



Study Group 10 Presents  
**SQL Mini-Project Presentation**

# Project Overview

The purpose of this project is to analyze Adventure Works retail sales data to uncover key business insights, identify trends, and provide actionable information to support decision-making. The analysis focuses on customers, products, categories, subcategories, territories, and sales performance using SQL queries.



# Problem Statement: Uncovering Key Insights

This project aims to answer critical business questions that can drive strategic decisions in this company. Our analysis focuses on:

1. Retrieve the customers who have placed orders with a total amount greater than \$10000.
2. Retrieve the total revenue and total orders generated by each product category
3. Retrieve the names of products and their categories for products with a selling price greater than the average selling price of all products. - SQ
4. How many customers have placed orders in “Canada”? List the customer names - SQ
5. Find the 10 products that have been returned the most. How much money was generated by these products? - SQ
6. Get a list of customers who have placed orders in more than one territory.
7. Retrieve the product names and their corresponding sub-categories for products that have been ordered at least 10 times.
8. List the customer names who have placed orders after 2021. What is the distribution of their occupation?
9. Get a list of products and their corresponding order quantities for products that have been ordered at least once.
10. Retrieve the product names that start with the letter "C" or "H" and are from the "Clothing" category.
11. Retrieve the product names that have been ordered in the 'United States' or "Australia".
12. Find the customer names who have placed orders with a total amount greater than the average total amount of orders. – SQ
13. Retrieve the top 5 customers who have placed the highest number of orders, along with their order counts.
14. List the customers who have placed orders within the last 6 months (consider the last date in the data)
15. We want to reach out to our best customers in 2022. Can you get emails of Top 50 customers based on revenue?

# Data Collection and Description

Our analysis is built on a dataset encompassing sales information across multiple countries from 2020 to 2022.



## → **Comprehensive Coverage**

The dataset includes various tables, offering a broad view of Adventure Works company over 3 years.

## → **Key Attributes**

Detailed tables such as customers, calendar, category, subcategory, products, returns, territory, sales data (2020-2022)

## → **Facilitator Provided**

Our facilitator provided the dataset for our monthly SQL Mini Project.

# Data Cleaning and Preparation

To ensure accuracy and reliability, the raw data underwent a rigorous cleaning and preparation process in Excel before being imported into PostgreSQL. This meticulous approach was crucial for a successful analysis.

01

## Duplicate Check

Verified and removed any duplicate records to maintain data integrity.

02

## Date & Type Standardization

Ensured consistent date formats and validated proper data types for all columns.

03

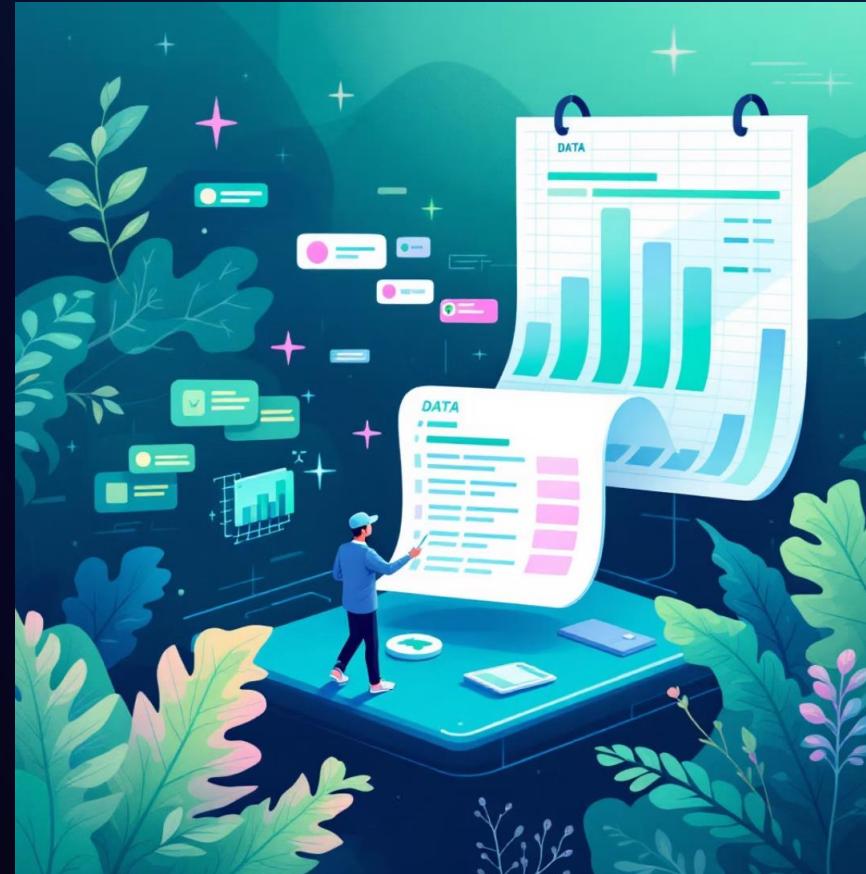
## SQL Table Creation

Created the SQL table with appropriate column types to match the cleaned data.

