

SQL Query Writing
AdventureWorks2012
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DBAS27198 - Professor Peter Riis

Simple Query 1

Exploring the Sales portion of the database starting from the SalesOrderDetail table. This will give some information on what is used to track and carry out orders.

```
SELECT *  
FROM Sales.SalesOrderDetail
```

SalesOrderID	SalesOrderDetailID	CarrierTrackingNumber	OrderQty	ProductID	SpecialOfferID	UnitPrice	UnitPriceDiscount	LineTotal	rowguid	ModifiedDate
43659	1	4911-403C-98	1	776	1	2024.994	0.00	2024.994000	B207C96D-D9E6-402B-8470-2CC176C42283	2005-07-01 00:00:00.000
43659	2	4911-403C-98	3	777	1	2024.994	0.00	6074.982000	7ABB600D-1E77-41BE-9FE5-B9142CFC08FA	2005-07-01 00:00:00.000
43659	3	4911-403C-98	1	778	1	2024.994	0.00	2024.994000	475CF8C6-49F6-486E-B0AD-AFC6A50CDD2F	2005-07-01 00:00:00.000
43659	4	4911-403C-98	1	771	1	2039.994	0.00	2039.994000	04C4DE91-5815-45D6-8670-F462719FBCE3	2005-07-01 00:00:00.000
43659	5	4911-403C-98	1	772	1	2039.994	0.00	2039.994000	5A74C7D2-E641-438E-A7AC-37BF23280301	2005-07-01 00:00:00.000
43659	6	4911-403C-98	2	773	1	2039.994	0.00	4079.988000	CE472532-A4C0-45BA-816E-EEFD3FD848B3	2005-07-01 00:00:00.000
43659	7	4911-403C-98	1	774	1	2039.994	0.00	2039.994000	80667840-F962-4EE3-96E0-AECA108E0D4F	2005-07-01 00:00:00.000
43659	8	4911-403C-98	3	714	1	28.8404	0.00	86.521200	E9D54907-E7B7-4969-80D9-76BA69F8A836	2005-07-01 00:00:00.000
43659	9	4911-403C-98	1	716	1	28.8404	0.00	28.840400	AA542630-BDCD-4CE5-89A0-C1BF82747725	2005-07-01 00:00:00.000
43659	10	4911-403C-98	6	709	1	5.70	0.00	34.200000	AC769034-3C2F-495C-A5A7-3B71CDB25D4E	2005-07-01 00:00:00.000
43659	11	4911-403C-98	2	712	1	5.1865	0.00	10.373000	06A68921-6B9F-4199-A912-DDAFD383472B	2005-07-01 00:00:00.000
43659	12	4911-403C-98	4	711	1	20.1865	0.00	80.746000	0E371EE3-253E-4BB0-B813-83CF4224F972	2005-07-01 00:00:00.000
43660	13	6431-4D57-83	1	762	1	419.4589	0.00	419.458900	419A1302-AC7A-4044-97B2-66D9D14CD02E	2005-07-01 00:00:00.000
43660	14	6431-4D57-83	1	758	1	874.794	0.00	874.794000	5D0B2B03-1D4C-4C34-9696-C14C58E7301C	2005-07-01 00:00:00.000
43661	15	4E0A-4F89-AE	1	745	1	809.76	0.00	809.760000	EDE1759E-6733-4C7B-A43F-DC6F48002D8A	2005-07-01 00:00:00.000
43661	16	4E0A-4F89-AE	1	743	1	714.7043	0.00	714.704300	FE10BF09-D477-485B-9541-27AE8053A6D4	2005-07-01 00:00:00.000
43661	17	4E0A-4F89-AE	2	747	1	714.7043	0.00	1429.408600	B136852E-24C9-4006-8048-B14AEFE6C337	2005-07-01 00:00:00.000
43661	18	4E0A-4F89-AE	4	712	1	5.1865	0.00	20.746000	F0F410B6-BC93-4D77-B70D-E4E2465D98EE	2005-07-01 00:00:00.000
43661	19	4E0A-4F89-AE	4	715	1	28.8404	0.00	115.361600	AE4CDA7D-9B6E-4ABB-A391-E9E9DD8101...	2005-07-01 00:00:00.000
43661	20	4E0A-4F89-AE	2	742	1	722.5949	0.00	1445.189800	054A9D3B-A178-4656-B2B0-9B9BDDF1C345	2005-07-01 00:00:00.000

The result of this query shows that a 'SalesOrderID' is used to track each order. This can be inferred by looking to the 'SalesOrderDetailID' column and recognizing that there are multiple details linked with the same Order ID. The 'CarrierTrackingNumber' is also the same for all entries of the SalesOrderID.

