Oops Questions:

Question No : 12

Create a class named **User** with the following private member variables / attributes.

- String userName
- String firstName
- String lastName
- String contact

Include a 4-argument argument constructor with following order **userName,firstName,lastName,contact**.
Include appropriate getters,setters and default constructor

This class includes the following methods:

No	Method Name	Description
1	User findUser(User userArray[],String userName)	In this method, find the appropriate user by username and return the user object, otherwise return null.
2	User findUser(User userArray[],StringfirstName,String lastName)	In this method, find the appropriate user by firstname and lastname and return the user object, otherwise return null.

Create a Main class to access the above class methods and display the user details.

[Note :Strictly adhere to the object oriented specifications given as a part of the problem statement.Use the same class names, attribute names and method names.]

Input and Output Format:
If the user is not present display 'User not found'
Refer sample input and output for formatting specification.

[All text in bold corresponds to input and the rest corresponds to output.]
Sample Input and Output 1:
Enter the total number of users
2
Enter user details
peeter,peeter,mark,9965000001
john,john,sam,9500484444
1)Search user by user name
2)Search user by first name and last name
Enter your option
1
Enter the user name to search
peeter
User details :

Username :peeter
FirstName :peeter
LastName :mark
Contact :9965000001

Sample Input and Output 2:

Enter the total number of users
1
Enter user details
suriya,suriya,sivakumar,9966554433
1)Search user by user name
2)Search user by first name and last name
Enter your option
1
Enter the user name to search
sivakumar
User not found

Question No : 13

Display container details

TheKarriers is a start-up in the logistics marketplace in the City. They are evolving to integrate the logistics network to provide transparent prices, extensive pincode coverage and powerful technology to track and manage shipments. The Company wished to expand its service boundary and decided to deploy Containers for their freight transport which would help them shorten shipping time and reduces losses from damage and theft. Containers were purchased immediately and ready for use while the Company wanted its Shipping Management System to be improved a bit more to manage, track and maintain the Container related information as well.

H elp the Company write a block of code to implement Single Inheritance and get the Container related information and display it in the specified format.
Container must have the properties of the Cargo class. Therefore, Container inherits the Cargo Class and its a single Inheritance.

Create a class named **Cargo** with the following protected member variables.

- Float length
- Float width
- Float height
- Double weight

Include appropriate getters, setters and constructors.
Use default constructor. Use getter to get the values and setter to set the values.

Create a class named **Container** that extends **Cargo** with the following private member variables.

- String containerNumber

In container class create the following public methods.

S.No	Method Name	Method Descripton
1	public void displayContainerDetails()	This method is used to display the container details.

Create another class **Main** and write a main method to test the above classes.
Print this format in display method
System.out.format("%-20s %-15s %-15s %-15s %s\n", "Container Number", "Length", "Width", "Height", "Weight")

Problem requirements :
Create container object and set all the values using getters and setters.

Input and Output Format:
The first input is an integer 'n' that corresponds to the number of containers.
The next 'n' inputs are strings. Each string consists of five comma separated values in the order container number,length, width, height and weight.
Refer sample input and output for formatting specifications.

[Note :
Strictly adhere to the object oriented specifications given as a part of the problem statement. Use the same class names and member variable names.
Follow the naming conventions mentioned for getters / setters.
Create separate classes in separate files.]

Sample Input and Output:
[All text in bold corresponds to input and the rest corresponds to output.]
Enter the number of containers :
2
Enter the container 1 details :
FRT/LKJ/025,30,70,40,10000
Enter the container 2 details :
JHG/JTR/354,40,80,30,8000
Container details are

Container Number	Length	Width	Height	Weight
FRT/LKJ/025	30.0	70.0	40.0	10000.0
JHG/JTR/354	40.0	80.0	30.0	8000.0

Question No : 14

Calculate Total Amount using Method Overriding

Anjali is so glad as its her nephew Anirudh's first birthday. She wished to send a very special birthday gift to her lilttle nephew from Canada to Singapore. She came to know the fact that a shipment can be dispatched by Agents and Companies on behalf of Customers. But she wanted to know the best means of shipping to send

her birthday gift and needs your help on the same. Total shipment cost when shipped through Companies is the sum of base price, luxury tax and corporate tax, whereas when shipped through Agents it is the sum of base price and the agent's referal fee. Write a program to guide Anjali to choose the best means of shipment.

This problem uses the concept of Method Overriding through Hierarchical Inheritance. In this type of inheritance multiple classes *inherits* from a single class the two classes “Agent” and “Company” is inherited from “Shipment” class. If the two subclasses provides the specific implementation of the method that has been already provided by one of its parent class, it is known as method overriding.

Create a class named **Shipment** class with the following protected member variables / attributes

- String name
- String source
- String destination
- Double price

Include appropriate getters and setters.
Include 4 argument constructor with argument order **Shipment(String name, String source, String destination, double price)**.
And this class includes the following method

No	Method Name	Description
1	double calculateShipmentAmount()	This is the super class method, which is overrided by the sub-classes.

Use this format for output.
System.out.format("%-15s %-15s %-15s %s","Name","Source","Destination","Total Amount").

Create a **AgentShipment** class, which extends Shipment class with the following private member variables / attributes

- Double referalFee

Include appropriate getters and setters.
Include 5 argument constructor with argument order **Agent(String name,String source,String destination,double price,double referalFee)**.
Call the super method inside the constructor with four arguements, which calls the Shipment's constructor.

And this class includes the following method

No	Method Name	Method Description
1	double calculateShipmentAmount()	In this method, calculate and return the total amount.

Create a **CompanyShipment** class,which extends Shipment class with the following private member variables / attributes

- private Double luxuryTax
- private Double corporateTax

Include appropriate getters and setters.
Include 6 argument constructor with argument order **Company(String name,String source,String destination,double price,double luxuryTax,double corporateTax)**.
Call the super method inside the constructor with four arguements, which calls the Shipment's constructor.
And this class includes the following method

No	Method Name	Method Description
1	double calculateShipmentAmount()	In this method, calculate and return the total amount.

