EG 792
Assignment #4
OOA Problem Set
Due 3/10/03, in class

(1) [10 points]
For each of the following, tell whether the relationship is A is-a B, B is-a A,
A has-a B, or B has-a A (don’t use arrows in your answer):

<p>| | | | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>(a)</td>
<td>horse</td>
<td>mane</td>
<td>(b)</td>
</tr>
<tr>
<td>(c)</td>
<td>orange tree</td>
<td>plant</td>
<td>(d)</td>
</tr>
<tr>
<td>(e)</td>
<td>house</td>
<td>roof</td>
<td>(f)</td>
</tr>
<tr>
<td>(g)</td>
<td>menu</td>
<td>window</td>
<td>(h)</td>
</tr>
<tr>
<td>(i)</td>
<td>major</td>
<td>officer</td>
<td>(j)</td>
</tr>
<tr>
<td>(k)</td>
<td>malibu</td>
<td>car</td>
<td></td>
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</tbody>
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(2) [10 points]
Write a class hierarchy for the following:
(a) squares and rectangles
(b) animals, dogs, and cats
(c) animals, mammals, and dogs
(d) animals, mammals, and egg laying mammals

(3) [10 points]
Suppose you were required to program a project in a non-object-oriented language, such as Pascal or C. How might you simulate the smalltalk notions of classes, methods, and inheritance?

(4) [10 points]
Classify each of the following as an analysis activity, a design activity, or a coding activity. Be sure and provide a one sentence justification for each answer.
1) underlining nouns and verbs.
2) grouping classes into a class hierarchy.
3) removing classes that are not relevant to the problem statement.
4) selecting the implementation programming language.
5) considering the human-computer interface.
6) incorporating the amount of memory the system is allotted.

(5) [30 points]
Do an OOA for the following problem statement:
Help Wally improve warehouse profitability by helping team members put away and pick items more efficiently, by keeping more accurate inventory counts, and by increasing fill rate (the number of orders that can be filled directly from inventory). Pallets of items arrive at the loading dock where they are unloaded and placed in bins. The warehouse has 4 aisles of bins. After an order is taken, a “picker” then fills the order by picking items from bins.

Include a model diagram and a description of each class.

(6) [30 points]
Write a problem statement for a problem you have recently dealt with (or are familiar with) and then create an OOA for that problem. Include a model diagram and a description of each class.