Simple Query 2

Some key information appeared to be missing from the SalesOrderDetail table so I queried the Sales.SalesOrderHeader table to gather a more complete picture of the sales ordering system. (3 pictures are shown to include all headings since there are many and most are very important to the system.)

```
SELECT *  
FROM Sales.SalesOrderHeader
```

	SalesOrderID	RevisionNumber	OrderDate	DueDate	ShipDate	Status	OnlineOrderFlag	SalesOrderNumber	PurchaseOrderNumber
1	43659	3	2005-07-01 00:00:00.000	2005-07-13 00:00:00.000	2005-07-08 00:00:00.000	5	0	SO43659	PO522145787
2	43660	3	2005-07-01 00:00:00.000	2005-07-13 00:00:00.000	2005-07-08 00:00:00.000	5	0	SO43660	PO18850127500
3	43661	3	2005-07-01 00:00:00.000	2005-07-13 00:00:00.000	2005-07-08 00:00:00.000	5	0	SO43661	PO18473189620
4	43662	3	2005-07-01 00:00:00.000	2005-07-13 00:00:00.000	2005-07-08 00:00:00.000	5	0	SO43662	PO18444174044
5	43663	3	2005-07-01 00:00:00.000	2005-07-13 00:00:00.000	2005-07-08 00:00:00.000	5	0	SO43663	PO18009186470
6	43664	3	2005-07-01 00:00:00.000	2005-07-13 00:00:00.000	2005-07-08 00:00:00.000	5	0	SO43664	PO16617121983
7	43665	3	2005-07-01 00:00:00.000	2005-07-13 00:00:00.000	2005-07-08 00:00:00.000	5	0	SO43665	PO16588191572
8	43666	3	2005-07-01 00:00:00.000	2005-07-13 00:00:00.000	2005-07-08 00:00:00.000	5	0	SO43666	PO16008173883
9	43667	3	2005-07-01 00:00:00.000	2005-07-13 00:00:00.000	2005-07-08 00:00:00.000	5	0	SO43667	PO15428132599
10	43668	3	2005-07-01 00:00:00.000	2005-07-13 00:00:00.000	2005-07-08 00:00:00.000	5	0	SO43668	PO14732180295
11	43669	3	2005-07-01 00:00:00.000	2005-07-13 00:00:00.000	2005-07-08 00:00:00.000	5	0	SO43669	PO14123169936
12	43670	3	2005-07-01 00:00:00.000	2005-07-13 00:00:00.000	2005-07-08 00:00:00.000	5	0	SO43670	PO14384116310
13	43671	3	2005-07-01 00:00:00.000	2005-07-13 00:00:00.000	2005-07-08 00:00:00.000	5	0	SO43671	PO13978119376
14	43672	3	2005-07-01 00:00:00.000	2005-07-13 00:00:00.000	2005-07-08 00:00:00.000	5	0	SO43672	PO13862153537
15	43673	3	2005-07-01 00:00:00.000	2005-07-13 00:00:00.000	2005-07-08 00:00:00.000	5	0	SO43673	PO13775141242
16	43674	3	2005-07-01 00:00:00.000	2005-07-13 00:00:00.000	2005-07-08 00:00:00.000	5	0	SO43674	PO12760141756
17	43675	3	2005-07-01 00:00:00.000	2005-07-13 00:00:00.000	2005-07-08 00:00:00.000	5	0	SO43675	PO12412186464
18	43676	3	2005-07-01 00:00:00.000	2005-07-13 00:00:00.000	2005-07-08 00:00:00.000	5	0	SO43676	PO11861165059
19	43677	3	2005-07-01 00:00:00.000	2005-07-13 00:00:00.000	2005-07-08 00:00:00.000	5	0	SO43677	PO11049174786