Create a **Main** class to test the above 3 classes. Invoke the calculateShipmentAmount methods in the CompanyShipment and AgentShipment class for calculate the total shipment amount and return that calculated amount like sample output.

Problem Specification :
Calculate the total amount using method overriding.
In AgentShipment class the shipment price will be added to referal fee.
In CompanyShipment class, need some calculation to compute the total amount.
The luxury tax and corporate tax are in percentage(%).

Input and Output Format:
Print the total amount by two decimal places.
Refer sample input and output for formatting specifications.

[Note :Strictly adhere to the object oriented specifications given as a part of the problem statement.Use the same class names, attribute names and method names.]
[All text in bold corresponds to input and the rest corresponds to output.]

Sample Input and Output 1:

Enter the shipment name :
NYK Line
Enter the source :
Perth
Enter the destination :
Gold Coast
Enter the price :
1800
1. Agent
2. Company
Enter your choice :
1
Enter the referal fee :

350.50
Agent details :

Name	Source	Destination	Total Amount
NYK Line	Perth	Gold Coast	2150.50

Sample Input and Output 2:

Enter the shipment name :
Wan Hai Lines
Enter the source :
Ballarat
Enter the destination :
Albany
Enter the price :
2000
1. Agent
2. Company
Enter your choice :
2
Enter the luxury tax and corporate tax:
15
12.75
Company details :

Name	Source	Destination	Total Amount
Wan Hai Lines	Ballarat	Albany	2555.00

Question No : 15

ShipmentEntity

TransGlobal Shipping Company is a big name in the Logistics marketplace, with their global presence in over 10 countries. Having a widespread influence, the Company has huge connects with many Agents and Carriers for a customer – centric delivery.

A Shipment Entity can be handled by Customer himself, Agents, Carriers or the Company. At TransGlobal, there is enourmous shipment data flowing across and therefore they need an efficient system to handle them. Write a program that will retrieve the details of the Shipment Entity based on 4 types of people who handle it namely, Customer, Agent, Carrier and Company. Get all the details related to the Shipment Entity as input from the user.

This problem uses the concept of Hierarchical Inheritance. ShipmentEntitty Class is the parent class and 4 classes Customer, Agent, Carrier and Company extends it.

[Note : Strictly adhere to the object oriented specifications given as a part of the problem statement. Use the same class names and member variable names. Create separate classes in separate files.]

1.Create a class named **ShipmentEntity**
Include the following protected data members / attributes:

- String shipmentEntityName
- String identificationNumber

Include appropriate getters and setters and constructor
Constructor : ShipmentEntity(String shipmentEntityName,String identificationNumber).
Include the methods **void display()** which will be implemented by all its sub classes.

2.Create a class named **Customer** that extends **ShipmentEntity**
Include the following private data members / attributes:

- Integer id
- String name

Include appropriate getters and setters and constructor.
Constructor : Customer(String shipmentEntityName,String identificationNumber,Integer id,String name)
Include the following methods :

S.NO	Method Name	Method Description
1	void display()	display the customer details

Use System.out.format("%-15s %-25s %-15s %-15s\n","Name","Identification Number","Customer Id","Customer Name") in display method.

3.Create a class named **Company** that extends **ShipmentEntity**

Include the following private data members / attributes:

- String identifier
- String iata
- String fmc

Include appropriate getters and setters and constructor.
Constructor : Company(String name,String identificationNumber,String identifier,String iata,String fmc).
Include the following methods :

S.NO	Method Name	Description
1	void display()	display the company details

Use System.out.format("%-15s %-25s %-15s %-15s %-15s\n","Name","Identification Number","Company Name","IATA","FMC") in display method.

4.Create a class named **Agent** that extends **ShipmentEntity**
Include the following private data members / attributes:

- String name
- String iata
- String fmc;

Include appropriate getters and setters and constructor.
Constructor as follows Agent(String shipmentEntityName,String identificationNumber,String name,String iata,String fmc)
Include the following methods :

S.NO	Method Name	Description
1	void display()	display the agent details

Use System.out.format("%-15s %-25s %-15s %-15s %-15s\n","Name","Identification Number ","Agent Name","IATA","FMC");

5.Create a class named **Carrier** that extends **ShipmentEntity**
Include the following private data members / attributes:

- String carrierCode
- String iata

Include the following methods :
Include appropriate getters and setters and constructor.
Constuctor : Carrier(String name,String identificationNumber,String carrierCode,String iata).

S.NO	Method Name	Description
1	void display()	display the carrier details

Use System.out.format("%-15s %-25s %-15s %-15s\n","Name","Identification Number","Code Name","IATA");

Input and Output Format:
Refer sample input and output for formatting specifications.
Note : [All text in bold corresponds to input and the rest corresponds to output.]

Sample Input and Output:
Enter the number of shipment entity
3
Enter the shipment entity 1 details :
Select the shipment entity type
1)Customer
2)Company
3)Agent
4)Carrier
1
Laptop,800101,111,Rahul
Enter the shipment entity 2 details :
Select the shipment entity type
1)Customer
2)Company
3)Agent
4)Carrier
1
Micro phone,801102,211,Mitharan

Enter the shipment entity 3 details :
Select the shipment entity type
1)Customer
2)Company
3)Agent
4)Carrier
3
Electric Fan,912115,Rahul,USCTG1230,PMI/SJC/1361
Shipment details are
Enter the shipment entity type to display
Customer

Name	Identification Number	Customer Id	Customer Name
Laptop	800101	111	Rahul
Micro phone	801102	211	Mitharan

Question No : 16

Display shipment details

TransGlobal, an established Shipping Company provides a diverse set of logistics services to meet the ever changing need's of its customers and the rapidly evolving logistics market in India. It is big enough to deliver goods of any kind, to any place via air, ocean, road or rail. The Company wanted a technology brilliant automated System to accomodate such large Shipment requirements through all the above said modes of logistics.

