Multi-Agent Data Analysis Report

Generated on 2025-11-24 20:51:27

Executive Summary

Processed dataset with 153 rows and 7 columns.

Insights

Key Findings

- Detected 11 anomalies across numeric columns.
- profit important (score=0.563)
- customers important (score=0.225)
- satisfaction important (score=0.088)

Recommendations

- Investigate outliers for data quality or business trends.
- Leverage top features to improve predictive modeling and decision-making.

Agent Execution Summary

Agent	Status	Execution Time (s)
Data Cleaning Agent	SUCCESS	7.705
EDA Agent	SUCCESS	6.116
Anomaly Detection Agent	SUCCESS	0.014
ML Agent	SUCCESS	6.074

Insights Agent

The Business Insights Agent consolidates outputs from all other agents, transforms them into actionable findings, and generates recommendations. It acts as the decision-making layer of the pipeline, summarizing complex analyses into clear business-focused insights.
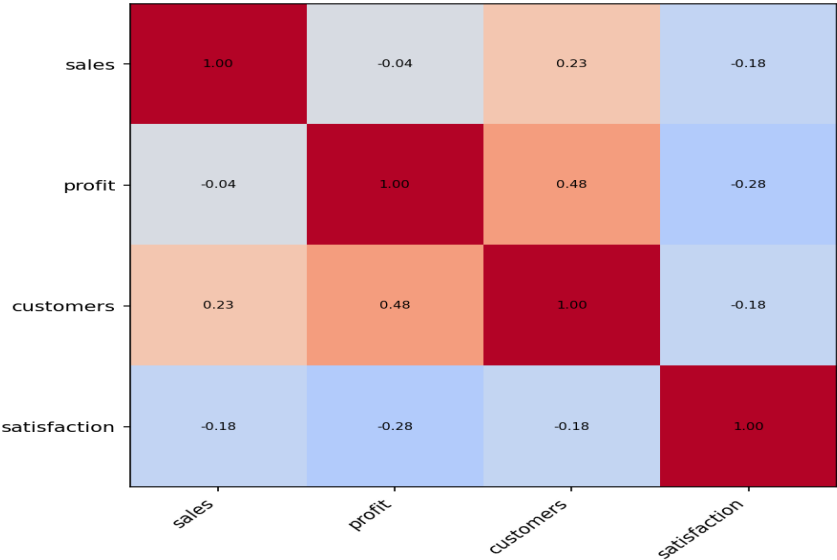
Data Cleaning Agent - Results

This agent is responsible for data preparation and quality assurance within the pipeline. It performs critical tasks such as handling missing values, resolving format inconsistencies, and removing duplicate records. The agent standardizes data types to ensure consistency and reliability. Its purpose is to provide a clean, reliable dataset, enabling accurate and efficient downstream analysis.
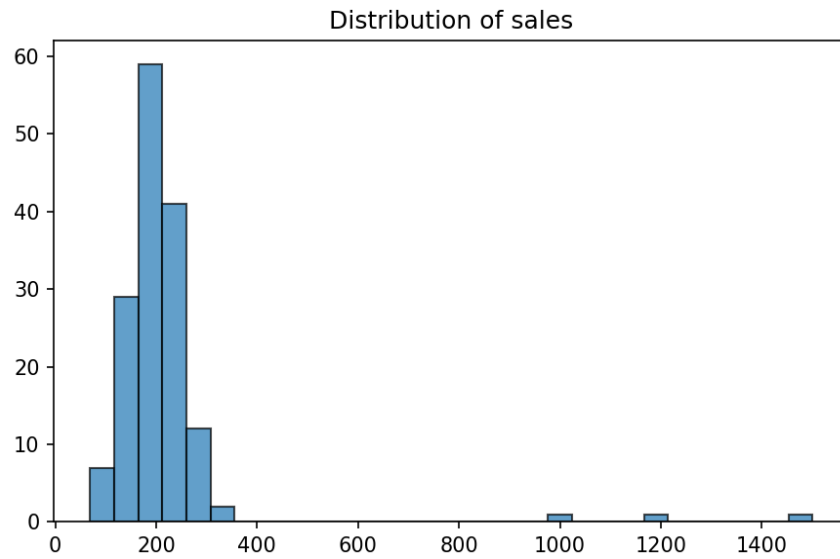
EDA Agent - Results