Query executed successfully. dbr.fast.sheridanc.on.ca (1... s23u19 (52) AdventureWorks2012 00:00:03 31,465 rows

SimpleQuery2_Shan...2012 (s23u19 (52))

USE AdventureWorks2012

SELECT *

FROM Sales.SalesOrderHeader

100 %

Results Messages

r	AccountNumber	CustomerID	SalesPersonID	TerritoryID	BillToAddressID	ShipToAddressID	ShipMethodID	CreditCardID	CreditCardApprovalCode	CurrencyRateID	SubTotal
1	10-4020-000676	29825	279	5	985	985	5	16281	105041V684182	NULL	20565.6206
2	10-4020-000117	29672	279	5	921	921	5	5618	115213V29411	NULL	1294.2529
3	10-4020-000442	29734	282	6	517	517	5	1346	85274V6854	4	32726.4786
4	10-4020-000227	29994	282	6	482	482	5	10456	125295V53935	4	28832.5289
5	10-4020-000510	29565	276	4	1073	1073	5	4322	45303V22691	NULL	419.4589
6	10-4020-000397	29898	280	1	876	876	5	806	95555V4081	NULL	24432.6088
7	10-4020-000146	29580	283	1	849	849	5	15232	35568V78804	NULL	14352.7713
8	10-4020-000511	30052	276	4	1074	1074	5	13349	105623V69217	NULL	5056.4896
9	10-4020-000646	29974	277	3	629	629	5	10370	55680V53503	NULL	6107.082
10	10-4020-000514	29614	282	6	529	529	5	1566	85817V8045	4	35944.1562
11	10-4020-000578	29747	283	1	895	895	5	15538	25877V80261	NULL	714.7043
12	10-4020-000504	29566	275	3	810	810	5	18017	105888V93490	NULL	6122.082
13	10-4020-000200	29890	283	1	855	855	5	13693	25904V70960	NULL	8128.7876
14	10-4020-000119	30067	282	6	464	464	5	3980	95915V20982	4	6124.182
15	10-4020-000618	29844	275	2	821	821	5	1417	35931V7271	NULL	3746.2015
16	10-4020-000083	29596	282	6	458	458	5	19204	26081V99806	4	2624.382
17	10-4020-000670	29827	277	3	631	631	5	11886	126121V61402	NULL	5716.3102
18	10-4020-000017	29811	275	5	755	755	5	18153	36168V94127	NULL	14203.458
19	10-4020-000679	29824	278	6	556	556	5	14030	16302V72763	4	7793.1108

Query executed successfully. dbr.fast.sheridanc.on.ca (1... s23u19 (52) AdventureWorks2012 00:00:03 31,465 rows

SimpleQuery2_Shan...2012 (s23u19 (52))

