

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
<code>_title</code> <code>_author</code> <code>_length</code> <code>_comments</code>
<code>+GetNumberOfComments()</code> <code>+AddComment(Comment)</code> <code>+ GetComments()</code> <code>+ GetTitle()</code> <code>+Video(title, author, length)</code>

Comment class
<code>_commenterName</code> <code>_commentText</code>
<code>+ GetCommenterName()</code> <code>+ GetCommentText()</code> <code>+ Comment(name, text)</code>

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
<u>_products</u> <u>_customer</u>
+CalculateTotalCost() + GetPackingLabel() + GetShippingLabel() + AddProduct() + Order()

Customer Class
<u>_name</u> <u>_address</u>
+ IsInUSA + GetName + GetAddress() + Customer()

Address Class
<u>_street</u> <u>_city</u> <u>_state</u> <u>_country</u>
+ IsInUSA() + GetFullAddress() + Address()

Product Class
<u>_name</u> <u>_productId</u> <u>_price</u> <u>_quantity</u>
+ GetTotalCost() + GetName() + GetProductId() + Product()