

A- Abstraction with YouTube Videos

1. Comment Class

Responsibilities:

- Store commenter's name
- Store comment text

Attributes (Member Variables):

_commenterName (string)
_commentText (string)

Methods:

GetCommenterName() - returns commenter's name
GetCommentText() - returns comment text
Constructor to initialize both attributes

2. Video Class

Responsibilities:

- Store video title, author, and length
- Maintain a list of comments
- Track number of comments

Attributes (Member Variables):

_title (string)
_author (string)
_length (int) - in seconds
_comments (List<Comment>)

Methods:

GetNumberOfComments() - returns count of comments
AddComment(Comment comment) - adds a comment to the list
GetComments() - returns list of comments
GetTitle(), GetAuthor(), GetLength() - getter methods

Class Diagram

Video class	Comment class
<p>_title _author _length _comments</p> <p>+GetNumberOfComments() +AddComment(Comment) + GetComments() + GetTitle() +Video(title, author, length)</p>	<p>_commenterName _commentText</p> <p>+ GetCommenterName() + GetCommentText() + Comment(name, text)</p>

B- Encapsulation with Online Ordering

1. Address Class

Responsibilities:

- Store street address, city, state/province, and country
- Determine if address is in USA
- Format address as string

Attributes (Member Variables):

_street (string)
_city (string)
_state (string)
_country (string)

Methods:

IsInUSA() - returns true if country is "USA"
GetFullAddress() - returns formatted address string
Getter methods for each attribute

2. Customer Class

Responsibilities:

- Store customer name and address
- Determine if customer lives in USA

Attributes (Member Variables):

_name (string)
_address (Address)

Methods:

IsInUSA() - delegates to Address.IsInUSA()
GetName() - returns customer name
GetAddress() - returns address object
Constructor to initialize name and address

3. Product Class

Responsibilities:

- Store product details
- Calculate total cost for the product

Attributes (Member Variables):

_name (string)
_productId (string)
_price (decimal)
_quantity (int)

Methods:

GetTotalCost() - calculates price × quantity
GetName(), GetProductId() - getter methods
Constructor to initialize all attributes

4. Order Class

Responsibilities:

- Manage list of products and customer
- Calculate total order cost including shipping
- Generate packing and shipping labels

Attributes (Member Variables):

_products (List<Product>)
_customer (Customer)

Methods:

CalculateTotalCost() - sums product costs + shipping
GetPackingLabel() - lists products with names and IDs
GetShippingLabel() - shows customer name and address
AddProduct(Product product) - adds product to order

Class Diagram

Order Class	Customer Class
<u>_products</u>	<u>_name</u>
<u>_customer</u>	<u>_address</u>
+CalculateTotalCost()	+ IsInUSA
+ GetPackingLabel()	+ GetName
+ GetShippingLabel()	+ GetAddress()
+ AddProduct()	+ Customer()
+ Order()	
Address Class	Product Class
<u>_street</u>	<u>_name</u>
<u>_city</u>	<u>_productId</u>
<u>_state</u>	<u>_price</u>
<u>_country</u>	<u>_quantity</u>
+ IsInUSA()	+ GetTotalCost()
+ GetFullAddress()	+ GetName()
+ Address()	+ GetProductId()
	+ Product()