This agent performs exploratory data analysis and pattern discovery within the pipeline. It generates statistical summaries and visualizations to reveal underlying data structures, relationships, and distributions. Identifying trends, correlations, and potential quality issues is crucial for informing subsequent analysis steps. Ultimately, its purpose is to provide actionable insights that guide further investigation and modeling.
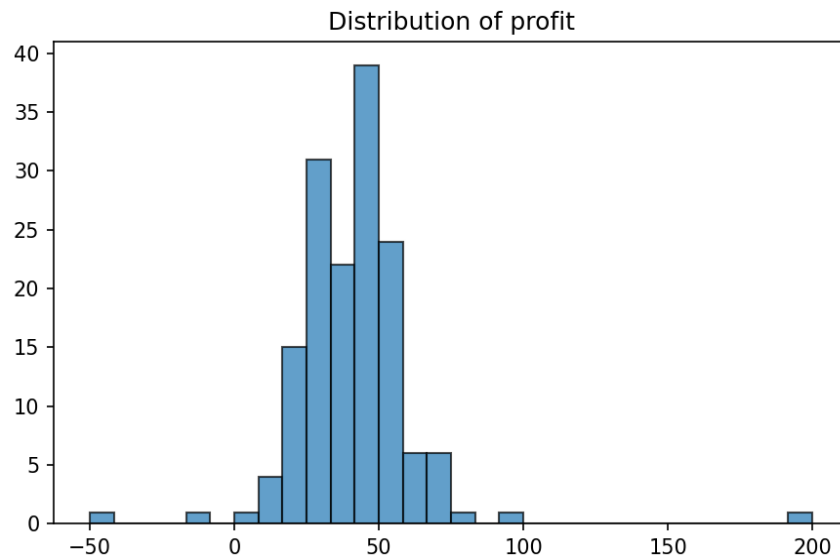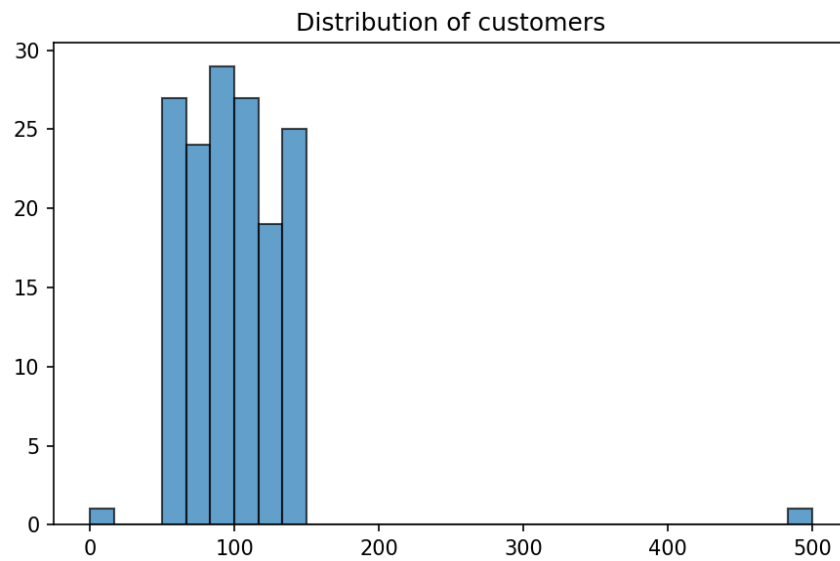
correlation_heatmap

distribution_sales

Distribution of sales

distribution_profit

Distribution of profit

distribution_customers

Distribution of customers

Anomaly Detection Agent - Results

This agent focuses on outlier detection and data quality monitoring within the pipeline. It performs anomaly detection using IQR-based statistical methods, flagging potential errors or noteworthy events in the data. The agent's purpose is to identify unusual patterns that may indicate data quality issues or significant occurrences. Finally, it outputs a summary of detected anomalies, including the affected features and their corresponding counts.

Anomaly Summary:

• sales: 5 outliers (3.27%)
• profit: 4 outliers (2.61%)
• customers: 1 outliers (0.65%)
• satisfaction: 1 outliers (0.65%)

ML Agent - Results

This ML Agent focuses on predictive modeling and feature analysis within the data pipeline. It performs baseline model training and calculates feature importance scores to identify key predictive patterns. The agent's purpose is to reveal the drivers of the target outcome, providing valuable insights for decision-making. Ultimately, it outputs a ranked list of features, highlighting their influence on the predicted result.

Top Features:

• profit: 0.5629
• customers: 0.2253
• satisfaction: 0.0878
• date: 0.0520
• category: 0.0431
• region: 0.0290