

MA Report - Mark Ehab

Name: Mark Ehab Farouk
ID: 20221372981
Level: 4
Department: Business Analytics

Introduction

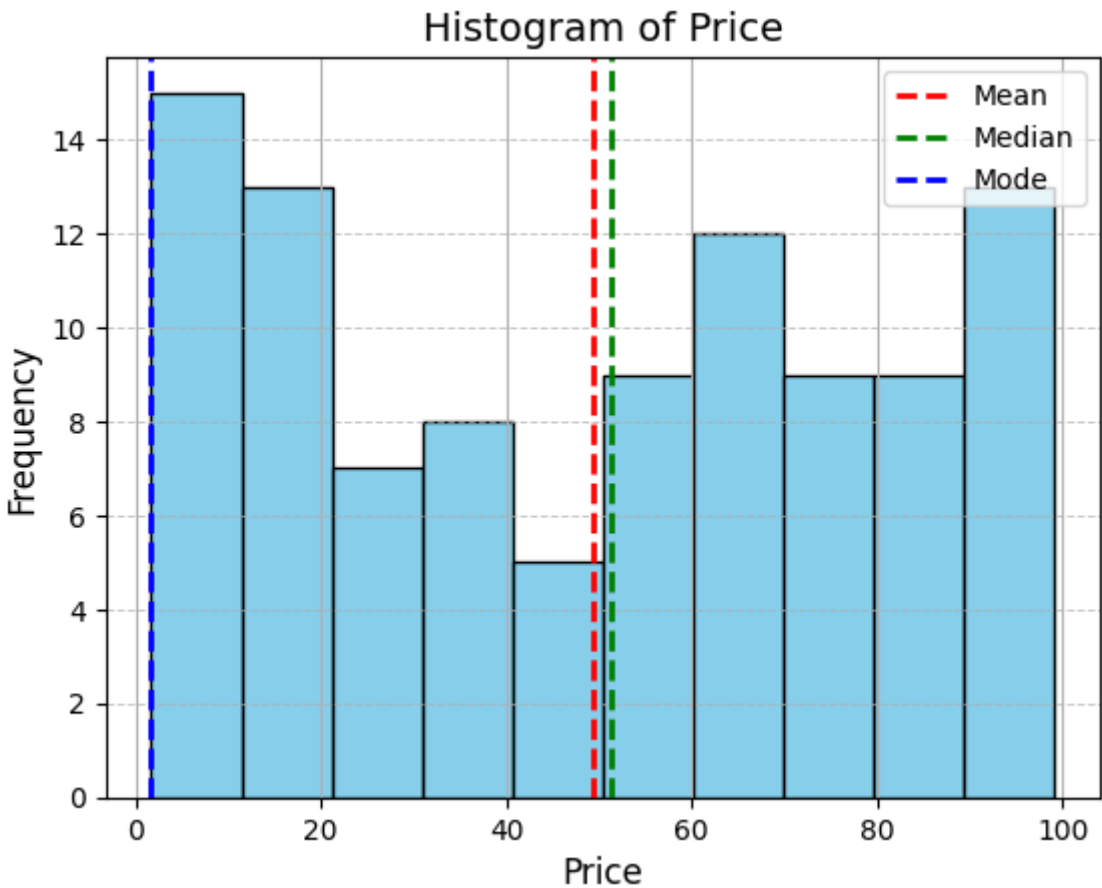
Data imported for analysis off [Kaggle](#).

The aim of this project is to take a poke at a "Data Driven" manufacturing analytics, to improve supply chain visibility through highlighting risk management, and accelerate insights

Data Analysis Report (Main)