USE AdventureWorks2012

SELECT *

FROM Sales.SalesOrderHeader

100 %

Results Messages

creditCardApprovalCode	CurrencyRateID	SubTotal	TaxAmt	Freight	TotalDue	Comment	rowguid	ModifiedDate
05041V684182	NULL	20565.6206	1971.5149	616.0984	23153.2339	NULL	79B65321-39CA-4115-9CBA-8FE0903E12E6	2005-07-08 00:00:00.000
15213V29411	NULL	1294.2529	124.2483	38.8276	1457.3288	NULL	738DC42D-D03B-48A1-9822-F95A67EA7389	2005-07-08 00:00:00.000
5274V6854	4	32726.4786	3153.7696	985.553	36865.8012	NULL	D91B9131-18A4-4A11-BC3A-90B6F53E9D74	2005-07-08 00:00:00.000
25295V53935	4	28832.5289	2775.1646	867.2389	32474.9324	NULL	4A1ECFC0-CC3A-4740-B028-1C50BB48711C	2005-07-08 00:00:00.000
5303V22691	NULL	419.4589	40.2681	12.5838	472.3108	NULL	9B1E7A40-6AE0-4AD3-811C-A64951857C4B	2005-07-08 00:00:00.000
5555V4081	NULL	24432.6088	2344.9921	732.81	27510.4109	NULL	22A8A5DA-8C22-42AD-9241-839489B6EF0D	2005-07-08 00:00:00.000
5568V78804	NULL	14352.7713	1375.9427	429.9821	16158.6961	NULL	5602C304-853C-43D7-9E79-76E320D476CF	2005-07-08 00:00:00.000
05623V69217	NULL	5056.4896	486.3747	151.9921	5694.8564	NULL	E2A90057-1366-4487-8A7E-8085845FF770	2005-07-08 00:00:00.000
5680V53503	NULL	6107.082	586.1203	183.1626	6876.3649	NULL	86D5237D-432D-4B21-8ABC-671942F5789D	2005-07-08 00:00:00.000
5817V8045	4	35944.1562	3461.7654	1081.8017	40487.7233	NULL	281CC355-D538-494E-9B44-461B36A826C6	2005-07-08 00:00:00.000
5877V80261	NULL	714.7043	70.5175	22.0367	807.2585	NULL	FABFC5C2-E034-4E0E-A573-6F39E9FA0484	2005-07-08 00:00:00.000
05888V93490	NULL	6122.082	587.5603	183.6126	6893.2549	NULL	573E52A7-573F-40B6-B695-6F3D242E0C6D	2005-07-08 00:00:00.000
5904V70960	NULL	8128.7876	780.8136	244.0042	9153.6054	NULL	005FDA9D-62E1-4001-A4AC-A976A7905F94	2005-07-08 00:00:00.000
5915V20982	4	6124.182	587.6023	183.6257	6895.41	NULL	194202AA-8E15-4932-A2C4-7A7AC0713639	2005-07-08 00:00:00.000
5931V7271	NULL	3746.2015	357.9614	111.8629	4216.0258	NULL	C5CD3AE9-41F5-4B71-A3F1-D550B928572B	2005-07-08 00:00:00.000
8081V99806	4	2624.382	251.9407	78.7315	2955.0542	NULL	CE8BCA02-F705-4AAE-A446-5D8B660C3A1B	2005-07-08 00:00:00.000
26121V61402	NULL	5716.3102	546.8759	170.8987	6434.0848	NULL	9F2CF0EE-F2B8-44D4-897D-7641F4FBD649	2005-07-08 00:00:00.000
6168V94127	NULL	14203.458	1363.266	426.0206	15992.7446	NULL	28C73732-D2FD-4F0D-A9A8-0E53595235F6	2005-07-08 00:00:00.000
6302V72763	4	7793.1108	747.1011	233.4691	8773.681	NULL	95FAAF28-6495-40B0-9789-466B195F2F96	2005-07-08 00:00:00.000

Query executed successfully. dbr.fast.sheridanc.on.ca (1... s23u19 (52) AdventureWorks2012 00:00:03 31,465 rows

The 'SalesOrderHeader' includes a majority of the information relevant to the AdventureWorks sales orders. It includes multiple identification numbers such as the OrderID, the OrderNumber, the PurchaseOrderNumber, the AccountNumber and the CustomerID. The SaleOrderID is the same identifier as in the previous simple query and the header appears to go into more detail about the specifics of each order. It also provides a nearly complete picture of the order-relevant information in the customer profile with BillToID, the ShipToID, the CreditCardID and even the CurrencyRateID, which appears to convert currencies to or from USD to or from another region, based on ID number. Finally all pricing is included such as the SubTotal, TaxAmt and TotalDue.

Intermediate Query 1

To learn more about the business side of Adventureworks, and the Sales portion specifically, the Sales.SalesPerson table was queried to learn more about compensation for sales people.

```
SELECT COUNT(Distinct BusinessEntityID) AS 'Number of Sales People',  
CommissionPct AS 'Commission Percentage' ,  
ROUND(AVG(Bonus), 2) AS 'Bonus Average'  
FROM Sales.SalesPerson  
Group By CommissionPct
```