04

## Data Import

Imported the cleaned dataset from Excel into the PostgreSQL database.



# Business Question 1: Top-Spending Customers

Retrieve the customers who have placed orders with a total amount greater than \$10000.

## Query

```
CREATE VIEW high_value_customers AS
SELECT
    c.prefix || ' ' || c.firstname || ' ' || c.lastname fullname,
    SUM(p.productprice * t.orderquantity) totalamount
FROM totalsales t
JOIN product p
    ON t.productkey = p.productkey
JOIN customer c
    ON t.customerkey = c.customerkey
GROUP BY c.customerkey, fullname
HAVING SUM(p.productprice * t.orderquantity) > 10000
ORDER BY totalamount DESC;
```

This query identifies customers with total orders > \$10,000. and highlights high-value clients driving significant revenue.

## Insight

There are 16 customers who placed orders with a total amount greater than \$10000.  
Top spenders: MR. MAURICE SHAN, MRS. JANET MUÑOZ

## Table

	fullname text	totalamount numeric
1	MR. MAURICE SHAN	12407.9545
2	MRS. JANET MUÑOZ	12015.4029
3	MRS. LISA CAI	11330.4494
4	MRS. LACEY ZHENG	11085.7504
5	MR. JORDAN TURNER	11022.4002

# Business Question 2: Revenue and Orders by Product Category

## 2. Retrieve the total revenue and total orders generated by each product category

### Query

```
CREATE VIEW category_revenue_orders AS
SELECT
    pc.categoryname,
    SUM(p.productprice * t.orderquantity) totalrevenue,
    COUNT(t.ordernumber) totalorders
FROM pcat pc
JOIN subcat sc
    ON pc.productcategorykey = sc.productcategorykey
JOIN product p
    ON sc.productsubcategorykey = p.productsubcategorykey
LEFT JOIN totalsales t
ON t.productkey = p.productkey
GROUP BY pc.categoryname;
```

This query calculates the total revenue and order count for each product category. It provides insight into which categories drive sales and customer demand.

### Insight

#### Top Revenue Category

Bikes: \$23.64M, 13,929 orders

### Table

	categoryname character varying (50)	totalrevenue numeric	totalorders bigint
1	Bikes	23642495.0952	13929
2	Accessories	906673.1070	33607
3	Clothing	365418.6171	8510
4	Components	[null]	0

# Business Question 3: Products Priced Above Average

Retrieve the names of products and their categories for products with a selling price greater than the average selling price of all products. - SQ

## Query

```
CREATE VIEW products_above_avg_price AS
SELECT
    p.productname,
    pc.categoryname
FROM product p
JOIN subcat sc
    ON p.productsubcategorykey = sc.productsubcategorykey
JOIN pcat pc
    ON sc.productcategorykey = pc.productcategorykey
WHERE p.productprice > (SELECT AVG (productprice) FROM product);
```

This identifies products with selling prices higher than the average price and highlights premium products across categories for pricing and inventory strategies.

## Insight

98 products are priced above the average selling price.  
Most high-priced products are Bikes

## Table

	productname character varying (50)	categoryname character varying (50)
1	Mountain-400-W Silver, 46	Bikes
2	Mountain-400-W Silver, 42	Bikes
3	Mountain-400-W Silver, 40	Bikes
4	Mountain-400-W Silver, 38	Bikes
5	Touring-3000 Blue, 50	Bikes

# Business Question 4: Customers with Orders in Canada

How many customers have placed orders in “Canada”? List the customer names - SQ

## Query

```
CREATE VIEW canadian_customers AS
SELECT COUNT (*)
FROM
(SELECT
    c.prefix || ' ' || c.firstname || ' ' || c.lastname fullname
FROM customer c
JOIN totalsales ts
    ON c.customerkey = ts.customerkey
JOIN territory t
    ON ts.territorykey = t.salesterritorykey
WHERE t.country = 'Canada'
GROUP BY c.customerkey, fullname
ORDER BY fullname);
```

This query identifies all customers who have placed orders in Canada. It provides insight into the customer base and market reach in the region.

