Students and Universities

Write a program that will create and store Universities and Students as separate objects. The program will accept input data for the Student and University objects from two separate CSV text files. Then the program will output three files. A Student File using Student objects instead of text data, University file using University objects instead of text files and a formatted report for each of the universities. The Student Class will extend the Person Class, the Person class will use the Name class for one of its fields. I have included an example output of the University report.

The Name class will contain the following information.

First Name // Fred

Middle Name // Lee

Last Name // Jones

The above fields will be immutable (use final in Java).

The Name class will implement the following methods at a minimum.

getFirstName():String

getMiddleName():String

getLastName():String

equals(Name):boolean – true when the first, middle, and last name of the calling object are equal to the first, middle, and last name of the argument object

toString():String – returns full name with a space between each name

compareTo(Name):int – returns -1 when the calling object should precede the argument object, 0 when the first, middle, and last names are identical, 1 when the calling object should come after the argument object. The order of precedence is last name, first name, middle name.

The Person class will use the Name class as an immutable (final) field variable and contain the following additional information.

Age // 19

Gender // M (This field will be immutable)

Street Address // 1934 Same Street

City // Annandale

State // State

ZIP // 02497

Phone number // 7033345343

The Person class will implement getter and setter methods for each field variable, except the Name field which will only require a getter. It will also include toString(), compareTo(Person), and equals() methods. The equals(Person):boolean method will return true if calling Person object and argument Person object’s Name, Age, Gender and all address Fields are all equal. The compareTo(Person):int - returns -1 when the calling object should precede the argument object, 0 when the calling object and argument objects are considered identical, 1 when the calling object should come after the argument object. The order of precedence is Name; age, gender. For gender female precedes male.

The Student class will extend the Person class and contain the following additional information.

Student ID // Combination of 10 numbers and uppercase letters (This field will be immutable)

University name //

Credits enrolled // 19

Qualifies for instate rate // yes or no

Late fee assessed // yes or no

Food Option Choice //A top plan, B middle plan, C bottom plan, D no plan

Health Option Choice // yes or no

The Student class will implement getter and setter methods for each field variable. It will also include toString(), compareTo(), and equals() methods. The equals(Student):boolean method will return true if the Student object’s and the argument Student object’s Name and student ID are equal. The compareTo(Student):int - returns -1 when the calling object should precede the argument object, 0 when the calling object and argument objects are considered identical, 1 when the calling object should come after the argument object. The order of precedence is Person, ID.

Each university object will contain the following information.

University Name

Street Address // 1934 Same Street

City // Annandale

State // State

ZIP // 02497

Phone number // 7033345343

In-State Tuition per credit

up to 12 credits

12 – 18 credits

over 18 credits

Out of State Tuition per credit

up to 12 credits

12 – 18 credits

over 18 credits

Late Fees

Incidental fees

per credit fee to some maximum fee

Optional Health Care

per credit scale

up to 12 credits

12 – 18 credits

over 18 credits

On Campus Meal Plan

Two or more plans with different costs each

The University class will implement getter and setter methods for each field variable. It will also include toString() and equals() methods.

The program will store these objects and their information in two separate dynamic data structures, one for the students and one for the universities. (ArrayList<Type>). The data must be stored in ascending order by (for students) last name, first name, middle name, and student ID, and (for universities) University name, State, and City.

You may use an insertion sort to directly store your student objects and university objects into their respective ArrayLists or you may sort after the files are read in. Remove any duplicates. Once you have university and student arrays that do not contain any duplicates you will then print reports for each of the universities. When you output your information, it must be in alphabetical order by university and the students by last name, first name, middle name, and student ID. Because the output will be potentially long, print your output to a file instead of the terminal. However, I would recommend that you develop your print format on the terminal, using just a few students and a couple of universities. When you are satisfied with the look of the output you can then just convert your print statements to text file output statements to put the output into a file. As a final step save the Student objects and the University objects to binary files.

I will provide large input files for the Students and the Universities.

I will provide two formatting modules to help you with formatting the text output.

I will provide a test reader that you may use to see if the object files are properly stored.

The calculations for the report are as follows:

Note: Each university may have different rates, as specified in the university’s input record.

