Phase 3: Development Part 1 - Project Plan

Objective: In Phase 3 - Development Part 1, the focus will be on preparing the foundation for the product sales analysis project. This phase aims to lay the groundwork for effective data analysis and visualization using IBM Cognos.

Step 1: Dataset Download

- Access the dataset from the provided Kaggle link: [Product ans Sales Dataset](**https://www.kaggle.com/datasets/ksabishek/product-sales-data**)
- Download the dataset to your local working directory or preferred location.

Step 2: Loading the Dataset

- Import the necessary Python libraries, including Pandas, for data analysis.
- Load the dataset into a Pandas DataFrame for further analysis.

Display the first few rows of the dataset to inspect the data structure

Step 3: Exploratory Data Analysis

- Data Overview:Load and inspect the dataset to understand its structure and features.
- Descriptive Statistics:Calculate and analyze basic statistics for product sales data, including mean, median, and standard deviation.
- Generate histograms and box plots to visualize the distribution of product sales.
- Product Performance:Examine the performance of each product, looking at total unit sales and revenue.
- Identify the best-performing and underperforming products.
- Seasonal Trends:Analyze seasonal trends in product sales to identify patterns throughout the year.
- Correlation Analysis:Explore correlations between product sales and external factors (e.g., marketing campaigns, promotions).

Step 4: Define Analysis Objectives

- Sales Optimization:Set objectives for optimizing product sales, identifying areas for improvement.
- Product Segmentation:Define objectives for product segmentation based on sales performance.
- Marketing Strategies:Establish goals for developing personalized marketing strategies for different products.

- Cross-selling and Upselling:Set objectives for implementing cross-selling and upselling techniques to maximize revenue.
- Market Expansion:Define objectives for exploring new markets or demographics to expand product reach.

Step 5: Data Cleaning and Preprocessing

- Handling Missing Data:Address any missing data in the product sales dataset through imputation or removal.
- Outlier Detection:Identify and handle outliers that may impact the accuracy of sales analysis.
- Data Transformation:Standardize and preprocess data, ensuring consistency and compatibility for analysis.
- Feature Engineering:Create new features that may enhance the analysis, such as sales growth rates or seasonality indicators.

Step 6: IBM Cognos for Visualization

- Data Connection:Connect IBM Cognos to the preprocessed product sales dataset.
- Sales Dashboards:Design dashboards highlighting key performance indicators, product sales trends, and revenue breakdowns.
- Product Performance Reports:Generate reports specifically focused on the performance of individual products.
- User Interaction:Create interactive features allowing stakeholders to explore and manipulate the sales data.

