

Core Java Exercises

General Instruction:

1. For doubt clarification please login to <https://im.htcindia.com> with your eportal credentials
2. Fill your profile by clicking image icon on top left corner.
3. Select group chat menu icon and fill the form as follows (conference.im.htcindia.com).
4. Click on show group chat button and choose LnB2020-Core Java.
5. Technical trainer will be available from 10 AM to 11 AM IST on week days in IM for doubt clarification.

Scenario: JavaPetShop

Java Language Basics conditional statements:

1. Calculate the discount applicable for "JavaPetshop" customers
 - a) if the customer is a Premium member then 20% discount is applicable on total bill value.
 - b) if the customer is a Gold member then 15% discount is applicable on total bill value.
 - c) if the customer is a Silver member then 10% discount is applicable on total bill value.
 - d) for all other customers the discount will be 5% of their total bill valued over 2000.
2. Implement the following logic to select the mode of transport for dispatching Pet animals from our "JavaPetshop" (DO NOT use logical operators)
 - a) If priority is not urgent and the weight is less than or equal to 5 Kg, dispatch by Bike.
 - b) If priority is not urgent and the weight is more than 5 Kg, select a lorry if the distance is less than or equal to 250 Km.
 - c) If the priority is urgent and distance is less than 50 Km and weight is less than 100 Kg, select a van
 - d) In all other cases, use a train

Loops:

3. Pet spa at JavaPetShop is open three days in a month, write a code snippet for a search algorithm to identify the next available dates & day of the Pet Spa in a month. Provide current date as search Key.

Array:

4. Write a code snippet to retrieve the pending Pet delivery list based on the given order Id's.

Sample input

Order List:

OR233	OR205	OR220	OR200	OR302	OR190	OR197	OR250
-------	-------	-------	-------	-------	-------	-------	-------

Delivered List:

OR190	OR200	OR205
-------	-------	-------

Sample output

Pending Delivery List:

OR233	OR220	OR302	OR197	OR250
-------	-------	-------	-------	-------

5. Implement the logic to calculate the total bill value for “JavaPetShop” customers.

Customer's ID	Pet's ID	Quantity
CR123	PR100	3
CR320	PR120	2
CR156	PR500	2
CR489	PR264	1
CR321	PR486	1

Pet's ID	Cost in Rs
PR100	1500.00
PR120	560.00
PR500	2600.00
PR264	700.00
PR486	350.00

String & functions:

6. Write a function validateEmail to validate the customers email ID which satisfy the below conditions

```
boolean validateEmail(String email){  
    ....  
    ....  
}
```

- a) Email id should not start with '.' and '@'
- b) Email id should end with either 'm' or 'n'
- c) Email id should have '@' only once
- d) Should have '.' after '@' but not immediately
- e) '_' should come before '@' symbol
- f) Length should be minimum 10 maximum 30

7. Identify Function prototype for the following requirements.
- a) Online shopping
 - b) E-ticket application
 - c) Fund transfer application
 - d) Mobile Recharge application
8. Create a function that takes the generated SMS as input and does the following validation
- a) Length of the sentence should not exceed maximum of 100 characters.
 - b) Sentence should have at-least one comma.
 - c) Sentence should not have dot in between.
 - d) Should not start and end with spaces.
 - e) Should end with dot.

Classes & Object

OOPS

9. Represent the JavaPetStore as a Class and provide its state and behaviors as follows.
- a) Create a class named Pet with the member variables petID, type, DOB, price, quantity. Generate getters & setters and constructors for all the member variables. Create an object for Pet class and assign values through setter methods and print the values in the console using getters.
 - b) Create a class PetStore with the member variables storeID,name,address and an array of Pet. Generate necessary constructors and getters & setters.
 - c) Prepare an interface IStoreServiceProvider which has the following methods.

```
public Pet searchPet(int petID);

public Pet[ ] availablePets();

public boolean updatePetDetails(Pet updatedPet);

public boolean sellPet(int petID,int quantity);
```

Perform necessary validations before implementing CRUD operation methods.

10. Prepare classes and business logic to represent the purchase order of JavaPetStore.

a) Introduce a method purchaseOrder in IStoreServiceProvider to purchase pet for our JavaPetStore

```
public boolean purchaseOrder(String petType, int quantity);
```

b) Create an abstract class SupplierServiceProvider class with an abstract method sellPets(petType, quantity) method from Supplier.

c) Prepare a class Supplier with the member variables supplierID, name, address and array of Pet to override the method sellPets(petType, quantity)

11. Identify the class names for the following apps:

- a) UBER App
- b) Amazon App c)
- IRCTC App d)
- Swiggy App
- e) Eportal App

12. Pick class names from the given list

Excellent
Lazy status
age transferMoney
productId
HTCGloabalservices
mobilenumber
Ram
sleep
fast
eating

Exception Handling:

throw, throws, try, catch & finally

13. Prepare UserDefined Exception classes to handle the exceptions in JavaPetStore. a)

Introduce an UserDefined exception class PetNotFoundException, alter the IStoreServiceProvider to incorporate this exception.

b) Introduce another exception class InsufficientPetException to handle insufficient quantity.

