

# SQL

# AdventureWorks Sales Insights

Showcasing Practical Exercises and Assignments, Tasks from  
the “SQL Fundamentals for Data Analysis” Course

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Github



# About the project

## 💡 Objective

Apply SQL logic to solve analytical questions and turn raw data into insights.

## 🔧 Tool

AzureDataStudio, Carbon, Canva

01. Basic SQL Queries

02. Joins and subqueries

03. Aggregations and grouping

04. SQL Theroy and Reporting

05. Working with multiple tables



## About the Data Set

The **Adventure Works Data Warehouse** is a publicly available sample database that simulates a real-world business environment. It is based on a fictitious global company called Adventure Works Cycles, a large multinational manufacturer that sells metal and composite bicycles across North America, Europe, and Australia. The dataset includes detailed information about employees, departments, sales regions, customers, and financial transactions, providing a rich source for practical SQL analysis. Because it mirrors real business operations, it's ideal for exploring queries related to sales performance, finance, and organizational data, just like those used in professional data analytics.



# Fact Internetsale Schema (Snowflake)



## Question

Create a list of product costs grouped by invoice numbers. Return only invoices that have a total product cost per invoice number greater than 2,000.

## Syntax



```
SELECT  
SalesOrderNumber as InvoiceNumber,  
SUM(TotalProductCost)as TotalProductcost  
FROM FactInternetSales  
group by SalesOrderNumber  
HAVING SUM(TotalProductCost)>2000  
order by TotalProductCost DESC
```

## Result

	InvoiceNumber	TotalProductcost
1	S043697	2171.2942
2	S043702	2171.2942
3	S043703	2171.2942
4	S043706	2171.2942
5	S043707	2171.2942
6	S043709	2171.2942
7	S043710	2171.2942
8	S043711	2171.2942
9	S043712	2171.2942
1..	S043713	2171.2942
1..	S043714	2171.2942
1..	S043715	2171.2942
1..	S043716	2171.2942
1..	S043718	2171.2942

1,551 rows

## Question

Write a query to return InvoiceNumber, InvoiceLineNumber, and SalesAmount from the FactInternetSales table. Then return only lines where the currency key is 100.

## Syntax



SELECT

```
SalesOrderNumber as InvoiceNumber,  
SalesOrderLineNumber as InvoiceLineNumber,  
SalesAmount as SalesAmount
```

FROM FactInternetSales

WHERE CurrencyKey = 100

## Result

	InvoiceNumber	InvoiceLineNumber	SalesAmount
1	SO43699	1	3399.99
2	SO43700	1	699.0982
3	SO43702	1	3578.27
4	SO43706	1	3578.27
5	SO43707	1	3578.27
6	SO43711	1	3578.27
7	SO43713	1	3578.27
8	SO43718	1	3578.27
9	SO43719	1	3578.27
10	SO43723	1	699.0982
11	SO43726	1	699.0982
12	SO43728	1	3578.27
13	SO43730	1	3399.99
14	SO43733	1	3578.27
15	SO43734	1	3578.27

33,400 rows

## Question

Write a query to return the sales territory column from the FactInternetSales table. Then return a unique list of territories only. Order the results alphabetically for ease.

## Syntax



```
SELECT Distinct  
    SalesTerritoryKey as SalesTerritory  
FROM FactInternetSales  
ORDER BY SalesTerritory ASC
```

## Result

	SalesTerritory	▼
1	1	
2	2	
3	3	
4	4	
5	5	
6	6	
7	7	
8	8	
9	9	
10	10	

0 rows

## Question

Sales territory 6 need a summary of their sales for the lead up period to Christmas. Write a query against the FactInternet Sales table that returns orders placed in December, but only for Sales Territory 6. The query should include SalesOrderNumber, SalesOrderLineNumber, SalesAmount and TaxAmount.

## Syntax



### SELECT

```
SalesOrderNumber as InvoiceNumber,  
SalesOrderLineNumber as InvoiceLineNumber,  
SalesAmount as SalesAmount,  
TaxAmt as TaxAmount  
FROM FactInternetSales  
WHERE DATENAME(Month,OrderDate)='December' AND SalesTerritoryKey=6
```

## Result

	InvoiceNumber	InvoiceLineNumber	SalesAmount	TaxAmount
1	S043697	1	3578.27	286.2616
2	S046487	1	699.0982	55.9279
3	S046411	1	3578.27	286.2616
4	S046412	1	3578.27	286.2616
5	S046413	1	3399.99	271.9992
6	S046425	1	3578.27	286.2616
7	S046427	1	3374.99	269.9992
8	S046468	1	3578.27	286.2616
9	S046489	1	3578.27	286.2616
10	S046491	1	3578.27	286.2616
11	S046510	1	3578.27	286.2616
12	S046511	1	3578.27	286.2616
13	S046513	1	3578.27	286.2616
14	S046528	1	3578.27	286.2616
15	S046538	1	3578.27	286.2616

