**Modeling the Gourmet Coffee System（美味咖啡系统）**

**Prerequisites, Goals, and Outcomes**

***Prerequisites:*** Before you begin this exercise, you need mastery of the following:

* *UML*
  + Knowledge of class diagram notation
* *Object-Oriented Design*
  + Knowledge of modeling concepts:
    - Identifying classes
    - Identifying relationships between classes
    - Identifying class attributes
    - Identifying class methods

***Goals:*** Reinforce your object-oriented design skills

***Outcomes:*** You will master the following skills:

* Produce a UML class diagram, from a specification, that shows:
  + classes
  + attributes
  + methods
  + relationships

**Background**

This assignment asks you to model a coffee store application.

**Description**

*Gourmet Coffee* is a store that sells coffee from countries around the globe. It also sells coffee brewing machines（咖啡冲泡机） and other accessories for coffee consumption（咖啡消费配件）. The *Gourmet Coffee System* maintains a product catalog, processes orders, and tracks the store's sales.

Gourmet Coffee是一家从世界各国销售咖啡的商店。该公司还销售咖啡冲泡机和其他咖啡消费配件。Gourmet Coffee系统维护产品目录、处理订单并跟踪商店的销售情况。

The catalog maintains the following information about the store's products:

目录维护有关商店产品的以下信息：

* Coffee
  + Code 编号
  + Description 描述
  + Price 价格
  + Country of origin 原产地
  + Type of roast 焙烧类型
  + Flavor 风味
  + Aroma 芳香
  + Acidity 酸度
  + Body 醇度

**所谓“body”，其实指的是人们对咖啡在口中的“重量”或者“厚度”的感觉的描述。**咖啡入口之后，人们需要用舌头的中间偏后的部位去感受它的“重量”。**Body可以以是轻巧纤弱，或者是厚实具有份量的**，很多人把Body 想像成跟咖啡的苦有关，这是一个很大的错误，苦不代表Body就是强的。

* Coffee brewer 咖啡机
  + Code
  + Description
  + Price
  + Model of the brewer 酿造组件~冲泡组件
  + Type of the water supply: *Pour-over* or *Automatic 倒咖啡或自动倒咖啡*
  + Capacity: number of cups 杯子数
* Coffee accessory 咖啡配件
  + Code
  + Description
  + Price

The following tables show some of the products sold by *Gourmet Coffee*.

|  |  |
| --- | --- |
|  | |
| **Figure 1** *Coffee* | |
|  |
| **Figure 2** *Coffee brewers* |

|  |
| --- |
|  |
| **Figure 3** *Coffee accessories* |

The *Gourmet Coffee System* processes orders. An order contains a list of products, their quantities, and the total cost. The following is an example of an order:

美味咖啡系统处理订单。订单包含产品列表、数量和总成本。以下是订单示例：

|  |
| --- |
|  |
| **Figure 4** *Order* |

In the *Gourmet Coffee System*, the user can:

* Display the catalog: lists the code and description of each product
* Display a product
* Display the current order: lists quantity, code, and price of each product in the current order, and the total of the order.
* Add a product to the current order—if the specified product is already part of the order, this command will modify the quantity of that product
* Remove a product from the current order
* Register the sale of the current order—this command adds the order to the store's sales and empties the current order
* Display the sales: lists all the orders that have been sold
* 在美味咖啡系统中，用户可以：
* •显示目录：列出每个产品的代码和描述
* •显示产品
* •显示当前订单：列出当前订单中每个产品的数量、代码和价格，以及订单总数。
* •将产品添加到当前订单如果指定的产品已经是订单的一部分，此命令将修改该产品的数量
* •从当前订单中删除产品
* •注册当前订单的销售，此命令将订单添加到商店的销售中并清空当前订单
* •显示销售：列出所有已售出的订单

Run the sample executable that is provided to learn more about the *Gourmet Coffee System*.

运行提供的示例可执行文件，以了解有关美味咖啡系统的更多信息。

**Files**

Following is a sample executable of the *Gourmet Coffee System*.

* [*gourmet-coffee-sample-executable.jar*](https://seqcc.icarnegie.com/content/SSD/SSD3/4.2.0.1/normal/pg-class-dsgn/pg-dsgnng-class/assm-exer-mdlng-cof-gou-sys/pool-pr-uml-mdlng/qn-pr-mdlng-gou-cof-sys/handout/gourmet-coffee-sample-executable.jar) — Download this file now. It is a sample executable.

