



Assignment 1

USING MYSQL TO IMPLEMENT A DATABASE SYSTEM

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INTRODUCTION

This assignment involves using the *classicmodels* database to create queries that will answer questions about the data set. The database contains data relating to the sale of scale models of different vehicles. The different information that is contained in the database is depicted in the ER diagram below. There are eight tables that hold all of the data for this business system. In order to answer the questions that we have, the first step is to install MySQL and run the provided code. The code will create the tables and database that is required.

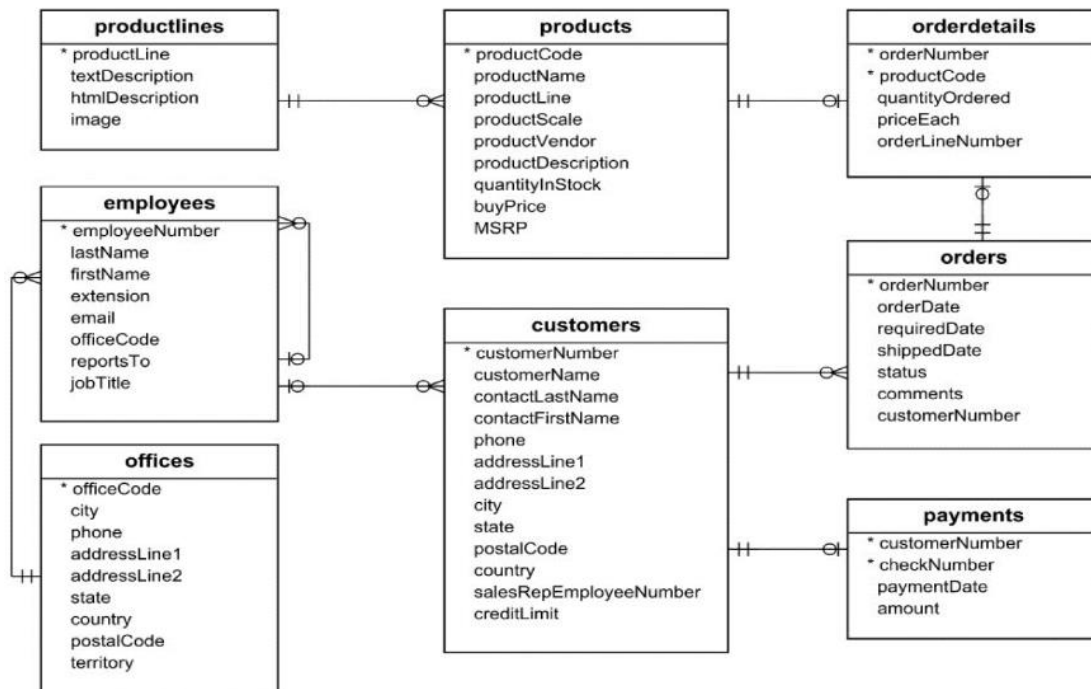


Figure 1 ER diagram for *classicmodels*

DATABASE TABLES AND DATA

The figures below show screenshots of the tables and 10 lines of sample data that the provided reference code created. Once this step is complete, the queries can be written.