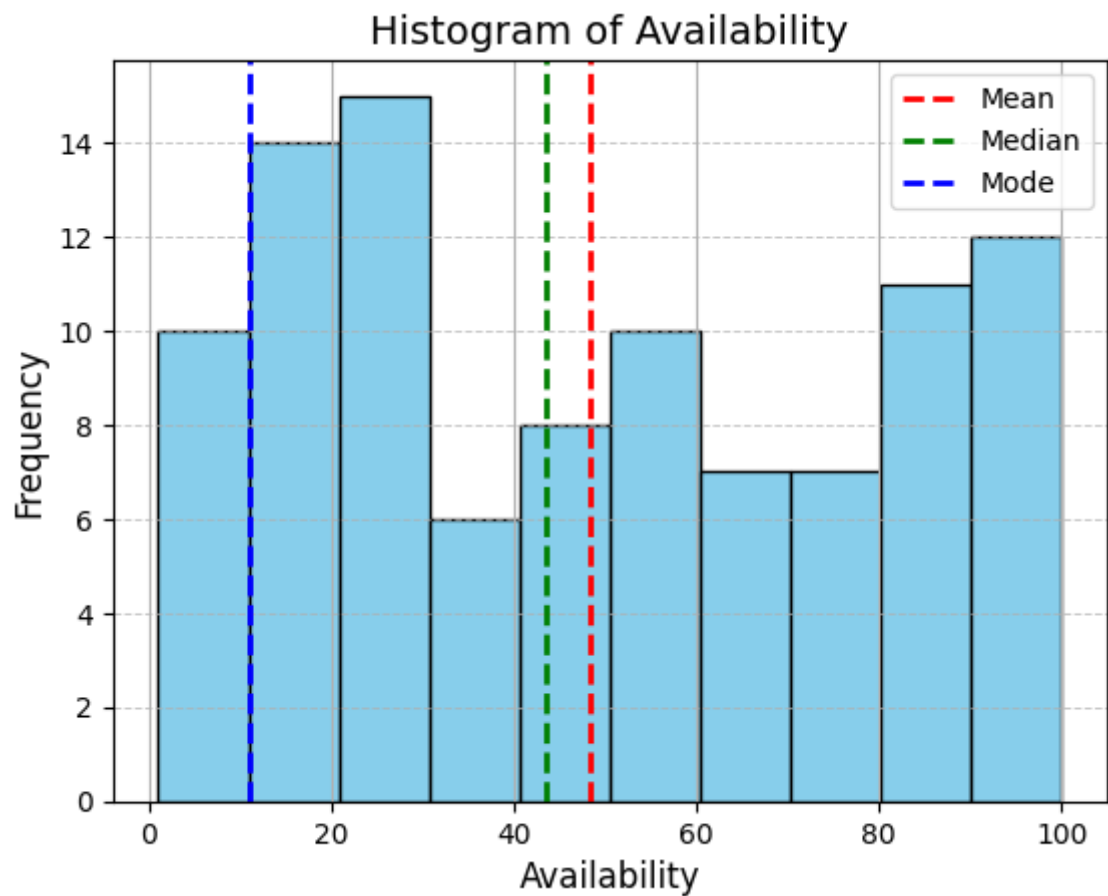
Summary Statistics of Key Metrics

1. Price
- **Mean:** \$49.46
 - **Range:** \$1.70 - \$99.17
 - Prices show a wide distribution, indicating a mix of low and high-value products.



