2018/19

Kingston University London

CI5320 Database Application Development

Coursework 1 -

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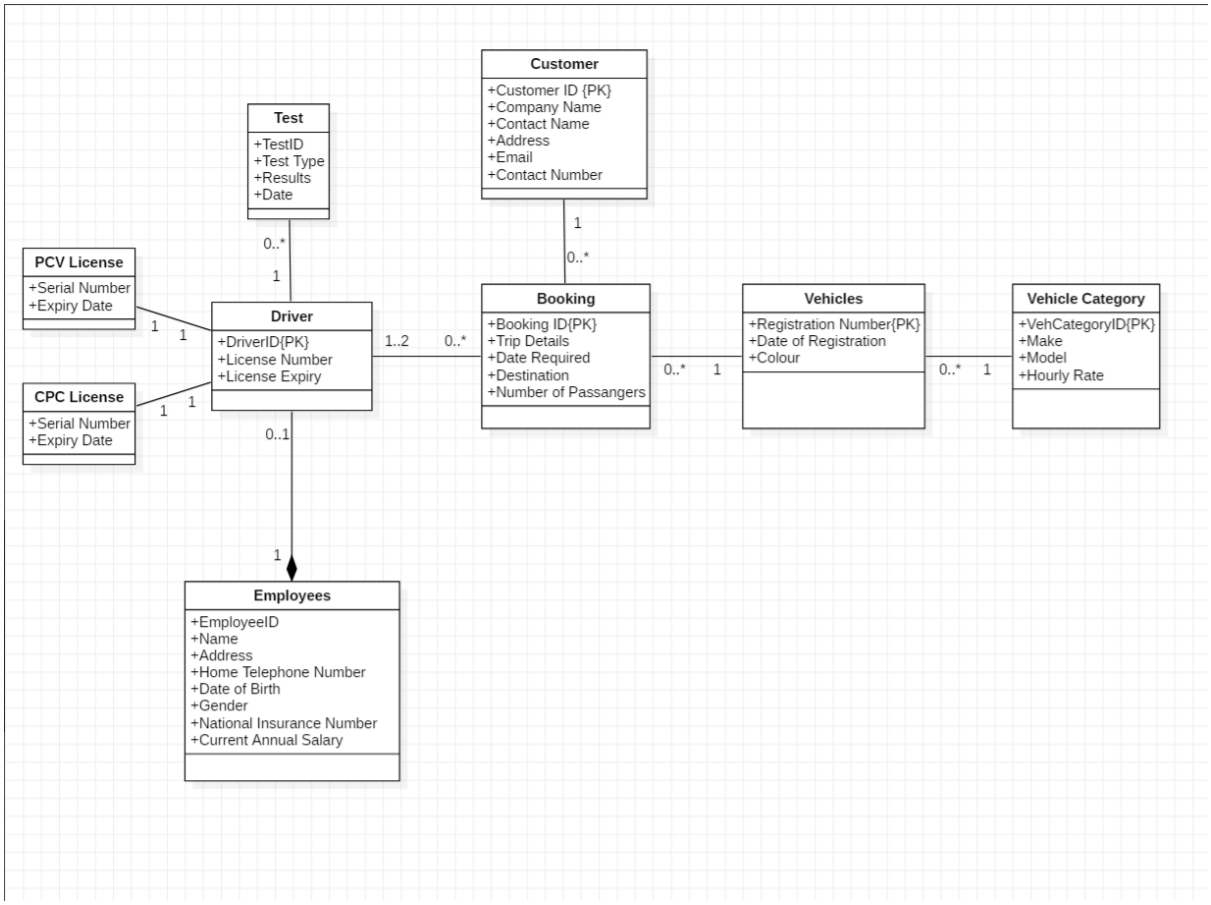
1. I declare that the attached work is all my own, and that where I have quoted from, used or referred to the opinions, work or writings of others, these have been fully and clearly acknowledged.
2. I am aware of the consequences of late submission.

Task 1: Entity Relationship Diagram

Booking HAS_A Customer, Customer MAY_HAVE_MANY Bookings – One to Many
Booking HAS_A Vehicle, Vehicles MAY_HAVE_MANY Bookings – One To Many
Vehicle HAS_A Vehicle Category, Vehicle Category HAS_MANY Vehicles – One To Many
Driver MAY_HAVE_MANY Bookings, Bookings HAS_ONE-TWO Drivers - One To Many
Driver MAY_HAVE_MANY Tests, Test HAS_A Driver – One To Many
Driver HAS_A PCV License, PCV License HAS_A Driver – One To One
Driver HAS_A CPC License, CPC License HAS_A Driver – One To One
Driver IS_AN Employee, Employee MAY_BE_A Driver – One To Many



Task 2: Data Dictionary

	A	B	C	D	E	F	G
1	Relation Name	Attribute Name	Data Type	Length	PK/FK	NOT NULL?	Other Comments
2	Customer	Customer_ID	VARCHAR2	8	PK	NOT NULL	
3		Company_Name	VARCHAR2	300		NOT NULL	
4		Contact_Name	VARCHAR2	300		NOT NULL	
5		Address	VARCHAR2	300		NOT NULL	
6		Email	VARCHAR2	30			CHECK (Email = NOT NULL OR Contact_Number = NOT NULL)
7		Contact_Number	CHAR	11			CHECK (Email = NOT NULL OR Contact_Number = NOT NULL)
8							
9	Booking	Booking_ID	VARCHAR2	8	PK	NOT NULL	
10		Trip_Details	VARCHAR2	30			
11		Date_Required	DATE			NOT NULL	
12		Destination	VARCHAR2	30		NOT NULL	
13		Number_of_Passangers	NUMBER	3		NOT NULL	CHECK (Number_of_Passangers >=0)
14		Customer_ID	VARCHAR2	8	FK	NOT NULL	
15		Driver_ID	VARCHAR2	8	FK	NOT NULL	
16		Registration_Number	VARCHAR2	8	FK	NOT NULL	
17							
18	Vehicles	Registration_Number	VARCHAR2	9	PK	NOT NULL	
19		Date_of_Registration	DATE			NOT NULL	
20		Colour	VARCHAR2	30			
21		Veh_Category_ID	VARCHAR2	8	FK	NOT NULL	
22							
23	Vehicle_Category	Veh_Category_ID	VARCHAR2	8	PK	NOT NULL	
24		VMake	VARCHAR2	24		NOT NULL	
25		VModel	VARCHAR2	24		NOT NULL	
26		Hourly_Rate	NUMBER	*,2		NOT NULL	
27							
28	Driver	Driver_ID	VARCHAR2	8	PK	NOT NULL	
29		License_Number	VARCHAR2	16		NOT NULL	
30		License_Expiry	DATE			NOT NULL	
31		PCV_Serial_Number	VARCHAR2	8	FK	NOT NULL	
32		CPC_Serial_Number	VARCHAR2	8	FK	NOT NULL	
33		Employee_ID	VARCHAR2	8	FK	NOT NULL	
34							
35	TestT	Test_ID	VARCHAR2	8	PK	NOT NULL	
36		Test_Type	VARCHAR2	8		NOT NULL	
37		Results	VARCHAR2	30		NOT NULL	
38		TDate	DATE			NOT NULL	DEFAULT sysdate
39		Driver_ID	VARCHAR2	8	FK	NOT NULL	
40							
41	PCV_License	PCV_Serial_Number	VARCHAR2	8	PK	NOT NULL	
42		PCV_Expiry_Date	DATE			NOT NULL	
43							
44	CPC_License	CPC_Serial_Number	VARCHAR2	8	PK	NOT NULL	
45		CPC_Expiry_Date	DATE			NOT NULL	
46							
47	Employees	Employee_ID	VARCHAR2	8	PK	NOT NULL	
48		EName	VARCHAR2	30		NOT NULL	
49		Address	VARCHAR2	30		NOT NULL	
50		Home_Telephone_Number	CHAR	11		NOT NULL	
51		Job_Description	VARCHAR2	300			
52		Date_of_Birth	DATE			NOT NULL	
53		Gender	CHAR	1		NOT NULL	CHECK (Gender ='M' OR Gender = 'F')
54		National_Insurance_Number	VARCHAR2	14		NOT NULL	
55		Current_Annual_Salary	NUMBER	8		NOT NULL	CHECK (Current_Annual_Salary > 0)

