Application Engineering and Development

ISY G100

Final Exam

12/12/2008

Exam Time: Two Hours

Closed Book

Professor

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1. Per the solutions selling project, draw the class diagram showing the information model for your system. The model must include classes and relationships (no attributes needed). Assume the functionality of the base project and customers might belong to zero or more markets but solutions are designed for single markets (this might be different from what some of you might have implemented). If you want to use a set of different assumptions clearly state them first. You will be tested on your ability to recall all the classes in your project and how they relate to each other at an abstract level away from java implementations.
2. Consider the case where a customer logs into the system and decides to browse the solutions catalog. The system will display the list of solutions that are available in their market. For example, if the site offers three solutions to dentist offices. The system will use the customer profile to display the available solutions targeting dentists. Assume an approach where the customer (a person) can be in multiple markets but the solution is for one single market. Write a java method on the solution offer catalog that returns a list of solutions given a customer object. Your focus is primarily on writing correct java code for the following method. Notice the method returns a list of solutions of type solutionoffer:

public ArrayList<SolutionOffer> getCustomerMarkets(Person customer){ …. }

1. Continuing with the previous exercise, assume an approach where the customer (a person) can be in multiple markets and a single solution could target multiple markets. In this case, assume the price is on the solution offer. In other words, if multiple markets are included per a single solution then the solution price will be the same for all target markets. The approach in this case, is to

* 1. Use the customer object to retrieve the list of customer markets
  2. For each solution in the solution offer catalog retrieve solution markets and perform the following steps:
     1. For each customer market do the following
        1. If customer market is a member of solution markets then return true else continue
  3. return false

3a) Write a java implementation using two nested loops as described above.

3b) The two nested loops we have above makes the code hard to read. Improve the code above (in question 3) by rewriting it using a single loop instead of the two nested loops. Explain how you abstract the inner loop it into something that is easy to read. Show all the code changes you have to make to make to the program in 3a.

Consider the following two models and answer the following set of questions. In the model below we separate a channel to a channel type and a channel. This allows you to use channel types to declare all the channels the company uses for its business while a channel instance allows you to express the channel requirement per individual markets. For example the teen age market uses tv (Channel Type) to market but the CBC channel (Channel) captures ads on CBS.

**Business**

**Order**

**Master Order List**

**Market List**

**Channel Type**

**Customer**

**Market**

**Channel**

**Solution**

**Invoice History**

**Invoice**

**Payment History**

**Payment**

**Site Financial Account**

Alternative approach to channel identification:

**Solution**

**Order**

**Customer**

**Internet Sales Oder**

**Indirect Sales Order**

**Direct Sales Oder**

**Distributor**

**Sales Person**

**Market**

**Invoice History**

**Invoice**

**Payment History**

**Payment**

**Site Financial Account**

Note: Arrows indicate inheritance.

1. Suppose the company defines the most profitable marketing campaign as the one that produces the most profit (sales revenues minus cost). Cost here means the amount of money they spend advertizing in a marketing channel. Explain which of the two models are better fit for calculating the most profitable marketing campaigns and why.
2. Continuing with the previous question, explain in plain English all the changes you need to make to the first model above to calculate the most profitable channel type for the company. You must determine all the attributes and methods you will need to support this functionality. You must say where these methods and attributes will reside as well. You don’t need to write java code but a software engineer should be able to understand all the specifics required to implement the new feature in java. You don’t need to worry about specifying the details of the usual methods and attributes we already discussed already (e.g. assume you have getOrderSalesVolume() already specified). We are only interested in the methods and attributes that are new and we have not discussed before.