Assignment # 1
SQL Review

Baruch College
CIS 9440 PMWA: Data Warehousing and Analytics

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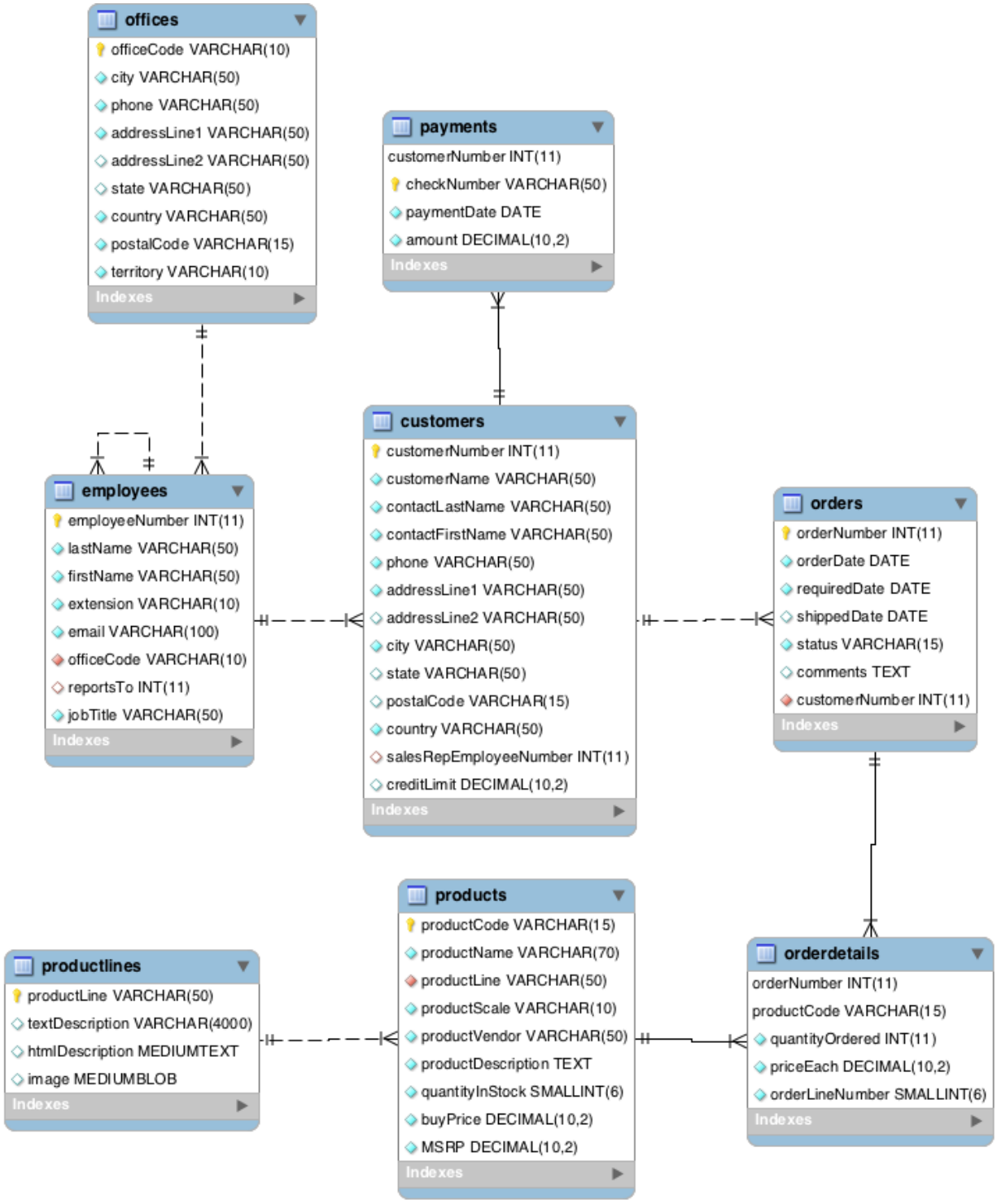


(1) Physical Level Diagram (MySQL)

(2) Write a SQL statement to show each customer's name, state and total amount spent ordered on the product '1962 Volkswagen Microbus' but only for customers with larger than average Credit Limits.