This problem will guide you through the concept of Multilevel Inheritance, Hierarchical Inheritance and the usage of super keyword.

Implement the Inheritance hierarchy given below

Create a class named **Shipment** with the following private member variables / attributes

- int id
- String customerName
- String arrivalPort
- String departurePort
- float weight

1) Include a 5-argument argument constructor in this class. The arguments passed to the constructor are in this order **(id, customeName, arrivalPort, departurePort, weight).**
2) Include appropriate getters and setters.And this class includes the following method

No	Method Name	Method Description
1	void displayDetails()	In this method, displays the shipmetId, name,

		source,destination and weight of the shipment details.

Use this format for output. System.out.format("%-15s %-15s %-15s %-15s%-15s","Id","Customer name","Arrival port","Departure port","Weight").

Create a class named **AirTransport** class, which extends Shipment class with the following private member variables / attributes

- String airwaysName

1) Include appropriate getters and setters.
2) Include 6 argument constructor : AirTransport **(int id, String customerName, String arrivalPort, String departurePort, float weight, String airwaysName).**
Include the following method in this class

No	Method Name	Method Description
1	void displayDetails()	In this method, display the AirTransport shipment details .

Use this format for output. System.out.format("%-15s %-15s %-15s %-15s%-15s%-15s","Id","Customer name","Arrival port","Departure port","Weight","Airways name").

Create a class named **GroundTransport** class, which extends Shipment class with the following private member variables / attributes

- String capacity

1) Include appropriate getters and setters.
2) Include 6 argument constructor : GroundTransport **(int id, String customerName, String arrivalPort, String departurePort, float weight, String capacity).**

Create a class named **WaterTransport** class,which extends Shipment class with the following private member variables / attributes

- String capacity

1) Include appropriate getters and setters.
2) Include 6 argument constructor : WaterTransport **(int id, String customerName, String arrivalPort, String departurePort, float weight, String capacity).**
Call the super method inside the constructor with 5 arguements, which calls the Shipment's constructor.

Create a class named **Truck** class,which extends GroundTransport class with the following private member variables / attributes

- int sizeOfContainer

1) Include appropriate getters and setters.
2) Include 7 argument constructor : Truck **(int id, String customerName, String arrivalPort, String departurePort, float weight, int sizeOfContainer, String capacity)**.
Include the following method in this class

No	Method Name	Method Description

1	void displayDetails()	In this method, display the Truck details.

Use this format for output.

Create a class named **Rail** class,which extends GroundTransport class with the following private member variables / attributes

- int numberOfContainer

1) Include appropriate getters and setters.
2) Include 7 argument constructor : Truck **(int id, String customerName, String arrivalPort, String departurePort, float weight, int numberOfContainer, String capacity).**
Include the following method in this class

No	Method Name	Method Description
1	void displayDetails()	In this method, display the Rail details.

Use this format for output. System.out.format("%-15s %-15s %-15s %-15s%-15s%-20s%-15s","Id","Customer name","Arrival port","Departure port","Weight",Number of container","Capacity").

Create a **BulkCarrier** class,which extends WaterTransport class with the following private member variables / attributes

- String companyName

1) Include appropriate getters and setters.
2) Include 7 argument constructor : BulkCarrier **(int id, String customerName, String arrivalPort, String departurePort, float weight, String companyName, String capacity).**
Include the following method in this class

No	Method Name	Method Description
1	void displayDetails()	In this method, display the BulkCarrier details.

Use this format for output. System.out.format("%-15s %-15s %-15s %-15s%-15s%-20s%-15s","Id","Customer name","Arrival port","Departure port","Weight","Company name","capacity").

Create a **ContainerShip** class,which extends WaterTransport class with the following private member variables / attributes

- String companyName

1) Include appropriate getters and setters.
2) Include 7 argument constructor : ContainerShip **(int id, String customerName, String arrivalPort, String departurePort, float weight, String companyName, String capacity).**
Include the following method in this class

No	Method Name	Method Description
1	void displayDetails()	In this method, display ContainerShip details.

Use this format for output. System.out.format("%-15s %-15s %-15s %-15s%-15s%-20s%-15s","Id","Customer name","Arrival port","Departure port","Weight","Company name","Capacity").

Create a **Ferries** class,which extends WaterTransport class with the following private member variables / attributes

- String agentName

1) Include appropriate getters and setters.
2) Include 7 argument: Ferries **(int id, String customerName, String arrivalPort, String departurePort, float weight, String agentName, String capacity).**
Include the following method in this class

No	Method Name	Method Description
1	void displayDetails()	In this method, display the Ferries details.

Use this format for output. System.out.format("%-15s %-15s %-15s %-15s%-15s%-20s%-15s","Id","Customer name","Arrival port","Departure port","Weight","Agent name","Capacity").

Create a **Main** class to test the above 9 classes. Invoke the displayDetail methods in the corresponding classes and display the details.

[Note :Strictly adhere to the object oriented specifications given as a part of the problem statement.Use the same class names, attribute names and method names.]
[All text in bold corresponds to input and the rest corresponds to output.]

