University of Waterloo

GSD Lab, University of Waterloo

Structural Modeling Study

Student Name:

Student ID:

Department:

Email Address:

Hello,

My name is Dina Zayan. I am the student investigator for the Structural Modeling study you agreed to participate in. The study will take place over a single 3-hour session. The answers you provide will help us understand how modeling techniques affect UML model comprehension. You were selected based on your answers to the screening survey which indicated you are familiar with UML. During the 3-hour period, you will be asked to sign a consent form, read a UML class diagram, create a UML object diagram as well as answer a set of questions. Feel free to ask any questions if you need during the study.

You are free to withdraw from the study at any time.

I would like to thank you in advance for your time and effort.

Regards,

Dina Zayan

CONSENT

I have read the information presented in the recruitment letter about the study being conducted by Dina Zayan and Associate Professor Krzysztof Czarnecki at the University of Waterloo.

I have the opportunity to ask any questions related to this study, to receive satisfactory answers to my questions, and any additional details I want. I am aware that I may withdraw from the study without penalty at any time by advising the researchers of this decision.

This project has been reviewed by, and received ethics clearance through, the Office of Research Ethics at the University of Waterloo.

With full knowledge of all foregoing, I agree, of my own free will, to participate in this study.

Participant's Name _____

Participant's Signature _____

Date _____

Witness Name _____

Witness Signature _____

Experimental Procedures

Club Sobeys is a program designed to reward members who shop at Sobeys, a leading national grocery retailer and food distributor in Canada. Every time a member swipes his/her card during checkout, they get rewarded using the program's points system. Members can redeem their points for instant savings off a bill or have them automatically converted to one of Sobeys' partners. Please exhibit the provided UML class diagram called "Club Sobeys Class".

Experimental Task 1

Please create a UML Object Diagram which represents a valid concrete instantiation of the attached UML Class Diagram for a rewards program for Club Sobeys members.

> Note: Don't copy and paste from the provided diagrams as it causes some problems when saving your project.

You are also provided with some examples for a similar loyalty program (Shoppers Optimum Loyalty Program) in terms of a set of object diagrams that might help you with your design. The focus of each example is as follows:

> **Example 1:** Shows how a member earns bonus points for "*NiveaBodyCare*" in store product.
>
> **Example 2:** Shows how a member earns bonus points through different bonus mechanics for two separate in store products, as well as a regular transaction with no offers for one product.
>
> **Example 3:** Shows an invalid instantiation of the class diagram since it violates the following constraint: "At most one price or Bonus Mechanic per offer."
>
> **Example 4:** Shows how a member earns bonus points for partner offers.
>
> **Example 5:** Shows how a member can redeem some of her points.
>
> **Example 6:** Shows an invalid instantiation of the class diagram since it violates the following constraint: "You can't accumulate and redeem points for the same bill".

When creating your object diagram, make sure the following list is present in your instantiation:

Item	Check Box
An account that uniquely identifies each member.	
A member earning points for regular transactions (i.e. no offers on the products)	
A member earning points through in store offers (i.e. Offers on products by the store)	
A member earning points through partner offers. For example, *Club Sobeys MasterCard* which is a product offered by one of Club Sobeys partners: BMO Bank.	
Sales channels through which the customer/member will know about the offers taking into account different ways for promoting in store and partner offers.	
The object diagram must include at least one instance of each class in the class diagram.	
All attribute values of the instances in the object diagram must be included.	
Possible ways by which a member can redeem points previously added to their account such as: • Inside the store to reduce overall grocery costs. • Through a Club Sobeys partner (For example; Aeroplan. Aeroplan Loyalty program was created in July 1984 by Air Canada as an incentive program for its frequent flyer customers. Aeroplan members collect miles via credit cards or through a conversion system between their partners.)	

Experimental Task 2

Please provide answers for the following questions based on the first task of the study. Try to answer each question; however, if you are not sure and feel you are guessing, do not provide an answer

Please record the time when you start and finish answering the questions as indicated.

Start Time: _____

1. Which of the following answers is true?
    a. Partner offers are applied to the entire member's bill.
    b. Partner offers can be applied to individual products inside the store.
    c. Both answers are correct.

2. Can a customer earn and redeem points for the same bill?
    a. Yes
    b. No

3. Is *Base Mechanic* mandatory in the case of earning points?
    a. Yes
    b. No

4. Are the *Points* collected by the *Bill* those that are deducted from the *Account*?
    a. Yes
    b. No
    c. Can't be determined.

5. What are the type(s) of points that are collected by the bill?

6. Are Bonus and/or Price mechanics mandatory?
    a. Yes
    b. No

7. When can a ***Bill*** have "*BonusMechanic*" without "*BaseMechanic*" ?

8. When would it be the case that a *Bill* does not contribute *Points* to the member's *Account*?

9. Please provide an example to demonstrate the difference between a "*FixedPriceOff*" mechanic and a "*FixedPercentOff*" mechanic.

10. Describe in your own words the difference between "*fixedAmount*" and the "*PointsMultiplier"* attribute inside the "*BonusMechanic"* class.

11. Which class(es) represent different ways of collecting points?

12. Why do you think the "*BasePoints*" class is associated with the "*BonusMechanic*" class?

13. What is the conceptual difference between the "*StorePoints*" and the "*TotalPoints*" attributes inside the "*Bill*" class?

14. Is it possible to have both "*Price Mechanic*" and "*Bonus Mechanic*" in the same object diagram? If yes, briefly describe the case.

15. Given your created object diagram, assume Sobeys suddenly decides to change its policy to 500 Club Sobeys points for every $1 spent in the store. Please mention <u>all</u> instances in your object diagram which would have their values changed accordingly to accommodate the change in Sobeys' policy?

End Time: _____