SQL:

```
SELECT customers.customerName, customers.state,
products.productName,
SUM(orderdetails.quantityOrdered) quantityOrdered,
AVG(orderdetails.priceEach) averagePriceEach,
SUM(orderdetails.quantityOrdered*orderdetails.priceEach)
totalPaid
FROM customers
JOIN orders ON customers.customerNumber = orders.customerNumber
JOIN orderdetails ON orders.orderNumber =
orderdetails.orderNumber
JOIN products ON orderdetails.productCode = products.productCode
WHERE customers.creditLimit >= (SELECT AVG(creditLimit) FROM
customers)
AND products.productName = '1962 Volkswagen Microbus'
GROUP BY customerName;
```

Results:

customerName	state	productName	quantityOrder...	averagePriceEach	totalPaid
Baane Mini Imports	NULL	1962 Volkswagen Microbus	36	107.340000	3864.24
Canadian Gift Exchange Network	BC	1962 Volkswagen Microbus	42	102.230000	4293.66
Corrida Auto Replicas, Ltd	NULL	1962 Volkswagen Microbus	64	115.010000	7283.94
Diecast Classics Inc.	PA	1962 Volkswagen Microbus	25	112.460000	2811.50
Diecast Collectables	MA	1962 Volkswagen Microbus	46	127.790000	5878.34
Down Under Souveniers, Inc	NULL	1962 Volkswagen Microbus	33	112.460000	3711.18
Dragon Souveniers, Ltd.	NULL	1962 Volkswagen Microbus	32	117.570000	3762.24
Euro+ Shopping Channel	NULL	1962 Volkswagen Microbus	140	118.843333	16378.75
Handji Gifts& Co	NULL	1962 Volkswagen Microbus	75	112.455000	8604.08
La Corne D'abondance, Co.	NULL	1962 Volkswagen Microbus	21	102.230000	2146.83
La Rochelle Gifts	NULL	1962 Volkswagen Microbus	49	127.790000	6261.71
Marta's Replicas Co.	MA	1962 Volkswagen Microbus	24	107.340000	2576.16
Mini Gifts Distributors Ltd.	CA	1962 Volkswagen Microbus	131	121.080000	15728.32
Oulu Toy Supplies, Inc.	NULL	1962 Volkswagen Microbus	42	109.900000	4615.80
Saveley & Henriot, Co.	NULL	1962 Volkswagen Microbus	49	112.460000	5510.54
Scandinavian Gift Ideas	NULL	1962 Volkswagen Microbus	48	109.900000	5275.20
Stylish Desk Decors, Co.	NULL	1962 Volkswagen Microbus	28	121.400000	3399.20
Technics Stores Inc.	CA	1962 Volkswagen Microbus	47	118.840000	5585.48
Vitachrome Inc.	NY	1962 Volkswagen Microbus	31	107.340000	3327.54

(3) Write a SQL statement to show the total amount spent ordered by customers summarized by country and each month of each Year (YYYY-MM).

SQL:

```
SELECT customers.country,
YEAR(orders.orderDate) year, MONTH(orders.orderDate) month,
SUM(orderdetails.quantityOrdered*orderdetails.priceEach)
totalPaid
FROM customers
JOIN orders ON customers.customerNumber = orders.customerNumber
JOIN orderdetails ON orders.orderNumber =
orderdetails.orderNumber
GROUP BY country, year, month;
```

Results: (PREVIEW! These pictures do not show the complete query results! Too large)