**Tasks**

These steps will guide you for completing this assignment:

1. **First**, run the sample executable by issuing the following command at the command prompt:

C:\>java -jar gourmet-coffee-sample-executable.jar

1. **Then**, follow the technique described in page [1.2.5 Modeling Classes](javascript:ContentByName('pg-mdlng-class');) to model the *Gourmet Coffee System*.

Identify the following:

* + The classes
  + The association relationships (include direction, multiplicity, and association attribute)
  + The specialization/generalization relationships
  + The attributes of each class
  + The methods of each class
  + 2.然后，按照第1.2.5页建模类中描述的技术对美味咖啡系统进行建模。
  + 确定以下内容：
  + o班
  + o关联关系（包括方向、多重性和关联属性）
  + o专业化/泛化关系
  + o每个类的属性
  + o每个类的方法

Your class diagram should include:

* + The class of the gourmet coffee application
  + The accessor methods
  + The mutator methods if are needed
  + For the collections:
    - The methods to add and access elements
    - The methods to remove elements if are needed
  + The methods that compute other values not included in the attributes.

Use Sun's coding conventions when naming classes, methods, and attributes.

你的类图应该包括：

o美食咖啡应用的类别

o访问方法

o如果需要的话，使用突变方法

o对于收藏品：

添加和访问元素的方法

必要时移除元件的方法

o计算属性中未包含的其他值的方法。

在命名类、方法和属性时使用Sun的编码约定。

1. Use Eclipse, [Violet](http://horstmann.com/violet/), PowerPoint, or another tool of your choosing to draw a UML class diagram.
2. Save the UML class diagram in a SVG, GIF, or JPG format in a file named *uml-gou-cof*.

**Submission**

Upon completion, submit **only** the SVG, GIF, or JPG file *uml-gou-cof*. The extension of this file will depend on the tool used to create the diagram.