The screenshot displays the SQL Server Enterprise Manager interface. At the top, a tab for 'IntermediateQuery1...2012 (s23u19 (53))' is active, showing a SQL query. Below the query editor, the 'Results' tab is selected, displaying a table with 8 rows of data. The table has four columns: 'Number of Sales People', 'Commission Percentage', and 'Bonus Average'. The first row is highlighted. At the bottom, a status bar indicates 'Query executed successfully.'

```
USE AdventureWorks2012  
  
SELECT COUNT(Distinct BusinessEntityID) AS 'Number of Sales People',  
CommissionPct AS 'Commission Percentage' ,  
ROUND(AVG(Bonus), 2) AS 'Bonus Average'  
FROM Sales.SalesPerson  
Group By CommissionPct
```

	Number of Sales People	Commission Percentage	Bonus Average
1	3	0.00	0.00
2	4	0.01	3937.50
3	2	0.012	3800.00
4	3	0.015	3166.67
5	1	0.016	985.00
6	2	0.018	2862.50
7	1	0.019	3900.00
8	1	0.02	5150.00

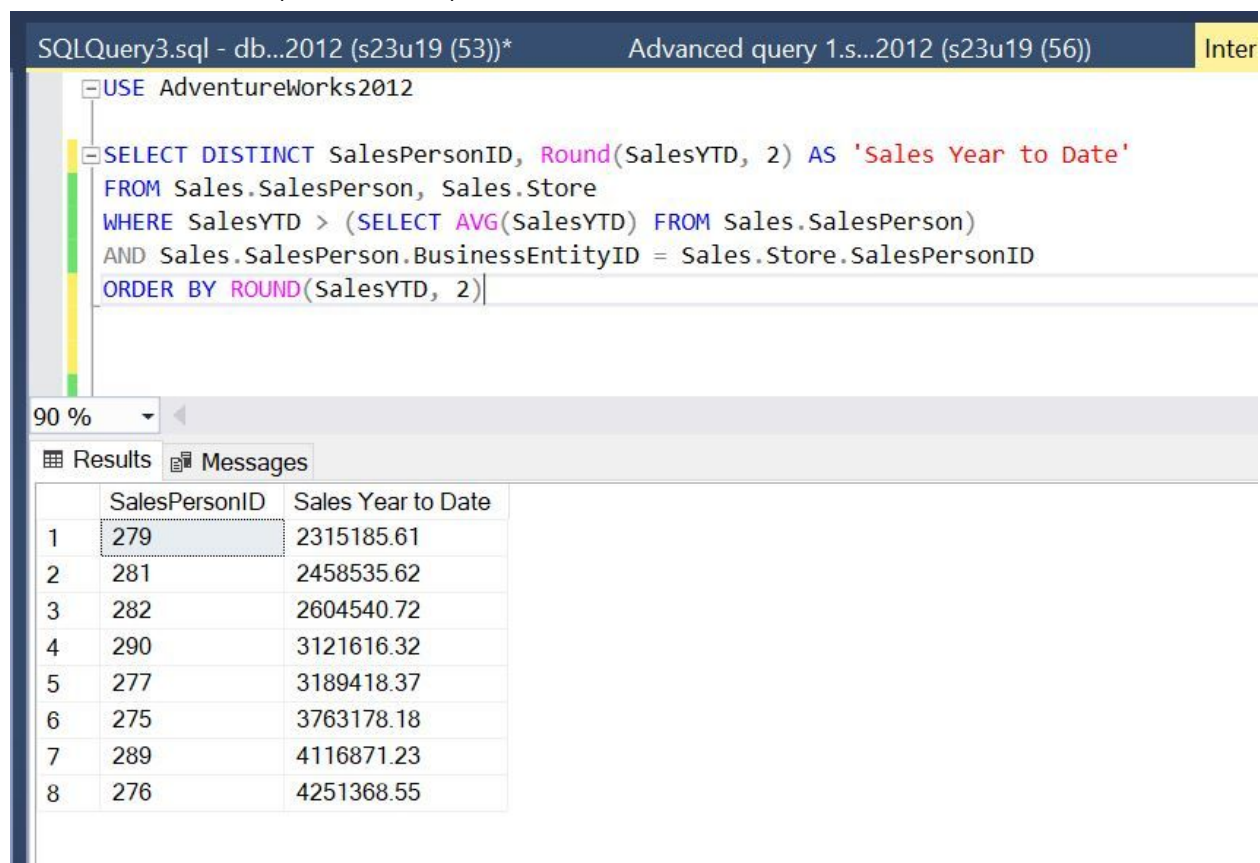
Query executed successfully.

