# Foundational SQL Data Exploration: Customers, Products, and Sales

**Datasets Used:** sales, customers, products  
**Business Domain:** Bike Retail

**Purpose:** This foundational report initiates the data analysis by exploring the schema, verifying data structure, identifying key business metrics, and evaluating country-level and category-level distributions. The findings here set the stage for deeper analysis, forecasting, and dashboard visualization.

## 📋 Schema Exploration

### 1. Column Metadata by Table

SELECT COLUMN\_NAME, DATA\_TYPE, IS\_NULLABLE, CHARACTER\_MAXIMUM\_LENGTH  
FROM INFORMATION\_SCHEMA.COLUMNS  
WHERE TABLE\_NAME = 'customers';

(Same query repeated for products and sales)

**Insight:** Understands the structure and data types of each table. Helpful for data validation and modeling.

**Impact:** Guides data cleaning, transformation, and joins during the analysis process.

## 📅 Date Range Exploration

### 2. Order Date Duration

SELECT MIN(order\_date) AS first\_order\_date,  
 MAX(order\_date) AS last\_order\_date,  
 ROUND(DATEDIFF(MAX(order\_date), MIN(order\_date))/30) AS order\_range\_months  
FROM sales;

**Insight:** Defines the time span of transactional data.

**Impact:** Helps scope time-series analysis.

### 3. Customer Age Profile

SELECT MIN(birthdate) AS oldest\_birthdate,  
 ROUND(DATEDIFF(CURDATE(), MIN(birthdate))/365) AS oldest\_age,  
 MAX(birthdate) AS youngest\_birthdate,  
 ROUND(DATEDIFF(CURDATE(), MAX(birthdate))/365) AS youngest\_age  
FROM customers;

**Insight:** Estimates customer age demographics.

**Impact:** Supports demographic segmentation.

## 📊 Business Metrics Overview

### 4. Key Business KPIs

SELECT 'Total Sales', SUM(sales\_amount) FROM sales  
UNION ALL  
SELECT 'Total Quantity', SUM(quantity) FROM sales  
UNION ALL  
SELECT 'Average Price', CONCAT('$', ROUND(AVG(price),2)) FROM sales  
UNION ALL  
SELECT 'Total Orders', COUNT(DISTINCT order\_number) FROM sales  
UNION ALL  
SELECT 'Total Products', COUNT(DISTINCT product\_name) FROM products  
UNION ALL  
SELECT 'Total Customers', COUNT(customer\_key) FROM customers;

**Insight:** Quantifies essential performance metrics: revenue, orders, product diversity, and customer base.

**Impact:** Summarizes the business health at a glance.

## 🌍 Customer Distribution

### 5. Customers by Country

SELECT country, COUNT(customer\_key) AS total\_customers  
FROM customers  
GROUP BY country  
ORDER BY total\_customers DESC;

### 6. Customers by Gender

SELECT gender, COUNT(customer\_key) AS total\_customers  
FROM customers  
GROUP BY gender  
ORDER BY total\_customers DESC;

**Insight:** Breaks down customer demographics.

**Impact:** Informs targeted marketing and regional sales strategy.

## 💰 Revenue Distribution

### 7. Revenue by Product Category

SELECT p.category, SUM(f.sales\_amount) AS total\_revenue  
FROM sales f  
LEFT JOIN products p ON p.product\_key = f.product\_key  
GROUP BY p.category  
ORDER BY total\_revenue DESC;

### 8. Revenue by Customer

SELECT c.customer\_key,  
 c.first\_name,  
 c.last\_name,  
 SUM(f.sales\_amount) AS total\_revenue  
FROM sales f  
LEFT JOIN customers c ON c.customer\_key = f.customer\_key  
GROUP BY c.customer\_key, c.first\_name, c.last\_name  
HAVING c.customer\_key IS NOT NULL  
ORDER BY total\_revenue DESC;

**Insight:** Uncovers which product categories and customers are driving sales.

**Impact:** Helps in product promotion, customer targeting, and ROI analysis.

## 📦 Product Movement by Region

### 9. Units Sold by Country

SELECT c.country,  
 SUM(f.quantity) AS total\_sold\_items  
FROM sales f  
LEFT JOIN customers c ON c.customer\_key = f.customer\_key  
GROUP BY c.country  
HAVING c.country IS NOT NULL  
ORDER BY total\_sold\_items DESC;

**Insight:** Shows where the most product units are being sold.

**Impact:** Enables logistics and supply chain optimization.

## 📌 Summary

### What We Learned

* The dataset spans multiple months, with consistent order activity.
* The customer age profile ranges broadly, allowing for diverse segmentation.
* Core KPIs like total sales, quantity, and customer base are healthy.
* Customer base is global, with strong presence in key countries.
* Top categories and customers can be identified for performance-driven campaigns.