customerNumber	customerName	contactLastName	contactFirstName	phone	addressLine1	addressLine2	city	state	postalCode	country	salesRepEmployeeNumber	creditLimit
103	Atelier graphique	Schmitt	Carine	40.32.2555	54, rue Royale	NULL	Nantes	NULL	44000	France	1370	21000.00
112	Signal Gift Stores	King	Jean	7025551838	8489 Strong St.	NULL	Las Vegas	NV	83030	USA	1166	71800.00
114	Australian Collectors, Co.	Perguson	Peter	03 9520 4555	636 St Kilda Road	Level 3	Melbourne	Victoria	3004	Australia	1611	117300.00
119	La Rochelle Gifts	Labrunie	Janine	40.67.8555	67, rue des Cinquante Otages	NULL	Nantes	NULL	44000	France	1370	118200.00
121	Baane Mini Imports	Bergulfen	Jonas	07-98 9555	Erling Skakkes gate 78	NULL	Stavern	NULL	4110	Norway	1504	81700.00
124	Mini Gifts Distributors Ltd.	Nelson	Susan	4155551490	5677 Strong St.	NULL	San Rafael	CA	97562	USA	1165	210500.00
125	Havel & Zbyszek Co	Piestrzeniewicz	Zbyszek	(26) 642-7555	ul. Filbrowa 68	NULL	Warszawa	NULL	01-012	Poland	1008	0.00
128	Blauer See Auto, Co.	Keitel	Roland	+49 69 66 90 2555	Lyonerstr. 34	NULL	Frankfurt	NULL	60528	Germany	1504	59700.00
129	Mini Wheels Co.	Murphy	Julie	6505555787	5557 North Pendale Street	NULL	San Francisco	CA	94217	USA	1165	64600.00
131	Land of Toys Inc.	Lee	Kwai	2125557818	897 Long Airport Avenue	NULL	NYC	NY	10022	USA	1323	114900.00

Figure 2 customers table

employeeNumber	lastName	firstName	extension	email	officeCode	reportsTo	jobTitle
1002	Murphy	Diane	x5800	dmurphy@classicmodelcars.com	1	NULL	President
1056	Patterson	Mary	x4611	mpatterson@classicmodelcars.com	1	1002	VP Sales
1076	Firrelli	Jeff	x9273	jfirrelli@classicmodelcars.com	1	1002	VP Marketing
1088	Patterson	William	x4871	wpatterson@classicmodelcars.com	6	1056	Sales Manager (APAC)
1102	Bondur	Gerard	x5408	gbondur@classicmodelcars.com	4	1056	Sale Manager (EMEA)
1143	Bow	Anthony	x5428	abow@classicmodelcars.com	1	1056	Sales Manager (NA)
1165	Jennings	Leslie	x3291	ljennings@classicmodelcars.com	1	1143	Sales Rep
1166	Thompson	Leslie	x4065	lthompson@classicmodelcars.com	1	1143	Sales Rep
1188	Firrelli	Julie	x2173	jfirrelli@classicmodelcars.com	2	1143	Sales Rep
1216	Patterson	Steve	x4334	spatterson@classicmodelcars.com	2	1143	Sales Rep

Figure 3 employees table

officeCode	city	phone	addressLine1	addressLine2	state	country	postalCode	territory
1	San Francisco	+1 650 219 4782	100 Market Street	Suite 300	CA	USA	94080	NA
2	Boston	+1 215 837 0825	1550 Court Place	Suite 102	MA	USA	02107	NA
3	NYC	+1 212 555 3000	523 East 53rd Street	apt. 5A	NY	USA	10022	NA
4	Paris	+33 14 723 4404	43 Rue Jouffroy D'abans	NULL	NULL	France	75017	EMEA
5	Tokyo	+81 33 224 5000	4-1 Kioicho	NULL	Chiyoda-Ku	Japan	102-8578	Japan
6	Sydney	+61 2 9264 2451	5-11 Wentworth Avenue	Floor #2	NULL	Australia	NSW 2010	APAC
7	London	+44 20 7877 2041	25 Old Broad Street	Level 7	NULL	UK	EC2N 1HN	EMEA
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Figure 4 offices table

orderNumber	productCode	quantityOrdered	priceEach	orderLineNumber
10100	S18_1749	30	136.00	3
10100	S18_2248	50	55.09	2
10100	S18_4409	22	75.46	4
10100	S24_3969	49	35.29	1
10101	S18_2325	25	108.06	4
10101	S18_2795	26	167.06	1
10101	S24_1937	45	32.53	3
10101	S24_2022	46	44.35	2
10102	S18_1342	39	95.55	2
10102	S18_1367	41	43.13	1