Collections:

List, Set & Map

14. Introduce a collection type (List or Set) in our PetStore instead of an array of Pet and update the business logic in PetStore CRUD methods.

15. Create a class Customer and map the customers to their Pets (update the existing classes as required) **ConcurrentHashMap<Integer, List<Pet>>** pets. Write necessary Interface and implementation class for the CRUD operations on Pets.

16. Implement the default sorting order for Pet class objects by implementing Comparable<Pet> interface. (Overload hashCode and equals method in all Entity class)

17. Create custom sorting order for Pet class based on petType, DOB, price, quantity.

Input/Output Stream: File Handling

18. Redo Question #6 & #8 with Regular expressions.

19. Prepare a log configuration with Log4j or Util logger to log the error messages and to track the application process in a log file.

20. Create an Address class to capture the address of our PetStore. Write a code snippet to Serialize PetStore object in a file "PetStore.txt". PetStore has Address as one of its property, which is not a Serializable type.

21. Consider the below excel files to prepare Transaction file by calculating the bill value of Orders placed in JavaPetStore & update Qty in hand in PetDetails file, provide read, write and update counter and log the count in a log file.

Handle necessary exceptions such as EmptyFileNotFoundException, PetNotFoundException, InsufficientPetException.

a) If the PetID is not available in PetDetails file move the order record to pending file and mark the status as NA (Not Available).

b) If the PetID is available in PetDetails file and the quantity on hand is less than quantity requested move the order record to Pending file and marks the status as NS (Not Sufficient).

OrderFile.xls

OrderID	PetID	Qty requested
OR233	PR100	3
OR205	PR120	2
OR220	PR458	10
OR200	PR265	1
OR302	PR265	2
OR190	PR078	4
OR197	PR089	2
OR250	PR300	1

PetDetailsFile.xls

PetID	Cost in Rs.	Qty in hand
PR100	1500.00	10
PR120	560.00	30
PR458	2600.00	5
PR265	700.00	15
PR265	350.00	6
PR078	180.00	200
PR089	650.00	50
PR301	500.00	30

TransactionFile.xls

OrderID	Bill Value
OR233	4500.00
OR205	1120.00
OR220	2600.00
OR200	700.00
OR302	700.00
OR190	720.00
OR197	1300.00
OR250	500.00

PendingFile.xls

OrderID	PetID	Status
OR250	PR300	NA
OR220	PR458	NS

Internationalization:**Date Format & Resource bundle**

22. Create a property file which contains PetID and system path to locate an image of a pet.
Introduce an image field in pet class and update the Pet image field by reading the property file.

23. Write a code snippet to format the type, DOB & Cost of our pet. Display the formatted data in 5 difference Locales.

24. Consider a property file “ApplicationResource.properties” consist of Customer name & next vaccination date(dd/MM/yyyy) for their pet.

Write a function to read the property file and generate an SMS & E-mail message for “JavaPetShop” customers to remind the next vaccination date for their Pet’s.

Output Message:

Dear < **Customer Name** > ,

Greeting of the day, we are pleased to inform you that your Pet’s next vaccination date is < **Date** >.

JDBC: (Read the connection properties from a property file)

Statement, PreparedStatement, CallableStatement

25. A Service file has details about serviceId, ServiceDescription and price, read the data from the file , validate and load the data to services table.

Possible values for Services Description are tooth brushing, hair styling, pawdicure (Use Enum to hold the values)

- Use Prepared Statement for JDBC implementations.
- Write the invalid data to rejection file
- Log the read and insert counter
- Redo the same question with .XLS , .CSV
- Handle EmptyFileException

26. Create a Customer class to keep track of “JavaPetStore” customers.

- Write SQL function / procedure to perform the CRUD operations.
- Use Callable statement for JDBC implementations.

27. Create a class Order to maintain the orders placed by each customer.
 - a) Write SQL function / procedure to perform the CRUD operations.
 - b) Use Callable statement & WebRowset for JDBC implementations.
 - c) A customer can place many orders.
28. Create a function to unload the customer records from the customer table
 - a) Write SQL function / procedure to perform the unload operation.
 - b) Use Callable statement for JDBC implementations.
29. Redo Question #20 with same files and PetDetails alone as a table.