CSE 1325
Course Project Phase 1
Assigned: January 27, 2016
Due: February 15, 2016

This file is an assignment for a college course that includes class-based work. If this file should submitted to a newsgroup or answer page, please contact me at becker@uta.edu. Thank you.

1 Instructions:

Students are to complete the following assignment by writing ***a pair*** of Java programs. These programs need to be complete and able to run in order to receive full credit. All work, diagrams, programs, and submitted outputs, should include the student name, UTA id number, and the date. ***You will need to demonstrate your code to Dr. Becker or his TAs.***

To turn in the Java code for this assignment, create a zip file of the working directory, and rename the file YourUTAIdNumber.zip. Then, upload this assignment to Blackboard.

In addition, any written documentation or diagrams must also be uploaded to Blackboard.

T***he project should be done in teams of two.*** In order to do so, teams must remain together throughout all phases of the project. Students wishing to work as a team must submit their request to the instructor in an e-mail including both names and UTA student ID numbers and a team name.

2 Objective:

The goal of this project is to cover the introductory material of the Java language, including

- Use of basic data types,
- Controls,
- Simple concrete classes,
- Files,
- Exception handling.
- Simple collection types

3 Problem:

Create two programs, one will be a dinosaur bone selling tool, and the other will be a dinosaur bone buying tool. These programs are to be built in an object-oriented manner. These will have a tool that shows the map of the world, which will be marked with the location of where the dinosaur bone was found. Also, the system shall list out current dinosaur bones for sale. In addition, two UML class diagrams, one for each program, will be submitted for grading.

4 The Diagrams and Output.

Create a ***class diagram*** of each program, showing the aggregation and association between the classes. There should be no inheritance links in this phase of the project. There should be two diagrams: One for Dinosaur Bone Seller Tool (DBST), and one for Dinosaur Bone Buyer Tool (DBBT). Turn in a printout of the finished map to Blackboard. The map must be populated with a minimum of 12 dinosaur bones.

5 DBST: The Dinosaur Bone Seller Tool:

Create a menu driven program that has the following options:

1. Load the World Map.
2. Handle a Dinosaur Bone.
3. Show the World Map with Dinosaur Bones.
4. Save files.
5. Load files.

5.1 Load the World Map

Go to the Blackboard and download the World Map text file "Map.txt". This file contains a map of 1200 lines of code designating coordinates for map pieces to make a map of the world 60 columns by 20 rows. Each line of the file starts with the column, the row, and whether the area is land or ocean. Write a function that will load this data set into an ArrayList or Vector of map grid points. Have the grid points of the ma be a class that contains the coordinates and the map type.

5.2 Handle a Dinosaur Bone

Dinosaur Bones will have certain key properties for the Dinosaur Bone shop. Write a menu option and a function that will create a dinosaur bone object from a dinosaur bone class. Dinosaur bones should have a location on the map, an identification number, and a price. Also 'they have a Boolean field to indicate if they have been sold.

5.2.1 Create a Dinosaur Bone

Have a menu item that will prompt the user for the coordinates, the price, and an identification number. When this is done, add the dinosaur bone to a collection type (ArrayList preferred). The Location should be twofold, one is the actual longitude and latitude of the dinosaur bone given by a user. The second should be the row and column on the 60x20 map of the world. Write a formula into your program to convert latitude and longitude to the best match in the two dimensional array. You will need to create 12 dinosaur bones. Use your imagination!

Example:

Longitude is either positive or negative 180 degrees about the earth from east to west, with 0 being the prime meridian and 180 being the opposite side of the globe. Above and below the equator is latitude, with the equator being 0, and the North Pole being positive 90 and the South Pole being negative 90. On a two-dimensional array that is 60 by 20, the North Pole would be at row 0, and the South Pole would be at row 19. The Prime Meriden would be at column 30. The Equator would be at row 10. Every index of latitude would be a shift of +/-9 degrees. Every index of latitude would be a shift of +/-6 degrees. Use this information to work out the correct integer index of the array.

5.2.2 Update a Dinosaur bone

Have a menu option that shows the user a list of available dinosaur bones and their identification numbers. Then, prompt the user to select a dinosaur bone or to quit the function. If a dinosaur bone is selected, prompt the user for the coordinates and price changes of the dinosaur bone.