Figure 5 orderdetails table

orderNumber	orderDate	requiredDate	shippedDate	status	comments	customerNumber
10100	2003-01-06	2003-01-13	2003-01-10	Shipped	NULL	363
10101	2003-01-09	2003-01-18	2003-01-11	Shipped	Check on availability.	128
10102	2003-01-10	2003-01-18	2003-01-14	Shipped	NULL	181
10103	2003-01-29	2003-02-07	2003-02-02	Shipped	NULL	121
10104	2003-01-31	2003-02-09	2003-02-01	Shipped	NULL	141
10105	2003-02-11	2003-02-21	2003-02-12	Shipped	NULL	145
10106	2003-02-17	2003-02-24	2003-02-21	Shipped	NULL	278
10107	2003-02-24	2003-03-03	2003-02-26	Shipped	Difficult to negotiate with customer. We need m...	131
10108	2003-03-03	2003-03-12	2003-03-08	Shipped	NULL	385
10109	2003-03-10	2003-03-19	2003-03-11	Shipped	Customer requested that FedEx Ground is used...	486

Figure 6 orders table

customerNumber	checkNumber	paymentDate	amount
103	HQ336336	2004-10-19	6066.78
103	JM555205	2003-06-05	14571.44
103	OM314933	2004-12-18	1676.14
112	BO864823	2004-12-17	14191.12
112	HQ55022	2003-06-06	32641.98
112	ND748579	2004-08-20	33347.88
114	GG31455	2003-05-20	45864.03
114	MA765515	2004-12-15	82261.22
114	NP603840	2003-05-31	7565.08
114	NR27552	2004-03-10	44894.74

Figure 7 payments table

productLine	textDescription	htmlDescription	image
Classic Cars	Attention car enthusiasts: Make your wildest ca...	NULL	NULL
Motorcycles	Our motorcycles are state of the art replicas of ...	NULL	NULL
Planes	Unique, diecast airplane and helicopter replicas ...	NULL	NULL
Ships	The perfect holiday or anniversary gift for exec...	NULL	NULL
Trains	Model trains are a rewarding hobby for enthusi...	NULL	NULL
Trucks and Buses	The Truck and Bus models are realistic replicas o...	NULL	NULL
Vintage Cars	Our Vintage Car models realistically portray aut...	NULL	NULL
NULL	NULL	NULL	NULL

Figure 8 productlines table

productCode	productName	productLine	productScale	productVendor	productDescription	quantityInStock	buyPrice	MSRP
S10_1678	1969 Harley Davidson Ultimate Chopper	Motorcycles	1:10	Min Lin Diecast	This replica features working kickstand, front su...	7933	48.81	95.70
S10_1949	1952 Alpine Renault 1300	Classic Cars	1:10	Classic Metal Creations	Turnable front wheels; steering function; detail...	7305	98.58	214.30
S10_2016	1996 Moto Guzzi 1100i	Motorcycles	1:10	Highway 66 Mini Classics	Official Moto Guzzi logos and insignias, saddle b...	6625	68.99	118.94
S10_4698	2003 Harley-Davidson Eagle Drag Bike	Motorcycles	1:10	Red Start Diecast	Model features, official Harley Davidson logos a...	5582	91.02	193.66
S10_4757	1972 Alfa Romeo GTA	Classic Cars	1:10	Motor City Art Classics	Features include: Turnable front wheels; steeri...	3252	85.68	136.00
S10_4962	1962 Lancia Delta 16V	Classic Cars	1:10	Second Gear Diecast	Features include: Turnable front wheels; steeri...	6791	103.42	147.74
S12_1099	1968 Ford Mustang	Classic Cars	1:12	Autoart Studio Design	Hood, doors and trunk all open to reveal highly ...	68	95.34	194.57
S12_1108	2001 Ferrari Enzo	Classic Cars	1:12	Second Gear Diecast	Turnable front wheels; steering function; detail...	3619	95.59	207.80
S12_1666	1958 Setra Bus	Trucks and Buses	1:12	Welly Diecast Productions	Model features 30 windows, skylights & glare re...	1579	77.90	136.67
S12_2823	2002 Suzuki XREO	Motorcycles	1:12	Unimax Art Galleries	Official logos and insignias, saddle bags located ...	9997	66.27	150.62

Figure 9 products table

QUERY 1

Find the last name of the employee whose job title is 'VP Sales'.