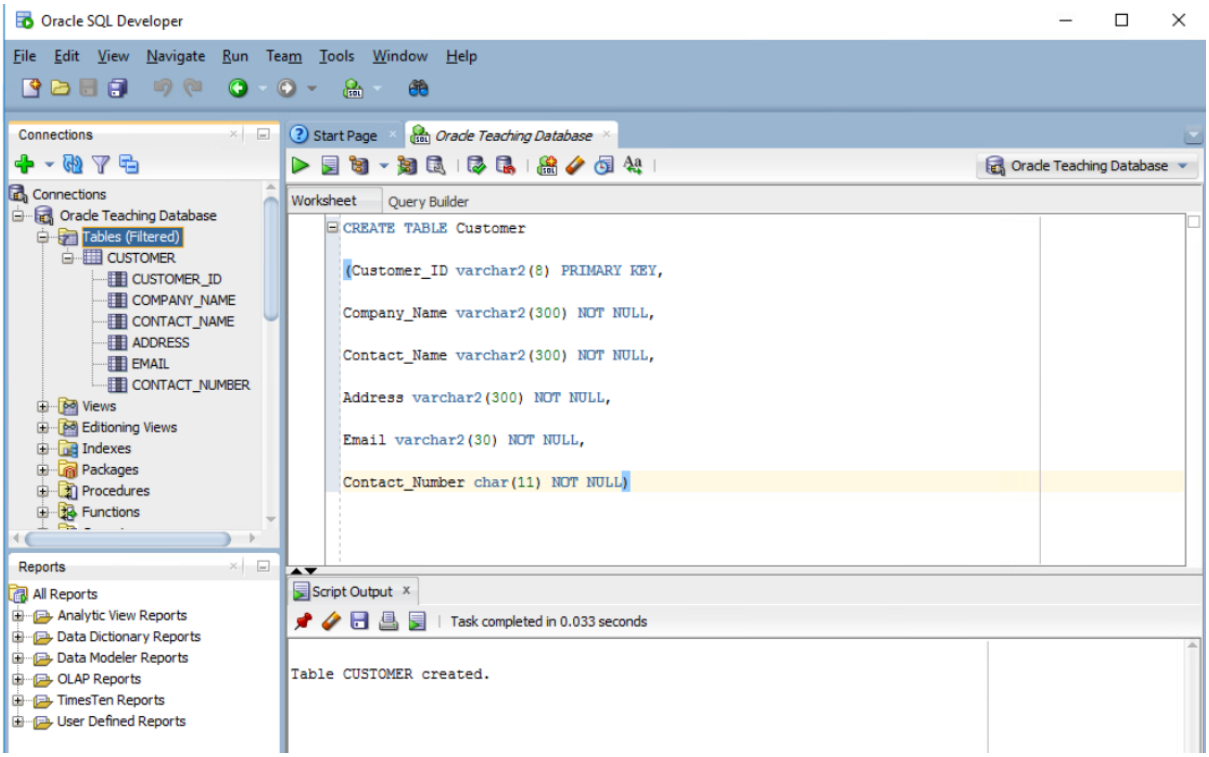
Task 3: CREATE TABLE statements

```
CREATE TABLE Employee
(Employee_ID varchar2(8) PRIMARY KEY,
EName varchar2(24) NOT NULL,
Address varchar2(30) NOT NULL,
Home_Telephone_Number char(11) NOT NULL,
Date_Of_Birth date NOT NULL,
Gender char(1) CHECK (Gender ="M" OR Gender = "F") NOT NULL,
Job_Description varchar2(300),
National_Insurance_Number varchar2(14) NOT NULL,
Current_Annual_Salary number(8) CHECK(Current_Annual_Salary > 0) NOT NULL)

CREATE TABLE Driver
(Driver_ID varchar2(8) PRIMARY KEY,
License_Number varchar2(16) UNIQUE NOT NULL,
License_Expiry date NOT NULL,
PCV_Serial_Number varchar2(8) REFERENCES PCV_License(PCV_Serial_Number) NOT NULL,
CPC_Serial_Number varchar2(8) REFERENCES CPC_License(CPC_Serial_Number) NOT NULL,
Employee_ID varchar2(8) REFERENCES Employee(Employee_ID) NOT NULL)

CREATE TABLE TestT
(Test_ID varchar2(8) PRIMARY KEY,
Test_Type varchar2(8) NOT NULL,
Results varchar2(8) NOT NULL,
TDate date DEFAULT sysdate,
Driver_ID varchar2(8) REFERENCES Driver(Driver_ID) NOT NULL)

CREATE TABLE PCV_License
(PCV_Serial_Number varchar2(8) PRIMARY KEY,
PCV_Expiry_Date date NOT NULL)

CREATE TABLE CPC_License
(CPC_Serial_Number varchar2(8) PRIMARY KEY,
CPC_Expiry_Date date NOT NULL)

CREATE TABLE Vehicle
(Registration_Number varchar2(9) PRIMARY KEY,
Date_Of_Registration date NOT NULL,
Colour varchar2(30),
Veh_Category_ID varchar2(8) REFERENCES Vehicle_Category(Veh_Category_ID) NOT NULL)

CREATE TABLE Vehicle_Category
(Veh_Category_ID varchar2(8) PRIMARY KEY,
VMake varchar2(24) NOT NULL,
VModel varchar2(24) NOT NULL,
Hourly_Rate number(*,2) NOT NULL)

CREATE TABLE Booking
(Booking_ID varchar2(8) PRIMARY KEY,
Trip_Details varchar2(200),
```

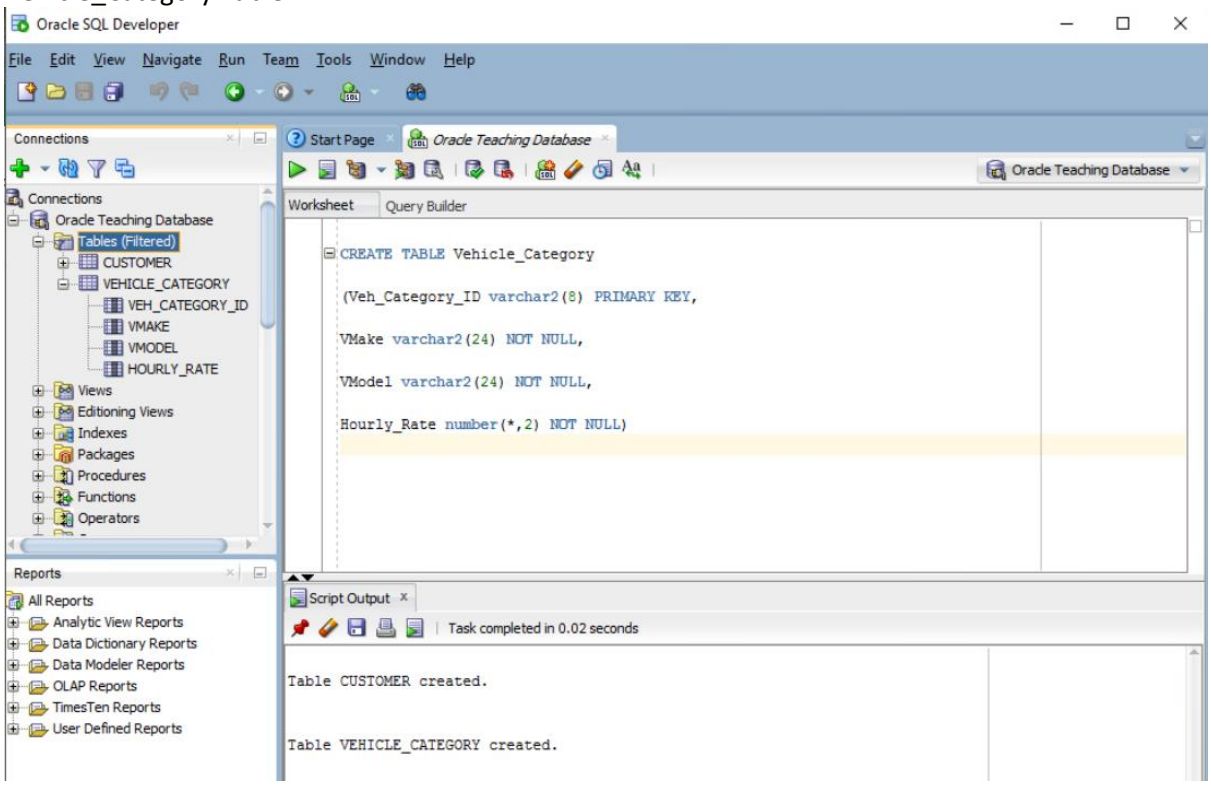
Date_Required date NOT NULL,
Destination varchar2(300) NOT NULL,
Number_Of_Passangers number(3) CHECK(Number_Of_Passangers >=0)NOT NULL,
Customer_ID varchar2(8) REFERENCES Customer(Customer_ID)NOT NULL,
Driver_ID varchar2(8) REFERENCES Driver(Driver_ID) NOT NULL,
Registration_Number varchar2(8) REFERENCES Vehicle(Registration_Number) NOT NULL)

CREATE TABLE Customer
(Customer_ID varchar2(8) PRIMARY KEY,
Company_Name varchar2(300) NOT NULL,
Contact_Name varchar2(300) NOT NULL,
Address varchar2(300) NOT NULL,
Email varchar2(30) NOT NULL,
Contact_Number char(11) NOT NULL)