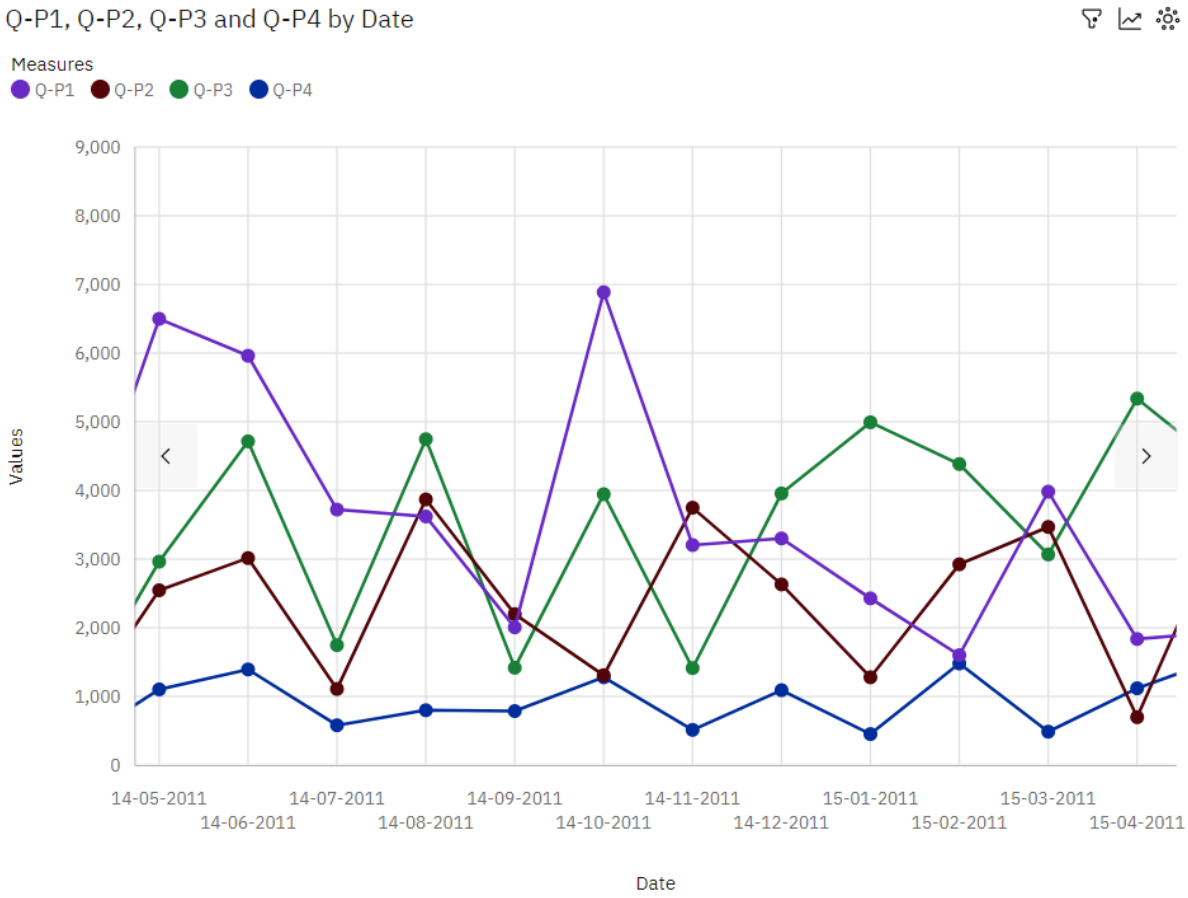
Step 7: Data Validation

- Data Integrity:Validate the integrity of the sales data to ensure accuracy in the analysis.
- Consistency Checks:Perform consistency checks to confirm that the dataset aligns with expected values.

