

Homework 1: Class and Package Diagrams using IBM Rational Software Development Platform

Laboratory Date: Monday, October 3, 2011
Take Home Due: Thursday, October 13, 2011

Name : _____

Student Number : _____

Laboratory Time : _____

Objectives

- Know your Windows and UNIX IDs and passwords in ICS computer labs
- Create a Project in Rational Software Development Platform
- Create a Class Diagram in Rational Software Development Platform
- Import a Class Diagram in Rational Software Development Platform
- Add Packages to a Class Diagram in Rational Software Development Platform

Preamble

The IBM Rational Software Development Platform is an open, proven, complete and modular solution comprised of a comprehensive set of tools, proven best practices and professional services. This modular solution provides all the tools that individuals and teams need to successfully build, integrate, extend, modernize and deploy software and software-intensive systems. This tool also includes a feature to draw UML 2.0 diagrams. The Use Case and Class diagrams are the most widely used types of diagrams from the UML family. This laboratory is a warm-up for both UML and IBM Rational Software Development Platform.

Grading Checklist (30 points)

By the end of the laboratory session, you need to demonstrate to the TA that you can do the following tasks. The TA will check off the items below that you have completed and collect this cover page from you.

- Create a Project in IBM Rational Software Development Platform
- Create initial UML Class Diagram
- Add details to UML Class Diagram
 - Multiplicities
 - Attribute and operation on Washer class
 - New sub-class
 - Note
 - Composition relation added to UML class diagram
- Import file and add packages to UML Class Diagram
- Add relationships to UML Class Diagram

TA Initials: _____

Instructions for the Laboratory

Task 1: Log in to ICS machines

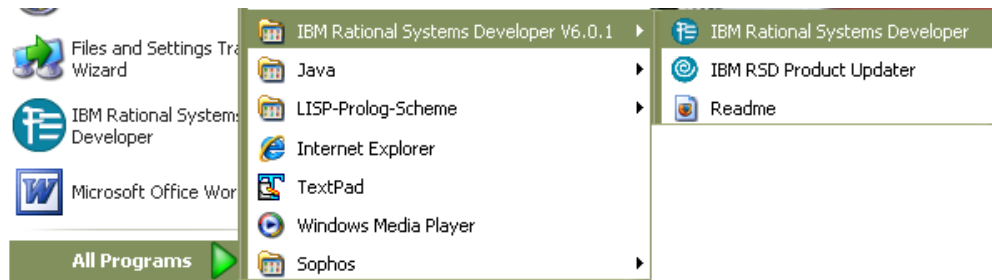
In order to complete laboratory exercises, you will need to be able to access the computers in the ICS labs. If you have not used the lab computer before you will need to have an account created and passwords set up by ICS Computer Support. The lab assistant in ICS 364 or the offices nearby can help with this.

- a) Know your ICS user ID
- b) Know your ICS Windows password
- c) Know your ICS UNIX password
 1. These two passwords are sometimes, but not always, the same. If you are setting up your account, making the passwords the same will make this simpler.
- d) Find an application on a Windows machine that will let you log on to a UNIX machine.

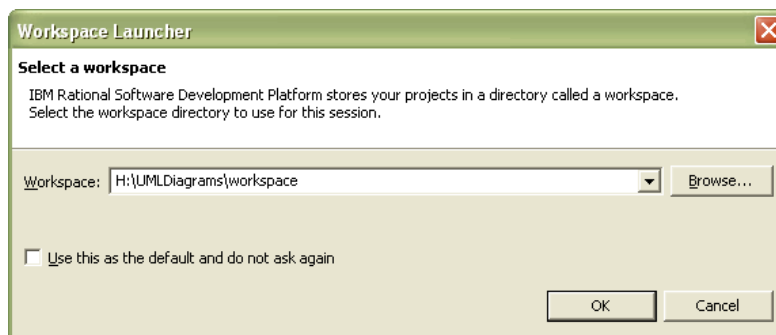
Task 2: Create a Project in IBM Rational Software Developer Workbench

For this task, you will create a UML Project using Rational Software Development Platform.