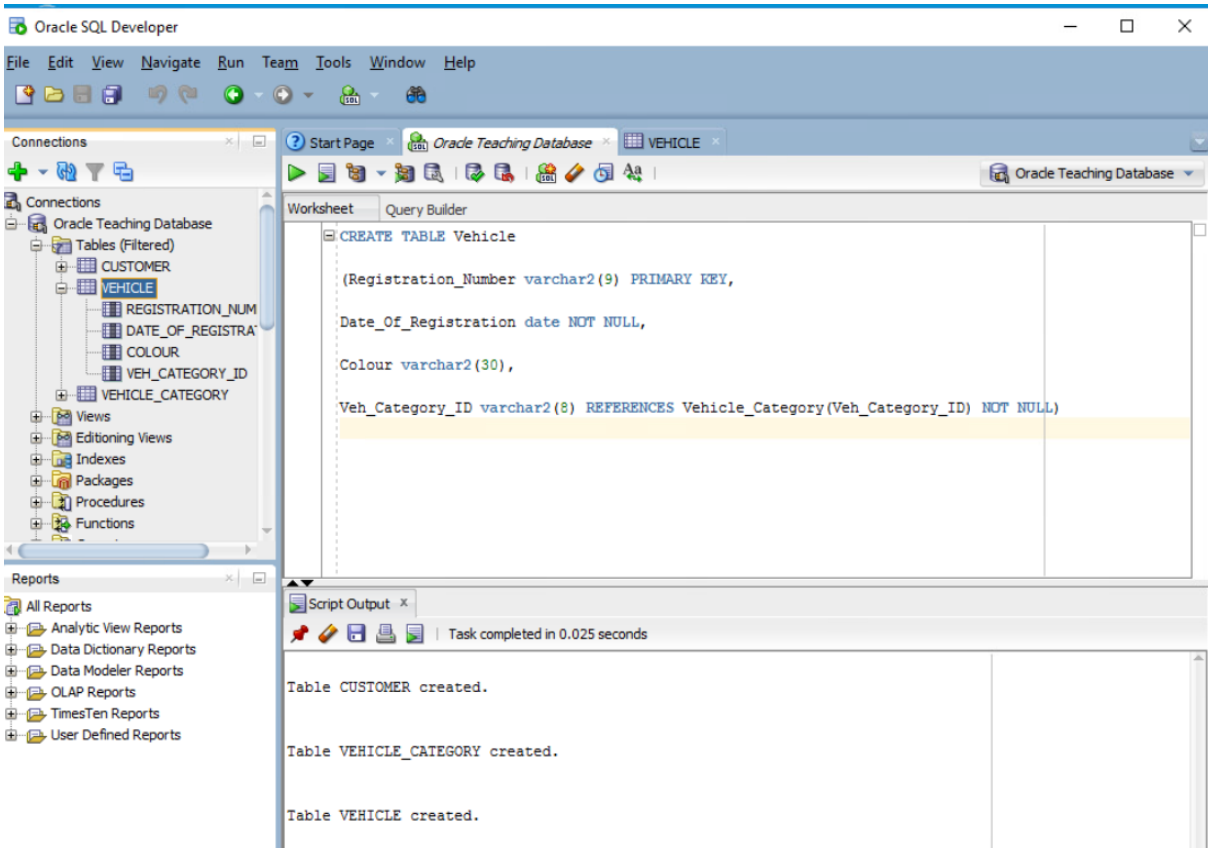
Customer Table



Vehicle_Category Table



Vehicle Table



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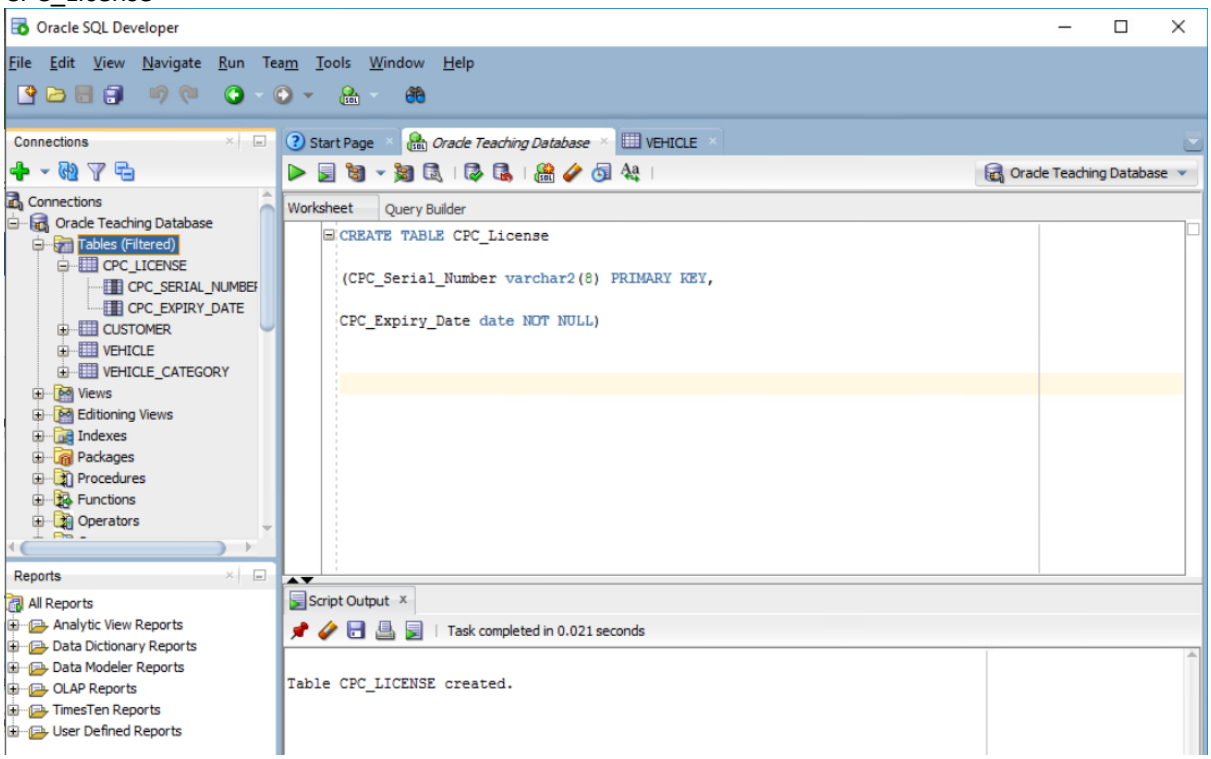
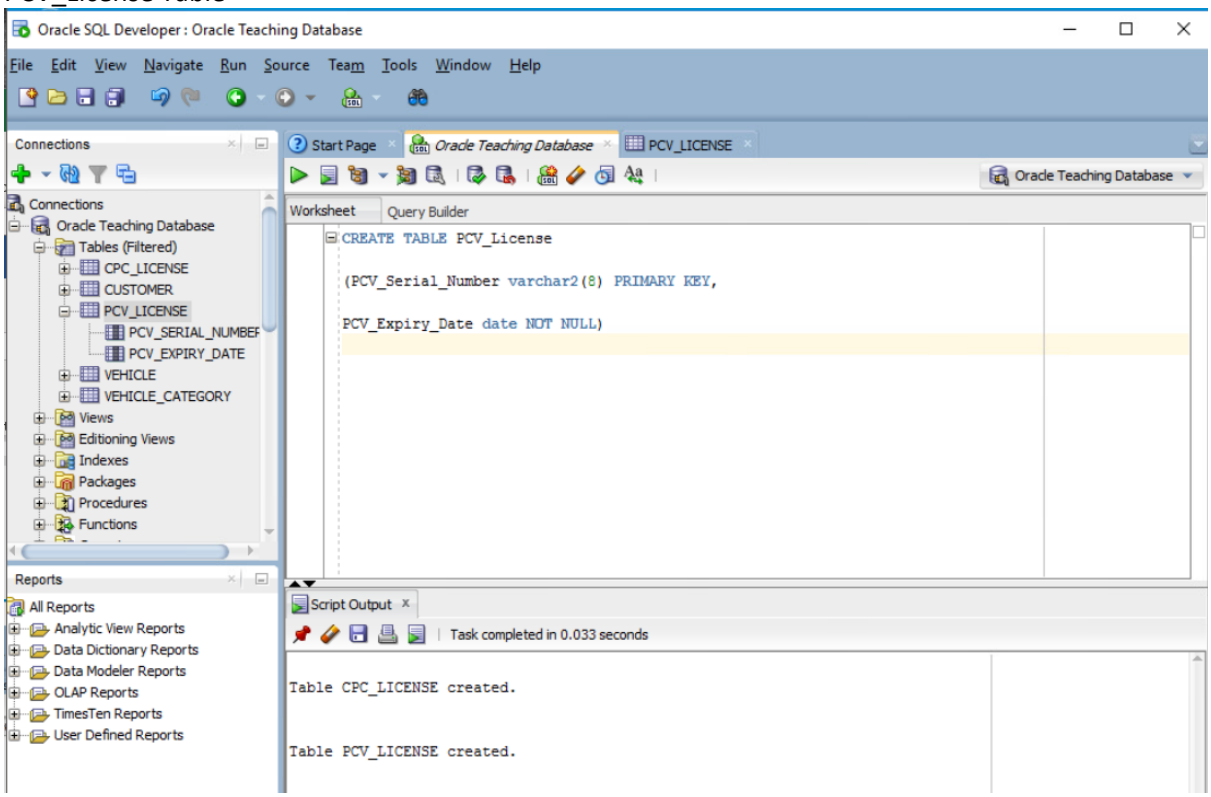
CPC_License



