

Search for Trains - JDBC

Indian Railways Department wants to automate a process in their system. The train details are available in the database. The user should have a facility to search and view the trains based on a particular coach type available in the train which starts from a particular source place and ends in a particular destination place. A train can have various coach types among AC1, AC2, AC3, Sleeper and Seater.

You being their software consultant have been approached by them to develop an application which can be used for managing their business. You need to implement a Java program to view all the train which runs between a source and a destination with a particular coach type. Display the trains in a sorted order based on train number.

Component Specification: Train (Model Class)

Type(Class)	Attributes	Methods
Train	int trainNumber String trainName String source String destination int ac1 int ac2 int ac3 int sleeper int seater	

Note: Appropriate public getters, setters and a nine argument constructor in the given order – trainNumber, trainName, source, destination, ac1, ac2, ac3, sleeper, seater are provided as a part of the code template.

Requirement: Retrieve all the trains between source and destination with the required coach type. The user should have a facility to search and view the trains which runs between a source and a destination with a particular coach type. Hence the system should fetch all the train details for the given source and destination which contains the given coach type, from the database. There can be more than one train which suits for the given requirement. So, the train details should be retrieved in a sorted order based on train number. Add all those train details into an ArrayList and return the same.

Component Specification: TrainManagementSystem

Component Name	Type (Class)	Methods	Responsibilities
Retrieve all the trains between source and destination with the given coachType	TrainManagementSystem	public ArrayList<Train> viewTrain (String coachType, String source, String destination)	This method should accept a coachType, source and destination as parameters and retrieve all the trains with the given coach type that runs between the source and destination from the database in ascending order based on train number. Return these details as ArrayList<Train>.

The train table is already created at the backend. The structure of train table is:

Column Name	Data Type
train_number	int
train_name	varchar(30)
source	varchar(30)
destination	varchar(30)
ac1	int
ac2	int
ac3	int

sleeper	int
seater	int

Sample records available in train table are:

train_number	train_name	source	destination	ac1	ac2	ac3	sleeper	seater
13005	Dehradun Mail	Howrah	Dehradun	3	0	3	5	0
13009	Doon Express	Howrah	Dehradun	5	5	10	0	0
22119	Pune Express	Mumbai	Pune	3	0	0	10	5
12123	Deccan Queen	Mumbai	Pune	0	7	0	5	0
15635	Dwarka Express	Okha	Guwahati	0	0	0	11	6
51422	Mumbai Pune Passenger	Mumbai	Pune	0	0	0	0	21
14645	Shalimar Express	Delhi	Jammu Tawi	0	8	7	0	2

To connect to the database you are provided with database.properties file and DB.java file. (Do not change any values in database.properties file)

Create a class called Main with the main method and get the inputs like source, destination and coachType from the user. The coachType should be any one among AC1, AC2, AC3, Sleeper and Seater (Case In-sensitive). If coachType is valid, then call viewTrain method in TrainManagementSystem class. Otherwise, display the output as "Invalid Coach Type".

Display the details of train such as trainNumber and trainName for all the trains returned as ArrayList<Train> from the method viewTrain in TrainManagementSystem class.

If no train is available as per the requirement, the output should be "No trains found".

Note:

- In the Sample Input / Output provided, the highlighted text in bold corresponds to the input given by the user and the remaining text represents the output.
- Ensure to follow object oriented specifications provided in the question description.

Ensure to provide the names for classes, attributes and methods as specified in the question description.

- Adhere to the code template, if provided.
- In database, the coach type of train is given as separate columns. This represents the number of respective coaches available in the train.
- The following Sample Inputs / Outputs are generated based on the above mentioned Sample records given in train table.

Sample Input / Output 1:

Enter the source

Howrah

Enter the destination

Dehradun

Enter the coach type

AC2

13009 Doon Express

Sample Input / Output 2:

Enter the source

Mumbai

Enter the destination

Pune

Enter the coach type

Sleeper

12123 Deccan Queen

22119 Pune Express

Sample Input / Output 3:

Enter the source

Okha

Enter the destination

Guwahati

Enter the coach type

AC

Invalid Coach Type

Sample Input / Output 4:

Enter the source

Okha

Enter the destination

Guwahati

Enter the coach type

AC1

No trains found