**Program 1: Abstraction with YouTube Videos**

1. **Class Video:**

|  |
| --- |
| Video |
| \_title :string |
| \_author :string |
| \_lenght :int |
| \_comments : List<Comment> |
| GetNumberOfComments():int |
| GetComments():List<Comment> |
| AddComment(Comment):void |

1. **Class Comment**

|  |
| --- |
| Comment |
| \_commenterName : string |
| \_text : string |
| Constructor (commenterName: string, text: string) |

1. **Class Program :**
2. Create Video objects.
3. Add Comment objects to Video objects.
4. Display each video's details and comments.

**Program 2: Encapsulation with Online Ordering**

* 1. **Class Order:**

1. **Order**

**Attributes:**

* + - List<Product> Products
    - Customer Customer

**Methods:**

* + - GetTotalCost():decimal
    - GetPackingLabel():string
    - GetShippingLabel():string

1. **Product**

**Attributes:**

* + - Name: string
    - ProductId: string
    - Price: decimal
    - Quantity: int

**Methods:**

* GetTotalCost():decimal

1. **Customer**

**Attributes:**

* + - Name: string
    - Address :Address

**Methods:**

IsInGhana():bool

1. **Address**

**Attributes:**

* + - StreetAddress: string
    - City: string
    - State: string
    - Country: string

**Methods:**

IsInGhana():bool

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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GetFullAddress():string

1. **Program**

**Methods:**

* + - Main method to create orders, products, and customers
    - Method to display order information, packing labels, and shipping labels

**Program 3: Inheritance with Event Planning**

**Class Diagram:**

1. **Event (Base Class)**

**Attributes:**

* + - string Title
    - string Description
    - DateTime Date
    - TimeSpan Time
    - Address Address

**Methods:**

* + - string GetStandardDetails()
    - virtual string GetFullDetails()
    - virtual string GetShortDescription()

1. **Lecture (Derived Class)**

**Attributes:**

* string Speaker
* int Capacity

**Methods:**

* + - Override GetFullDetails()
    - Override GetShortDescription()

1. **Reception (Derived Class)**

**Attributes:**

* + - string RSVPEmail

**Methods:**

* + - Override GetFullDetails()
    - Override GetShortDescription()

1. **OutdoorGathering (Derived Class)**

**Attributes:**

* + - string WeatherForecast

**Methods:**

* + - Override GetFullDetails()
    - Override GetShortDescription()

1. **Address**

**Attributes:**

* + - string StreetAddress
    - string City
    - string State
    - string Country

**Methods:**

* + - string GetFullAddress()

1. **Program**

**Methods:**

* + - Main method to create events and display their details

**Program 4: Polymorphism with Exercise Tracking**

**Class Diagram:**

1. **Activity (Base Class)**
   * **Attributes:**
     + DateTime Date
     + int Length (in minutes)
   * **Methods:**
     + virtual double GetDistance()
     + virtual double GetSpeed()
     + virtual double GetPace()
     + virtual string GetSummary()
2. **Running (Derived Class)**
   * **Attributes:**
     + double Distance
   * **Methods:**
     + Override GetDistance()
     + Override GetSpeed()
     + Override GetPace()
     + Override GetSummary()
3. **Cycling (Derived Class)**
   * **Attributes:**
     + double Speed
   * **Methods:**
     + Override GetDistance()
     + Override GetSpeed()
     + Override GetPace()
     + Override GetSummary()
4. **Swimming (Derived Class)**
   * **Attributes:**
     + int Laps
   * **Methods:**
     + Override GetDistance()
     + Override GetSpeed()
     + Override GetPace()
     + Override GetSummary()
5. **Program**
   * **Methods:**
     + Main method to create activities and display their summaries