PCV_License Table



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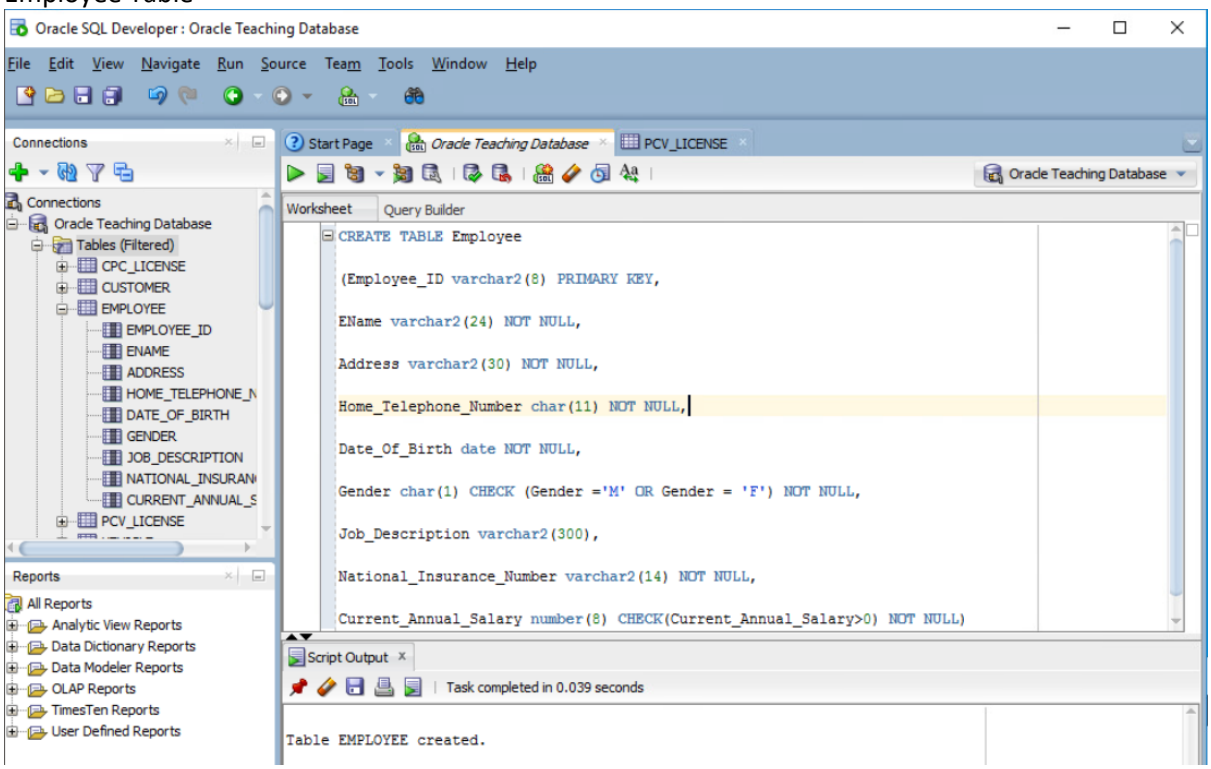
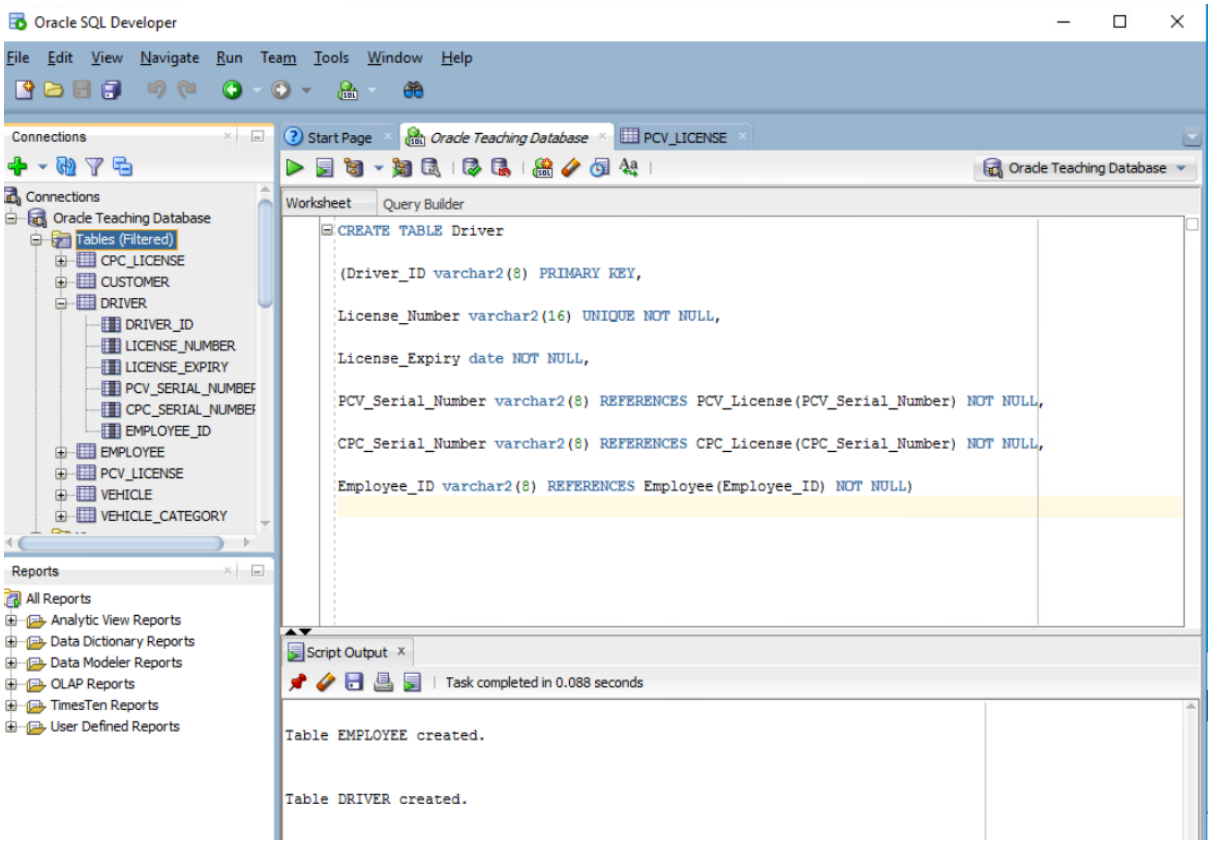
Employee Table