country	year	month	totalPaid
Australia	2003	4	45864.03
Australia	2003	5	7565.08
Australia	2003	7	24013.52
Australia	2003	9	51376.05
Australia	2003	11	97989.35
Australia	2004	2	44894.74
Australia	2004	7	45221.86
Australia	2004	11	82261.22
Australia	2004	12	31835.36
Australia	2005	1	27083.78
Australia	2005	2	21432.31
Australia	2005	3	29848.52
Australia	2005	5	53196.77
Austria	2003	4	35826.33
Austria	2003	10	27121.90
Austria	2003	11	15130.97
Austria	2004	7	6419.84
Austria	2004	11	42813.83
Austria	2005	3	8807.12
Austria	2005	5	52420.07
Belgium	2003	4	1627.56
Belgium	2003	8	1128.20
Belgium	2004	2	16901.38
Belgium	2004	7	45352.47
Belgium	2004	11	12081.52
Belgium	2005	1	14379.90
Belgium	2005	5	8597.73
Canada	2003	11	16909.84
Canada	2003	12	36527.61
Canada	2004	4	29284.42
Canada	2004	6	22997.45
Canada	2004	8	37527.58
Canada	2004	10	33594.58
Canada	2005	5	29070.38
Denmark	2003	2	53959.21
Denmark	2003	10	36164.46
Denmark	2004	4	28211.70
Denmark	2004	6	4710.73
Denmark	2004	10	53745.34
Denmark	2004	11	20564.86
Denmark	2005	4	21638.62
Finland	2003	8	29716.86
Finland	2003	9	32723.04
Finland	2003	10	37602.48
Finland	2004	4	16212.59
Finland	2004	5	28394.54
Finland	2004	9	34341.08
Finland	2005	1	92555.86
Finland	2005	2	23602.90
France	2003	4	33383.14
France	2003	5	82096.57
France	2003	7	51572.43
France	2003	11	116314....
France	2004	1	98779.88
France	2004	2	24757.31
France	2004	3	40978.53
France	2004	4	36069.26
France	2004	5	25080.96
France	2004	6	4632.31
France	2004	7	47924.19
France	2004	8	1960.80
France	2004	9	6066.78
France	2004	10	72618.81
France	2004	11	88878.94
France	2004	12	58912.24
France	2005	1	1834.56
France	2005	2	49523.67
France	2005	3	77017.35
France	2005	4	47348.60

...

(4) Write a SQL statement to show the total amount spent ordered by customers summarized by product line and Year.

SQL:

```
SELECT products.productLine,
YEAR(orders.orderDate) year,
SUM(orderdetails.quantityOrdered*orderdetails.priceEach)
totalPaid
FROM orders
JOIN orderdetails ON orders.orderNumber =
orderdetails.orderNumber
JOIN products ON orderdetails.productCode = products.productCode
JOIN productlines ON products.productLine =
productlines.productLine
GROUP BY productLine, year;
```

Results:

productLine	year	totalPaid
Classic Cars	2003	1374832.22
Classic Cars	2004	1763136.73
Classic Cars	2005	715953.54
Motorcycles	2003	348909.24
Motorcycles	2004	527243.84
Motorcycles	2005	245273.04
Planes	2003	309784.20
Planes	2004	471971.46
Planes	2005	172881.88
Ships	2003	222182.08
Ships	2004	337326.10
Ships	2005	104490.16
Trains	2003	65822.05
Trains	2004	96285.53
Trains	2005	26425.34
Trucks and…	2003	376657.12
Trucks and…	2004	465390.00
Trucks and…	2005	182066.45
Vintage Cars	2003	619161.48
Vintage Cars	2004	854551.85
Vintage Cars	2005	323846.30

(5) Write a SQL statement to show which sales manager supervises the sales reps that have the highest sales. (Use the “reportsto” relationship to find the supervisors of the sales reps).

SQL:

```
SELECT sr.employeeNumber, sr.jobTitle,
CONCAT(sr.lastName, ', ', sr.firstName) AS 'salesRep',
SUM(orderdetails.quantityOrdered*orderdetails.priceEach)
totalSales,
CONCAT(sv.lastName, ', ', sv.firstName) AS 'supervisior'
FROM employees sr
INNER JOIN employees sv ON sr.reportsTo = sv.employeeNumber
JOIN customers ON sr.employeeNumber =
customers.salesRepEmployeeNumber
JOIN orders ON customers.customerNumber = orders.customerNumber
JOIN orderdetails ON orders.orderNumber =
orderdetails.orderNumber
WHERE sr.jobTitle = 'Sales Rep'
GROUP BY sr.employeeNumber
ORDER BY totalSales DESC
LIMIT 5;
```

Results:

employeeNumb...	jobTitle	salesRep	totalSales	supervisior
1370	Sales Rep	Hernandez, Gerard	1258577.81	Bondur, Gerard
1165	Sales Rep	Jennings, Leslie	1081530.54	Bow, Anthony
1401	Sales Rep	Castillo, Pamela	868220.55	Bondur, Gerard
1501	Sales Rep	Bott, Larry	732096.79	Bondur, Gerard
1504	Sales Rep	Jones, Barry	704853.91	Bondur, Gerard

6) Assume the BUYPRICE is the price Classic Cars pays for the product and PRICEEACH is the price the customer paid. What was the most profitable month? Justify your rationale and show your SQL query.