5.2.3 Remove a Dinosaur bone

Have a menu option that shows the user a list of available dinosaur bones and their identification numbers. Then, prompt the user to select a dinosaur bone or to quit the function. If a dinosaur bone is selected, remove the dinosaur bone from the list of objects in the program.

5.3 Show the World Map with Dinosaur bones

Write a menu option that takes the collection of map points and the list of dinosaur bones and creates a map showing their original location on the grid. Remember, index of the array is not the same as longitude and latitude. Put an "X" into the two-dimensional array to show the location of the dinosaur bone if it is unsold. If it has been sold, put in the symbol of a "$"

5.4 Save Files

Give the Dinosaur bone Seller Tool the ability to save the list of dinosaur bones to a file. The file should be comma separated values with one dinosaur bone per line. Each dinosaur bone line should include its original location, its value, and whether or not it has been sold.

5.5 Load Files

Give the Dinosaur bone Seller Tool the ability to load the list of dinosaur bones from a file. The file should be comma separated values with one dinosaur bone per line. Each dinosaur bone line should include its original location, its value, and whether or not it has been sold.

6 The Dinosaur bone Buyer Tool:

Create a menu driven program that has the following options:

1. Load the World Map.
2. Show the World Map with Dinosaur bones.
3. Allows the user to buy a dinosaur bone
4. Save files.
5. Load files.

6.1 Load the World Map

As with the Seller Tool, Go to the Blackboard and download the World Map text file "MMarket.txt". This file contains a map of 1200 lines of code designating coordinates for map pieces to make a map of the world 60 columns by 20 rows. Each line of the file starts with the column, the row, and whether the area is land or ocean. Write a function that will load this data set into an ArrayList or Vector of map grid points. Have the grid points of the ma be a class that contains the coordinates and the map type.

6.2 Show the World Map with Dinosaur Bones

Write a menu option that takes the collection of map points and the list of dinosaur bones and creates a map showing their original location on the grid. Remember, index of the array is not the same as longitude and latitude. Put an "X" into the two-dimensional array to show the location of the dinosaur bone if it is unsold. If it has been sold, put in the symbol of a "$"

6.3 Buy a Dinosaur Bone

Write a menu option to allow the user to buy a dinosaur bone. When executed, the program shall list out all the available dinosaur bones that are available for sale, including their ID number. Allow the user to select the dinosaur bone by ID number and ask for confirmation if the buyer really wants to get the space rock. After this prompt, the tool will change the Boolean status of the dinosaur bone to sold and then acknowledge the buyer.

6.4 Save Files

Give the Dinosaur bone Seller Tool the ability to save the list of dinosaur bones to a file. The file should be comma separated values with one dinosaur bone per line. Each dinosaur bone line should include its original location, its value, and whether or not it has been sold.

6.5 Load Files

Give the Dinosaur bone Seller Tool the ability to load the list of dinosaur bones from a file. The file should be comma separated values with one dinosaur bone per line. Each dinosaur bone line should include its original location, its value, and whether or not it has been sold.

Bonus Work:

A. Give your shop a name, and have this name appear at the top of the map. Include the naming of the shop as an option in the Dinosaur bone Seller Tool. (5 points)
B. Add symbols and statements to mark out the prime meridian and equator on your map of the world in both tools. (5 points)
C. Research and find 12 real dinosaur bones for sale. EBay, specialties shopping sites, Wikipedia, etc all have sources of information on dinosaur bones. Remember to reference your material! (10 pts)

Appendix: Attributes of the Classes

Buyer • Name • Address • e-mail	Seller • Name • Address • e-mail • Shop Name
Dinosaur Bone • Age • Price • Condition • Coordinates • Country of Origin • Dimensions • Weight (in kilograms) • Prospector	Address • Street Number • Street Name • City • State or Province • Country • Postal Code
Coordinate • Longitude, as an index of the world array • Latitude, as an index of the world array • Longitude, as a double data value on the globe • Latitude, as a double data value on the globe	Dimension • Length (metres) • Width(metres) • Height(metres)