

Computer Science 2334
Programming Structures and Abstractions

Midterm Exam

Fall 2006

Name: _____ ID #: _____ (1 point)

UOSA Statement of Academic Integrity:

On my honor I affirm that I have neither given nor received inappropriate aid in the completion of this exercise.

Signature: _____ Date: _____

!!!! Read ALL questions carefully before answering! !!!!

- Show all work in the space provided.
- You may write on the back side of the pages if you need more space (if you use the back side of a page, be sure to clearly indicate in the space provided for the question that the answer is on the back).
- Write clearly and be concise.
- Partial credit will only be given if all work is clearly shown and written legibly.
- You must work all problems with the requested techniques, methods, classes, and interfaces to receive credit. For example, a question requesting a List solution will receive no credit for an array solution.
- You may include (but are not required to include) comments explaining your ideas/intentions behind any code that you write.

Do not open the test until you are told to do so.

1. List and give a short definition of the three primary features of Object Oriented Programming. (18 points)

a.) Feature: _____
Definition: _____

b.) Feature: _____
Definition: _____

c.) Feature: _____
Definition: _____

2. Label the following items as being an *Abstract Data Type*, *Data Structure*, *Algorithm*, *Interface*, *GUI Component*, *GUI Container*, or *none of the above*. If more than one classification may apply, then choose the one that best describes the item. (12 points)

a) sort

b) an array of objects

c) Cloneable

d) LinkedList

e) JFrame

f) split

3. You have been hired by American Motors (AM). You are their head Java programmer and you have been assigned to lead a new project to develop an inventory tracking system for their new Tactical Equipment (TE) division which manufactures cruisers for the government. AM wants to keep track of the cruisers they have built and sold.

All of the cruisers built by the TE division of AM are battle cruisers or urban cruisers that are intended for use by the military and civilians, respectively. Each individual cruiser has a serial number that identifies the cruiser, as well as, the model year it was built in, a model number, a manufacturing cost, and a price it was sold for associated with it. Battle cruisers are equipped with a gun that has an integer size from 16mm to 90mm and an armor plating that is from 1.0 inches to 10.0 inches thick. Each urban cruiser has number of airbags and a safety rating from 0.0 to 10.0.

The inventory system tracks all cruisers that are in stock and all cruisers that have been sold. Users should be able to easily add a new cruiser and sell existing cruisers that are in stock. Executive users also want to be able to calculate the total profit to date and the current value of the cruisers in stock. The data stored in the system must be sorted and easily written to/read from a file.

Create a UML class design for this data model. Use inheritance, encapsulation, proper UML syntax, and at least two interfaces. Be sure to include constructors in your classes if they take parameters. You may write on the back of this page if you run out of room on the front. (20 points)