Sample Input and Output 1:
Enter the number of shipments
2
Enter the transportation 1 details :
Select the transportation mode
1)Air
2)Truck
3)Rail
4)BulkCarrier
5)ContainerShip
6)Ferries
Enter your choice
1
Enter the shipment 1 details
1,Vicky,Chennai,Mumbai,65,KingFisher
Enter the transportation 2 details :
Select the transportation mode
1)Air
2)Truck
3)Rail

4)BulkCarrier
5)ContainerShip
6)Ferries
Enter your choice
6
Enter the shipment 2 details
2,Aravi,Chennai,Australia,100,Mark,1000
Enter the mode to display
Ferries
Mode of Transportation : Water

Id	Customer name	Arrival port	Departure port	Weight	Agent name	Capacity
2	Aravi	Chennai	Australia	100.0	Mark	1000

Sample Input and Output 2:
Enter the number of shipments
3
Enter the transportation 1 details :
Select the transportation mode
1)Air
2)Truck
3)Rail
4)BulkCarrier
5)ContainerShip
6)Ferries
Enter your choice
1
Enter the shipment 1 details
1,Vicky,Chennai,Mumbai,65,KingFisher
Enter the transportation 2 details :
Select the transportation mode
1)Air
2)Truck
3)Rail
4)BulkCarrier
5)ContainerShip
6)Ferries
Enter your choice
5
Enter the shipment 2 details
2,Martin,America,India,100,12,100
Enter the transportation 3 details :
Select the transportation mode
1)Air
2)Truck
3)Rail
4)BulkCarrier
5)ContainerShip
6)Ferries
Enter your choice

5
Enter the shipment 3 details
3,mark,America,Australia,1000,10,1000
Enter the mode to display
Ferries
No shipment available

Question No : 17

Abstract Class -- WaterCarrier

Vinay and his family is going to relocate to London and they were looking for a good Shipping Company that would make their relocation hassle-free and reliable. Vinay's friend suggested him about the Gaati Group of Shipping in their locality as the Company is a reputed firm specialised especially in Ocean freight transport.

The Company had a variety of Water carriers namely Bulk Ships, Container Ships owned by Company ,Ferries(small ships) and other carriers are owned by Agents, for their shipments. Vinay placed his shipment order in the Company but was interested to know the details of different ships in each category of the Water Carriers and requested the Shipping Officer for the same. The Officer needs your help to write a block of code in fetching the details of the ships based on the category of Water carriers.

This program will help you familiarize the need of Abstract classes. Abstract class is a class that is declared abstract—it may or may not include abstract methods. Abstract classes cannot be instantiated, but they can be subclassed.

[Note : Strictly adhere to the object oriented specifications given as a part of the problem statement. Use the same class names and member variable names. Create separate classes in separate files.]

Create an abstract class named **WaterCarrier** with the following protected attributes / member variables.

- String carrierName
- String carrierCode
- String carrierType
- String iataCode
- String carrierAddress
- Include appropriate getters and setters.
- Include default constructor and 5-argument constructor,with the following order **carrierName,carrierCode,iataCode,carrierAddress,carrierType.**
- Include a abstract method **displayShipDetails()**.
- Include the following methods :

Method Name	Description
static WaterCarrier createShip(String carrierName, String carrierCode, String iataCode, String carrierAddress,String	to create and return the water carrier objects.

carrierType,Integer capacity)	
static String returnOwner(WaterCarrier waterCarrier)	to return the owner of the ship(either company or agent).

Create a class named **ContainerShips**. The class ContainerShips is a derived class of **WaterCarrier**. Include the following private attributes / member variables.

- Integer noOfContainers
- Include appropriate getters and setters.
- Include default constructor and 6-argument constructor,with the following order **carrierName,carrierCode,iataCode,carrierAddress,carrierType,noOfContainers**.

Create a class named **BulkShips**. The class BulkShips is a derived class of **WaterCarrier**. Include the following private attributes / member variables.

- Integer noOfCargoes
- Include appropriat getters and setters.
- Include default constructor and 6-argument constructor,with the following order **carrierName,carrierCode,iataCode,carrierAddress,carrierType,noOfcargoes**.

Create a class named **Ferries**. The class Ferries is a derived class of **WaterCarrier**. Include the following private attributes / member variables.

- Integer maxLoad
- Include appropriate getters and setters.
- Include default constructor and 6-argument constructor, with the following order **carrierName,carrierCode,iataCode,carrierAddress,carrierType,maxLoad**.
- Below methods are overrided in all child classes.

S.No	Method Name	Method description
1	**displayShipDetails()**	to display details of the ship

Display details using **System.out.format("%-20s%-15s%-15s%-15s%-15s%-25s%s\n","Carrier type","Name","Code","IATAcode","Location","Capacity","OwnedBy")**

Create another class called **Main**. In the method, create instances of the above classes and test the above classes.

Input and Output Format:
The ship details are entered as comma separated values with following order **carrierName,carrierCode,iataCode,carrierAddress,carrierType,capacity**

Refer sample input andoutput for formatting specifications.
All text in bold corresponds to input and the rest corresponds to output.

Sample Input and Output :
Enter the number of carriers :
3
Enter the carrier 1 details :
Titanic,CR20,IATA001,California,BulkShip,10
Enter the carrier 2 details :
Arcadia,CR21,IATA002,Mexico,ContainerShip,10
Enter the carrier 3 details :
Lexcorp,CR22,IATA003,Bermuda,Ferries,25
Ship details are
Carrier
type Name Code IATAcode Location Capacity
OwnedBy
BulkShip Titanic CR20 IATA001 California 10
cargoes Company
ContainerShip Arcadia CR21 IATA002 Mexico 10
containers Company
Ferries Lexcorp CR22 IATA003 Bermuda 25
kilograms Agent

Question No : 18

Abstract Class -- ShipmentEntity

A Shipment Entity can be handled by an Agent or the Company. At TransGlobal Logistics a globally
recognised shipping Company, be it an Agent or a Company, there is a maximum capacity(in rupees)
for each Shipment the Company allots. Now, using the concept of abstract classes and methods,
write a program to check whether the total shipment cost ofAgents/Company is within the given
capacity of Shipment. Total shipment cost when shipped through Companies is the sum of base
price, luxury tax and corporate tax, whereas when shipped through Agents it is the sum of base
price and the agent's referal fee. Write a program to compute the shipment cost and validate
whether the total shipment cost is within the given capacity.

