

Coffee Sales Analysis and Forecasting

A Data Science Project

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About Me

- Name: Shreyash Jha
- Role: Data Scientist & Computer Science Engineer, 3rd Year
- Institution: K.R. Mangalam University
- Internship: Data Science Intern at Unified Mentor Pvt. Ltd.
- Passion: Leveraging data science to optimize business operations, like running a virtual coffee shop!

Project Overview

Objective

Analyze synthetic coffee sales data for 2024 and forecast sales for the next 30 days using data science techniques.

- Create a dataset of 1000 coffee sales
- Visualize sales trends
- Predict future sales using Linear Regression
- Provide insights for coffee shop planning

Data Description

- **Time Period:** January 1, 2024 – December 31, 2024
- **Data:** 1000 synthetic sales records
- **Columns:** Date, Coffee Type (Latte, Cappuccino, Espresso, Americano), Price (2.5, 3.0, 3.5, 4.0), Customer ID, Location (Downtown, Mall, Campus)
- **Source:** Simulated data stored in `coffee_sales.csv`

Sample Data

Date: 2024-09-26, Coffee: Espresso, Price: 3.0, Customer: 121, Location: Campus

- 1 **Data Generation:** Created synthetic dataset using Pandas and NumPy
- 2 **Data Cleaning:** Checked for missing values (`df.isnull().sum()`) – none found
- 3 **Feature Engineering:** Added Day of Week from Date column
- 4 **Modeling:** Used Linear Regression to model daily sales trends
- 5 **Visualization:** Plotted sales data and predictions using Matplotlib
- 6 **Forecasting:** Predicted sales for the next 30 days

Results: Sales Trends

Key Findings

- Sales vary by coffee type, location, and day of the week
- Downtown and Campus locations show high sales
- Consistent daily sales with slight upward trend

Visualization

[Image: coffee_sales_trend.png shows scatter plot of daily sales with trend line]

Sales Forecast

Prediction

- Used Linear Regression to forecast sales for 30 days post-2024
- Model predicts stable or slightly increasing sales
- *[Image: coffee_sales_forecast.png shows past sales and predicted trend]*

Insight

Stock up on coffee beans to meet steady demand!

- **Popular Products:** Lattes and Espressos dominate sales
- **High-Traffic Locations:** Downtown and Campus
- **Peak Days:** Fridays and weekends show higher sales
- **Recommendation:** Increase inventory for popular items and promote at high-traffic locations

Action Plan

Optimize stock levels and target marketing for Downtown and Campus customers.

Why It Matters

- Data-driven decisions improve coffee shop efficiency
- Forecasting helps plan inventory and staffing
- Insights can boost sales and customer satisfaction

Learn More

Explore data science for business at:

<https://www.datasciencecentral.com/>

Conclusion

Key Takeaways

- Successfully analyzed 2024 coffee sales data
- Predicted stable sales for the next 30 days
- Identified high-demand products and locations
- Demonstrated data science's role in business planning

Future Steps

Expand analysis with real data and advanced models (e.g., time-series forecasting).

Thank You!

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