Tuition rates (per credit) Instate rate Out of state rate

Less than 12 credits $102.50 $351.00

12 – 18 credits $75.45 $255.00

Credits over 18 $93.00 $304.00

Late fee is 10% of tuition bill figured on credit cost only.

Incidental fees are $20 / credit up to a maximum of $250.00.

Optional health care: $25.00 first 10 credits

(per credit) $20.00 next 5 credits

$15.00 over 15 credits

If on campus food is the case then further input from the user is necessary:

Meal plan A meals is $4,999.00.

Meal plan B meals is $3,499.00

Meal plan C meal is $2,599.00

You must use the format below for your Report.

Example output for 4 students and 2 Universities using the above data is: (this is computed accurately for each student)

UNIVERITY OF COMPUTERS

1234 Main Street

Annandale, VA 02749

(703) 333-1234

NAME Foster Lane Jackson CREDITS 15

ADDRESS 934 South Street, Maysville, WV 02749

PHONE (602) 434-3383

TUITION $ 4,977.00

LATE FEE $ 0.00

INCEDENTAL $ 250.00

HEALTH CARE $ 350.00

MEAL PLAN $ 4,999.00 TOTAL $ 10,576.00

NAME Fred Lee Jones CREDITS 19

ADDRESS 1934 Same Street , Annandale, VA 02749

PHONE (703) 334-5343

TUITION $ 1,748.65

LATE FEE $ 174.86

INCEDENTAL $ 250.00

HEALTH CARE $ 410.00

MEAL PLAN $ 3,499.00 TOTAL $ 6,082.51

UNIVERITY OF COMPUTERS TOTALS

NUMBER OF STUDENTS 2

INSTATE 1

OUT OF STATE 1

MEAL PLAN 3 Meals a day 1 $ 4,999.00

2 Meals a day 1 $ 0.00

1 Meal a day 0 $ 0.00

FOOD SUB TOTAL $ 8,498.00

TUITION $ 6,725.65

LATE FEE $ 174.86

INCEDINTAL $ 500.00

HEALH CARE $ 760.00 TOTAL $ 16,658.30

UNIVERITY OF COLORADO

1234 Mountain Street

Vale, CO 02749

(703) 333-1234

UNIVERITY OF COLORADO TOTALS

NUMBER OF STUDENTS 0

INSTATE 0

OUT OF STATE 0

MEAL PLAN 3 Meals a day 0 $ 0.00

2 Meals a day 0 $ 0.00

1 Meal a day 0 $ 0.00

FOOD SUB TOTAL $ 0.00

TUITION $ 0.00

LATE FEE $ 0.00

INCEDINTAL $ 0.00

HEALH CARE $ 0.00 TOTAL $ 0.00

UNIVERITY OF WASHINGTON

1234 Main Street

Annandale, VA 02749

(703) 333-1234

NAME Frank Lance Jackson CREDITS 15

ADDRESS 934 North Street, Maysville, WA 99832

PHONE (602) 434-3323

TUITION $ 4,977.00

LATE FEE $ 0.00

INCEDENTAL $ 250.00

HEALTH CARE $ 350.00

MEAL PLAN $ 4,999.00 TOTAL $ 10,576.00

NAME Sariah Mary Jones CREDITS 15

ADDRESS 194 10th Street, East Wenatchee, WA 98802

PHONE (703) 334-6673

TUITION $ 4,977.00

LATE FEE $ 0.00

INCEDENTAL $ 250.00

HEALTH CARE $ 350.00

MEAL PLAN $ 4,999.00 TOTAL $ 10,576.00

UNIVERITY OF WASHINGTON TOTALS

NUMBER OF STUDENTS 2

INSTATE 2

OUT OF STATE 0

MEAL PLAN 3 Meals a day 2 $ 4,999.00

2 Meals a day 0 $ 0.00

1 Meal a day 0 $ 0.00

FOOD SUB TOTAL $ 9,998.00

TUITION $ 9,954.00

LATE FEE $ 0.00

INCEDINTAL $ 500.00

HEALH CARE $ 700.00 TOTAL $ 21,152.00