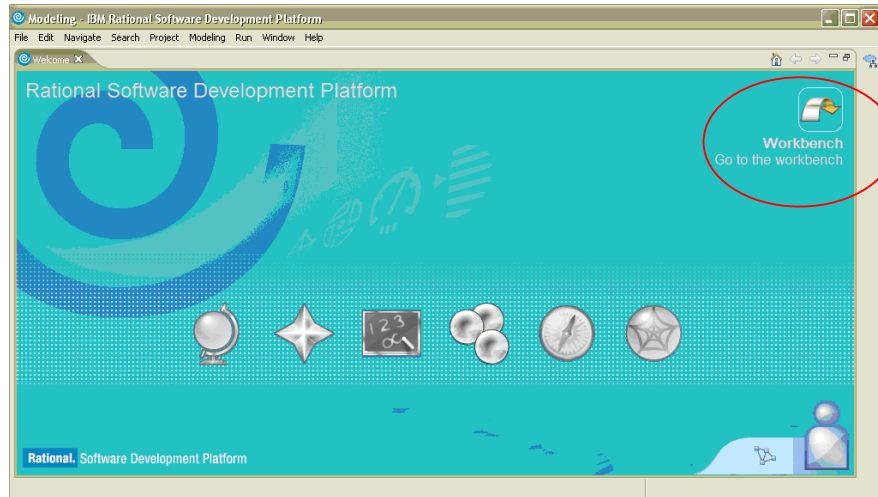
- a) Create a Directory called "UMLDiagrams" in your H directory.
- b) Start Rational Software Development Platform.



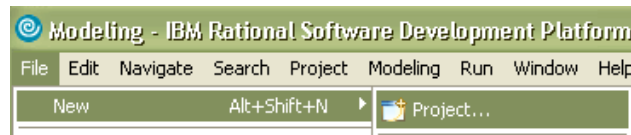
- c) Change the Workspace location to H:\UMLDiagrams\workspace



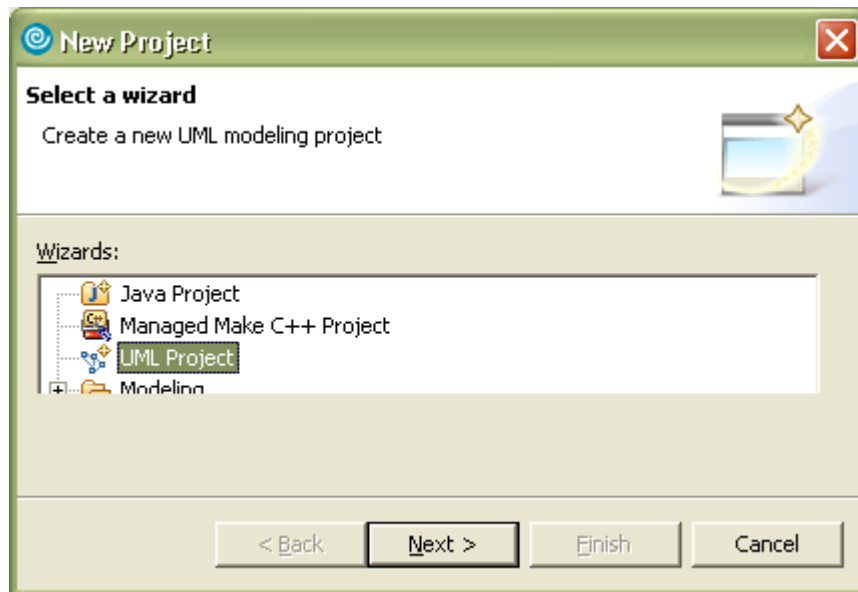
- d) Click on Workbench.



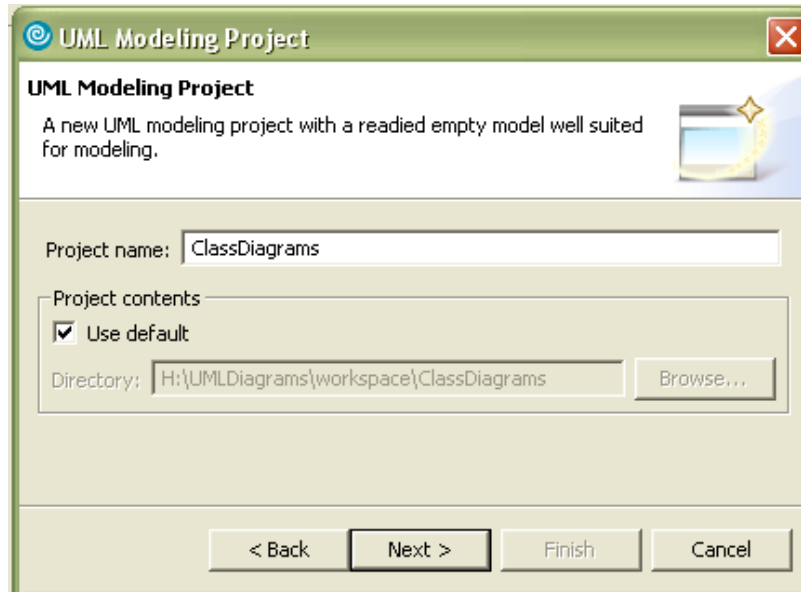
e) Create a new Project. Go to File -> New -> Project