完成后，只提交SVG、GIF或JPG文件uml gou cof。此文件的扩展名将取决于用于创建关系图的工具。

choice> 4

Product code> A001

Quantity> 90

The product A001 has been added

Product code> B001

Quantity> 30

The product B001 has been added

Product code> C001

Quantity> 40

The product C001 has been added

choice> 3

90,A001,9.0

30,B001,150.0

40,C001,17.99

Total: ￥6,029.60

choice> 7

Order 1

90,A001,9.0

30,B001,150.0

40,C001,17.99

Total: ￥6,029.60

choice> 6

The current order is empty

Main-Class: GourmetCoffee

八个类：

Catalog.class

Coffee.class

CoffeeBrewer.class

GourmetCoffee.class

Order.class

OrderItem.class

Product.class

Sales.class

功能：

[0] Quit

[1] Display catalog

[2] Display product

[3] Display current order

[4] Add|modify product to|in current order

[5] Remove product from current order

[6] Register sale of current order

[7] Display sales

choice>

挖出来的数据

C001 Colombia, Whole, 1 lb

C002 Colombia, Ground, 1 lb

C003 Italian Roasts, Whole, 1 lb

C004 Italian Roasts, Ground, 1 lb

C005 French Roasts, Whole, 1 lb

C006 French Roasts, Ground, 1 lb

C007 Guatemala, Ground, 1 lb

C008 Guatemala, Ground, 1 lb

C009 Guatemala, Whole, 1 lb

C010 Guatemala, Ground, 1 lb

C011 Special Blend, Whole, 1 lb

C012 Special Blend, Ground, 1 lb

B001 Home Coffee Brewer

B002 Coffee Brewer, 2 Warmers

B003 Coffee Brewer, 3 Warmers

B004 Commercial Brewer, 20 cups

B005 Commercial Brewer, 40 cups

A001 Almond Flavored Syrup

A002 Irish Creme Flavored Syrup

A003 Mint Flavored syrup

A004 Caramel Flavored Syrup

A005 Gourmet Coffee Cookies

A006 Gourmet Coffee Travel Thermo

A007 Gourmet Coffee Ceramic Mug

A008 Gourmet Coffee 12 Cup Filters

A009 Gourmet Coffee 36 Cup Filters

Product code> C001

Description: Colombia, Whole, 1 lb

Price: 17.99

Origin: Colombia

Roast: Medium

Flavor: Rich and Hearty

Aroma: Rich

Acidity: Medium

Body: Full

Product code> C002

Description: Colombia, Ground, 1 lb

Price: 18.75

Origin: Colombia

Roast: Medium

Flavor: Rich and Hearty

Aroma: Rich

Acidity: Medium

Body: Full

Product code> C003

Description: Italian Roasts, Whole, 1 lb

Price: 16.8

Origin: Latin American Blend

Roast: Italian Roast

Flavor: Dark and heavy

Aroma: Intense

Acidity: Low

Body: Medium

Product code> C004

Description: Italian Roasts, Ground, 1 lb

Price: 17.55

Origin: Latin American Blend

Roast: Italian Roast

Flavor: Dark and heavy

Aroma: Intense

Acidity: Low

Body: Medium

Product code> C005

Description: French Roasts, Whole, 1 lb

Price: 16.8

Origin: Latin American Blend

Roast: French Roast

Flavor: Bittersweet, full intense

Aroma: Intense, full

Acidity: None

Body: Medium

Product code> C006

Description: French Roasts, Ground, 1 lb

Price: 17.55

Origin: Latin American Blend

Roast: French Roast

Flavor: Bittersweet, full intense

Aroma: Intense, full

Acidity: None

Body: Medium

Product code> C007

Description: Guatemala, Ground, 1 lb

Price: 17.99

Origin: Guatemala

Roast: Medium

Flavor: Rich and complex

Aroma: Spicy

Acidity: Medium to high

Body: Medium to full

Product code> C008

Description: Guatemala, Ground, 1 lb

Price: 18.75

Origin: Guatemala

Roast: Medium

Flavor: Rich and complex

Aroma: Spicy

Acidity: Medium to high

Body: Medium to full

Product code> C009

Description: Guatemala, Whole, 1 lb

Price: 19.99

Origin: Sumatra

Roast: Medium

Flavor: Vibrant and powdery

Aroma: Like dark chocolate

Acidity: Gentle

Body: Rich and full

Product code> C010

Description: Guatemala, Ground, 1 lb

Price: 20.5

Origin: Sumatra

Roast: Medium

Flavor: Vibrant and powdery

Aroma: Like dark chocolate

Acidity: Gentle

Body: Rich and full

Product code> C011

Description: Special Blend, Whole, 1 lb

Price: 16.8

Origin: Latin American Blend

Roast: Dark roast

Flavor: Full, roasted flavor

Aroma: Hearty

Acidity: Bold and rich

Body: Full

Product code> C012

Description: Special Blend, Ground, 1 lb

Price: 17.55

Origin: Latin American Blend

Roast: Dark roast

Flavor: Full, roasted flavor

Aroma: Hearty

Acidity: Bold and rich

Body: Full

Product code> B001

Description: Home Coffee Brewer

Price: 150.0

Model: Brewer 100

Water Supply: Pourover

Number of Cups: 6

Product code> B002

Description: Coffee Brewer, 2 Warmers

Price: 200.0

Model: Brewer 200

Water Supply: Pourover

Number of Cups: 12

Product code> B003

Description: Coffee Brewer, 3 Warmers

Price: 280.0

Model: Brewer 210

Water Supply: Pourover

Number of Cups: 12

Product code> B004

Description: Commercial Brewer, 20 cups

Price: 380.0

Model: Quick Coffee 100

Water Supply: Automatic

Number of Cups: 20

Product code> B005

Description: Commercial Brewer, 40 cups

Price: 480.0

Model: Quick Coffee 200

Water Supply: Automatic

Number of Cups: 40

Product code> A001

Description: Almond Flavored Syrup

Price: 9.0

Product code> A002

Description: Irish Creme Flavored Syrup

Price: 9.0

Product code> A003

Description: Mint Flavored syrup

Price: 9.0

Product code> A004

Description: Caramel Flavored Syrup

Price: 9.0

Product code> A005

Description: Gourmet Coffee Cookies

Price: 12.0

Product code> A006

Description: Gourmet Coffee Travel Thermo

Price: 18.0

Product code> A007

Description: Gourmet Coffee Ceramic Mug

Price: 8.0

Product code> A008

Description: Gourmet Coffee 12 Cup Filters

Price: 15.0

Product code> A009

Description: Gourmet Coffee 36 Cup Filters

Price: 45.0