SQL 686 rows Choose SQL Language 00:00:00 prod-sql-cfieducation.database.windows.net:

## Question

Marketing need a list of homeowner customers along with the number of cars owned by each. First, write a query against the customer dimension table that returns all customers that are homeowners and that have more than one car. The query should include full customer names, number of cars owned, and email. As you can see in the output here, I want you to group the number of cars owned, and you should categorize them into 2-3 and 4+,

## Syntax



SELECT

```
    CONCAT(FirstName, ' ', LastName) as CustomerName,  
    CASE  
        WHEN NumberCarsOwned in(2,3) THEN '2-3'  
        WHEN NumberCarsOwned >=4 THEN '4+'  
    END as NumberOfCarsOwned,  
    EmailAddress as Email  
FROM DimCustomer  
WHERE HouseOwnerFlag =1 and NumberCarsOwned >1
```

## Result

	CustomerName	NumberOfCarsOwned	Email
1	Elizabeth Johnson	4+	elizabeth5@adventure-works.com
2	Marco Mehta	2-3	marco14@adventure-works.com
3	Rob Verhoff	2-3	rob4@adventure-works.com
4	Curtis Lu	4+	curtis9@adventure-works.com
5	Lauren Walker	2-3	lauren41@adventure-works.com
6	Ian Jenkins	2-3	ian47@adventure-works.com
7	Shannon Wang	2-3	shannon1@adventure-works.com
8	Clarence Rai	2-3	clarence32@adventure-works.com
9	Russell Xie	2-3	russell7@adventure-works.com
10	Alejandro Beck	2-3	alejandro45@adventure-works.com
11	Jessie Zhao	2-3	jessie16@adventure-works.com
12	Jill Jimenez	2-3	jill13@adventure-works.com
13	Jimmy Moreno	2-3	jimmy9@adventure-works.com
14	Bethany Yuan	2-3	bethany10@adventure-works.com
15	Theresa Ramos	2-3	theresa13@adventure-works.com

SQL 6,126 rows Choose SQL Language 00:00:00 prod-sql-ctfeducation.database.windows.net /

## Question

Summarize the Internet Sales by subcategory and return the top 5 subcategories. Write a query that returns the top 5 best-selling subcategories by sales amount. We're only interested in sales from our website, so Internet sales. Finally, the data should only include sales where the country is United States and the currency is US dollar. You should avoid using the view we created.

## Result

	Subcategory	SalesAmount
1	Road Bikes	4289925.8958
2	Mountain Bikes	3417457.735
3	Touring Bikes	1292475.90
4	Tires and Tubes	88762.86
5	Helmets	76663.09

## Syntax

```
SELECT TOP (5)
    dps.EnglishProductSubcategoryName as Subcategory,
    SUM(fs.SalesAmount) as SalesAmount

FROM FactInternetSales as fs
    join DimProduct as dp
        on fs.ProductKey = dp.ProductKey
    join DimProductSubcategory as dps
        on dp.ProductSubcategoryKey = dps.ProductSubcategoryKey
    join DimCurrency as dc
        on fs.CurrencyKey = dc.CurrencyKey
    join DimSalesTerritory as dst
        on fs.SalesTerritoryKey = dst.SalesTerritoryKey

WHERE dst.SalesTerritoryCountry ='United States'
    AND dc.CurrencyName = 'US Dollar'

Group by dps.EnglishProductSubcategoryName

Order BY SalesAmount desc
```

## Question

HR in Europe needs to seize sales by sales representative and by currency. Write a query that will return a list of all current sales representatives or sales managers in the European territory. For each person, HR needs to see sales amounts grouped by currency. Please include the following field, full employee name, employee title, currency name, and total sales amount. The query should be sorted by employee name first and then sales amount.

## Result

	EmployeeName	EmployeeTitle	Currency	TotalSalesAmount
1	Amy Alberts	European Sales Manager	US Dollar	98836.2386
2	Amy Alberts	European Sales Manager	EURO	200960.5696
3	Amy Alberts	European Sales Manager	United Kingdom Pound	441881.6364
4	José Saraiva	Sales Representative	United Kingdom Pound	3837927.1902
5	Rachel Valdez	Sales Representative	EURO	1798648.2311
6	Ranjit Varkey Chudukatil	Sales Representative	EURO	482934.9885
7	Ranjit Varkey Chudukatil	Sales Representative	US Dollar	4826954.0245

## Syntax



SELECT

```
CONCAT(de.FirstName, ' ', de.LastName) AS EmployeeName,  
de.Title AS EmployeeTitle,  
dc.CurrencyName AS Currency,  
SUM(frs.SalesAmount) AS TotalSalesAmount
```