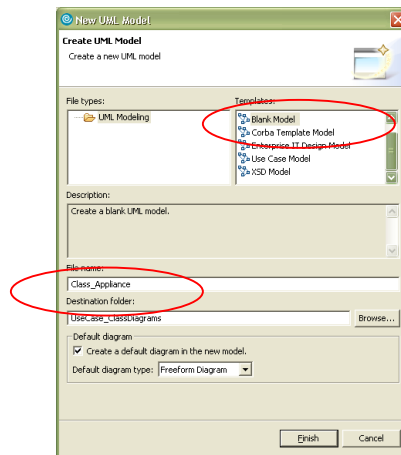
f) Select the UML Project wizard. Click Next.



g) In the Project name field, enter "ClassDiagrams". Click Next.



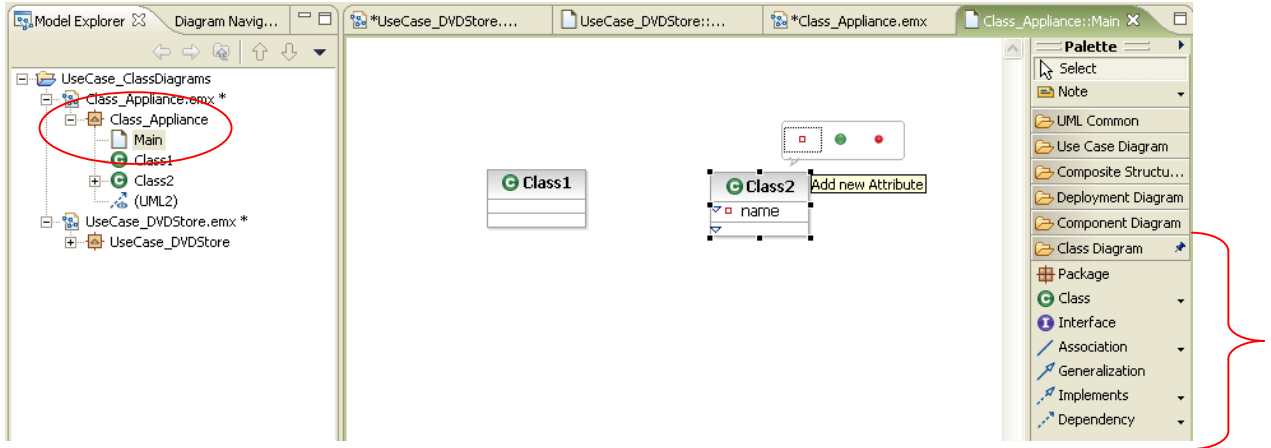
h) Select Blank Model template. In the File name, enter "Class_Appliance." Click Finish.



