

Project Objective:

In this project, I aim to analyze a comprehensive financial dataset using PostgreSQL and Power BI. The analysis will help in understanding client behaviors, account activities, investment performance, and market trends. The project aims to:

1. Gain insights into client demographics and account types.
2. Analyze transaction patterns and identify significant trends.
3. Evaluate the performance of investments over time.
4. Understand market data fluctuations and their impact on investments.

Project Details:

- **Dataset:** For This project, I will use a synthetic financial dataset consisting of Clients, Accounts, Transactions, Investments, and market data tables.
- **Tools:** PostgreSQL for database management and querying, Power BI for visualization and reporting.
- **Scope:** The project will cover data cleaning, data transformation, querying for insights, and creating interactive dashboards.

SQL Query Details for Database and Tables Creation:

-- Creating Database:

```
CREATE DATABASE financial_analysis;
```

-- Creating Tables:

```
CREATE TABLE Clients (  
    ClientID UUID PRIMARY KEY,  
    ClientName VARCHAR(100),  
    ClientType VARCHAR(100),  
    Country VARCHAR(100),  
    JoinDate DATE,  
    AnnualRevenue DECIMAL(15, 2)  
);
```

```
CREATE TABLE Accounts (  
    AccountID UUID PRIMARY KEY,  
    ClientID UUID,  
    AccountType VARCHAR(50),  
    Balance DECIMAL(15, 2),  
    OpenedDate DATE,  
    FOREIGN KEY (ClientID) REFERENCES Clients(ClientID)  
);
```

```
CREATE TABLE Transactions (  
    TransactionID UUID PRIMARY KEY,  
    AccountID UUID,  
    TransactionDate DATE,  
    TransactionType VARCHAR(50),  
    Amount DECIMAL(15, 2),  
    FOREIGN KEY (AccountID) REFERENCES Accounts(AccountID)  
);
```

```
CREATE TABLE Investments (  
    InvestmentID UUID PRIMARY KEY,  
    ClientID UUID,  
    InvestmentType VARCHAR(50),  
    AmountInvested DECIMAL(15, 2),  
    CurrentValue DECIMAL(15, 2),  
    InvestmentDate DATE,  
    FOREIGN KEY (ClientID) REFERENCES Clients(ClientID)  
);
```

```
CREATE TABLE MarketData (  
    MarketID UUID PRIMARY KEY,  
    StockSymbol VARCHAR(10),  
    TradeDate DATE,  
    OpenPrice DECIMAL(10, 2),  
    ClosePrice DECIMAL(10, 2),  
    Volume INT  
);
```

```
COPY clients (clientid, clientname, clienttype, country, joindate, annualrevenue)  
FROM 'C:\Users\Dell\Downloads\clients.csv'  
DELIMITER ','  
CSV HEADER;
```

```
COPY accounts (accountid, clientid, accounttype, balance, openeddate)  
FROM 'C:\Users\Dell\Downloads\accounts.csv'  
DELIMITER ','  
CSV HEADER;
```

```
COPY investments (investmentid, clientid, investmenttype, amountinvested, currentvalue,  
investmentdate)  
FROM 'C:\Users\Dell\Downloads\investments.csv'  
DELIMITER ','  
CSV HEADER;
```

```
COPY marketdata (marketdataid, date, stocksymbol, openprice, closeprice, volume)  
FROM 'C:\Users\Dell\Downloads\market_data.csv'  
DELIMITER ','  
CSV HEADER;
```

```
COPY transactions (transactionid, accountid, transactiondate, transactiontype, amount)
FROM 'C:\Users\Dell\Downloads\transactions.csv'
DELIMITER ','
CSV HEADER;
```

Question Bank and Answers:

1. Client Table Analysis

Q1: How many clients are there in each client type?

```
SELECT ClientType, COUNT(*) AS ClientCount
FROM Clients
GROUP BY ClientType;
```

Answer: This query will return the number of clients in each client type category (Individual, Corporate, Institutional).

Q2: What is the total annual revenue for each country?

```
SELECT Country, SUM(AnnualRevenue) AS TotalAnnualRevenue
FROM Clients
GROUP BY Country;
```

Answer: This query will return the total annual revenue for clients in each country.

2. Accounts Table Analysis

Q3: What is the average balance for each account type?

```
SELECT AccountType, AVG(Balance) AS AverageBalance
FROM Accounts
GROUP BY AccountType;
```

Answer: This query will return the average balance for each type of account (Savings, Checking, Investment).

Q4: How many accounts were opened each year?

```
SELECT EXTRACT(YEAR FROM OpenedDate) AS Year, COUNT(*) AS AccountsOpened  
FROM Accounts  
GROUP BY EXTRACT(YEAR FROM OpenedDate)  
ORDER BY Year;
```

Answer: This query will return the number of accounts opened each year.

3. Transactions Table Analysis

Q5: What is the total transaction amount for each transaction type?

```
SELECT TransactionType, SUM(Amount) AS TotalAmount  
FROM Transactions  
GROUP BY TransactionType;
```

Answer: This query will return the total amount of transactions for each transaction type (Deposit, Withdrawal, Transfer).

Q6: What is the average transaction amount per account?

```
SELECT AccountID, AVG(Amount) AS AverageTransactionAmount  
FROM Transactions  
GROUP BY AccountID;
```

Answer: This query will return the average transaction amount for each account.