Driver Table



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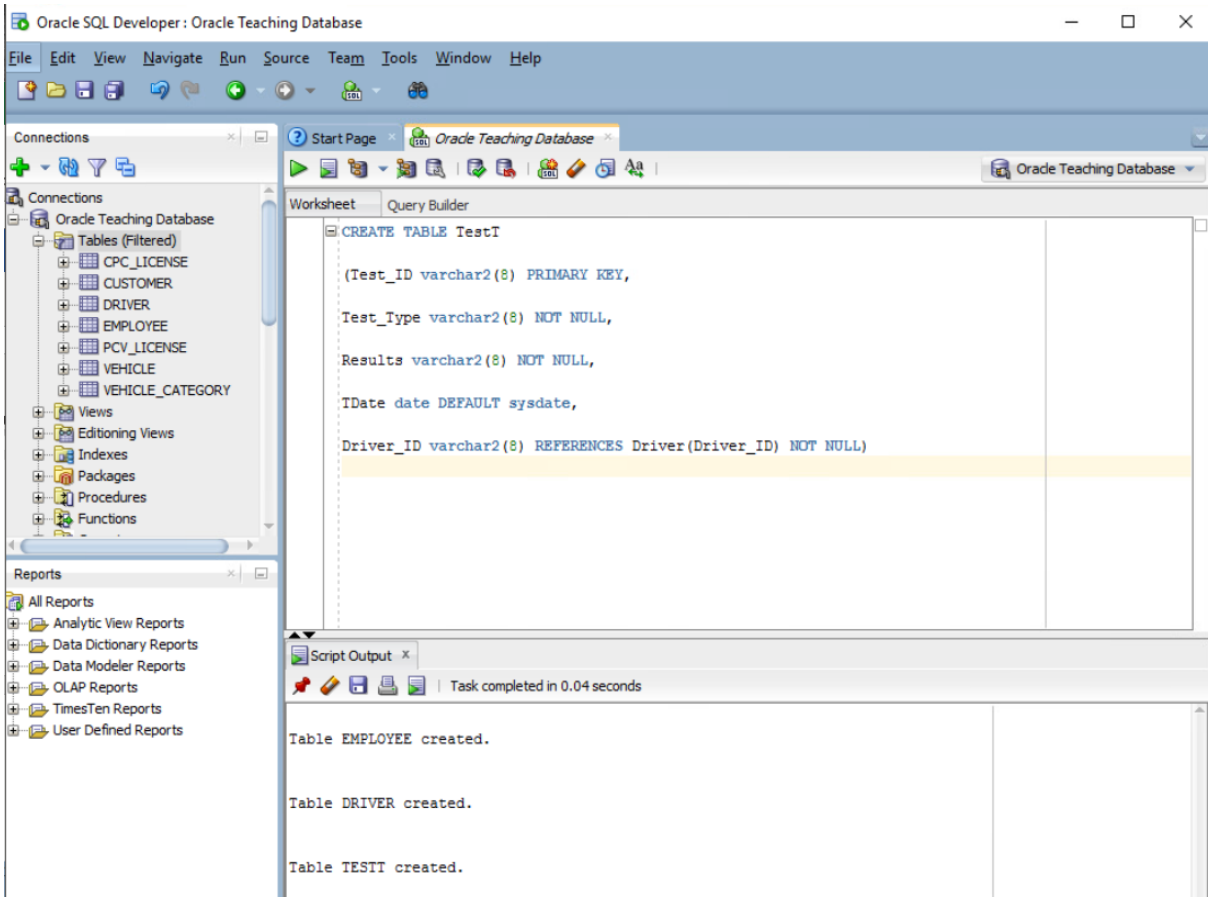
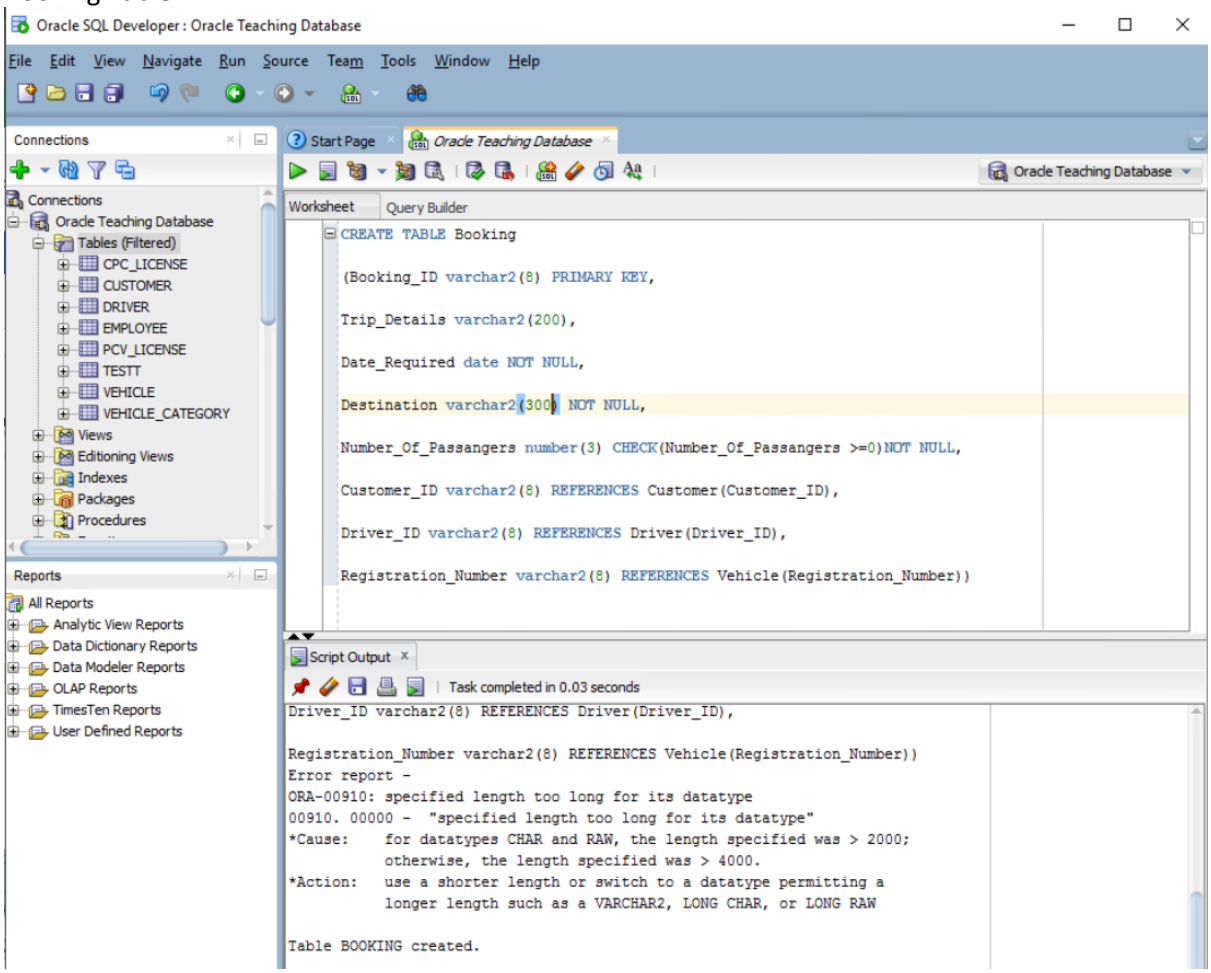
TestT Table

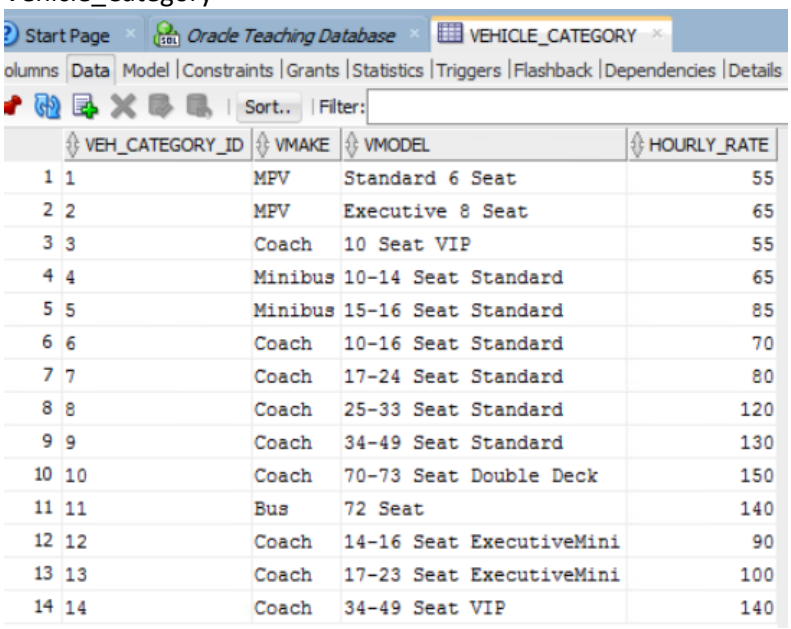


Booking Table



Task 4: Screenshot of populated data

Vehicle_Category



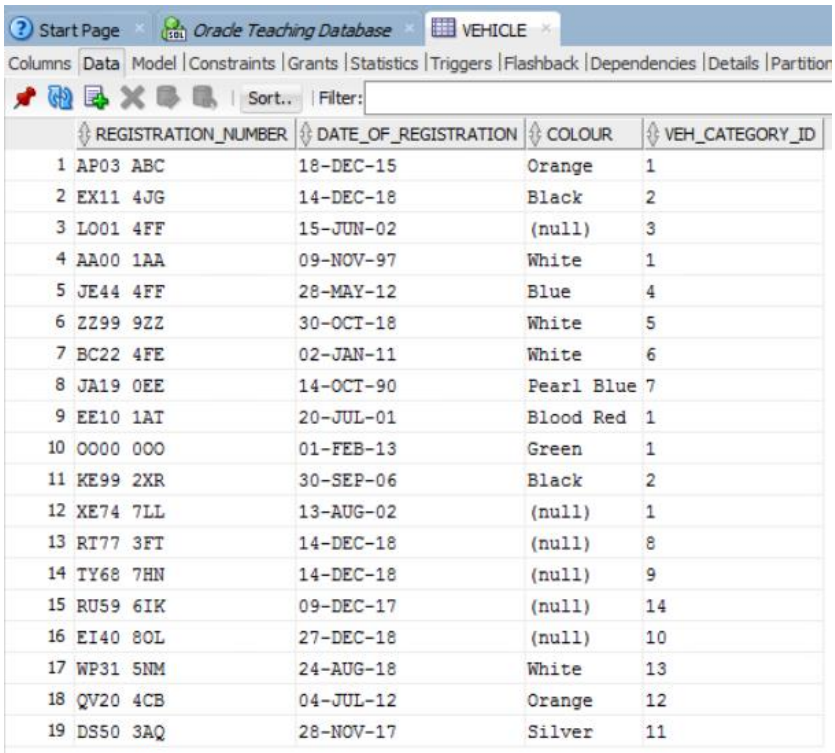
Start Page | Oracle Teaching Database | VEHICLE_CATEGORY

olumns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | Dependencies | Details

Sort.. | Filter:

	VEH_CATEGORY_ID	VMAKE	VMODEL	HOURLY_RATE
1	1	MPV	Standard 6 Seat	55
2	2	MPV	Executive 8 Seat	65
3	3	Coach	10 Seat VIP	55
4	4	Minibus	10-14 Seat Standard	65
5	5	Minibus	15-16 Seat Standard	85
6	6	Coach	10-16 Seat Standard	70
7	7	Coach	17-24 Seat Standard	80
8	8	Coach	25-33 Seat Standard	120
9	9	Coach	34-49 Seat Standard	130
10	10	Coach	70-73 Seat Double Deck	150
11	11	Bus	72 Seat	140
12	12	Coach	14-16 Seat ExecutiveMini	90
13	13	Coach	17-23 Seat ExecutiveMini	100
14	14	Coach	34-49 Seat VIP	140

Vehicle



Start Page | Oracle Teaching Database | VEHICLE

Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | Dependencies | Details | Partitior

Sort.. | Filter:

	REGISTRATION_NUMBER	DATE_OF_REGISTRATION	COLOUR	VEH_CATEGORY_ID
1	AP03 ABC	18-DEC-15	Orange	1
2	EX11 4JG	14-DEC-18	Black	2
3	LO01 4FF	15-JUN-02	(null)	3
4	AA00 1AA	09-NOV-97	White	1
5	JE44 4FF	28-MAY-12	Blue	4
6	ZZ99 9ZZ	30-OCT-18	White	5
7	BC22 4FE	02-JAN-11	White	6
8	JA19 0EE	14-OCT-90	Pearl Blue	7
9	EE10 1AT	20-JUL-01	Blood Red	1
10	OOOO OOO	01-FEB-13	Green	1
11	KE99 2XR	30-SEP-06	Black	2
12	XE74 7LL	13-AUG-02	(null)	1
13	RI77 3FT	14-DEC-18	(null)	8
14	TY68 7HN	14-DEC-18	(null)	9
15	RU59 6IK	09-DEC-17	(null)	14
16	EI40 8OL	27-DEC-18	(null)	10
17	WP31 5NM	24-AUG-18	White	13
18	QV20 4CB	04-JUL-12	Orange	12
19	DS50 3AQ	28-NOV-17	Silver	11

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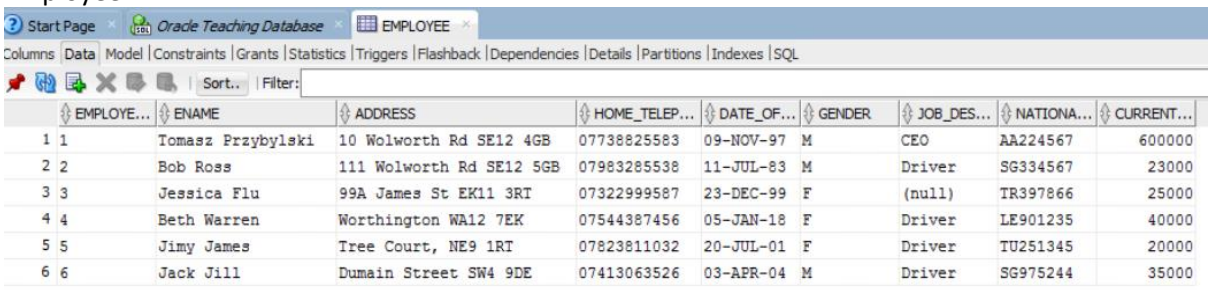
Employee



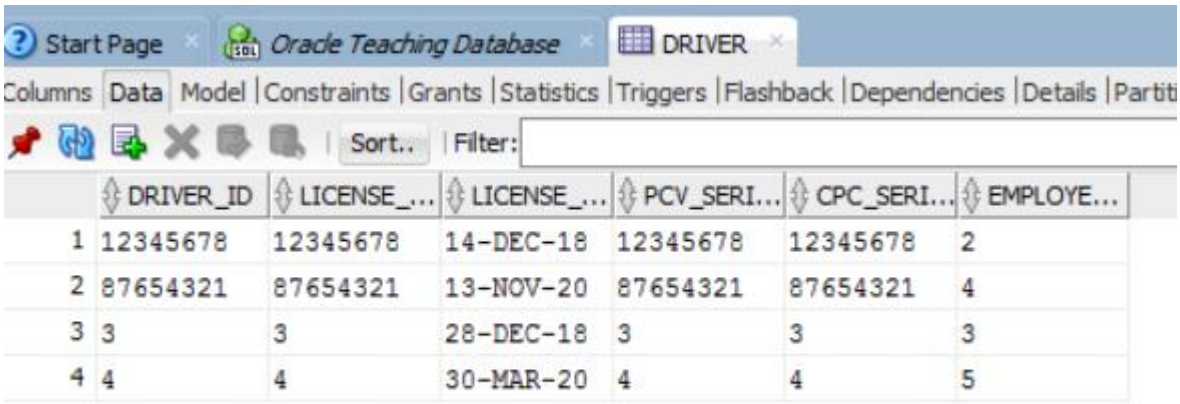
Start Page | Oracle Teaching Database | EMPLOYEE

Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | Dependencies | Details | Partitions | Indexes | SQL

Sort.. | Filter:

	EMPLOYE...	ENAME	ADDRESS	HOME_TELEP...	DATE_OF...	GENDER	JOB_DES...	NATIONA...	CURRENT...
1	1	Tomasz Przybylski	10 Wolworth Rd SE12 4GB	07738825583	09-NOV-97	M	CEO	AA224567	600000
2	2	Bob Ross	111 Wolworth Rd SE12 5GB	07983285538	11-JUL-83	M	Driver	SG334567	23000
3	3	Jessica Flu	99A James St EK11 3RT	07322999587	23-DEC-99	F	(null)	TR397866	25000
4	4	Beth Warren	Worthington WA12 7EK	07544387456	05-JAN-18	F	Driver	LE901235	40000
5	5	Jimy James	Tree Court, NE9 1RT	07823811032	20-JUL-01	F	Driver	TU251345	20000
6	6	Jack Jill	Dumain Street SW4 9DE	07413063526	03-APR-04	M	Driver	SG975244	35000

Driver



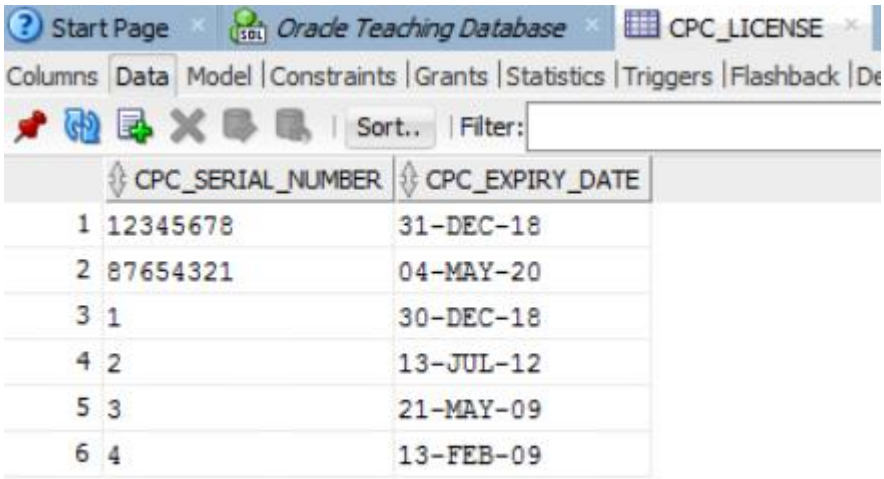
Start Page | Oracle Teaching Database | DRIVER

Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | Dependencies | Details | Partiti

Sort.. | Filter:

	DRIVER_ID	LICENSE_...	LICENSE_...	PCV_SERI...	CPC_SERI...	EMPLOYE...
1	12345678	12345678	14-DEC-18	12345678	12345678	2
2	87654321	87654321	13-NOV-20	87654321	87654321	4
3	3	3	28-DEC-18	3	3	3
4	4	4	30-MAR-20	4	4	5

CPC License



Start Page | Oracle Teaching Database | CPC_LICENSE

Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | De

Sort.. | Filter:

	CPC_SERIAL_NUMBER	CPC_EXPIRY_DATE
1	12345678	31-DEC-18
2	87654321	04-MAY-20
3	1	30-DEC-18
4	2	13-JUL-12
5	3	21-MAY-09
6	4	13-FEB-09