## Insight

1,499 customers have placed orders in Canada.

## Visual

1499

# Business Question 5: Top 10 Returned Products & Revenue Impact

Find the 10 products that have been returned the most. How much money was generated by these products? - SQ

## Query

```
CREATE VIEW top_returned_products AS
SELECT
    p.productname,
    r.total_returns,
    SUM(ts.orderquantity * p.productprice) total_revenue
FROM (
    SELECT
        r.productkey,
        SUM(r.returnquantity) total_returns
    FROM return r
    GROUP BY r.productkey
    ORDER BY total_returns DESC
    LIMIT 10
) r
JOIN product p
    ON r.productkey = p.productkey
LEFT JOIN totalsales ts
    ON p.productkey = ts.productkey
GROUP BY p.productname, r.total_returns
ORDER BY r.total_returns DESC;
```

## Table

	productname character varying (50)	total_returns bigint	total_revenue numeric
1	Water Bottle - 30 oz.	155	39755.33
2	Patch Kit/8 Patches	95	13506.42
3	Mountain Tire Tube	93	28333.22
4	Mountain Bottle Cage	77	38061.90
5	Sport-100 Helmet, Red	70	73444.01
6	Road Tire Tube	67	17264.73
7	Sport-100 Helmet, Blue	66	67120.1790
8	Road Bottle Cage	56	29927.71
9	Fender Set - Mountain	54	87040.80
10	Sport-100 Helmet, Bla...	52	65269.7480

This query identifies the 10 products with the highest number of returns and calculates total revenue generated by these products to assess financial impact and operational concerns.

## Insight

Multiple Sport-100 Helmet variants appear among the top returns. Some high-return products, like the Fender Set - Mountain, still generate significant revenue. Items like Water Bottle - 30 oz. and Patch Kit/8 Patches have high return counts but relatively lower revenue impact.

# Business Question 6: Customers Ordering Across Multiple Territories

Get a list of customers who have placed orders in more than one territory.

## Query

```
CREATE VIEW multi_territory_customers AS
SELECT
    c.prefix || ' ' || c.firstname || ' ' || c.lastname fullname
FROM customer c
JOIN totalsales ts
    ON c.customerkey = ts.customerkey
JOIN territory t
    ON ts.territorykey = t.salesterritorykey
WHERE c.prefix || ' ' || c.firstname || ' ' || c.lastname IS NOT NULL
GROUP BY c.customerkey, fullname
HAVING COUNT(salesterritorykey) > 1;
```

## Table

	fullname text
1	MRS. ALEXANDRIA PRICE
2	MR. TERRANCE FERNANDEZ
3	MRS. CHLOE RAMIREZ
4	MR. KRISTOPHER PEREZ
5	MR. HECTOR HERNANDEZ

This query identifies customers who have placed orders in more than one sales territory. It highlights cross-territory purchasing behavior, useful for understanding customer reach and loyalty patterns

## Insight

In total, 14,984 customers are purchasing from multiple regions, showing strong engagement.

# Business Question 7: Most Ordered Products by Sub-Category

Retrieve the product names and their corresponding sub-categories for products that have been ordered at least 10 times.

## Query

```
CREATE VIEW frequently_ordered_product AS
SELECT
    p.productname,
    sc.subcategoryname
FROM product p
JOIN subcat sc
    ON p.productsubcategorykey = sc.productsubcategorykey
JOIN totalsales ts
    ON p.productkey = ts.productkey
GROUP BY p.productname, sc.subcategoryname
HAVING SUM(ts.orderquantity) >= 10;
```

This query identifies products that have been ordered at least 10 times. Associate each product with its corresponding sub-category to highlight popular product lines. Provides insight into which product types drive the most sales and customer demand

## Table

	productname character varying (50)	subcategoryname character varying (50)	2,774,168,962
1	All-Purpose Bike Stand	Bike Stands	
2	AWC Logo Cap	Caps	
3	Bike Wash - Dissolver	Cleaners	
4	Classic Vest, L	Vests	
5	Classic Vest, M	Vests	

## Insight

Road Bikes have the highest number of frequently ordered products. Mountain Bikes and Touring Bikes also feature heavily among top-ordered items. Sub-categories like Tires and Tubes, Jerseys, Helmets, and Gloves are also popular.

# Business Question 8: Customers and their Occupations After 2021

List the customer names who have placed orders after 2021. What is the distribution of their occupation?