In order to do this query, we needed to select the lastName of the employee who had the VP Sales jobTitle attribute. Each employee has jobTitle and lastName attributes that are in the employees table, so only the employees table needed to be used. The query and results are shown in the figure and table below.

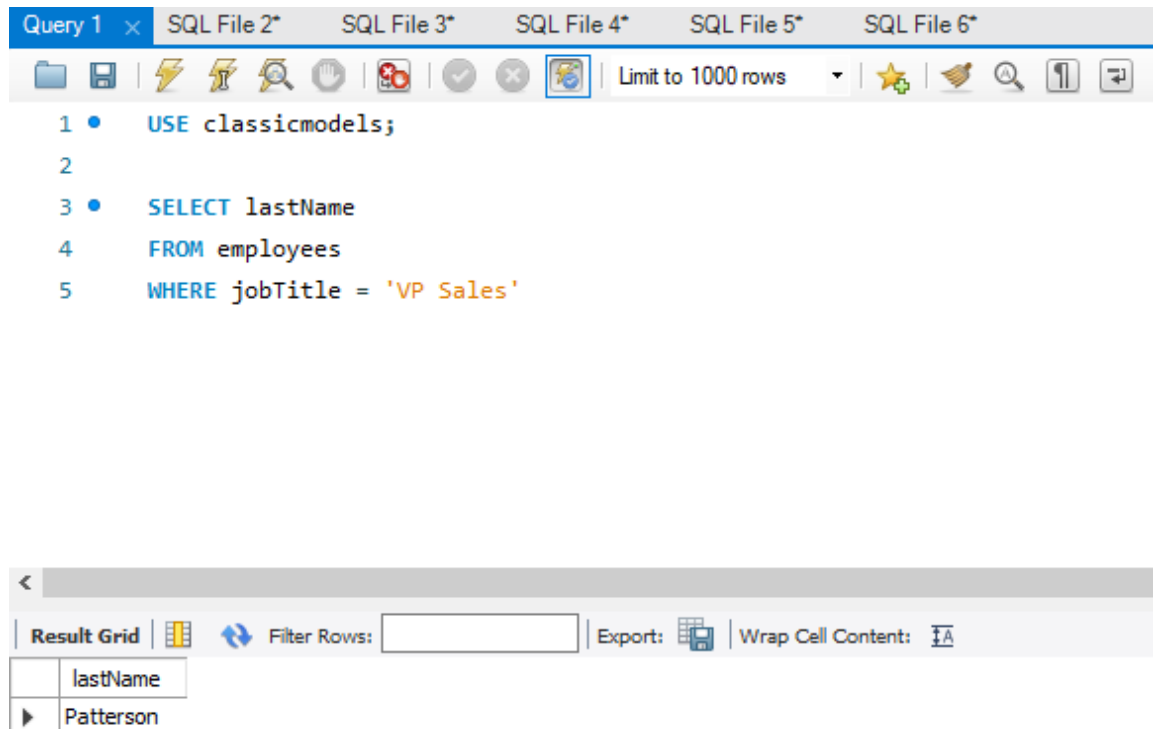


Figure 10 Query 1 and results

Column1
lastName
Patterson

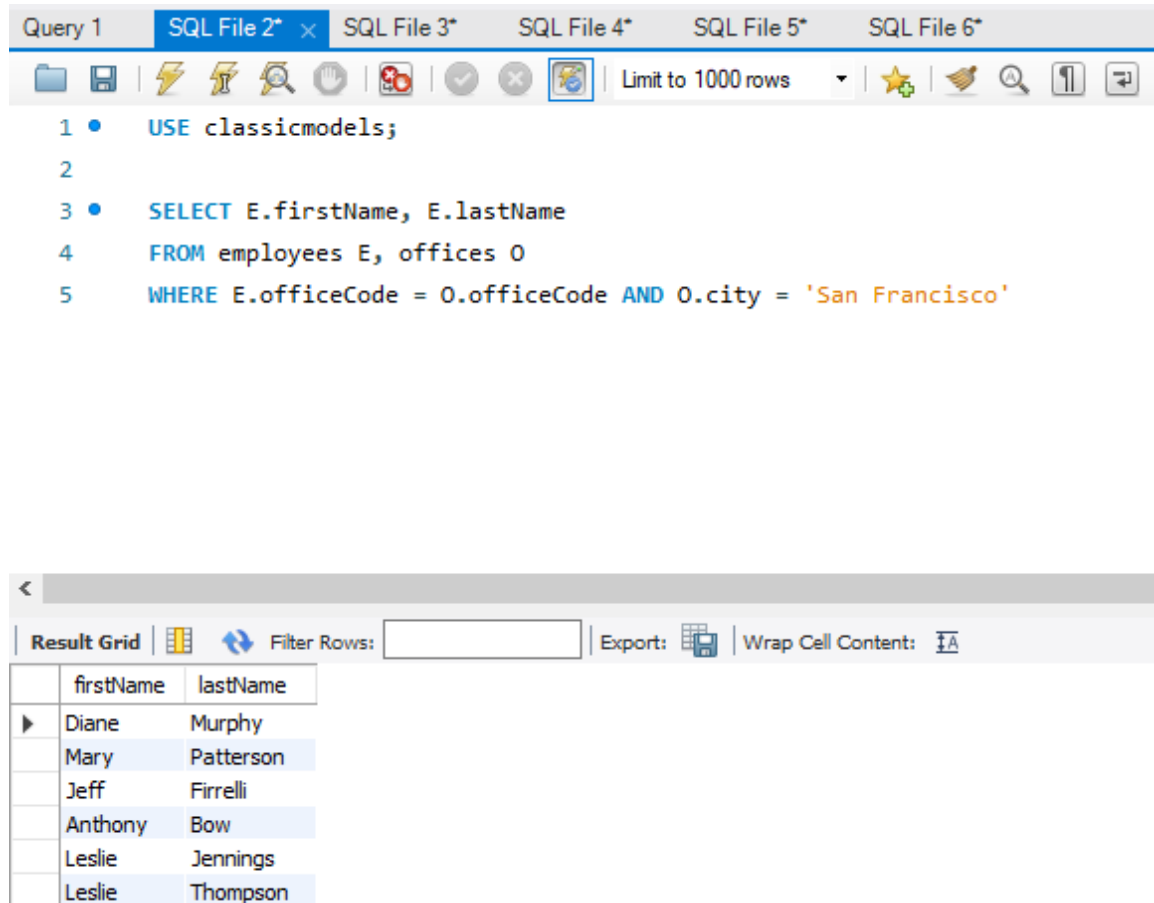
Table 1 Query 1 results

QUERY 2

Find the names of employees (last name, first name) whose offices are in 'San Francisco'.

In order to do this query, we needed to select the firstName and lastName of the employees who work in San Francisco. The employees table contains the officeCode as a foreign key that references the offices table that contains the address of an employee's

office. Therefore, we needed to use both the employees and offices tables and match the employee's officeCode to the officeCode of an office and then compare the city to San Francisco. The query and results are shown in the figure and table below.



The screenshot shows a SQL IDE interface with a query editor and a results grid. The query editor contains the following SQL code:

```

1 • USE classicmodels;
2
3 • SELECT E.firstName, E.lastName
4 FROM employees E, offices O
5 WHERE E.officeCode = O.officeCode AND O.city = 'San Francisco'
  
```

The results grid displays the following data:

firstName	lastName
Diane	Murphy
Mary	Patterson
Jeff	Firrelli
Anthony	Bow
Leslie	Jennings
Leslie	Thompson

Figure 11 Query 2 and results

Column1	Column2
firstName	lastName
Diane	Murphy
Mary	Patterson
Jeff	Firrelli
Anthony	Bow
Leslie	Jennings
Leslie	Thompson

Table 2 Query 2 results

QUERY 3

Find the names of customers (last name, first name) who purchased 'Classic Cars' according to the productLine feature of the products.