SQL:

```
SELECT YEAR(orders.orderDate) year, MONTH(orders.orderDate)
month,
products.productLine,
AVG(products.buyPrice) averageBuyPrice,
AVG(orderdetails.priceEach) averagePriceEach,
SUM(orderdetails.quantityOrdered) totalQuantityOrdered,
SUM((orderdetails.priceEach -
products.buyPrice)*orderdetails.quantityOrdered) profit
FROM orders
JOIN orderdetails ON orders.orderNumber =
orderdetails.orderNumber
JOIN products ON orderdetails.productCode = products.productCode
WHERE products.productLine = 'Classic Cars'
GROUP BY year, month
ORDER BY profit DESC
LIMIT 5;
```

Results:

year	month	productLine	averageBuyPrice	averagePriceEach	totalQuantityOrder...	profit
2003	11	Classic Cars	64.996053	107.118509	3879	165447.50
2004	11	Classic Cars	65.048381	109.428381	3669	162927.50
2004	10	Classic Cars	67.511000	112.982400	1786	82821.14
2004	8	Classic Cars	64.309818	107.025636	1885	80576.21
2003	10	Classic Cars	63.415161	103.134194	2032	78614.43

Rationale:

The SQL query returns the top 5 most profitable months for Classic Cars.
SUM((orderdetails.priceEach - products.buyPrice)*orderdetails.quantityOrdered) = Profit.
November 2003 is the most profitable month for Classic Cars. This month had the highest profit in the amount of $165,447.50

(7) Who is the “best” customer? Justify your rationale and back it up with a query showing the data. You may also wish to graph your data to support your justification.

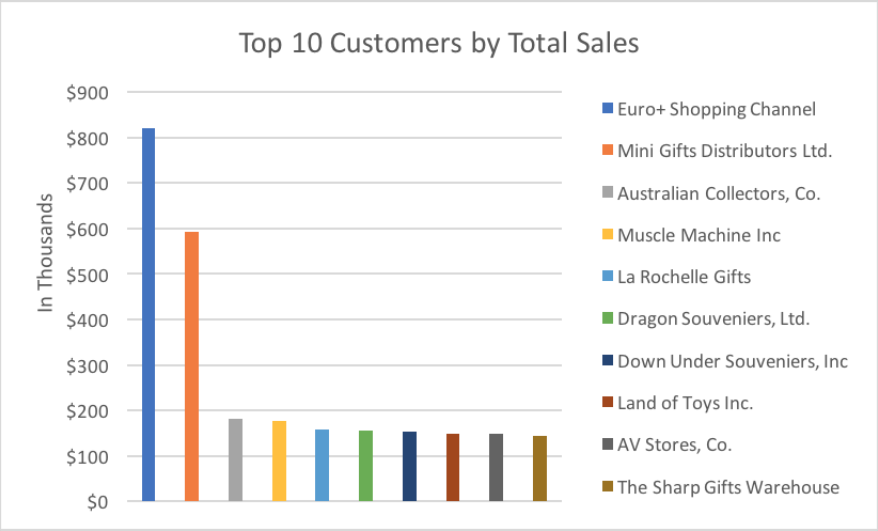
SQL:

```
SELECT customers.customerName,
SUM(orderdetails.quantityOrdered) totalQuantityOrdered,
AVG(orderdetails.priceEach) averagePricePaidPer,
SUM(orderdetails.quantityOrdered* orderdetails.priceEach)
totalSpent
FROM customers
JOIN orders ON customers.customerNumber = orders.customerNumber
JOIN orderdetails ON orders.orderNumber =
orderdetails.orderNumber
GROUP BY customers.customerName
ORDER BY totalSpent DESC
LIMIT 10;
```

Results:

customerName	totalQuantityOrder...	averagePricePaidPer	totalSpent
Euro+ Shopping Channel	9327	87.567568	820689.54
Mini Gifts Distributors Ltd.	6366	93.036556	591827.34
Australian Collectors, Co.	1926	93.803455	180585.07
Muscle Machine Inc	1775	100.015417	177913.95
La Rochelle Gifts	1832	85.938868	158573.12
Dragon Souveniers, Ltd.	1524	101.686047	156251.03
Down Under Souveniers, Inc	1691	91.069130	154622.08
Land of Toys Inc.	1631	93.387143	149085.15
AV Stores, Co.	1778	84.270784	148410.09
The Sharp Gifts Warehouse	1656	84.260000	143536.27

***Graph and rational explanation on next page (p. 9)...**



Rationale:(Question 7)
Let's assume that the best customer is the one that spent the most on purchases. Euro+ Shopping Channel is the best customer with over 800k spent on products. It leads with 200k more than second best, Mini Gifts Distributors Ltd.