For a large company with over 700 locations, there are surprisingly few sales people. 3 are registered but are not currently earning commissions or bonuses. The rest are scattered among the different levels of commission percentages, with less sales people in the higher commission brackets.

Intermediate Query 2

Building on the previous query, a deeper look into the sales employee's salaries was required to find who is above the average salary.

```
SELECT DISTINCT SalesPersonID, Round(SalesYTD, 2) AS 'Salary'
FROM Sales.SalesPerson, Sales.Store
WHERE SalesYTD > (SELECT AVG(SalesYTD) FROM Sales.SalesPerson)
AND Sales.SalesPerson.BusinessEntityID = Sales.Store.SalesPersonID
ORDER BY ROUND(SalesYTD, 2)
```



The screenshot shows a SQL Server Enterprise Manager window with a query titled 'SQLQuery3.sql - db...2012 (s23u19 (53))*'. The query is executed against the 'AdventureWorks2012' database. The query text is as follows:

```
USE AdventureWorks2012
SELECT DISTINCT SalesPersonID, Round(SalesYTD, 2) AS 'Sales Year to Date'
FROM Sales.SalesPerson, Sales.Store
WHERE SalesYTD > (SELECT AVG(SalesYTD) FROM Sales.SalesPerson)
AND Sales.SalesPerson.BusinessEntityID = Sales.Store.SalesPersonID
ORDER BY ROUND(SalesYTD, 2)
```

The results are displayed in a table with two columns: 'SalesPersonID' and 'Sales Year to Date'. The table contains 8 rows of data, sorted by 'Sales Year to Date' in descending order.

	SalesPersonID	Sales Year to Date
1	279	2315185.61
2	281	2458535.62
3	282	2604540.72
4	290	3121616.32
5	277	3189418.37
6	275	3763178.18
7	289	4116871.23
8	276	4251368.55

Out of the 17 sales people found to be working at AdventureWorks, 8 are above the average, although this includes the 3 that are not earning any commission so likely not working, therefore bringing down the average considerably.

Advanced Query 1

Looking to join into other tables to attach names to SalesPersonIDs as well as get the current number of orders they have open in the system. While the orders dramatically range in price,

the more the better. The sale person's previous annual sales is also included alongside their current year to date sales. The final column shows the difference between last years earnings and the employee's year to date earnings. A negative number shows positive sales growth year over year.

```
SELECT p.FirstName AS 'First Name',
p.LastName AS 'Last Name',
sh.SalesPersonID AS 'ID Number',
COUNT(sh.SalesOrderID) AS 'Number of Current Orders',
ROUND(SalesLastYear, 2) AS 'Sales Total Last Year'
FROM Sales.SalesOrderHeader sh INNER JOIN Sales.SalesPerson sp
ON sh.SalesPersonID = sp.BusinessEntityID INNER JOIN Person.Person p
ON p.BusinessEntityID = sp.BusinessEntityID
Group By SalesPersonID, SalesLastYear, FirstName, LastName
ORDER BY SalesLastYear
```

SQLQuery3.sql - db...2012 (s23u19 (53))* Advanced query 1.s...2012 (s23u19 (56)) IntermediateQuery2...2012 (s23u19 (57))

USE AdventureWorks2012

```
SELECT p.FirstName AS 'First Name',
p.LastName AS 'Last Name',
sh.SalesPersonID AS 'ID Number',
COUNT(sh.SalesOrderID) AS 'Number of Current Orders',
ROUND(SalesLastYear, 2) AS 'Sales Total Last Year',
ROUND(SalesYTD, 2) AS 'Sales Year to Date',
ROUND(SalesLastYear - SalesYTD, 2) AS 'Sales Difference YoY'
FROM Sales.SalesOrderHeader sh INNER JOIN Sales.SalesPerson sp
ON sh.SalesPersonID = sp.BusinessEntityID INNER JOIN Person.Person p
ON p.BusinessEntityID = sp.BusinessEntityID
Group By SalesPersonID, SalesLastYear, SalesYTD, FirstName, LastName
ORDER BY SalesLastYear
```