FROM FactResellerSales AS frs

```
JOIN DimEmployee AS de  
ON frs.EmployeeKey = de.EmployeeKey
```

```
JOIN DimSalesTerritory AS dst  
ON frs.SalesTerritoryKey = dst.SalesTerritoryKey
```

```
JOIN DimCurrency AS dc  
ON frs.CurrencyKey = dc.CurrencyKey
```

WHERE dst.SalesTerritoryGroup = 'Europe'

AND de.Status = 'Current'

GROUP BY de.FirstName, de.LastName, de.Title, dc.CurrencyName

ORDER BY EmployeeName, TotalSalesAmount

## Question

Create a summary of expenditure accounts. I want you to write a query that will return the sum of actuals from the FactFinance table. You'll need to create a join between your fact table and your scenario table to identify which transactions belong to the actual scenario. Once you've done that, filter the data to meet the following conditions. We only want to see transactions from January 2011. We only want to see transactions from the Southwest Division, and we only want to see transactions that belong to expenditure accounts.

## Syntax

```
SELECT
    o.OrganizationName AS Organization,
    a.AccountType AS AccountType,
    a.AccountDescription AS Account,
    SUM(ff.Amount) AS Amount

FROM FactFinance AS ff
    INNER JOIN DimScenario AS s
        ON ff.ScenarioKey = s.ScenarioKey
    INNER JOIN DimDate AS d
        ON ff.DateKey = d.DateKey
    INNER JOIN DimOrganization AS o
        ON ff.OrganizationKey = o.OrganizationKey
    INNER JOIN DimAccount AS a
        ON ff.AccountKey = a.AccountKey

WHERE s.ScenarioName = 'Actual'
    AND d.CalendarYear = 2011
    AND d.EnglishMonthName = 'January'
    AND o.OrganizationName = 'Southwest Division'
    AND a.AccountType = 'Expenditures'

GROUP BY OrganizationName, AccountType, AccountDescription
ORDER BY Amount DESC
```

## Result

	Organization	AccountType	Account	Amount
1	Southwest Division	Expenditures	Standard Cost of Sales	122573
2	Southwest Division	Expenditures	Salaries	67520
3	Southwest Division	Expenditures	Taxes	36583
4	Southwest Division	Expenditures	Commissions	15640
5	Southwest Division	Expenditures	Variances	13034
6	Southwest Division	Expenditures	Payroll Taxes	6469
7	Southwest Division	Expenditures	Employee Benefits	5291
8	Southwest Division	Expenditures	Telephone	4162
9	Southwest Division	Expenditures	Returns and Adjustments	3918
10	Southwest Division	Expenditures	Building Leasehold	1593
11	Southwest Division	Expenditures	Utilities	1467
12	Southwest Division	Expenditures	Rent	1440
13	Southwest Division	Expenditures	Travel Transportation	1185
14	Southwest Division	Expenditures	Travel Lodging	1005
15	Southwest Division	Expenditures	Vehicles	985
16	Southwest Division	Expenditures	Marketing Collateral	782

## Question

Create a summary of expenditure accounts. Write a query that will return the sum of actuals from the FactFinance table. Join between fact table and your scenario table to identify which transactions belong to the actual scenario. Once you've done that, filter the data to meet the following conditions. We only want to see transactions from January 2011. We only want to see transactions from the Southwest Division, and we only want to see transactions that belong to expenditure accounts.

## Syntax

```
SELECT
    a.AccountDescription AS AccountDescription,
    SUM(ff.Amount) AS Amount,
    SUM(ff.Amount) / (SELECT
        SUM(ff.Amount) AS Amount
    FROM FactFinance AS ff
        INNER JOIN DimScenario AS s
            ON ff.ScenarioKey = s.ScenarioKey
        INNER JOIN DimAccount AS a
            ON ff.AccountKey = a.AccountKey
        INNER JOIN DimDate AS d
            ON ff.DateKey = d.DateKey
        INNER JOIN DimOrganization AS o
            ON ff.OrganizationKey = o.OrganizationKey
    WHERE s.ScenarioName = 'Actual'
        AND d.CalendarYear = 2013
        AND o.OrganizationName = 'Canadian Division'
        AND a.AccountType = 'Expenditures') as PercentageofTotal

    FROM FactFinance AS ff
        INNER JOIN DimScenario AS s
            ON ff.ScenarioKey = s.ScenarioKey
        INNER JOIN DimAccount AS a
            ON ff.AccountKey = a.AccountKey
        INNER JOIN DimDate AS d
            ON ff.DateKey = d.DateKey
        INNER JOIN DimOrganization AS o
            ON ff.OrganizationKey = o.OrganizationKey

    WHERE s.ScenarioName = 'Actual'
        AND d.CalendarYear = 2013
        AND o.OrganizationName = 'Canadian Division'
        AND a.AccountType = 'Expenditures'

    GROUP BY a.AccountDescription, s.ScenarioName, o.OrganizationName
    ORDER BY Amount DESC
```