## Query

```
CREATE VIEW customers_post_2021 AS
SELECT
    DISTINCT c.customerkey,
    c.prefix || ' ' || c.firstname || ' ' || c.lastname fullname
FROM customer c
JOIN totalsales ts
    ON c.customerkey = ts.customerkey
WHERE ts.orderdate >= '2022/01/01';

CREATE VIEW customersocc_post_2021 AS
SELECT
    c.occupation,
    COUNT(DISTINCT c.customerkey) num_customers
FROM customer c
JOIN totalsales ts
    ON c.customerkey = ts.customerkey
WHERE ts.orderdate >= '2022-01-01'
GROUP BY c.occupation
ORDER BY num_customers DESC;
```

This query identifies customers who placed orders after 2021 and the distribution of their occupations.

## Insight

A total of 10,502 customers placed orders after 2021 with professionals being the leading occupation of these customers.

# Business Question 9: Products Ordered at Least Once

Get a list of products and their corresponding order quantities for products that have been ordered at least once.

## Query

```
CREATE VIEW products_ordered AS
SELECT
    p.productname,
    SUM(ts.orderquantity) orders
FROM product p
JOIN totalsales ts
    ON p.productkey = ts.productkey
GROUP BY p.productname
HAVING SUM(ts.orderquantity) >= 1
ORDER BY orders DESC;
```

This query identifies the products that have been ordered at least once.

## Table

	productname character varying (50)	orders bigint
1	Water Bottle - 30 oz.	7967
2	Patch Kit/8 Patches	5898
3	Mountain Tire Tube	5678
4	Road Tire Tube	4327
5	AWC Logo Cap	4151

## Insight

While over 130 products were ordered at least once, water bottles and the Patch kit top our most ordered products.

# Business Question 10: C and H Products in the Clothing Category

Retrieve the product names that start with the letter "C" or "H" and are from the "Clothing" category.

## Query

```
CREATE VIEW clothing_products_C_H AS
SELECT
    p.productname
FROM product p
JOIN subcat sc
    ON p.productsubcategorykey = sc.productsubcategorykey
JOIN pcat pc
    ON sc.productcategorykey = pc.productcategorykey
WHERE (p.productname LIKE 'C%' OR p.productname LIKE 'H%') AND pc.categoryname = 'Clothing';
```

## Table

	productname character varying (50)	bag
1	Half-Finger Gloves, S	
2	Half-Finger Gloves, M	
3	Half-Finger Gloves, L	
4	Classic Vest, S	
5	Classic Vest, M	
6	Classic Vest, L	

This query identifies the product names that start with the letter "C" or "H" and are from the "Clothing" category..

## Insight

The Half Finger Gloves and Classic Vests are the two products names that start with the letter "C" or "H" and are from the "Clothing" category.

# Business Question 11: United States and Australia Ordered Products

Retrieve the product names that have been ordered in the 'United States' or "Australia".

## Query

```
CREATE VIEW products_us_au AS
SELECT
    DISTINCT p.productname
FROM product p
JOIN totalsales ts
    ON p.productkey = ts.productkey
JOIN territory t
    ON ts.territorykey = t.salesterritorykey
WHERE t.country = 'United States' OR t.country = 'Australia';
```

## Table

	productname character varying (50)	lock
1	Road-250 Red, 58	
2	Mountain-100 Black, 38	
3	Half-Finger Gloves, M	
4	Road-150 Red, 52	
5	Road-550-W Yellow, 42	

This query identifies the product names that have been ordered in the 'United States' or 'Australia'.

## Insight

Most ordered product names include

Bikes: Road Bikes, Mountain Bikes, Touring Bikes

Accessories: Gloves, Helmets, Tires, Jerseys, Shorts, Hydration Packs

# Business Question 12: High Value Customers

Find the customer names who have placed orders with a total amount greater than the average total amount of orders. – SQ

## Query

```
CREATE VIEW customers_above_avg_orders AS
SELECT
    c.prefix || ' ' || c.firstname || ' ' || c.lastname fullname,
    SUM(ts.orderquantity * p.productprice) total_amount
FROM customer c
JOIN totalsales ts
    ON c.customerkey = ts.customerkey
JOIN product p
    ON ts.productkey = p.productkey
GROUP BY c.customerkey, fullname
HAVING SUM(ts.orderquantity * p.productprice) > (
    SELECT AVG(customer_total)
    FROM (
        SELECT SUM(ts2.orderquantity * p2.productprice) customer_total
        FROM customer c2
        JOIN totalsales ts2
            ON c2.customerkey = ts2.customerkey
        JOIN product p2
            ON ts2.productkey = p2.productkey
        GROUP BY c2.customerkey
    )
)
ORDER BY total_amount DESC;
```

## Table

	fullname text	totalAmount numeric
1	MR. MAURICE SHAN	12407.9545
2	MRS. JANET MUÑOZ	12015.4029
3	MRS. LISA CAI	11330.4494
4	MRS. LACEY ZHENG	11085.7504
5	MR. JORDAN TURNER	11022.4002

This query identifies customers who have placed orders with a total amount greater than the average total amount of orders

## Insight

There are 6,237 customers who placed orders with a total amount greater than the average total amount of orders.