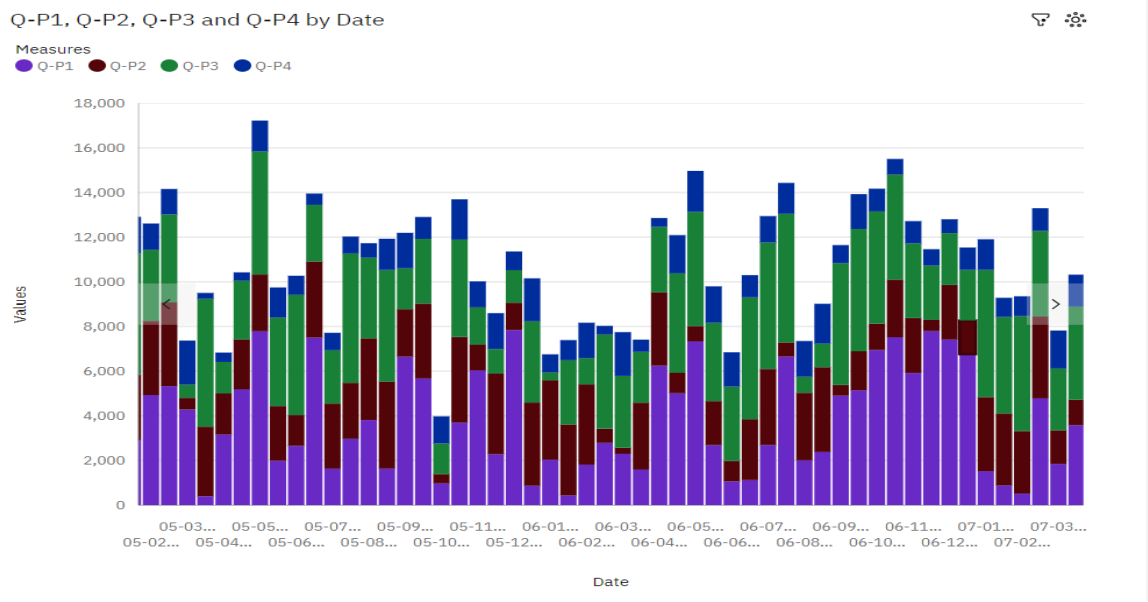
Step 8: Documentation

- Data Source Documentation:Document details about the source of the product sales data, including its origin, format, and any data transformations applied.
- Data Cleaning Documentation:Detail the steps taken for data cleaning and preprocessing, capturing decisions made during this phase.
- Analysis Objectives Documentation:Clearly articulate and document the specific objectives and goals of the product sales analysis.

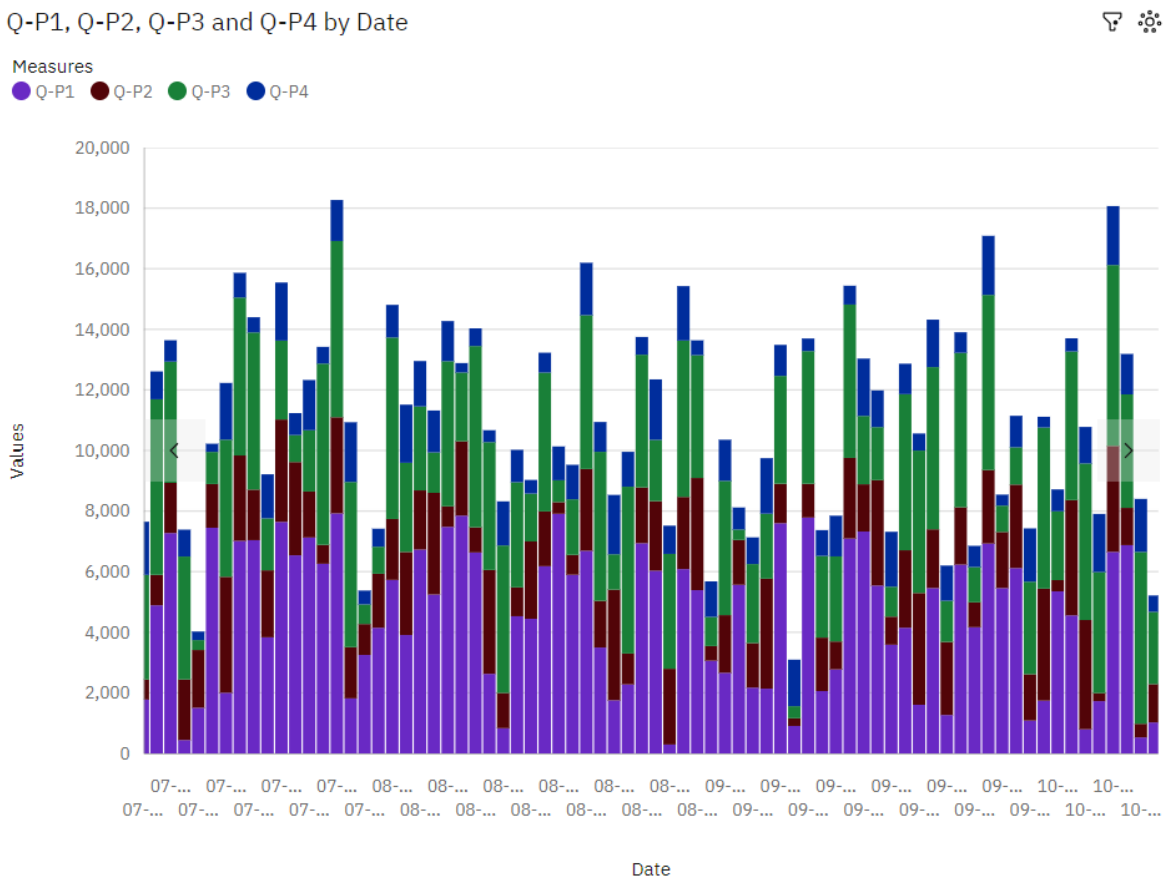
DATA Visualisation using IBM COGNOS:



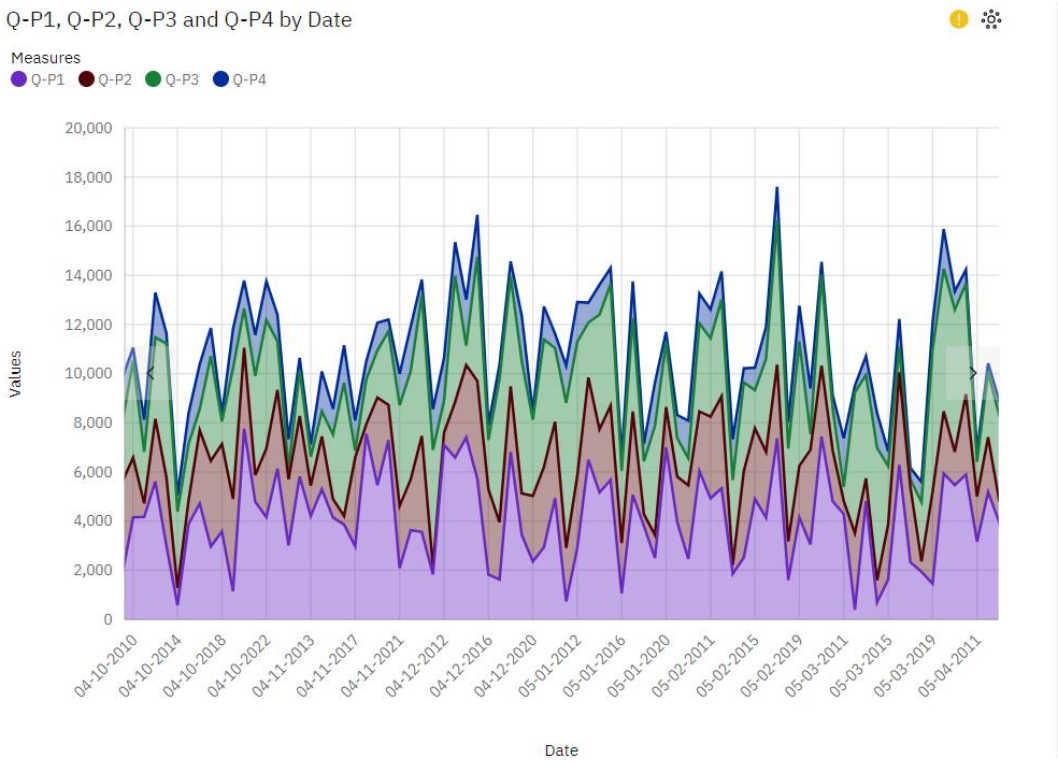
Line Chart for Dates.