In this query, several tables needed to be used because we needed to trace the purchases of customers from the customers table to the orders, orderdetails, and products table in order to find the customers that have purchased Classic Cars. Customers could have also purchased multiple Classic Cars so GROUP BY needed to be used in order to only select each customer's name once. The query and results are shown in the figure and table below.

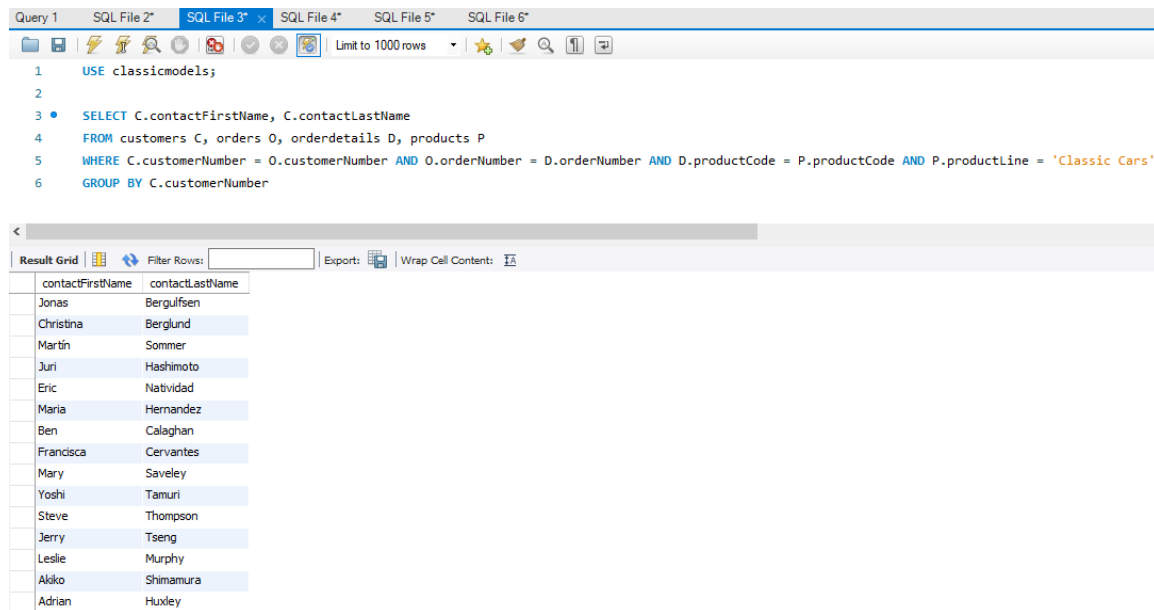


Figure 12 Query 3 and results

Column1	Column2
contactFirstName	contactLastName
Jonas	Bergulfsen
Christina	Berglund
Martín	Sommer
Juri	Hashimoto
Eric	Natividad
Maria	Hernandez
Ben	Calaghan
Francisca	Cervantes
Mary	Saveley
Yoshi	Tamuri
Steve	Thompson
Jerry	Tseng
Leslie	Murphy
Akiko	Shimamura
Adrian	Huxley
Paolo	Accorti
Martha	Larsson
Daniel	Tonini
Susan	Nelson
Dorothy	Young
Julie	Murphy
Peter	Ferguson
Allen	Nelson
Julie	Brown
Anna	O'Hara
Jean	Fresnière
Diego	Freyre
Jytte	Petersen
Georg	Pipps
Ann	Brown
Wing	Huang
Matti	Karttunen
Annette	Roulet
Thomas	Smith
Eduardo	Saavedra
Brian	Chandler
Valarie	Thompson
Sarah	McRoy
Kwai	Lee
Catherine	Dewey
Elizabeth	Lincoln
Juri	Yoshido
Helen	Bennett
Paul	Henriot