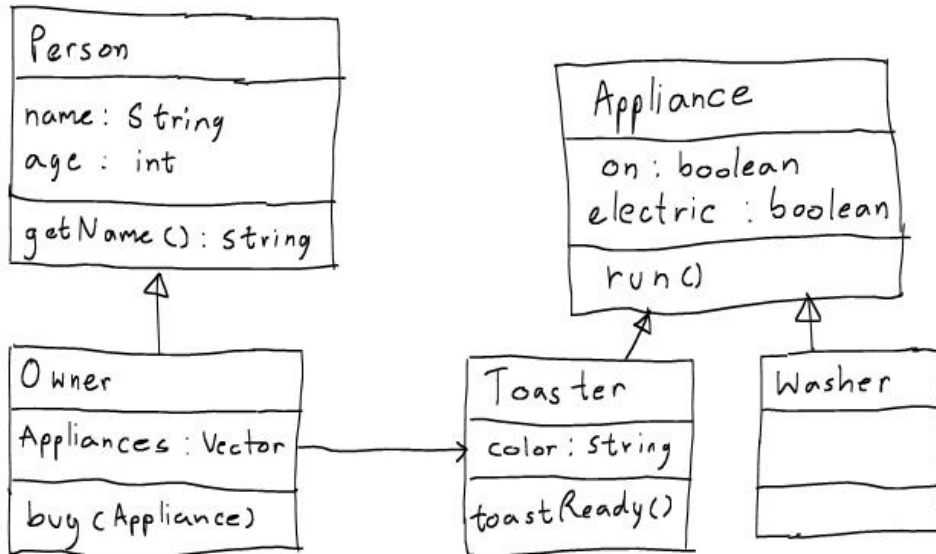
Task 3: Create a UML Class Diagram

For this task, you will create a UML Class Diagram based on a sketch provided to you and you will have to add details.

a) Select Main under Class_Appliance in the Model Explorer. Expand the "Class Diagram" section in the Palette (which should be on the right side of the screen). You can select the objects you need to create in the next step from the Class Diagram Palette.



- b) Turn the hand-drawn sketch of appliances and owners into a UML class diagram in Rational Software Development Platform. To see the signature of methods: Right click on the class, select Filters, and select Show Signature. To add attributes or methods (operations) to a class, click on the class and use appropriate tabs in the properties view.



Task 4: Add Details to the UML Class Diagram

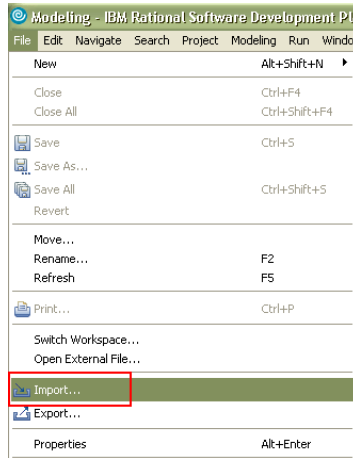
- Add appropriate multiplicities to the association between Owner and Toaster.
- Add one attribute and one operation to the Washer class. (These additions should make sense for a clothes washer.)
- Add a new sub-class to the Appliance class.
- Add a note to the diagram with your name and today's date (using "Note" from the Palette).
- Add a Slot class that is related to the Toaster class using a Composition relation. This class must have "length", "width", and "full" Attributes. Add appropriate types for these Attributes. To get a Composition relation, first, select the association and make change to. Then in the General Tab in the Properties view, select Composition from the Type dropdown.
- After you are done with the changes, go to File -> Save All.

You will show this class diagram to the TA when you finish all tasks.

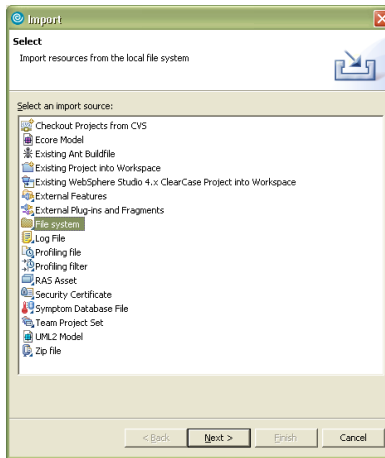
Task 5: Add Packages to a UML Class Diagram

For this task, you will add Packages to the UML Class Diagram for the DVD Online Store provided to you.

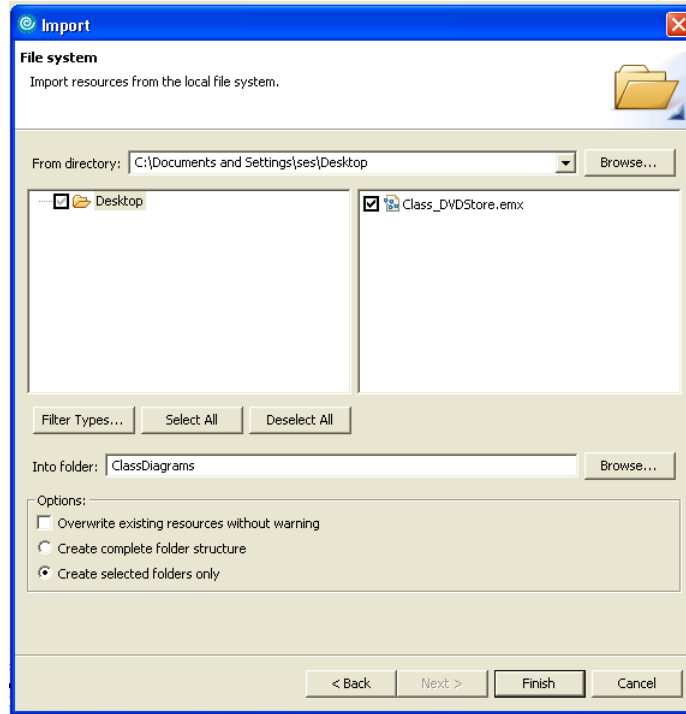
- a) Make sure you have the directory "UMLDiagrams" in your H directory. If not, create it.
- b) Download the Rational project Class_DVDStore.emx from the course web site and save it in the Desktop.
- c) In order to open the model Class_DVDStore.emx that you downloaded, select the project you just created, and then go to File -> Import.