Bar Chart for Product vs Dates in 2011

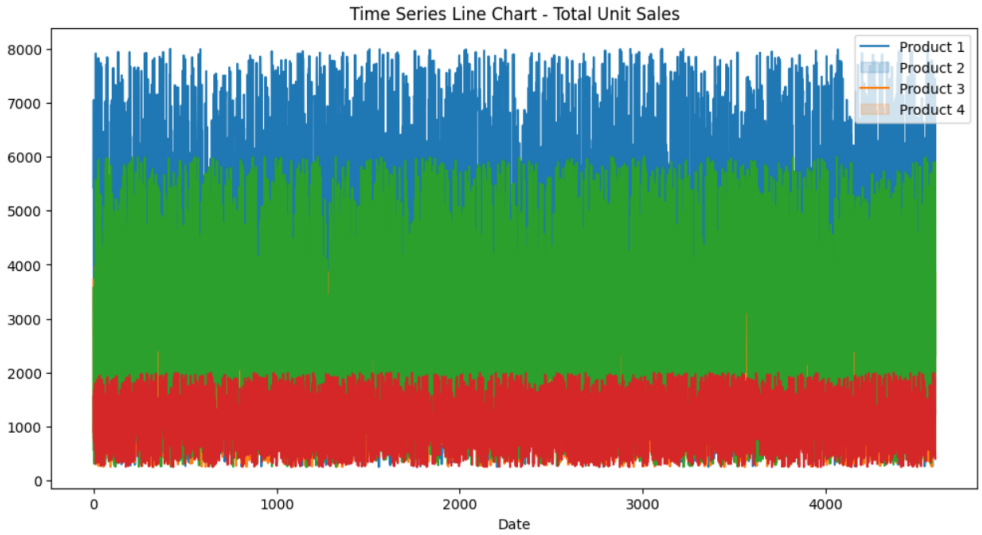


Bar Chart for Product vs Date in 2012

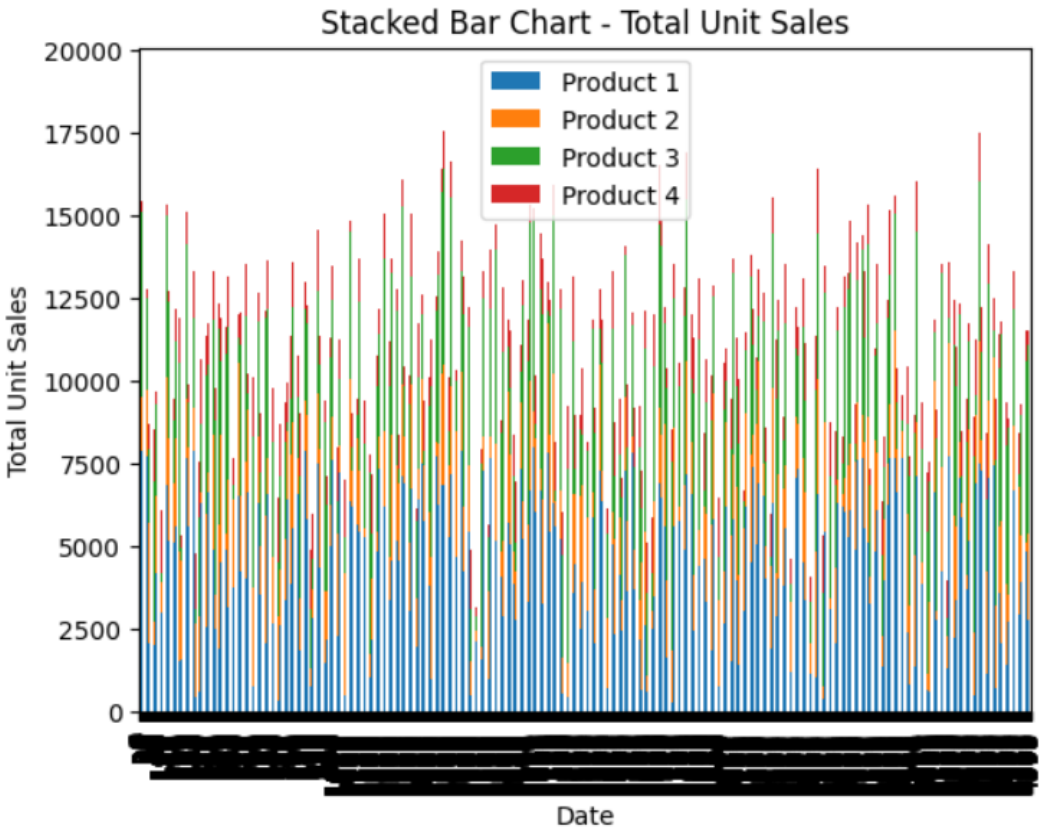


Area Chart for Dates vs Product in 2011

