Reporting Project: Adventurework Company

Project Objective

Project Overview

Organizations rely on data-driven decision-making to stay competitive and efficient. As an SQL data analyst, your role is to extract meaningful insights from AdventureWorks' database using advanced SQL queries. Through this project, students will develop advanced SQL querying techniques, including joins, subqueries, common table expressions (CTEs), window functions, and aggregations, to extract, analyze, and present meaningful insights from business data.

Business Context

AdventureWorks is a global manufacturing company specializing in high-end bicycles, bicycle parts, and cycling accessories. Founded in the late 1990s, the company has expanded its operations worldwide, selling products through retail stores, online platforms, and direct business partnerships.

AdventureWorks has three main business divisions:

- **Sales & Marketing** – Manages customer relationships, sales channels, and promotional campaigns.
- **Manufacturing & Inventory** – Oversees production, supply chain management, and inventory tracking.
- **Human Resources & Employee Management** – Handles workforce planning, employee performance, and payroll.

With thousands of customers and millions of transactions, AdventureWorks relies on SQL Server databases to store and process critical business information. Business managers, analysts, and executives use these databases to generate reports and make data-driven decisions to improve operations, sales performance, and customer satisfaction.

This project is designed to simulate real-world business reporting requirements, where students will:

- Extract relevant data from multiple tables in the AdventureWorks database.
- Apply advanced SQL techniques to perform trend analysis, sales performance tracking, customer segmentation, and operational insights.
- Present findings in a structured and meaningful way to support business decision-making.

Project Task:

In this project, students will create reports based on business requirements. Each report will require analyzing data from multiple tables, applying SQL techniques, and generating insights to help business teams make informed decisions.

Report #1: Top 10 Best-Selling Products

Business Requirements:

The sales team wants to identify the top 10 best-selling products based on total revenue to focus on high-demand items and adjust marketing strategies.

Tables & Columns to Use:

- Sales.SalesOrderDetail → (ProductID, OrderQty, UnitPrice, LineTotal)
- Production.Product → (ProductID, Name)

Expected Result:

- Product Name
- Total Sales Revenue
- Total Quantity Sold

Report #2: Top 10 Best-Selling Projects In Each Product Category

Business Requirements:

The **sales and marketing teams** want to identify the **top 10 best-selling products** within each product category based on total revenue. This insight will help in optimizing marketing strategies, inventory management, and production planning.

Tables & Columns to Use:

1. Sales Data
    a. Sales.SalesOrderDetail
        i. ProductID (Product identifier)
        ii. OrderQty (Number of units sold)
        iii. UnitPrice (Price per unit)
        iv. LineTotal (Total sales for the order line)
2. Product Information
    a. Production.Product
        i. ProductID (Links to SalesOrderDetail)
        ii. Name (Product name)
        iii. ProductSubcategoryID (Links to ProductSubcategory)
3. Category Information
    a. Production.ProductSubcategory
        i. ProductSubcategoryID (Links to Product)
        ii. ProductCategoryID (Links to ProductCategory)
    b. Production.ProductCategory
        i. ProductCategoryID (Primary category identifier)
        ii. Name (Category name)

Expected Result:

- Product Category
- Product Name
- Total Sales Revenue
- Total Quantity Sold

Report #3: Monthly Sales Trend Analysis

Business Requirements:

Management wants to track **monthly sales trends** to understand revenue fluctuations throughout the year.

Tables & Columns to Use:

- Sales.SalesOrderHeader → (OrderDate, TotalDue)

Expected Result:

- Year
- Month
- Total Sales Revenue

Report #4: Customers with Highest Lifetime Value

Business Requirements:

The business wants to identify **customers with the highest lifetime spending** to offer loyalty rewards.

Tables & Columns to Use:

- Sales.SalesOrderHeader → (CustomerID, TotalDue)
- Sales.Customer → (CustomerID, PersonID, CompanyName)
- Person.Person → (BusinessEntityID, FirstName, LastName)

Expected Result:

- Customer Name
- Total Lifetime Spend

Report #5: Customer Order Frequency

Business Requirements:

Marketing wants to analyze **customer purchasing behavior** to identify frequent buyers.

Tables & Columns to Use:

- Sales.SalesOrderHeader → (CustomerID, SalesOrderID)
- Sales.Customer → (CustomerID, PersonID)
- Person.Person → (BusinessEntityID, FirstName, LastName)

Expected Result:

- Customer Name
- Number of Orders

Report #6: Customer Retention Analysis

Business Requirements:

The company wants to analyze **repeat customers** vs. one-time buyers.

Tables & Columns to Use:

- Sales.SalesOrderHeader → (CustomerID, SalesOrderID, OrderDate)

Expected Result:

- Customer ID
- First Purchase Date
- Most Recent Purchase Date
- Number of Orders

Report #7: Most Profitable Sales Regions

Business Requirements:

The company wants to identify **top-performing sales regions** based on revenue.

