McGill University
COMP 303 – Fall 2009 – Class Quiz #2

Name:	**Student ID:**

We are interested in an inventory system capable of keeping track of electronic equipment. An `Item` of equipment records a serial *number* (`int`) and production *year* (`int`). An `Inventory` object aggregates a bunch of `Item`s. Clients can add or remove `Item`s from the `Inventory` at any time. Various entities are interested in changes to the state of the `Inventory`. For example, it should be possible to show the items in the Inventory in a `ListView`. It should also be possible to view a `PieChart` representing the proportion of `Item`s in the `Inventory` for each production year (e.g., 2004=25%; 2005=30%, etc.). Views should be updated whenever items are added or removed from the `Inventory`.

a) Design a system providing this functionality through the OBSERVER pattern (with a class diagram). Make sure to include an `Inventory`, `Item`, and `ListView` and `PieChart` classes in your design (in addition to whatever else you need). Your design should strictly implement a push-style data-flow between the Subject and Observer. Provide enough detail to make it obvious what classes are subjects, observers, etc. Include all the methods needed to implement the observer mechanism and the functionality described above, with the appropriate parameter and return types.

b) Observer notification should be triggered whenever an `Item` is added or removed from the `Inventory`, without `Clients` having to ensure this behavior. Complete the sequence diagram to show the notification interactions for a design that would support this requirement.