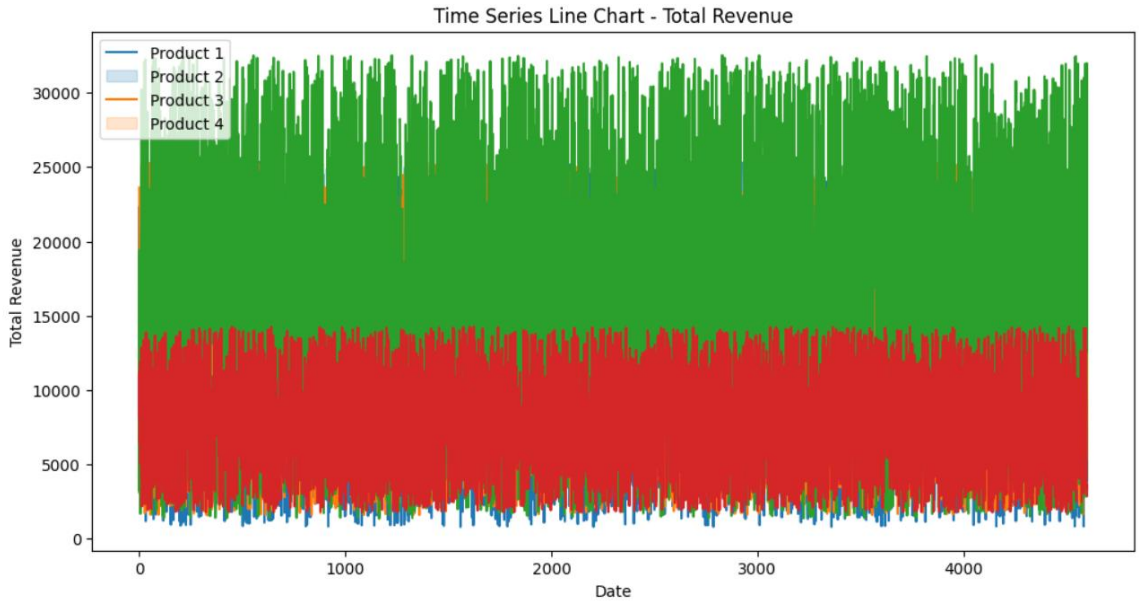
Data Visualisation by Python:



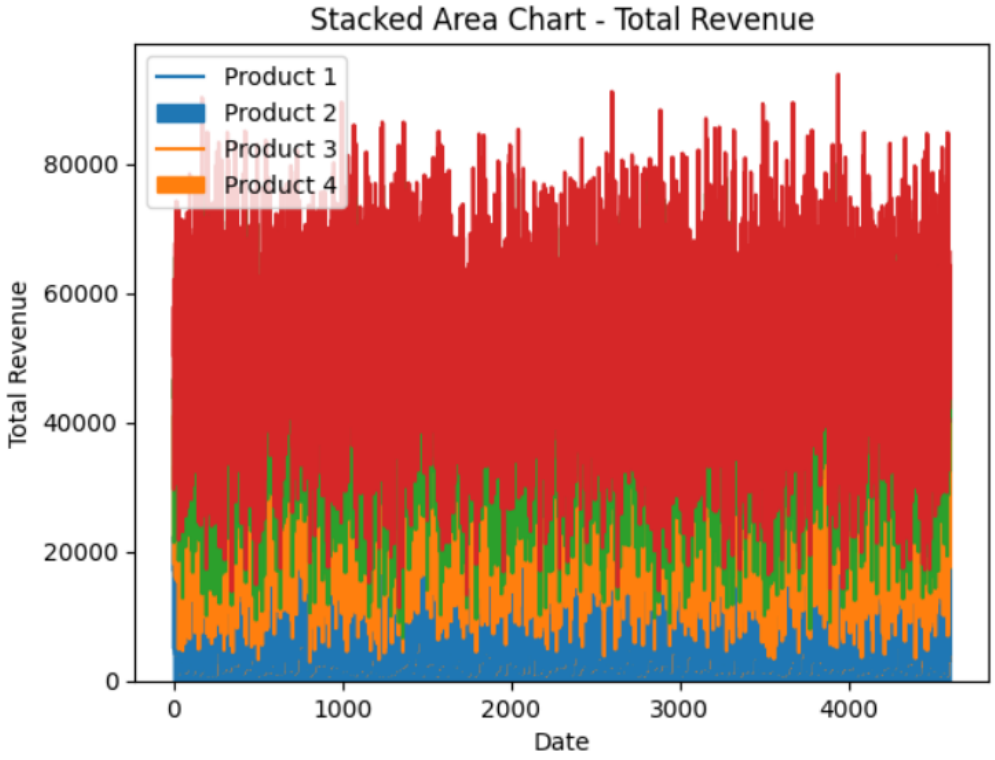
Line Chart



Stacked Bar Chart



Line Chart



Stacked Area Chart