Tables & Columns to Use:

- Sales.SalesOrderHeader → (TerritoryID, TotalDue)
- Sales.SalesTerritory → (TerritoryID, Name)

Expected Result:

- Sales Region
- Total Sales Revenue

Report #8: Employee Tenure Analysis

Business Requirements:

HR needs to analyze employee tenure to study retention trends.

Tables & Columns to Use:

- HumanResources.Employee → (BusinessEntityID, HireDate)
- Person.Person → (BusinessEntityID, FirstName, LastName)

Expected Result:

- Employee Name
- Hire Date
- Years of Service

Report #9: Customer Lifetime Value (CLV) Analysis

Business Requirements:

The **sales team** wants to understand the **most valuable customers** based on their total spending across all orders.

Tables & Columns to Use:

- **Sales.Customer** (CustomerID, PersonID)
- **Person.Person** (BusinessEntityID, FirstName, LastName)
- ***Sales.SalesOrderHeader*** *(CustomerID, TotalDue, SalesOrderID)*

Expected Result:

- Customer Name
- Total Orders
- Total Amount Spent

Report #10: Employee Sales Performance Ranking

Business Requirements:

The **management team** wants a report ranking employees based on **total sales revenue**.

Tables & Columns to Use:

- **Sales.SalesPerson** (BusinessEntityID, SalesYTD)
- **Person.Person** (BusinessEntityID, FirstName, LastName)

Expected Result:

- Employee Name
- Total Sales
- Rank

Report #11: Monthly Sales Growth Rate

Business Requirements:

The **finance team** wants to calculate **the monthly sales growth percentage**.

Tables & Columns to Use:

- **Sales.SalesOrderHeader** (OrderDate, TotalDue)

Expected Result:

- Month
- Sales
- Growth % - Growth calculation using ((current - previous) / previous * 100)

Report #12: Customers Who Haven't Purchased in the Last Year

Business Requirements:

The **marketing team** wants a list of customers who have **not placed any orders in the previous year**.

Tables & Columns to Use:

- **Sales.SalesOrderHeader** (CustomerID, OrderDate)
- **Person.Person** (BusinessEntityID, FirstName, LastName)

Expected Result:

- Customer Name
- Last Order Date

Report #13: Identifying High-Value Customers Using RFM Analysis

Business Requirements:

The **marketing team** wants to categorize customers based on **Recency, Frequency, and Monetary Value (RFM)**.

Tables & Columns to Use:

- **Sales.SalesOrderHeader** (CustomerID, OrderDate, TotalDue)
- **Person.Person** (BusinessEntityID, FirstName, LastName)

Expected Result:

- Customer Name
- Recency (Days since last order)

- Frequency (Total Orders)
- Monetary (Total Spend)

Report #14: Monthly Revenue and Customer Growth Trend Analysis

Business Requirements:

The **business development team** wants to track **monthly revenue growth** and **customer growth**. The goal is to analyze how revenue and customer base are growing over time and identify any significant dips or growth spurts.

Tables & Columns to Use:

- **Sales.SalesOrderHeader** (OrderDate, TotalDue)
- **Sales.Customer** (CustomerID)
- **Person.Person** (BusinessEntityID, FirstName, LastName)

Expected Result:

- Month/Year
- Total Revenue
- New Customers Acquired
- Percentage Change in Revenue
- Percentage Change in Customers

*Noted: calculated **percentage change** in revenue and customers month-over-month*

Report #15: Top 3 Products by Revenue in Each Sales Territory Region

Business Requirements:

The **sales management team** wants to identify the **top 3 products** that generate the most revenue within each **sales territory region**. This will help the team understand which products are performing the best in different regions and potentially inform sales and inventory strategies.

Tables & Columns to Use:

- **Sales.SalesOrderDetail** (SalesOrderID, ProductID, LineTotal)
- **Sales.SalesOrderHeader** (SalesOrderID, TerritoryID)
- **Sales.SalesTerritory** (TerritoryID, Name)
- **Production.Product** (ProductID, Name)

Expected Result:

- Sales Territory Region Name
- Product Name
- Revenue
- Rank (Top 3) within Territory

Submission Guideline

Guideline	Description
SQL Code	Provide the full SQL Query for each report
Output Samples	Include screenshots or tables with the first **10 rows** of each query output.
Document	Put SQL Code and Output Sample in a document.

Grading Criterial

Criterial	Description	Score
Correctness of SQL Query	Queries should be syntactically correct and return the expected results.	50%
Use of Advanced SQL Techniques	Must include **joins, subqueries, CTEs, ranking functions, and aggregations**.	30%
Clear and Clean	Make sure the code clear and clean, easy to view and check.	20

Dateline

- First Submission: **26-Mar-2025**
- Final Submission: **31-Mar-2025**