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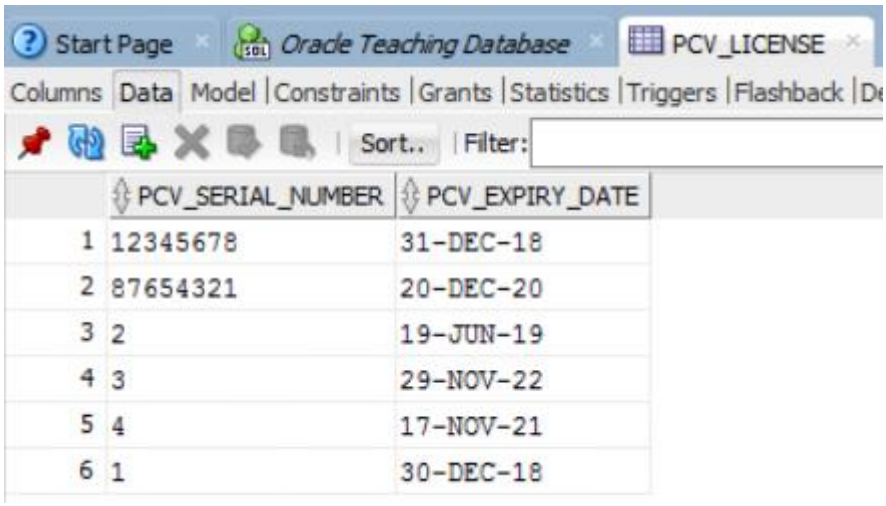
PCV License

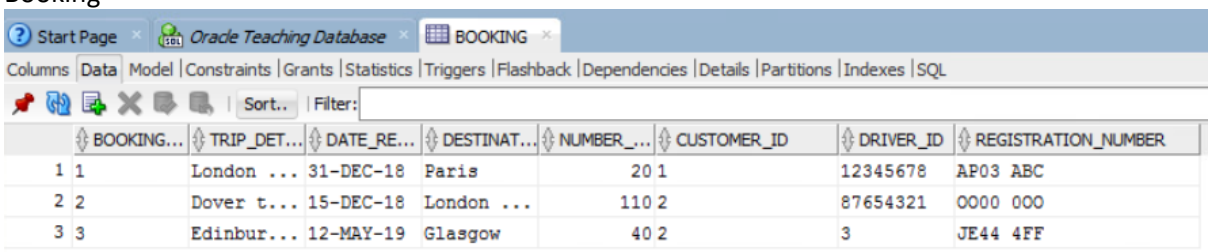

Start Page | Oracle Teaching Database | PCV_LICENSE

Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | De

Sort.. | Filter:

	PCV_SERIAL_NUMBER	PCV_EXPIRY_DATE
1	12345678	31-DEC-18
2	87654321	20-DEC-20
3	2	19-JUN-19
4	3	29-NOV-22
5	4	17-NOV-21
6	1	30-DEC-18

Booking

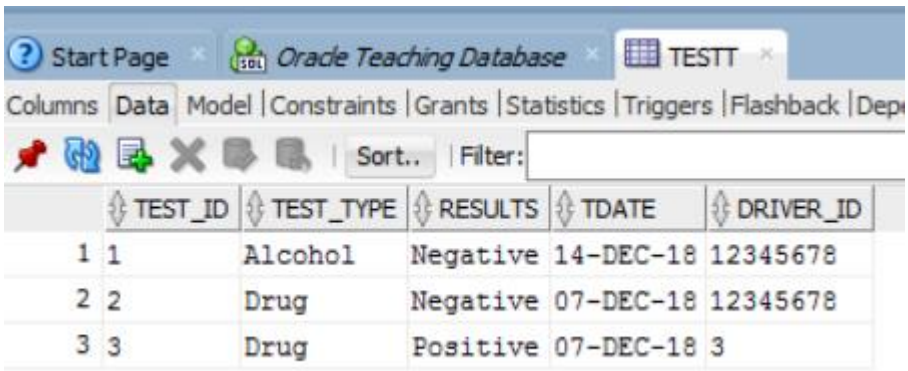

Start Page | Oracle Teaching Database | BOOKING

Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | Dependencies | Details | Partitions | Indexes | SQL

Sort.. | Filter:

	BOOKING...	TRIP_DET...	DATE_RE...	DESTINAT...	NUMBER_...	CUSTOMER_ID	DRIVER_ID	REGISTRATION_NUMBER
1	1	London ...	31-DEC-18	Paris	20	1	12345678	AP03 ABC
2	2	Dover t...	15-DEC-18	London ...	110	2	87654321	OOOO OOO
3	3	Edinbur...	12-MAY-19	Glasgow	40	2	3	JE44 4FF

TestT


Start Page | Oracle Teaching Database | TESTT

Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | Dep

Sort.. | Filter:

	TEST_ID	TEST_TYPE	RESULTS	TDATE	DRIVER_ID
1	1	Alcohol	Negative	14-DEC-18	12345678
2	2	Drug	Negative	07-DEC-18	12345678
3	3	Drug	Positive	07-DEC-18	3

Task 5: Discussion of constraints used

Table Employee
Employee_ID uses a PRIMARY KEY constraint, this is to ensure each employee is uniquely identified
EName uses a NOT NULL constraint, this is to ensure that each employee has a name in the system
Address uses a NOT NULL constraint, this is to ensure that each employee has an address in the system
Home_Telephone_Number uses a NOT NULL constraint, this is to ensure that each employee has a telephone number in the system
Date_Of_Birth uses a NOT NULL constraint, this is to ensure that each employee has a DOB stored in the system
Gender uses a CHECK constraint, this is to ensure that each employee has a listed gender of "F" or "M", the two legal inputs
National_Insurance_Number uses a NOT NULL constraint, this is to ensure that each employee has a NI Number in the system
Current_Annual_Salary uses a CHECK constraint to ensure the salary is more than 0, and a NOT NULL constraint to ensure that each employee has a Current_Annual_Salary
Job_Description uses no constraints

Table Driver
Driver_ID uses a PRIMARY KEY constraint to ensure each Driver is uniquely identified
License_Number uses a UNIQUE constraint to ensure each Driver has a unique License_Number, and a NOT NULL constraint to ensure that each Driver has a License_Number
License_Expiry uses a NOT NULL constraint to ensure each Driver has a License_Expiry
PCV_Serial_Number uses a FOREIGN KEY constraint to ensure that a PCV_Serial_Number entered for a Driver exists in the PCV_License Table, and a NOT NULL constraint to ensure that each Driver has a PCV_Serial_Number
CPC_Serial_Number uses a FOREIGN KEY constraint to ensure that a CPC_Serial_Number entered for a Driver exists in the CPC_License Table, and a NOT NULL constraint to ensure that each Driver has a CPC_Serial_Number
Employee_ID uses a FOREIGN KEY constraint to ensure that a Employee_ID entered for a Driver exists in the Employee Table, and a NOT NULL constraint to ensure that each Driver has an Employee_ID

Table Test
Test_ID uses a PRIMARY KEY constraint to ensure each Test is uniquely identified
Test_Type uses a NOT NULL constraint to ensure that each Test has a Test_Type
Results uses a NOT NULL constraint to ensure that each Test has Results
TDate uses a DEFAULT constraint to ensure that TDate defaults to sysdate if nothing is entered in the table
Driver_ID uses a FOREIGN KEY constraint to ensure that a Driver_ID entered for a Test exists in the Driver Table, and a NOT NULL constraint to ensure each Test has a Driver_ID

Table PCV_License
PCV_Serial_Number uses a PRIMARY KEY constraint to ensure each PCV_License is uniquely identified
PCV_Expiry_Date uses a NOT NULL constraint to ensure each PCV_License has a PCV_Expiry_Date

Table CPC_License
CPC_Serial_Number uses a PRIMARY KEY constraint to ensure each CPC_License is uniquely identified
CPC_Expiry_Date uses a NOT NULL constraint to ensure each CPC_License has a CPC_Expiry_Date

Table Vehicle
Registration_Number uses a PRIMARY KEY constraint to ensure each Vehicle is uniquely identified
Date_of_Registration uses a NOT NULL constraint to ensure each Vehicle has a Date_of_Registration
Veh_Category_ID uses a FOREIGN KEY constraint to ensure that a Veh_Category_ID entered for a Vehicle exists in the Vehicle_Category Table, and a NOT NULL constraint to ensure each Vehicle has a Veh_Category_ID
Colour uses no constraints