Pirkko	Koskitalo
Daniel	Da Silva
Sue	Frick
Marie	Bertrand
Roland	Mendel
Valarie	Franco
Wendy	Victorino
Kelvin	Leong
Marta	Hernandez
Janine	Labrune
Arnold	Cruz
Laurence	Lebihan
Veysel	Oeztan
Henriette	Pfalzheim
Dominique	Perrier
Mihael	Holz
Elizabeth	Devon
Maurizio	Moroni
Miguel	Barajas
Roland	Keitel
Mike	Graham
Kalle	Suominen
Jeff	Young
Dean	Cassidy
Jesus	Fernandez
Wales	MacKinlay
Rachel	Ashworth
Palle	Ibsen
Julie	King
Michael	Frick
Mary	Young
Violeta	Benitez
Frédérique	Citeaux
Rosa	Salazar
Mory	Kentary
Jean	King
Jan	Klaeboe
Carine	Schmitt
Julie	Young
Pascale	Cartrain
José Pedro	Roel
Steve	Frick
Sue	Taylor
Franco	Ricotti
Sean	Clenahan
Yu	Choi
Dan	Lewis
Martine	Rancé
Tony	Snowden
Giovanni	Rovelli

Table 3 Query 3 results

QUERY 4

Find the productName of products which has the highest MSRP price.

This query required that the max MSRP of all the products was found and then the product with that MSRP was selected. In order to do this, a nested query was used with the MAX operator finding the largest MSRP of all the products. The higher-level query then found the product that had an MSRP attribute equal to this value. The query and results are shown in the figure and table below.

The screenshot shows a SQL IDE interface with a query editor and a results grid. The query editor displays the following SQL code:

```

1 • USE classicmodels;
2
3 • SELECT P.productName
4 FROM products P
5 WHERE P.MSRP = (SELECT MAX(P2.MSRP)
6                 FROM products P2)

```

The results grid shows the following data:

productName
1952 Alpine Renault 1300

Figure 13 Query 4 and results

Column1
productName
1952 Alpine Renault 1300

Table 4 Query 4 results

QUERY 5

Find the last names of the customers who have made 5 or more payments.

In order to find the customers who have made at least 5 payments, the customer and payments tables needed to be used. All of the payments for each customer were selected and the results were grouped by the customerNumber. Then all groups that did not have at least 5 entries were eliminated and the last name of the customers that satisfied the HAVING statement was selected. The query and results are shown in the figure below.

The screenshot shows a SQL IDE interface with a query editor and a results grid. The query editor contains the following SQL code:

```

1 • USE classicmodels;
2
3 • SELECT C.contactLastName
4 FROM customers C, payments P
5 WHERE C.customerNumber = P.customerNumber
6 GROUP BY C.customerNumber
7 HAVING COUNT(*) > 4
  
```

The results grid shows the following data:

