Multi-Agent Data Analysis Report

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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	7.679
EDA Agent	SUCCESS	6.417
Anomaly Detection Agent	SUCCESS	0.023
ML Agent	SUCCESS	7.573

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.
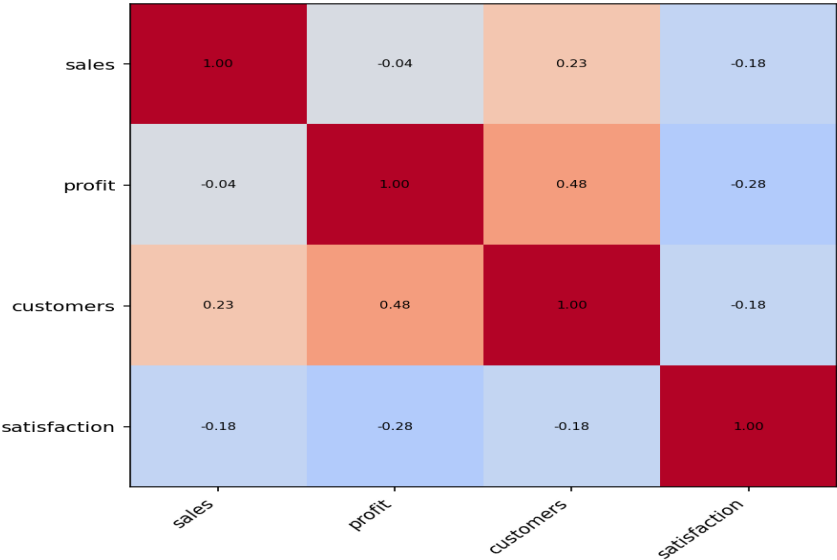
Data Cleaning Agent - Results

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. Its purpose is to provide a clean, reliable dataset, thereby ensuring the accuracy and validity of subsequent analyses. The agent standardizes data types to facilitate seamless integration with downstream processes.
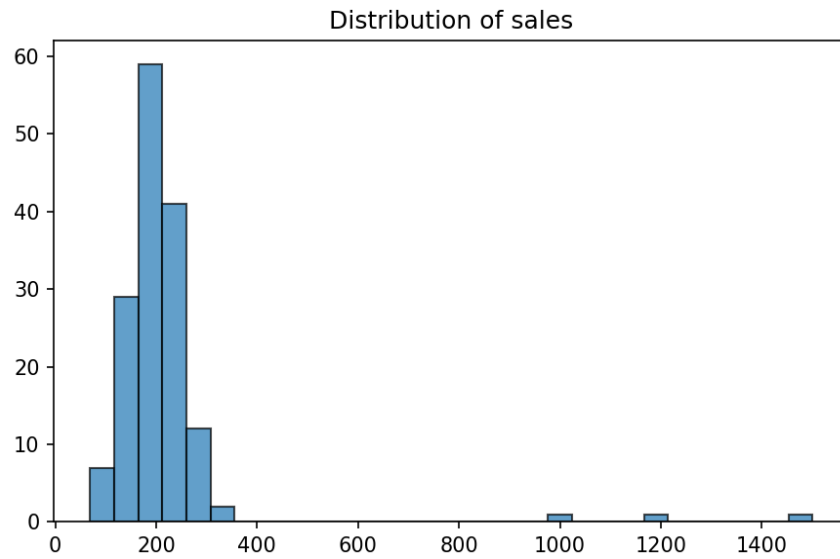
EDA Agent - Results

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 data quality issues is also a key function. Ultimately, its purpose is to provide actionable insights that inform subsequent analysis and modeling stages.
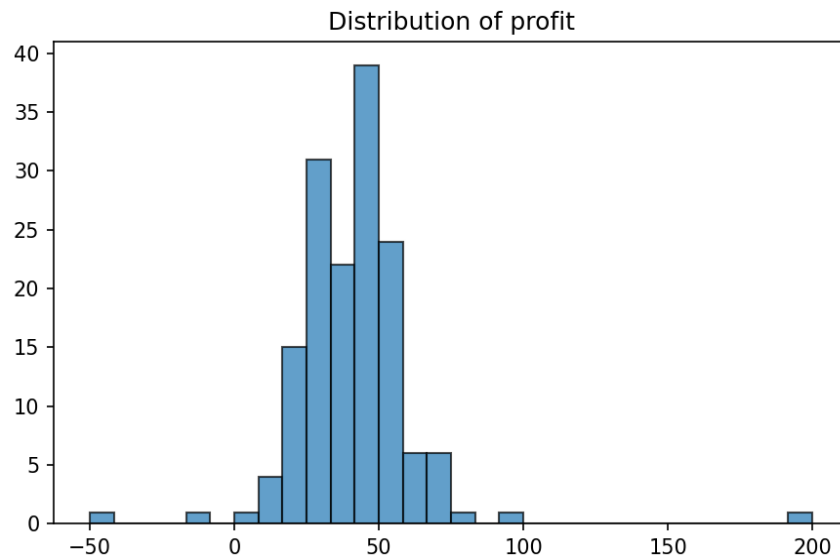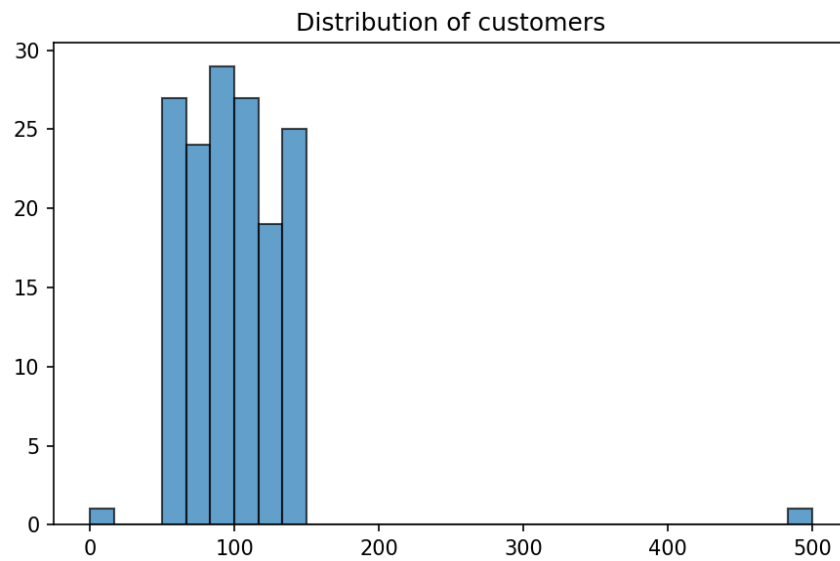
correlation_heatmap

distribution_sales

Distribution of sales

distribution_profit

Distribution of profit

distribution_customers

Distribution of customers

Anomaly Detection Agent - Results

This agent performs anomaly detection and data quality monitoring within the pipeline. It identifies unusual data points and patterns using IQR-based statistical methods. The agent flags potential errors, special events, and outliers, providing a summary of anomalies that includes affected features and their counts. Its purpose is to improve data reliability and highlight areas requiring further investigation.

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 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 most influential factors driving the target outcome. Ultimately, it delivers a ranked list of features, providing crucial insights for informed decision-making.

Top Features:

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