Create an abstract class named **Shipment** with the following protected attributes / member variables

- String name
- Double weight
- Integer quantity
- Double transferCost

- Double maxShipmentCapacity
- Include a default constructor and 5-argument constructor with following order
- **name,weight,quantity,transferCost,maxShipmentCapacity.**
- Include appropriate getters and setters.
- Include following two abstract methods **abstract void calculateCost(), abstract void**

  operatingCapacity().

Create a class named **CustomerShipment**. The class CustomerShipment is a derived class of ShipmentEntity. Include the following private attributes / member variables.

- Double referalFee
- Include a default constructor and 6-argument constructor with following order **name, weight, quantity,**

  transferCost,maxShipmentCapacity, referalFee
- Include appropriate getters and setters.
- Include the following methods.

S.NO	Method Name	Method Description
1	public void calculateCost()	this method is used to compute cost for the Customer
2	public void operatingCapacity()	this method is to check whether the shipment is within the maximum shipment capacity of customer

Create a class named **CompanyShipment**. The class CompanyShipment is a derived class of ShipmentEntity. Include the following private attributes / member variables.

- Integer tax

Include a default constructor and 6-argument constructor with following order **name, weight, quantity, transferCost,**
maxShipmentCapacity,tax
Include appropriate getters and setters.
Include the following methods.

S.NO	Method Name	Method Description
1	public void calculateCost()	this method is to compute tax for the corresponding cost and display it.
2	public void operatingCapacity()	this method is to check whether the shipment is within the maximum shipment capacity of company.

Create another class called **Main**. In the method, create instances of the above classes and test the above classes.

Input and Output Format:
Refer sample input andoutput for formatting specifications.

[All text in bold corresponds to input and the rest corresponds to output.]
Sample Input and Output 1:
1. Customer Shipment
2. Company Shipment
Enter your choice :
1
Enter the name :
Saisaran
Enter the weight :
100
Enter the quantity :
20
Enter the shipment transfer cost :
500
Enter the maximum shipment capacity :
30
Enter the referal fee :
100
Cost for the shipment is 1000100.0
The shipment is not within the shipping capacity of the agent

Sample Input and Output 2:
1. Customer Shipment
2. Company Shipment
Enter your choice :
2
Enter the name :
Haritha
Enter the weight :
20
Enter the quantity :
30
Enter the shipment transfer cost :
150
Enter the maximum shipment capacity :
800
Enter the tax percentage:
3
Cost for the shipment is 92700.0
The shipment is within the shipping capacity of the company

Question No : 19

Carrier maintainance

TransGlobal Shipping Company has widespread influence in the Logistics marketplace, with their global presence in over 10 countries. They are capable to deliver goods of any kind, to any place via air, ocean, road or rail. The Company maintains a repository of information related to the details of various Carriers. As a part of Carrier mainenance, there are numerous operations like creating a new

Carrier information, retrieving information on existing carriers, updating information and deleting them if its no longer needed. Write a program using the concept of Interfaces to let the company perform all the above said operations on Carriers. Here 'Carrier' class should implement the 'IMaintainCarrier' Interface which inturn contains a set of methods.

An interface is a reference type, similar to a class, that can contain *only* constants, method signatures, default methods, static methods, and nested types. Method bodies exist only for default methods and static methods. Interfaces cannot be instantiated—they can only be *implemented* by classes or *extended* by other interfaces.

Create a "**Carrier**" class and an interface "**IMaintainCarrier**" . The carrier class should implement the IMaintainCarrier interface and maintain the carrier details using the methods in the interface.

Create a interface **IMaintainCarrier** with the methods

S.no	Method name	Method description
1	public Carrier createCarrier(String carrierValues)	This method will create a new carrier object and return the created carrier object.
2	public Carrier retrieveCarrier(String carrierCode, Carrier[] carrierArray)	This method is will search a carrier in carrier array with the given carrier code. If the carrier is found then return the carrier object, else return null.
3	public Boolean deleteCarrier(String carrierCode, Carrier[] carrierArray)	This method is used to delete a carrier value from the carrier array with the given carrier code. If the carrier value is found and deleted then return true, else return false.
4	public Boolean updateCarrier(String carrierCode, Carrier[] carrierArray, String carrierValues)	This method is used to update the value in a carrier using carrier code. But this method won't change the carrier code. If the carrier code is found then update the value and return true, else return false.

Create a class **Carrier** . The class implements **IMaintainCarrier**. The Carrier class has the following private members

- String iataCode

- String user
- String address
- String carrierCode

Implement all the methods specified in **IMaintainCarrier** interface in the carrier class.

Include the following method in carrier class

S.no	Method name	Method description
1	public void display(Carrier[] carriers)	This method is used to display all the values in the carrier array.

Write appropriate getters & setters and default constructor for the class.
Naming Conversion:
Getter: getUser, getAddress…
Setter: setUser, setAddress…

Carrier details is in format:
System.out.format("%-15s %-15s %-15s %s\n","IATA Code","User Name","Address","Carrier code")

Input/Output format:
Refer sample input and output for formatting specifications.

[Note :
Strictly adhere to the object oriented specifications given as a part of the problem statement.
Use the same class names and member variable names.
Follow the naming conventions mentioned for getters / setters]

Sample Input and Output:
[All text in bold are input and the remaining are output]

Carrier Maintainance
1.Create carrier
2.Retrieve carrier
3.Delete carrier
4.Update carrier
5.Display
Enter your choice :
1
Enter the carrier values :
KJSNDXJ87,Mark Antony,England,CON001
Carrier successfully created.
Do you want to continue(yes/no) :
yes
Carrier Maintainance
1.Create carrier