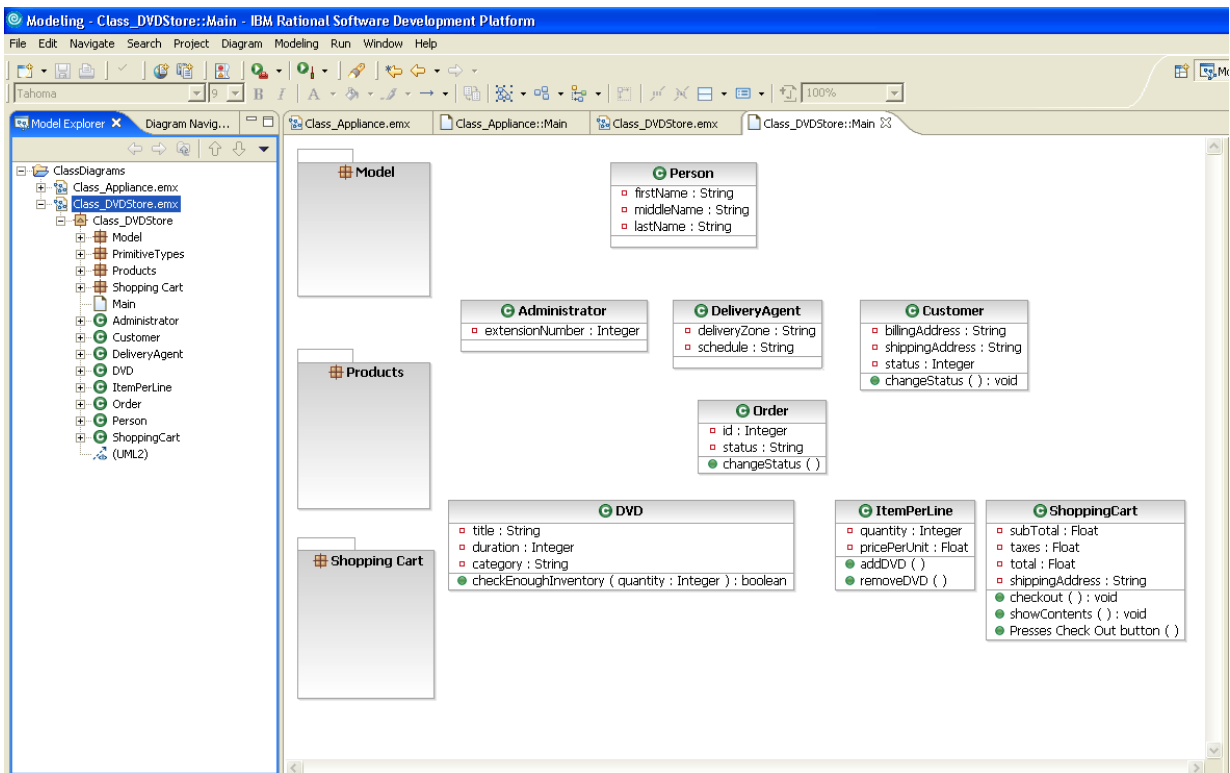
- d) In the Import window, choose File system and click Next.



- e) To import a file, select the folder (Desktop) where you saved Class_DVDStore.emx and check Class_DVDStore.emx. Click Finish. Put "ClassDiagrams" in "Into folder" area.



- f) In the Model Explorer, you can see the imported Class_DVDStore.emx. Double click on the model Class_DVDStore.emx to see its contents.



Task 6: Add Relationships to a UML Class Diagram

- a) You should create the associations, generalizations, and compositions between classes, as well as include multiplicities. Then, you should move the classes to their corresponding packages so that you will have the following structure.

