Student ID: _____

Full Names: _____

Basic OO Modeling/Java Programming Test

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1. The time allotted for completing this test is 2 hours.
2. You are expected to use a computer with IDE or any Code Editor tool to implement your solution for the question.
3. Upon completion, submit to Sakai.

Make sure to pay attention to all the details required in the question

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OO Design Modeling/Java Programming Test (50 points)

Evaluating your Basic OO/Java Coding ability:

1. (50 points) **Perform Basic Object-oriented Software modeling and Java programming:**

   Assume you have been hired by a national grocery chain named, **LoVee Grocers, LLC**. And they want you to design and implement a basic Java Command-Line Interface (CLI) application for their Suppliers Relationship Management (SRM) system, based on the following data specification:

   ### **Product**:

   productId, (e.g. 3128874119, 2927458265, 9189927460 etc.)
   Note: These productIds are numbers

   productName, (e.g. Banana, Apple, Carrot etc.)

   dateSupplied, (e.g. 2023-01-24, 2022-12-09, 2023-03-31 etc.)

   quantityInStock, (e.g. 124, 18, 89 etc.)

   unitPrice, This is money (in dollars and cents) (e.g. $0.55, $1.09, $2.99 etc.)

   ### **Supplier**:

   supplierNumber, (e.g. SS0013, PS1909, EP9981 etc.)

   supplierName, (e.g. Argos Fruit Supplies, Iowa Farms LLC, Barneys Poultries etc.)

   contactPhoneNumber, (e.g. (641) 451-0098, (123) 462-1123, etc.)

   ### **Address**: This class represents the primary address of a Supplier

   street, (e.g. 1000 North Main Street etc.)

   city, (e.g. Fairfield etc.)

   state, (IA, MD, CA etc.)

   zipCode, (e.g. 52556-0001, 20910, 90210 etc.)

For the purpose of this Quiz1, here is a simplified description of the Object-oriented Software solution domain/data model for the system:

A **Product** is supplied by one **Supplier**. And every **Product** MUST have a **Supplier**.
A **Supplier** can supply one or more **Products**.
A **Supplier** has one **Address**. And every Supplier must have an Address.
An **Address** belongs to one and only one **Supplier.** And every **Address** MUST have a **Supplier.**

IMPORTANT: Your solution model should consist of only these three classes:

1. Product
2. Supplier
3. Address

Data:

Here is the company's existing data, which you are expected to load/use it your Program and print as output upon its execution:

Address data:

	Street	City	State	Zip Code
1.	1000 N Main Street	Fairfield	IA	52556-0001
2.	2 South Circle Road	San Jose	CA	98123-0011
3.	4500 Gallery Blvd	Phoenix	AZ	85020-1988

Suppliers data:

	Supplier Number	Name	Contact Phone No	Address
1.	SS0013	Argos Fruit Supplies	(641) 451-0098	1
2.	PS1909	Iowa Farms LLC	(123) 462-1123	2
3.	EP9981	Barneys Poultries	(660) 123-9811	3

Products data:

Product Id	Name	Date Supplied	Quantity In Stock	Unit Price (in US$)	Supplier
3128874119	Banana	2023-01-24	124	0.55	1
2927458265	Apple	2022-12-09	18	1.09	1
9189927460	Carrot	2023-03-31	89	2.99	2
8761230987	Pear	2023-02-19	256	0.50	1
8761230989	Berries	2024-2-19	1200	1.50	3

For this question, you are required to do the following:

1. Draw a UML Class diagram (Static model) for the system, showing the Product class, Supplier class and Address class. Make sure to correctly indicate, in your model/diagram, the class name and the attributes including the **correct/appropriate data types** for each data field (a.k.a attribute or property). Let the data given above, guide your thinking/design.

   Also, show in your class diagram, the correct/appropriate Association relationships, based on the description of the data model given above. And for each Association, indicate the multiplicities (including the correct cardinalities and optionalities).

   Make the Association between Product and Supplier, Unidirectional.
   Make the Association between Supplier and Address, Bidirectional.

2. Using your IDE (Eclipse or IntelliJ etc.) on your computer, create a new Java Command Line Interface (CLI) project. And in it, implement Java code the Product class, the Supplier class and the Address class, based on your UML diagram in Task 1 above. In your code, include the following:
   a. Instance variables for the classes (ensure you implement correct encapsulation)
   b. The Default (No Argument) constructor
   c. All arguments constructor
   d. The Getter and Setter methods for each data field (property)
   e. Make the classes be inside a package named, edu.miu.cs.cs401.quiz1.srmapp.model

3. Add Java code for an executable class named, SRMAppMain, and in it include the main method. And, in the main method, create an array of Products using the company's data, as given above. Also, add code to print-out each Product in the array of products to the console/screen, in the format like this:

   Products Inventory:
   1. { ProductId: 3128874119, Name : Banana, DateSupplied: 2023-01-24, QuantityInStock: 124, UnitPrice: $0.55 }
   2. { ProductId: 3128874119, Name : Apple, DateSupplied: 2023-01-24, QuantityInStock: 18, UnitPrice: $1.09 }
   3. { ProductId: 3128874119, Name : Carrot, DateSupplied: 2023-01-24, QuantityInStock: 89, UnitPrice: $2.55 }

   Make the SRMAppMain class be inside a package named, edu.miu.cs.cs401.quiz1. srmapp

//-- The End --//