High Value Customers: MR. MAURICE SHAN, MRS. JANET MUÑOZ

# Business Question 13: Top Ordering Customers

Retrieve the top 5 customers who have placed the highest number of orders, along with their order counts.

## Query

```
CREATE VIEW top_customers_by_orders AS
SELECT
    c.prefix || ' ' || c.firstname || ' ' || c.lastname fullname,
    COUNT(ts.ordernumber) order_count
FROM customer c
JOIN totalsales ts
    ON c.customerkey = ts.customerkey
GROUP BY c.customerkey, fullname
ORDER BY order_count DESC
LIMIT 5;
```

This query identifies the top 5 customers who have placed the highest number of orders, along with their order counts.

## Table

	fullname text	order_count bigint
1	MR. FERNANDO BARNES	64
2	MRS. ASHLEY HENDERSON	61
3	MRS. JENNIFER SIMMONS	59
4	MR. CHARLES JACKSON	57
5	MRS. SAMANTHA JENKINS	56

## Insight

Top Ordering Customers: Mr. Fernando Barnes, Mrs. Ashley Henderson

# Business Question 14: Orders in the Past 6 months

List the customers who have placed orders within the last 6 months (consider the last date in the data)

## Query

```
CREATE VIEW recent_customers_6months AS
SELECT DISTINCT
    c.customerkey,
    c.prefix || ' ' || c.firstname || ' ' || c.lastname fullname
FROM customer c
JOIN totalsales ts
    ON c.customerkey = ts.customerkey
WHERE ts.orderdate > (
    SELECT MAX(ts2.orderdate) - INTERVAL '6 months'
    FROM totalsales ts2
)
```

This query identifies the customers who have placed orders within the last 6 months

## Insight

A total of 10,523 customers have ordered in the past six months

## Visual

10,523

Customers

# Business Question 15: Top 50 Customers by Revenue (2022)

We want to reach out to our best customers in 2022. Can you get emails of Top 50 customers based on revenue?

## Query

```
CREATE VIEW top50_customers_2022 AS
SELECT
    c.emailaddress,
    SUM (p.productprice * ts.orderquantity) revenue
FROM customer c
JOIN totalsales ts
    ON c.customerkey = ts.customerkey
JOIN product p
    ON ts.productkey = p.productkey
WHERE ts.orderdate >= '2022/01/01'
GROUP BY c.emailaddress
ORDER BY revenue DESC
LIMIT 50;
```

This query returns the emails of our top 50 customers based on revenue in 2022

## Insight

Top spenders generated revenues ranging from \$4,585 to \$6,801.

## Table

	emailaddress character varying (100)	revenue numeric
1	jordan59@adventure-works.com	6801.9568
2	lacey32@adventure-works.com	6180.38
3	marco17@adventure-works.com	6135.5242
4	ariana5@adventure-works.com	6035.0026
5	larry9@adventure-works.com	5606.5562

## Strategic Recommendations for Adventure Works

- Focus Marketing on High-Value Customers

Target MR. MAURICE SHAN, MRS. JANET MUÑOZ, and other top spenders with personalized promotions and loyalty programs to maximize revenue.

- Prioritize High-Revenue Categories

Bikes generate the most revenue. Invest in marketing and bundles for Road, Mountain, and Touring Bikes to boost profits.

- Optimize Product Pricing & Promotions

98 products are priced above average, mostly Bikes. Highlight premium products in campaigns and consider strategic discounts to drive high-value sales.

- Manage Returns Efficiently

Items like Sport-100 Helmets and Fender Sets have high returns but strong revenue. Implement better quality checks and offer targeted exchanges/refunds to maintain customer trust.

- Capitalize on Popular Accessories

Frequent orders for Gloves, Helmets, Tires, Jerseys, Shorts, and Hydration Packs indicate strong accessory demand. Promote combos with bikes for cross-selling opportunities.

- Expand International Engagement

Tailor marketing campaigns by region.

- Leverage Customer Occupation Insights

Professionals are leading buyers. Create campaigns and premium packages targeting this occupation.