2.Retrieve carrier
3.Delete carrier
4.Update carrier
5.Display
Enter your choice :
1
Enter the carrier values :
KJHSBHHJ987,Bill Clinton,USA,CON002
Carrier successfully created.
Do you want to continue(yes/no) :
yes
Carrier Maintainance
1.Create carrier
2.Retrieve carrier
3.Delete carrier
4.Update carrier
5.Display
Enter your choice :
2
Enter the carrier code to retrieve :
CON02
Carrier code not found.
Do you want to continue(yes/no) :
yes
Carrier Maintainance
1.Create carrier
2.Retrieve carrier
3.Delete carrier
4.Update carrier
5.Display
Enter your choice :
2
Enter the carrier code to retrieve :
CON002
Carrier details :
IATA code : KJHSBHHJ987
User : Bill Clinton
Address : USA
Carrier code :CON002
Do you want to continue(yes/no) :
yes
Carrier Maintainance
1.Create carrier
2.Retrieve carrier
3.Delete carrier
4.Update carrier
5.Display
Enter your choice :
4
Enter the carrier code to update :

CON002
Enter the carrier values :
KJHSBHHJ987,Bill Clinton,Australia
Carrier successfully updated.
Do you want to continue(yes/no) :
yes
Carrier Maintainance
1.Create carrier
2.Retrieve carrier
3.Delete carrier
4.Update carrier
5.Display
Enter your choice :
3
Enter the carrier code to delete :
CON11
Carrier code not found.
Do you want to continue(yes/no) :
yes
Carrier Maintainance
1.Create carrier
2.Retrieve carrier
3.Delete carrier
4.Update carrier
5.Display
Enter your choice :
5

IATA Code	User Name	Address	Carrier code
KJSNDXJ87	Mark Antony	England	CON001
KJHSBHHJ987	Bill Clinton	Australia	CON002

Do you want to continue(yes/no) :
yes
Carrier Maintainance
1.Create carrier
2.Retrieve carrier
3.Delete carrier
4.Update carrier
5.Display
Enter your choice :
3
Enter the carrier code to delete :
CON002
Carrier successfully deleted.
Do you want to continue(yes/no) :
yes
Carrier Maintainance
1.Create carrier
2.Retrieve carrier
3.Delete carrier
4.Update carrier

5.Display
Enter your choice :
4
Enter the carrier code to update :
CON002
Enter the carrier values :
KJHSBHHJ987,Bill Clinton,USA
Carrier code not found.
Do you want to continue(yes/no) :
yes
Carrier Maintainance
1.Create carrier
2.Retrieve carrier
3.Delete carrier
4.Update carrier
5.Display
Enter your choice :
5
IATA Code User Name Address Carrier code
KJSNDXJ87 Mark Antony England CON001
Do you want to continue(yes/no) :
no

Question No : 20

Display shipment details

A Shipping management System has many entities similar to Shipment Entity and there will arise a need for the data related to few entities
of one system to be communicated to other systems. Write a program that would implement a predefined interface to export data in given
formats. The entites should implement 2 methods – one to display the details in the format of JSON and the other in the format of CSV.

Create a class named **Shipment** with the following protected member variables / attributes

- int id
- String name
- String arrivalPort
- String departurePort
- ShipmentStatus status

1) Include appropriate getters and setters.
2) Include a default and 5 argument constructor with argument order **id,name,arrivalPort,departurePort,ShipmentStatus status.**

Create a class named **ShipmentStatus** with the following private member variables / attributes

- String code

- String name

1) Include appropriate getters and setters.
2) Include a default and 2 argument constructor with argument order **code,name**

Create a class named **ShipmentBO** which implements IExportData interface. It has an implementation of the two methods in the
IExportData interface .

Create an interface named **IExportData** with the following methods

No	Method Name	Method Description
1	void convertToJSON(Shipment[] shipmentObj)	In this method, display the shipment details in the format of JSON.
2	void convertToCSV(Shipment[] shipmentObj)	In this method, display the shipment details in the format of CSV.

Create **Main** class and in the main method create instances of the above class and test them.

Input Format:
Get the Shipment details which is seperated by comma(,).
The input format for shipment details is
id,shipmentName,arraivalPort,departurePort,shipmentStatusCode,shipmentStatusName.
Refer sample input and output for formatting specifications.

**[Note :Strictly adhere to the object oriented specifications given as a part of the problem statement.Use the same class names,
attribute names and method names.]**
[All text in bold corresponds to input and the rest corresponds to output.]

Sample Input and Output 1 :
Enter the number of shipment
1
Enter Shipment 1 details
1,NonFood,Chennai,Kolkata,DEL,Delivered
Enter the type to display the data (JSON/XML)
json
JSON Data:
[
{
"id":1
"name":"NonFood"
"arrivalName":"Chennai"
"departureName":"Kolkata"
"shipmentCode":"DEL"
"shipmentName":"Delivered"

}
]

Sample Input and Output 2 :
Enter the number of shipment
1
Enter Shipment 1 details
10,Cake,America,Australia,PEN,Pending
Enter the type to display the data (JSON/CSV)
CSV
CSV Data:
10,Cake,America,Australia,PEN,Pending

10th

Question No : 21

Calculating revenue and tax

A Shipment Entity can be handled by Customer himself, Agents, Carriers or the Company. When handlling a Shipment Entity the Agent and Company has to comply to certain formalities like total revenue earned and tax filing amount, whereas a Carrier should comply to rules like printing the minimum number of ports and list the ports. Write a program to get the shipment entity details as input, create Menus separately for Company, Agent and Carrier, and display the informations respective to each of them.

Below are the problem constraints:
1. For a Company, tax payable is 8% of profit and for an Agent tax payable is 5% of commision.
2. Company Id should start with the String “CO”.
3. Agent Id should start with the String “AG”.
4. Carrier Id should start with the String “CA”.

The problem has three Class Company, Agent and Carrier. Every class has to implement the MenuDrivenEntity Interface. Company and Agent should Implement Taxpayer Interface. Carrier should implement ICarrier Interface.

Create an Interface called **MenuDrivenEntity** with the following methods

S. no	Method name	Method description
1	public void displayMenu()	This method is used to display the menu with choice for each entity.
2	public void choiceAction(int choice)	This method is used to check for the choice and call the particular action for the choice and display the details.