Package: Model

Classes:

- Person
- Administrator
- Delivery Agent
- Customer
- Order

Package: Products

Classes:

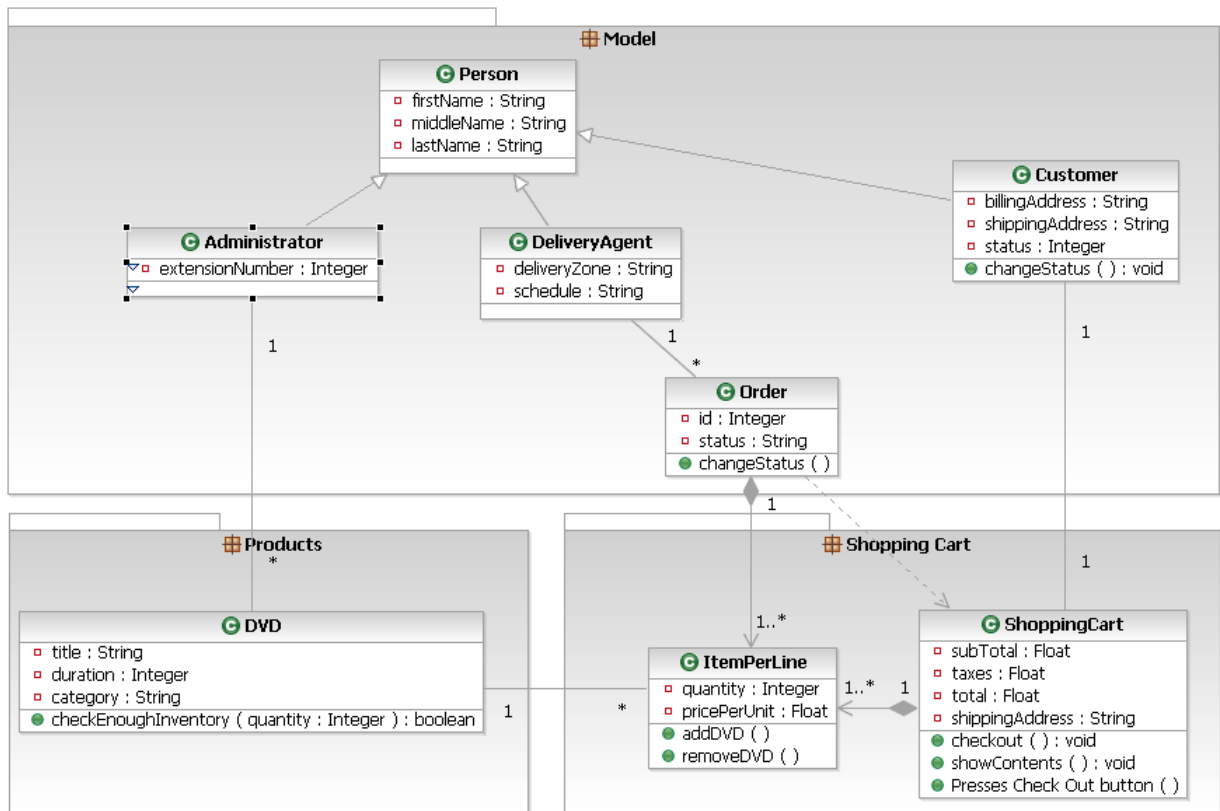
- DVD

Package: ShoppingCart

Classes:

- ShoppingCart
- ItemPerLine

- b) Your final diagram should look similar to the following one:



Take Home

1. Draw a class diagram for the Self Check Out system. (60 points)

Your diagram must include the following classes and their packages:

- **Code**
- **UPC**
- **PackagedProduct**
- **ProductInfo**
- **GroceryItem**
- **CheckoutCart**

Add all the attributes and methods (include constructors) per each class.

- **For attributes, you must include visibility, name, and type.**
- **For operations, you must include visibility, name, parameter list, and return type.**

Make sure that your diagram will show the complete signature of attributes and methods. Include generalizations, realizations, associations, and multiplicities where they apply.

You must use Rational Software Development Platform (or a similar software engineering tool) to draw your diagram. You may not use a drawing program (e.g. Visio or Paint) or a presentation program (PowerPoint or Keynote). You may not draw the diagram by hand.

Submit screenshot(s) showing your class diagram, put them in a single document (Word or pdf).