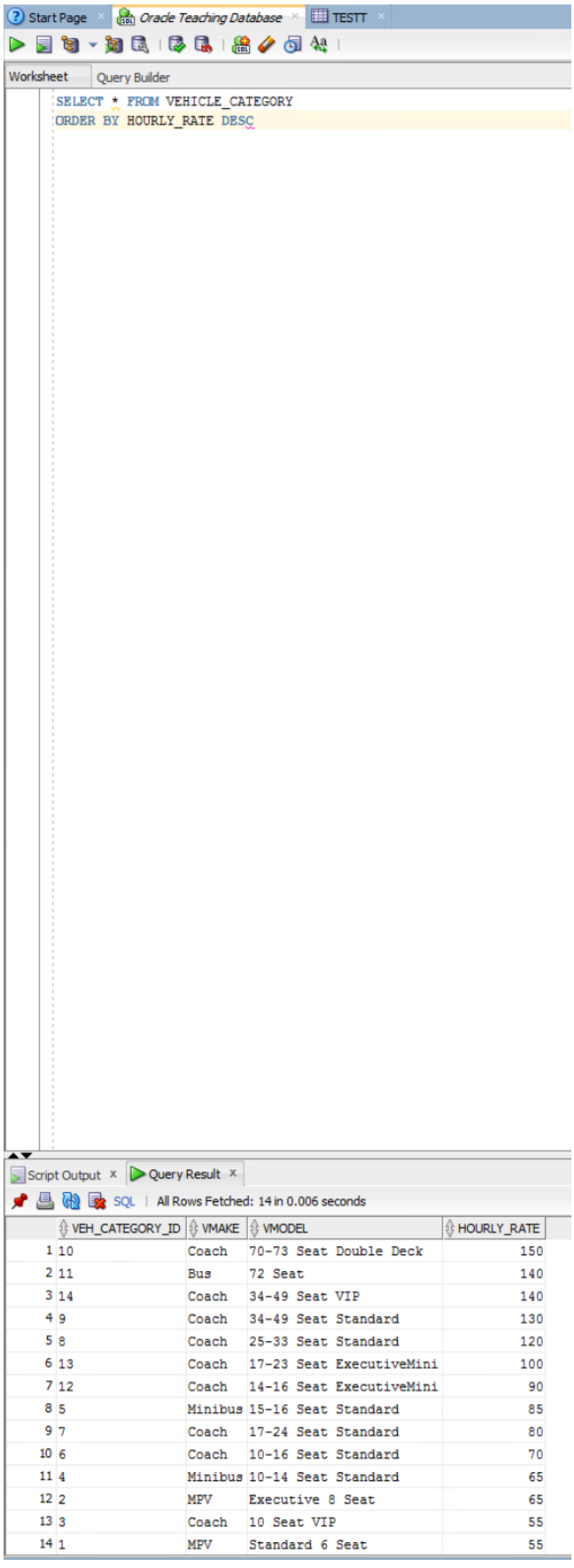
Table Vehicle_Category
Veh_Category_ID uses a PRIMARY KEY constraint to ensure each Vehicle_Category is uniquely identified
VMake uses a NOT NULL constraint to ensure each Vehicle_Category has a VMake
VModel uses a NOT NULL constraint to ensure each Vehicle_Category has a VModel
Hourly_Rate uses a NOT NULL constraint to ensure each Vehicle_Category has an Hourly_Rate

Table Booking
Booking_ID uses a PRIMARY KEY constraint to ensure each Booking is uniquely identified
Date_Required uses a NOT NULL constraint to ensure each Booking has a Date_Required
Destination uses a NOT NULL constraint to ensure each Booking has a Destination

Number_of_Passangers uses a CHECK constraint to ensure the Number_of_Passangers is 0 or more, and a NOT NULL constraint to ensure each Booking has a Number_of_Passangers
Customer_ID uses a FOREIGN KEY constraint to ensure that a Customer_ID entered for a Booking exists in the Customer Table, and a NOT NULL constraint to ensure each Booking has a Customer_ID
Driver_ID uses a FOREIGN KEY constraint to ensure that a Driver_ID entered for a Booking exists in the Driver Table, and a NOT NULL constraint to ensure each Booking has a Driver_ID
Registration_Number uses a FOREIGN KEY constraint to ensure that a Registration_Number entered for a Booking exists in the Driver Table, and a NOT NULL constraint to ensure each Booking has a Registration_Number
Trip_Details uses no constraints

Table Customer
Customer_ID uses a PRIMARY KEY constraint to ensure each Customer is uniquely identified
Company_Name uses a NOT NULL constraint to ensure each Customer has a Company_Name
Contact_Name uses a NOT NULL constraint to ensure each Customer has a Contact_Name
Address uses a NOT NULL constraint to ensure each Customer has an Address
Email uses a NOT NULL constraint to ensure each Customer has an Email
Contact_Number uses a NOT NULL constraint to ensure each Customer has a Contact_Number

Task 6 (i): Query 1



	VEH_CATEGORY_ID	VMAKE	VMODEL	HOURLY_RATE
1	10	Coach	70-73 Seat Double Deck	150
2	11	Bus	72 Seat	140
3	14	Coach	34-49 Seat VIP	140
4	9	Coach	34-49 Seat Standard	130
5	8	Coach	25-33 Seat Standard	120
6	13	Coach	17-23 Seat ExecutiveMini	100
7	12	Coach	14-16 Seat ExecutiveMini	90
8	5	Minibus	15-16 Seat Standard	85
9	7	Coach	17-24 Seat Standard	80
10	6	Coach	10-16 Seat Standard	70
11	4	Minibus	10-14 Seat Standard	65
12	2	MPV	Executive 8 Seat	65
13	3	Coach	10 Seat VIP	55
14	1	MPV	Standard 6 Seat	55

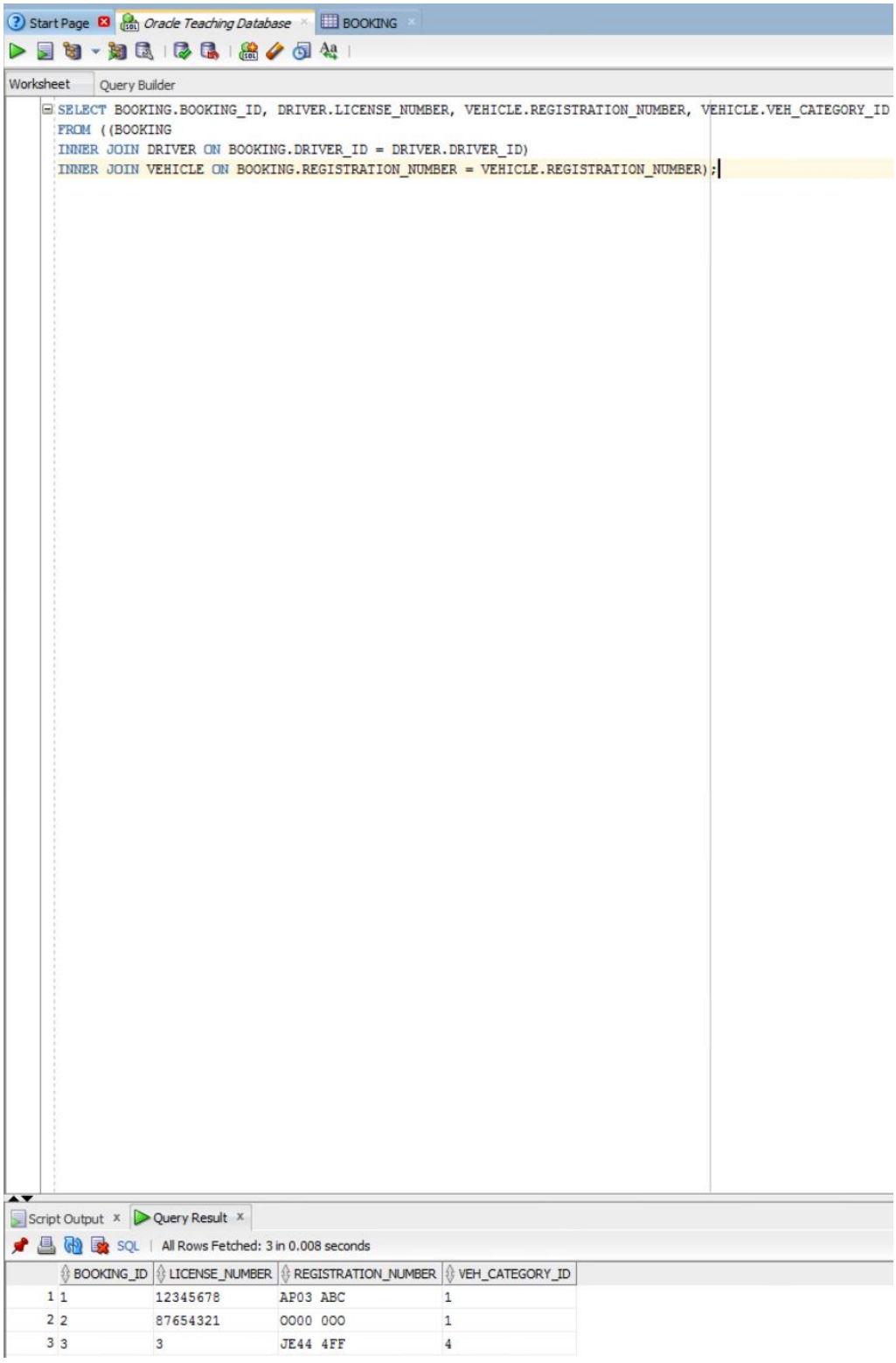
Selecting everything from the Vehicle_Category table, ordering in descending order of Hourly_Rate.

Task 6 (ii): Query 2

Select & count Registration_Number and Veh_Category_ID, and return any Veh_Category_ID that has 2 or more entries.

This returns the Veh_Category_IDs of 1, 2 and 12 as these are the Veh_Category_IDs that have 2 or more Registration_Numbers

Task 6 (iii): Query 3



This query joins the Booking, Driver and Vehicle Tables and displays the Booking(Booking_ID), Driver(License_Number), Vehicle(Registration_Number) and Vehicle(Veh_Category_ID) wherever the Driver_ID match between the Booking and Driver tables, and wherever the Registration_Number matches between the Booking and Vehicle tables