Foundation Four Requirements

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The specification for the Foundation Four final project option has some prose that can be confusing. This document represents my interpretation of what the minimum requirements are to correctly complete the assignment and earn full points.

1 Abstraction With YouTube Videos

For this assignment, you need to have two classes: **Video** and **Comment**. The **Video** class should contain the following attributes:

- The name of the author
- The title of the video
- The running time of the video
- A list of comments (as represented by an instance of **Comment**)

The **Comment** class should contain the following attributes:

- The name of the author (who is not necessarily the same as the author of the video)
- The text of the comment

You must also:

- Create a program that creates three or four instances of **Video**, adds three or four comments to each instance, and then prints them to the console.

You do *not* need:

- User interaction
- Real data
- Meaningful data

2 Encapsulation With Online Ordering

For this assignment, you need four classes.

2.1 Product

The **Product** class should have the following attributes:

- Name of product
- ID of product (which is not the same as the name)
- Per-unit price of product
- Quantity of each prouct

2.2 Customer

The **Customer** class should have the following attributes:

- Name of customer
- Address of customer, as represented by an instance of **Address**

And the following methods:

- A method returning whether or not the customer lives in the United States

2.3 Address

The **Address** class should have the following attributes:

- Street address
- City
- State/province/county
- Country

And the following methods:

- Return whether or not the address is in the United States
- Join all of the attributes together into a single string representation (including newlines)

2.4 Order

The **Order** class should have the following attributes:

- A list of instances of **Product**
- A instance of **Customer**

And the following methods:

- Compute the total cost of the order
  - The total cost is computed as the sum of the total price of all products plus a shipping fee
  - The shipping fee is $5 if the customer lives in the United States and $35 if they do not
- Generate a packing label with the name and product ID of each produt in the order
- Generate a shipping label with the name and address of the customer

You must also:

- Ensure all member fields are private
- Define getters and setters as needed
- Define constructors as needed
- Write a program that creates at least two instances of **Order**, with each order having two or three products, and then displays the following information for each instance:
  - Packing label
  - Shipping label
  - Total cost

You do *not* need:

- User interaction
- Real data
- Meaningful data

3 Inheritance With Event Planning

For this assignment, you need to have at least four classes:

- A base **Event** class with the following attributes:
  - Event title
  - Event description
  - Date
  - Time
  - Address

  And the following methods:
  - Generate string message with standard details:
    - Title
    - Description
    - Date
    - Time
    - Address
  - Generate string message with full details, which is all of the details from the standard message plus information specific to the type of event
- Generate short description of the event with:
  - Type of event
  - Title
  - Date
- **Lecture** class with the following additional attributes:
  - Speaker
  - Capacity

- **Reception** class with the following additional attributes:
  - RSVP email
- **OutdoorGathering** class with the following additional attributes:
  - Weather forecase for the event
- A small program that creates at least one of each type of **Event** subclass and prints out each type of message for that instance

In addition to this, you must also:

- Use proper inheritance
- Use proper access modifiers (all fields should be private)
- Use a proper **Address** class

You do *not* need:

- User interaction
- Real data
- Meaningful data

4 Polymorphism With Exercise Tracking

For this assignment, you need the following classes:

- **Activity** class with the following methods:
  - Get distance (virtual)
  - Get speed (virtual)
  - Get pace (virtual)
  - Get summary
- **Running** class
- **StationaryBike** class
- **Swimming** class

You must also:

- Write a small program that creates at least one of each of the derived classes, places them into *the same list*, and iterates through the list, calling the summary method on each instance
- Use proper inheritance
- Override all virtual methods
- Follow the principle of encapsulation
- Make all fields private

You do *not* need:

- User interaction
- Real data
- Meaningful data