Create an Interface called **TaxPayer** with the following methods

S. no	Method name	Method description
1	public Double calculateRevenue()	This method is used to calculate the revenue and return the value.

		Revenue is the sum of expense and profit (in the case of Company). Revenue is the sum of expense and commission(in the case of Agent).
2	public Double calculateTax()	This method is used to calculate the tax and return the value. For Agent tax is 5% of commission and for Company tax is 8% of profit.

Create an Interface called **ICarrier** with the following methods

S. no	**Method name**	**Method description**
1	public void listOfPorts()	This method is used to display all the ports
2	public void noOfPorts()	This method is used to display the number of ports in the list.

Create a class called **Carrier** with the following private member variables

- String id
- Double expense
- String modeOfTransport
- String[] listOfPorts

Create a single argument constructor with attribute (String value).

The value consists of all attibute values in csv format. Split the String value and store the attribute values.

Implement the methods in MenuDrivenEntity and ICarrier Interface.
Write appropriate getters & setters.

Create a class called **Agent** with the following private member variables

- String id
- Double expense
- Double commission

Create a single argument constructor with attribute (String value).

The value consists of all attibute values in csv format. Split the String value and store the attribute values.

Implement the methods in MenuDrivenEntity and TaxPayer Interface.
Write appropriate getters & setters.

Create a class called **Company** with the following private member variables

- String id
- Double expense

- Double profit

Create a single argument constructor with attribute **value** of type String.

The value consists of all attibute values in csv format. Split the String value and store the attribute values.

Implementthe methods in MenuDrivenEntity and ICarrier Interface.
Write appropriate getters & setters.
Example:
Attribute - id
Method - getId(), setId(String id)

Create a driver class named **Main** and in the main method create instances of the above classes and test them.

Input and Output Format:
Refer Sample Input and Output for formatting specifications.
All Double values are displayed correct to 1 decimal place.

[Note: Strictly adhere to the object oriented specifications given as part of the problem statement. Use the same class names and member variable names.]

[All text in bold are input and the remaining are output]
Sample Input and Output 1:
Enter the number of shipment entity :
3
Enter the entity 1 details :
CO001,500000,100000
Enter the entity 2 details :
AG001,25000,10000
Enter the entity 3 details :
CA001,60000,Airway,HongKong,Kolkata,Mumbai,Tuticorin,LosAngeles
Enter the entity id :
CA001
Carrier menu
1.List the ports
2.Calculate number of ports
1
List of ports :
HongKong
Kolkata
Mumbai
Tuticorin
LosAngeles

Sample Input and Output 2:
Enter the number of shipment entity :
2
Enter the entity 1 details :

CO01,60000,1000
Enter the entity 2 details :
CA001,60000,Airway,HongKong,Kolkata,Mumbai,Tuticorin,LosAngeles
Enter the entity id :
CA001
Carrier menu
1.List the ports
2.Calculate number of ports
2
Number of ports :5

Sample Input and Output 3:
Enter the number of shipment entity :
2
Enter the entity 1 details :
CO001,80000,22000
Enter the entity 2 details :
AG002,20000,5000
Enter the entity id :
AG002
Agent menu
1.Calculate agent revenue
2.Calculate agent tax
1
Revenue for AG002 is 25000.0

Sample Input and Output 4:
Enter the number of shipment entity :
2
Enter the entity 1 details :
AG005,65000,32000
Enter the entity 2 details :
CO010,88000,61000
Enter the entity id :
CO010
Company menu
1.Calculate company revenue
2.Calculate company tax
2
Tax for CO010 is 4880.0

EXCEPTION HANDLING : 4 problems:

Question No : 22

Arithmetic Exception The Datax shipping company wants to calculate the average cost of each item in the container. Get the	

container price and the number of items in the container as input. Write a program to get the average cost of
each item. This program will throw an arithmetic exception when number of items in the container is
zero(divide by zero). Use Exception handling mechanism to handle the exception. Use single try and catch
block. In catch block print the exception thrown.

Problem Specification :
The file name should be Main.java

Input format :
The first integer consists of an integer which corresponds to the number of items in the container.
The second integer consists of an integer which corresponds to the total amount of items in the container.

Output format :
The output consists of an Integer value which corresponds to the average cost of the item.
If the number of items in the container is 0 it will throw an exception, print the exception in the specified format.
Refer sample input and output for display specifications.

[All text in bold corresponds to input and rest corresponds to output]
Sample Input and Output 1:
Enter the container price :
12000
Enter the number of items in the container :
0
Exception : java.lang.ArithmeticException

Sample Input and Output 2:
Enter the container price :
35000
Enter the number of items in the container :
500
The average price of the item is Rs.70

Question No : 23

Number Format Exception

The Datax shipping company wants to calculate the total cost of each item in the container. Get the number of items in container and cost
of each item as input. Write a program to calculate the total cost of each item in the container. This program will throw
a NumberFormatException when cost of a item is not a number. Use Exception handling mechanism to handle the exception.

Problem specification:
The file name should be Main.java

Input and Output format:
Refer sample input and output for formatting specifications.
[All text in bold corresponds to input and the rest corresponds to output]

Sample Input and Output 1:
Enter the total number of items
5
Enter the shipping price of the item 1 :
10
Enter the shipping price of the item 2 :
67
Enter the shipping price of the item 3 :
26
Enter the shipping price of the item 4 :
14
Enter the shipping price of the item 5 :
2
Total cost of the container is 119

Sample Input and Output 2:
Enter the total number of items
3
Enter the shipping price of the item 1 :
1
Enter the shipping price of the item 2 :
hai
Exception : java.lang.NumberFormatException
Re-enter the item price :
3
Enter the shipping price of the item 3 :
10
Total cost of the container is 14

Question No : 24

Invalid port Exception

Shilpa is a regular Customer of TeCo Shipping Company. She once wanted to transfer few goods from India to her brother at Singapore.
She placed a shipment order through the Company's official Shipping Management System giving all the needed details.
The System gets the shipment id and shipment name as the input and displays a list of available ports. From the list of available ports
Shilpa is allowed to select the arrival and departure ports for her shipment. Write a program to implement this requirement and
when both arrival and departure ports are the same, it should throw an custom exception named **InvalidPortException.**
Use Exception handling mechanism to handle the exception.