90 %

Results Messages

	First Name	Last Name	ID Number	Number of Current Orders	Sales Total Last Year	Sales Year to Date	Sales Difference YoY
1	Stephen	Jiang	274	48	0.00	559697.56	-559697.56
2	Tete	Mensa-Annan	284	140	0.00	1576562.20	-1576562.20
3	Syed	Abbas	285	16	0.00	172524.45	-172524.45
4	Amy	Alberts	287	39	0.00	519905.93	-519905.93
5	Rachel	Valdez	288	130	1307949.79	1827066.71	-519116.92
6	David	Campbell	283	189	1371635.32	1573012.94	-201377.62
7	Linda	Mitchell	276	418	1439156.03	4251368.55	-2812212.52
8	Garrett	Vargas	278	234	1620276.90	1453719.47	166557.43
9	Jae	Pak	289	348	1635823.40	4116871.23	-2481047.83
10	Michael	Blythe	275	450	1750406.48	3763178.18	-2012771.70
11	Tsvi	Reiter	279	429	1849640.94	2315185.61	-465544.67
12	Pamela	Ansman-Wolfe	280	95	1927059.18	1352577.13	574482.05
13	Lillian	Carson	277	473	1997186.20	3189418.37	-1192232.16

Query executed successfully. dbr.fast.sheridanc.on.ca (1... s23u19 (56) AdventureWorks2012

Most employees have a positive year over year sales increase, denoted by a negative number in the final column. Some have even almost doubled their previous years sales.

Advanced Query 2

A table similar to the SalesOrderHeader Table which houses most information related to orders is the SalesOrderHeaderSalesReason. This query was used to analyze averages based on the 'reason for sale' or the point of contact with the customer. The price ranges are dramatic but it provides a good picture of the business revenue and marketing/customer contact methods.

```
SELECT COUNT(hr.SalesOrderID) AS 'Number of Sales',  
r.[Name] AS 'Reason for Sale',  
ROUND(AVG(SubTotal), 2) AS 'Average Order SubTotal',  
ROUND(AVG(Freight), 2) AS 'Average Freight Cost'  
FROM Sales.SalesReason r INNER JOIN Sales.SalesOrderHeaderSalesReason hr  
ON r.SalesReasonID = hr.SalesReasonID  
INNER JOIN Sales.SalesOrderHeader sh ON sh.SalesOrderID = hr.SalesOrderID  
GROUP BY r.[Name]  
ORDER BY COUNT(hr.SalesOrderID)
```


SQLQuery4.sql - db...2012 (s23u19 (55))*
advq2.sql - dbr.fas...s2012 (s23u19 (53))
Ad

```

SELECT COUNT(hr.SalesOrderID) AS 'Number of Sales',
r.[Name] AS 'Reason for Sale',
ROUND(AVG(SubTotal), 2) AS 'Average Order SubTotal',
ROUND(AVG(Freight), 2) AS 'Average Freight Cost'
FROM Sales.SalesReason r INNER JOIN Sales.SalesOrderHeaderSalesReason hr
ON r.SalesReasonID = hr.SalesReasonID
INNER JOIN Sales.SalesOrderHeader sh ON sh.SalesOrderID = hr.SalesOrderID
GROUP BY r.[Name]
ORDER BY COUNT(hr.SalesOrderID)

```

90 %

Results

Messages

	Number of Sales	Reason for Sale	Average Order SubTotal	Average Freight Cost
1	722	Television Advertisement	38.06	0.95
2	1245	Review	1361.35	34.03
3	1395	Other	178.12	4.45
4	1551	Quality	3578.27	89.46
5	1746	Manufacturer	3435.35	85.88
6	3515	On Promotion	1809.91	45.25
7	17473	Price	628.16	15.70

✓ Query executed successfully.
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The number of sales in relation to the reason for sale was expected, since 'Price' appears to be a default reason if there was no marketing involved. The average freight cost appears to align closely with the average subtotal, even though the subtotal does not include the freight cost. Weight of products were not explored at this time, which may have a clear effect on freight costs.

AdventureWorks Sales Domain