(8) Create a VIEW in your own schema that joins together all of the columns in the CUSTOMERS, ORDERS, ORDERDETAILS, EMPLOYEES, PAYMENTS and PRODUCTS tables.

SQL:

```
CREATE VIEW view_1 as
SELECT
e.employeeNumber, e.lastName, e.firstName, e.extension, e.email,
e.officeCode, e.reportsTo, e.jobTitle,
c.customerNumber, c.customerName, c.contactLastName,
c.contactFirstName, c.phone, c.addressLine1, c.addressLine2,
c.city, c.state, c.postalCode, c.country,
c.salesRepEmployeeNumber, c.creditLimit,
p.checkNumber, p.paymentDate, p.amount,
r.orderNumber, r.orderDate, r.requiredDate, r.shippedDate,
r.status, r.comments,
d.quantityOrdered, d.priceEach, (d.quantityOrdered*d.priceEach)
totalPerProduct, d.orderLineNumber,
s.productCode, s.productName, s.productLine, s.productScale,
s.productVendor, s.productDescription, s.quantityInStock,
s.buyPrice, s.MSRP
FROM employees e
JOIN customers c ON e.employeeNumber = c.salesRepEmployeeNumber
JOIN payments p ON c.customerNumber  = p.customerNumber
JOIN orders r ON c.customerNumber = r.customerNumber
JOIN orderdetails d ON r.orderNumber = d.orderNumber
JOIN products s ON d.productCode = s.productCode
GROUP BY d.orderNumber, s.productCode
ORDER BY d.orderNumber;
```

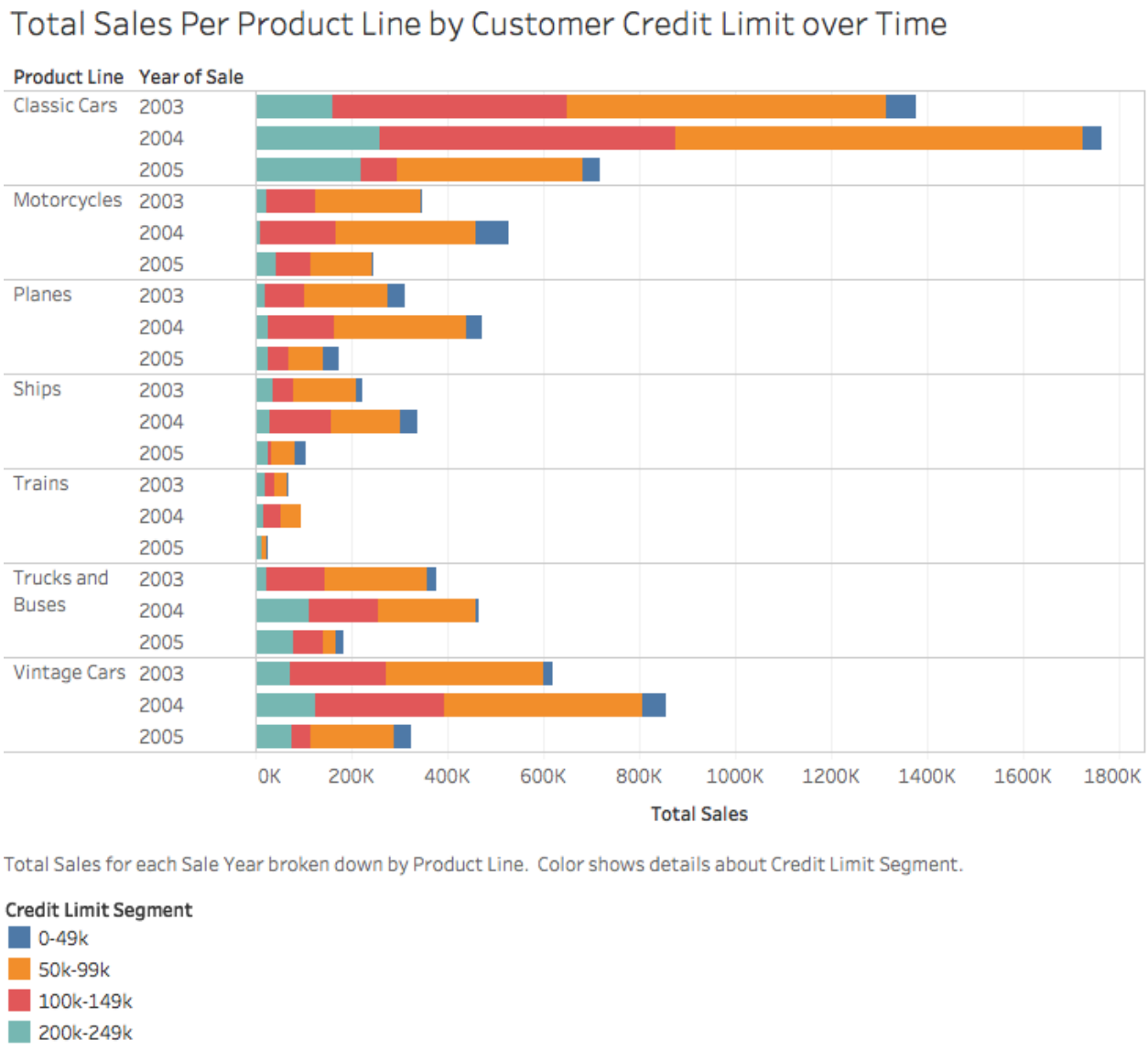
(9) Import all of the data from your view into Microsoft Excel. Create a pivot table from the resulting data set and then summarize the data according to total sales by productline and customer country.