Exception Specification :
Throw exception for the following scenario
When both arrival and departure ports are the same throw exception

Create a class named **Shipment** with the following private member variables / attributes

- **Integer id**
- **String name**
- **Port arrivalPort**
- **Port departurePort**
- Include a 4-argument argument constructor in this class. The arguments passed to the constructor are in the

  following order --- **id,name,arrivalPort,departurePort**.
- Include appropriate getters and setters.

Create a class named **Port** with the following private member variables / attributes

- **Integer id**
- **String country**
- **String name**
- Include a 3-argument argument constructor in this class. The arguments passed to the constructor are in

  this order --- **id,country,name.**
- Include appropriate getters and setters.

Create a class named **ShipmentBO** with the following private member variables / attributes
Include a method.

S.No	Method Name	Method description
1	Boolean validateShipment(String s1,String s2,Port[] p)	to check whether the port is valid or invalid.
2	void displayShipmentDetails(Shipment shipmentObj,port[] ports,String p1,String p2)	to diplay the shipmentdetails.

Create a class named **InvalidPortException**
It will display **"Invalid Port".**
Create a class **Main** and write a main method to test the above class.

Note:
Port details are pre populated.Choose the port details from pre the populated data.
If the chosen port details are in lower case ,handle the case and display the output in upper case.

Problem Specification:
1)Create a custom exception named as **InvalidPortException.**
2)Use System.out.format("%-15s%-15s%-15s%-15s\n", "Shipment id","Shipment name","Arrival place","Departure place") to display the

shipment details.

[Note :Strictly adhere to the object oriented specifications given as a part of the problem statement.Use the same class names,

method names and attribute names.]

Input and Output Format:
Refer sample input and output for formatting specifications.

[All text in bold corresponds to input and the rest corresponds to output.]
Sample Input and Output 1:
Enter the Shipment Id
1
Enter the Shipment Name
Food item
Available ports are
ID Country PortName
1 India Chennai
2 America California
3 England London
4 Australia Melbourne
Enter the arrival port name
Chennai
Enter the departure port name
Melbourne
Shipment Details :
Shipment id Shipment name Arrival place Departure place
1 Food item Chennai/India Melbourne/Australia

Sample Input and Output 2:
Enter the Shipment Id
1
Enter the Shipment Name
Electronic items
Available ports are
ID Country PortName
1 India Chennai
2 America California
3 England London
4 Australia Melbourne
Enter the arrival port name
California
Enter the departure port name
California

InvalidPortException: The port name is invalid

Question No : 25

Container Overloaded Exception

The DataX Shipping Company is a leading logistics Company that transports goods from one location to another. There are cases in such
shipping Companies that during loading Containers, employees unknowingly add extra weight into the containers. In order to caution
the employee regarding the overload, write a program to add the weight of every item added to the container and if the added weight of
the items exceeds the actual capacity of the container throw an exception named **"ContainerOverloadedException**".

Create a class named **Commodity** with the following private member variables / attributes

- **String commodityId**
- **Float totalWeight**
- **Integer quantity**
- Include a 3-argument constructor with argument in this order --- **commodityId,totalWeight,quantity**.
- Include appropriate getters and setters.

Create a class named **Container** with the following private member variables / attributes

- **String number**
- **Float containerWeight**
- **Commodity[] commodities**

1) Include 3-argument construtor with arguments in this order --- **number,containerWeight,commodities.**
2) Include a method named as **displayDetails()** in Container to display the container details.

S.No	Method Name	Method description
1	void displayDetails()	to display the commodity details

Create a class named **ShipmentBO** with the method validate.
--- **validate(Container,Commodity[])** to check whether the weight of commodities is less than capacity of the container.

S.No	Method Name	Method description
1	void validate(Container container, Commodity[]commodity)	To check whether the weight of all the commodities is less than capacity of the container. If it satisfies the above condition display the commodity details or else throw ContainerOverloadedException.

Create a class name **ContainerOverloadedException** which extends Exception. If any exception occurs in the above class throw
the exception to this **ContainerOverloadedException**class with custom message. This class will handle the exception

Create a class **Main** and write a main method to test the above class.

Hint:
Invoke the displayDetails method from main class and
throw **ContainerOverloadedException** from the ShipmentBO class.

Problem Specification:
1) Commodity details are entered by comma separated values in the following order**(commodityId,totalWeight,quantity)**.
2) Create a custom exception named as **ContainerOverloaded**.
3) Check whether all commodities loaded into the container.If all commodities are loaded display the commodity details or else throw ContainerOverloaded exception display the string Container is overloaded.
4) Use **System.out.format("%-15s%-15s%s\n", "Id","Weight","Quantity")** to display the commodity details.

**[Note :Strictly adhere to the object oriented specifications given as a part of the problem statement.Use the same class names,
method names and attribute names.]**

Input and Output Format:
Refer sample input and output for formatting specifications.All text in bold corresponds to input and the rest corresponds to output.

Sample Input and Output 1:
Enter the container number :
C001
Enter the capacity of container :
40
Enter the number of commodities :
4
Enter the commodities :
CM01,10,1
CM02,20,2
CM03,5,1
CM04,5,1
Commodity details are

Id	Weight	Quantity
CM01	10	1
CM02	20	2
CM03	5	1
CM04	5	1

Sample Input and Output 2:
Enter the container number :
C001
Enter the capacity of container :
40
Enter the number of commodities :
4
Enter the commodities :
CM01,10,4
CM02,20,2
CM03,10,1
CM04,10,2
ContainerOverloadedException: Container is overloaded