```

You are given a **`Personnel`** class that contains the following **`readData()`** method, where **`in`** refers to a **`Scanner`** object for the input file **personnel.csv**:

```
private void readData()
{
    while (in.hasNextLine()) {
        String line = in.nextLine();
        String tag  = line.split(",")[0];

        if (tag.equals("ADDRESS")) {
            Address addr = new Address(line);
            out.println(addr);
        }
        else if (tag.equals("DEPT")) {
            Department dept = new Department(line);
            out.println(dept);
        }
        else if (tag.equals("MANAGER")) {
            Manager mgr = new Manager(line);
            out.println(mgr);
        }
        else if (tag.equals("WORKER")) {
            Worker wrkr = new Worker(line);
            out.println(wrkr);
        }
    }
}
```

Draft **Personnel.java:**
http://www.cs.sjsu.edu/~mak/CS46B/assignments/4/draft/Personnel.java

Note that **`readData()`** constructs an **`Address`**, **`Department`**, **`Manager`**, or **`Worker`** object depending on the input line it just read, and that it passes the input line to the object's constructor. Therefore, the constructor for each class should have one parameter that is the input line. For example:

```
public Address(String line) { ... }
```

The constructor should read the comma-separated values from the line to set the values of the object's instance variables.

Method **`readData()`** generates the output text file **personnel.out** by printing each object right after it is created:

```
Department[name=Engineering]
Employee[id=16243][name=Felicia Hernandez]:Manager
Address[street=123 Main Street][city=San Jose][state=CA]
Employee[id=29532][name=John Smith]:Worker
Address[street=77 Easy Street][city=Sunnyvale][state=CA]
Employee[id=81283][name=Mary Wilson]:Worker
Address[street=924 Post Avenue][city=San Francisco][state=CA]
Employee[id=81215][name=Susan Lee]:Worker
Address[street=101 O'Farrell Avenue][city=San Mateo][state=CA]
Department[name=Sales]
Employee[id=71023][name=Alice Wong]:Manager
Address[street=222 Green Blvd][city=Oakland][state=CA]
Department[name=Manufacturing]
Employee[id=30411][name=Earl Washington]:Manager
Address[street=82142 Ambly Lane][city=Cupertino][state=CA]
Employee[id=52001][name=Jorge Pena]:Worker
Address[street=89 Silver Creek Blvd.][city=San Jose][state=CA]
Employee[id=39719][name=Donald Brown]:Worker
Address[street=1193 Cutter Circle][city=Campbell][state=CA]
```

Draft **personnel.out**:
http://www.cs.sjsu.edu/~mak/CS46B/assignments/4/draft/personnel.out

Draft submission

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http://codecheck.it/codecheck/files/1506161025v35hsxjohx9p5kstpwzzcrui

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Final

Modify class **`Department`** so that each of its objects aggregates its **`Manager`** object. Modify class **`Manager`** so that each of its objects aggregates its **`Worker`** objects. Each employee object should have an address.

Create class **`Company`** that aggregates its departments. Modify the **`readData()`** method to return a reference to a **`Company`** object.

Generate the final output file **personnel.out** by starting with the **`Company`** object. Iterate over the **`Company`** object's **`Department`** objects. Process each **`Department`** object's **`Manager`** object. Iterate over each **`Manager`** object's **`Worker`** objects. Print each employee's address underneath the employee's name.

```
     DEPARTMENT   MANAGER                 WORKERS

    Engineering   Felicia Hernandez
                  123 Main Street
                  San Jose, CA
                                        John Smith
                                        77 Easy Street
                                        Sunnyvale, CA

                                        Mary Wilson
                                        924 Post Avenue
                                        San Francisco, CA

                                        Susan Lee
                                        101 O'Farrell Avenue
                                        San Mateo, CA

          Sales   Alice Wong
                  222 Green Blvd
                  Oakland, CA

  Manufacturing   Earl Washington
                  82142 Ambly Lane
                  Cupertino, CA
                                        Jorge Pena
                                        89 Silver Creek Blvd.
                                        San Jose, CA

                                        Donald Brown
                                        1193 Cutter Circle
                                        Campbell, CA
```

Final **personnel.out**:
http://www.cs.sjsu.edu/~mak/CS46B/assignments/4/final/personnel.out

Final submission

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