Total Sales by Product Line and Customer Country

Country	Classic Cars	Motorcycles	Planes	Ships	Trains	Trucks and Buses	Vintage Cars	Grand Total
Australia	$187,965	$84,583	$65,268	$4,410	$1,887	$69,845	$148,624	$562,583
Austria	$101,526	$18,039	$16,064	$7,712		$19,563	$25,636	$188,540
Belgium	$18,460		$5,625	$27,855	$7,815		$40,314	$100,069
Canada	$59,660	$3,727	$23,540	$36,605		$46,366	$36,014	$205,912
Denmark	$140,726		$7,209	$33,848	$9,241	$7,561	$20,411	$218,995
Finland	$143,593	$36,587	$31,962	$23,745	$4,862	$34,483	$19,918	$295,149
France	$394,961	$198,702	$88,434	$58,769	$15,497	$99,355	$151,656	$1,007,374
Germany	$132,047	$6,491	$19,601	$4,510	$5,184	$7,976	$20,662	$196,471
Hong Kong		$2,832	$37,359				$5,290	$45,481
Ireland	$26,414	$4,554	$11,033		$2,699	$3,426	$1,772	$49,898
Italy	$120,420	$8,762	$103,733	$15,200	$5,367	$7,311	$99,824	$360,617
Japan	$41,139	$32,643	$41,535	$16,112	$3,658	$11,386	$21,439	$167,910
New Zealand	$151,699	$82,975	$45,211	$29,401	$8,113	$19,241	$140,207	$476,847
Norway	$36,941	$19,368			$4,023	$26,456	$17,437	$104,225
Norway	$91,868	$27,168	$28,506				$19,079	$166,622
Philippines	$51,986	$14,839	$18,975				$1,669	$87,468
Singapore	$118,486	$3,516		$14,394	$11,423	$83,658	$32,522	$263,998
Spain	$450,543	$62,166	$86,487	$108,080	$33,569	$156,650	$201,894	$1,099,389
Sweden	$66,590	$10,126	$8,962	$28,441	$3,033	$40,834	$29,652	$187,638
Switzerland	$108,778							$108,778
UK	$147,173	$37,259	$39,590	$65,253	$12,568	$24,547	$110,558	$436,947
USA	$1,262,947	$467,091	$275,545	$189,664	$59,594	$365,457	$652,982	$3,273,280
Grand Total	**$3,853,922**	**$1,121,426**	**$954,638**	**$663,998**	**$188,533**	**$1,024,114**	**$1,797,560**	**$9,604,191**

USA leads in Grand total sales and in every product category!

(10) Import all of the data from your view into Tableau. Create an appropriate visualization from the resulting data set that summarizes the data according to total sales by productline and customer credit limit over time.



Classic Cars had the overall biggest year in sales during 2004, with those in the 50k-99k credit Limit segment responsible for most of the purchases.