contactLastName
Nelson
Freyre

Figure 14 Query 5 and results

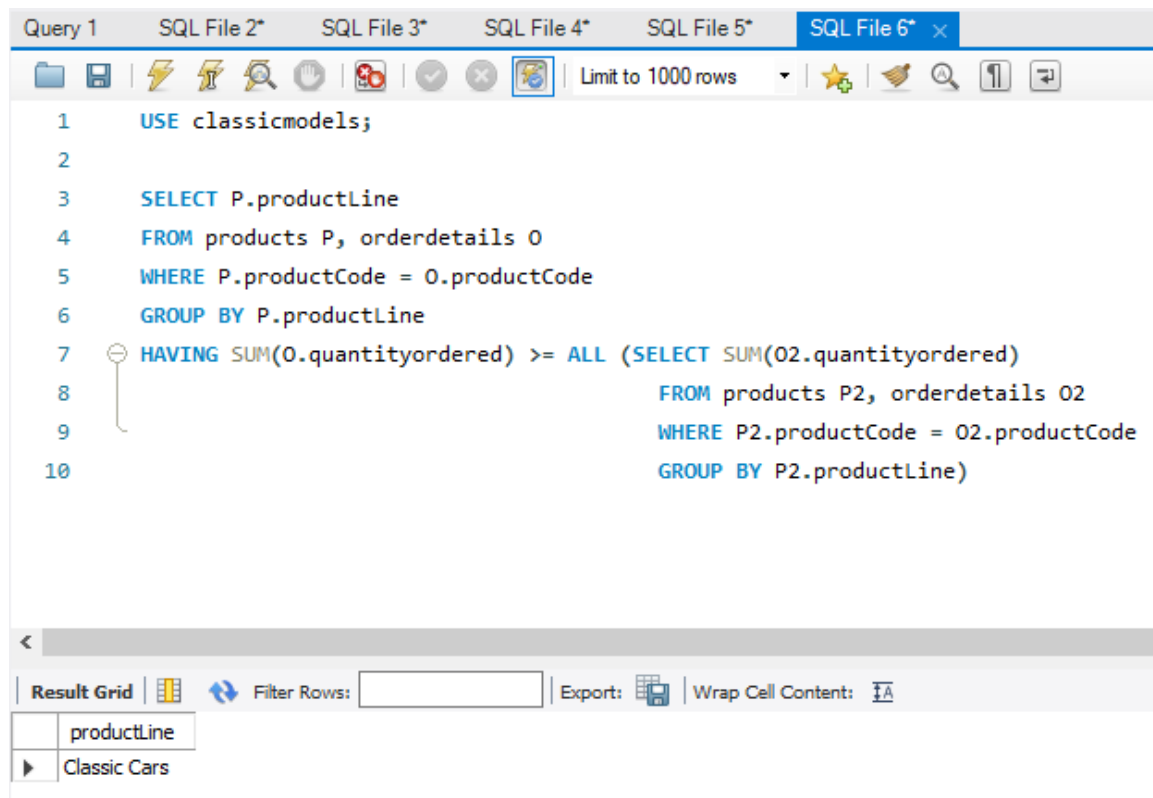
Column1
contactLastName
Nelson
Freyre

Table 5 Query 5 results

QUERY 6

Find the most popular productLine (which means that it was purchased the most (maximum number of orders)).

The most popular productLine is the one in which the most products from the line were sold. In order to determine this, the quantity of each product sold from each product line needed to be summed up. The product line with the largest sum then needed to be selected. The query and results are shown in the figure below.



The screenshot shows a SQL query editor with a toolbar and a results grid. The query is as follows:

```

1  USE classicmodels;
2
3  SELECT P.productLine
4  FROM products P, orderdetails O
5  WHERE P.productCode = O.productCode
6  GROUP BY P.productLine
7  HAVING SUM(O.quantityordered) >= ALL (SELECT SUM(O2.quantityordered)
8                                         FROM products P2, orderdetails O2
9                                         WHERE P2.productCode = O2.productCode
10                                        GROUP BY P2.productLine)

```

The results grid shows the following data:

productLine
Classic Cars

Figure 15 Query 6 and results

Column1
productLine
Classic Cars

Table 6 Query 6 results

DISCUSSIONS AND CONCLUSIONS

Overall, this assignment demonstrated the way that MySQL can be used to query data and answer questions relating to a dataset. The schema of the database that was used contained many different constraints and tables that demonstrated what a realistic database system could look like and how it could be used. The basics of MySQL and its usage were also shown in this assignment.

REFERENCES

1. Cover photo by [Sunder Muthukumaran](#) on [Unsplash](#)
2. Hamedani, M. (n.d.). *MySQL tutorial for beginners [full course]* - youtube. Retrieved February 27, 2022, from https://www.youtube.com/watch?v=7S_tz1z_5bA