## Result

	AccountDescription	Amount	PercentageofTotal
1	Standard Cost of Sales	2672984.1	0.35721658239829834
2	Salaries	2163556.2999999993	0.28914543332392134
3	Taxes	665875.3699999999	0.08898997562418392
4	Variances	441498.920000000004	0.05900350110392012
5	Commissions	328161.79	0.04278757132565135
6	Returns and Adjustments	268098.570000000004	0.034760506916128
7	Payroll Taxes	223394.410000000003	0.029855231168058386
8	Employee Benefits	164690.269999999993	0.022009799098221778
9	Discounts	181335.44	0.013542832100033746
10	Telephone	99489.040000000001	0.013296872573559076
11	Building Leasehold	49159.299999999996	0.00656982538443795
12	Rent	42389.159999999999	0.005654348875791289
13	Utilities	42194.029999999984	0.005638961689156199
14	Vehicles	38437.77	0.004067812885693733
15	Travel Transportation	38181.699999999997	0.004833598771339113
16	Travel Lodging	27445.280000000006	0.0036678857759774295

01 ✶

# Assessment Questions

What is the first and last name of the Adventure Works customer that spent the most on the website? Only include transactions paid in currency 'US Dollar'.



```
SELECT TOP(1)
    c.FirstName,
    c.LastName,
    SUM(f.SalesAmount) AS TotalSpent
FROM FactInternetSales AS f
JOIN DimCustomer AS c
    ON f.CustomerKey = c.CustomerKey
JOIN DimCurrency AS cur
    ON f.CurrencyKey = cur.CurrencyKey
WHERE cur.CurrencyName = 'US Dollar'
GROUP BY c.FirstName, c.LastName
ORDER BY TotalSpent DESC;
```

Answer

	FirstName	LastName	TotalSpent
1	Jordan	Turner	15999.0996



02 \*

# Assessment Questions

What was the English name of the promotion that generated the most sales with the network of resellers? Filter>>Paid in “EURO”, Exclude “Discount”, Exclude promotions where the left of the name is ‘Volume’.



```
SELECT TOP(1)
    p.EnglishPromotionName AS PromotionName,
    SUM(fr.SalesAmount) AS Sales

FROM FactResellerSales as fr
    JOIN DimCurrency as c
        ON fr.CurrencyKey = c.CurrencyKey
    JOIN DimPromotion as p
        ON fr.PromotionKey= p.PromotionKey

WHERE c.CurrencyName = 'EURO'
    AND p.EnglishPromotionName <> 'NO Discount'
    AND LEFT(p.EnglishPromotionName,6) <> 'Volume'

GROUP BY EnglishPromotionName

ORDER BY Sales DESC
```

## Answer

	PromotionName	Sales
1	Touring-3600 Promotion	68431.6801



# Assessment Questions

03★

How many resellers are there in the United States? Use the dimReseller and dimGeography tables.



```
SELECT  
    COUNT(r.ResellerName) AS ResellerCount  
  
FROM dimReseller AS r  
    JOIN dimGeography AS g  
        ON r.Geographykey = g.Geographykey  
  
WHERE g.EnglishCountryRegionName = 'United States'
```

Answer

	ResellerCount	▼
1	427	



# Assessment Questions

04★

What is the best-selling online product in the '**North America**' sales territory group?  
Use the **FactInternetSales** , **dimProduct** and **dimSalesTerritory** tables.

```
● ● ●  
SELECT TOP(1)  
    p.EnglishProductName,  
    SUM(f.SalesAmount) AS SalesAmount  
  
FROM FactInternetSales AS f  
    JOIN DimProduct AS p  
    ON f.ProductKey = p.ProductKey  
    JOIN DimSalesTerritory AS t  
    ON f.SalesTerritoryKey = t.SalesTerritoryKey  
  
WHERE t.SalesTerritoryGroup = 'North America'  
GROUP BY EnglishProductName  
ORDER BY SalesAmount DESC
```

## Answer

EnglishProductName	SalesAmount
Mountain-200 Black, 46	596779.363



# Assessment Questions

05★

Create a query that returns the number and % of employees that are married ('M') or single ('S'). Please include only current employees



```
SELECT  
    MaritalStatus,  
    COUNT(*) AS Number,  
    CAST(COUNT(*)* 100/(SELECT COUNT(*)  
        FROM DimEmployee  
        WHERE [Status] = 'Current')AS DECIMAL(5,2))  
        AS Percentage  
  
FROM DimEmployee  
WHERE [Status] = 'Current'  
GROUP BY MaritalStatus
```

Answer

MaritalStatus	Number	Percentage
M	146	50.00
S	144	49.00





The End