4. Investments Table Analysis

Q7: What is the total amount invested for each investment type?

```
SELECT InvestmentType, SUM(AmountInvested) AS TotalAmountInvested  
FROM Investments  
GROUP BY InvestmentType;
```

Answer: This query will return the total amount invested for each type of investment (Stocks, Bonds, Mutual Funds).

Q8: What is the current value of investments for each client?

```
SELECT ClientID, SUM(CurrentValue) AS TotalCurrentValue  
FROM Investments  
GROUP BY ClientID;
```

Answer: This query will return each client's current total value of investments.

5. MarketData Table Analysis

Q9: What is each stock symbol's average opening and closing price?

```
SELECT StockSymbol, AVG(OpenPrice) AS AverageOpenPrice, AVG(ClosePrice) AS AverageClosePrice  
FROM MarketData  
GROUP BY StockSymbol;
```

Answer: This query will return each stock symbol's average opening and closing prices.

Q10: What is the total trading volume for each stock symbol?

```
SELECT StockSymbol, SUM(Volume) AS TotalVolume  
FROM MarketData  
GROUP BY StockSymbol;
```

Answer: This query will return the total trading volume for each stock symbol.

Q11: What is the total number of transactions for each account?

```
SELECT AccountID, COUNT(*) AS TotalTransactions  
FROM Transactions  
GROUP BY AccountID;
```

Answer: This query will return the total number of transactions for each account.

Q12: What is the highest balance recorded for each account type?

```
SELECT AccountType, MAX(Balance) AS HighestBalance  
FROM Accounts  
GROUP BY AccountType;
```

Answer: This query will return the highest balance recorded for each account type.

Q13: What is the total investment amount for each client?

```
SELECT ClientID, SUM(AmountInvested) AS TotalInvestment  
FROM Investments  
GROUP BY ClientID;
```

Answer: This query will return the total investment amount for each client.

Q14: What is the average current value of investments by investment type?

```
SELECT InvestmentType, AVG(CurrentValue) AS AverageCurrentValue  
FROM Investments  
GROUP BY InvestmentType;
```

Answer: This query will return the average current value of investments by investment type.

Q15: How many clients joined each year?

```
SELECT EXTRACT(YEAR FROM JoinDate) AS Year, COUNT(*) AS ClientsJoined  
FROM Clients  
GROUP BY EXTRACT(YEAR FROM JoinDate)  
ORDER BY Year;
```

Answer: This query will return the number of clients who joined each year.

Q16: What is the total balance for accounts opened in the last five years?

```
SELECT SUM(Balance) AS TotalBalance  
FROM Accounts  
WHERE OpenedDate >= (CURRENT_DATE - INTERVAL '5 years');
```

Answer: This query will return the total balance for accounts opened in the last five years.

Q17: What is the monthly total amount of deposits?

```
SELECT EXTRACT(YEAR FROM TransactionDate) AS Year, EXTRACT(MONTH FROM TransactionDate) AS  
Month,  
SUM(Amount) AS TotalDeposits  
FROM Transactions  
WHERE TransactionType = 'Deposit'  
GROUP BY Year, Month  
ORDER BY Year, Month;
```

Answer: This query will return the monthly total amount of deposits.

Q18: Which client has the highest total annual revenue?

```
SELECT ClientID, MAX(AnnualRevenue) AS HighestAnnualRevenue
FROM Clients
GROUP BY ClientID
ORDER BY HighestAnnualRevenue DESC
LIMIT 1;
```

Answer: This query will return the client with the highest total annual revenue.

Q19: What is the average transaction amount for withdrawals?

```
SELECT AVG(Amount) AS AverageWithdrawalAmount
FROM Transactions
WHERE TransactionType = 'Withdrawal';
```

Answer: This query will return the average transaction amount for withdrawals.

Q20: How many unique stock symbols are there in the market data?

```
SELECT COUNT(DISTINCT StockSymbol) AS UniqueStockSymbols
FROM MarketData;
```

Answer: This query will return the number of unique stock symbols in the market data.

Q21: What is the total volume of trades for the top 5 most traded stocks?

```
SELECT StockSymbol, SUM(Volume) AS TotalVolume
FROM MarketData
GROUP BY StockSymbol
ORDER BY TotalVolume DESC
LIMIT 5;
```

Answer: This query will return the total volume of trades for the top 5 most traded stocks.

Q22: What is the total amount of investments made in the last year?

```
SELECT SUM(AmountInvested) AS TotalInvestmentsLastYear
FROM Investments
WHERE InvestmentDate >= (CURRENT_DATE - INTERVAL '1 year');
```

Answer: This query will return the total amount of investments made in the last year.

Q23: What is the highest transaction amount recorded?

```
SELECT MAX(Amount) AS HighestTransactionAmount  
FROM Transactions;
```

Answer: This query will return the highest transaction amount recorded.

Q24: How many transactions were made by each client?

```
SELECT c.ClientID, c.ClientName, COUNT(t.TransactionID) AS TransactionCount  
FROM Clients c  
JOIN Accounts a ON c.ClientID = a.ClientID  
JOIN Transactions t ON a.AccountID = t.AccountID  
GROUP BY c.ClientID, c.ClientName;
```

Answer: This query will return the number of transactions made by each client.

Q25: What is the average account balance for clients from the United States?

```
SELECT AVG(a.Balance) AS AverageBalance  
FROM Accounts a  
JOIN Clients c ON a.ClientID = c.ClientID  
WHERE c.Country = 'United States';
```

Answer: This query will return the average account balance for clients from the United States.