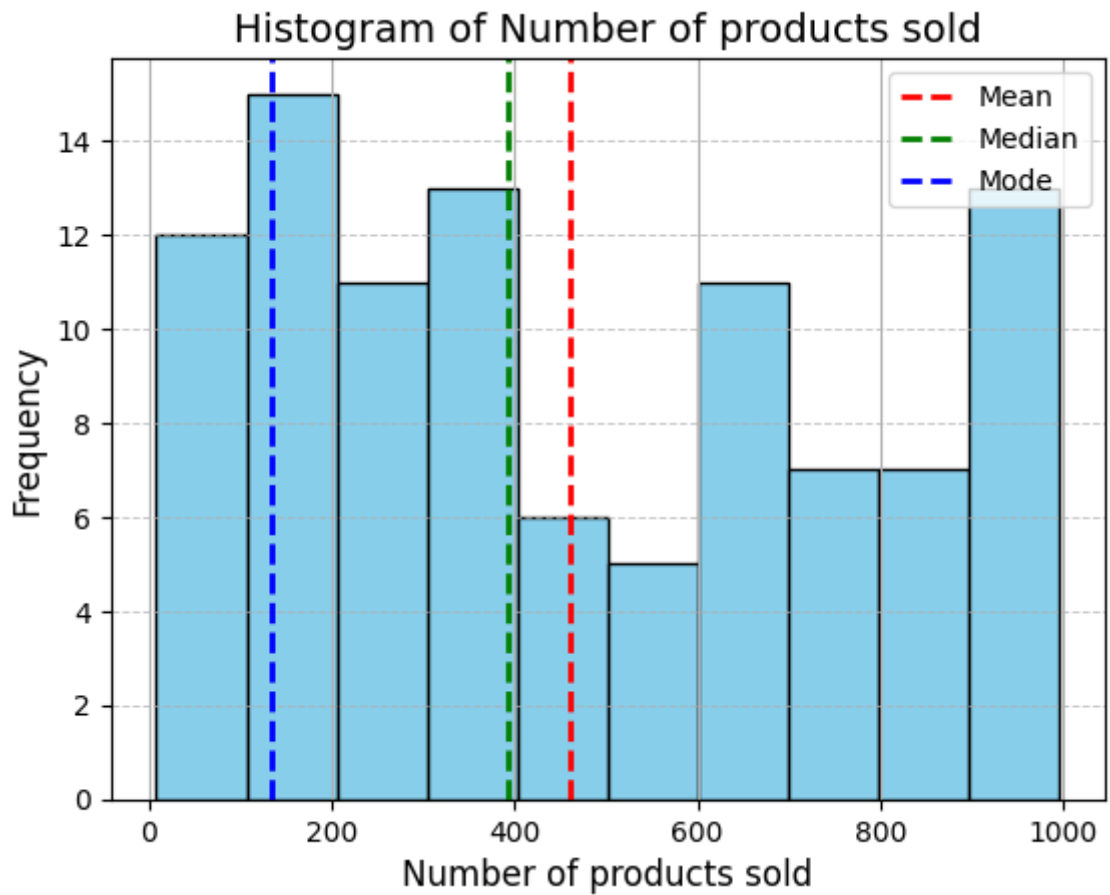
2. Availability

- **Mean:** 48.40 units
- **Range:** 1 - 100 units
- The standard deviation of 30.74 suggests variability in stock availability across products.



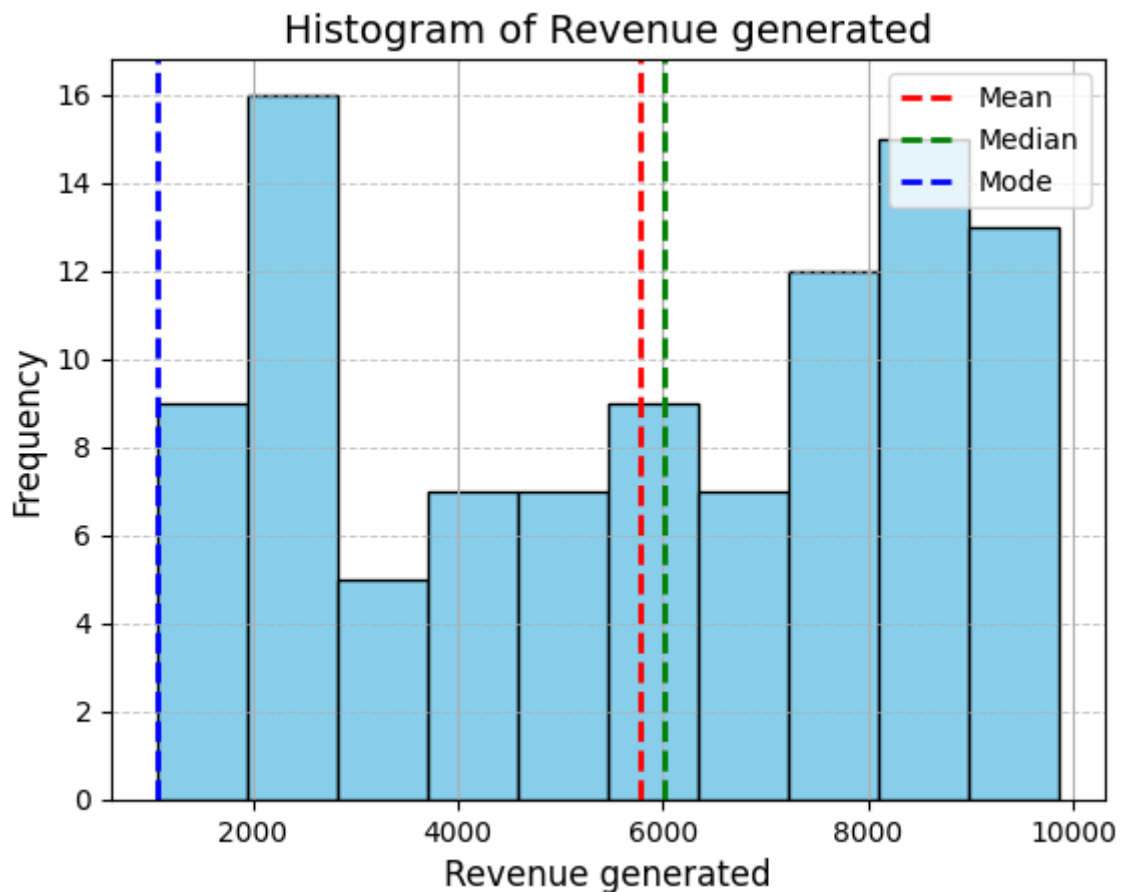
3. Number of Products Sold

- **Mean:** 460.99 units
- **Range:** 8 - 996 units
- The 75th percentile (704.25 units) indicates a skew towards high sales volumes for top products.



4. Revenue Generated

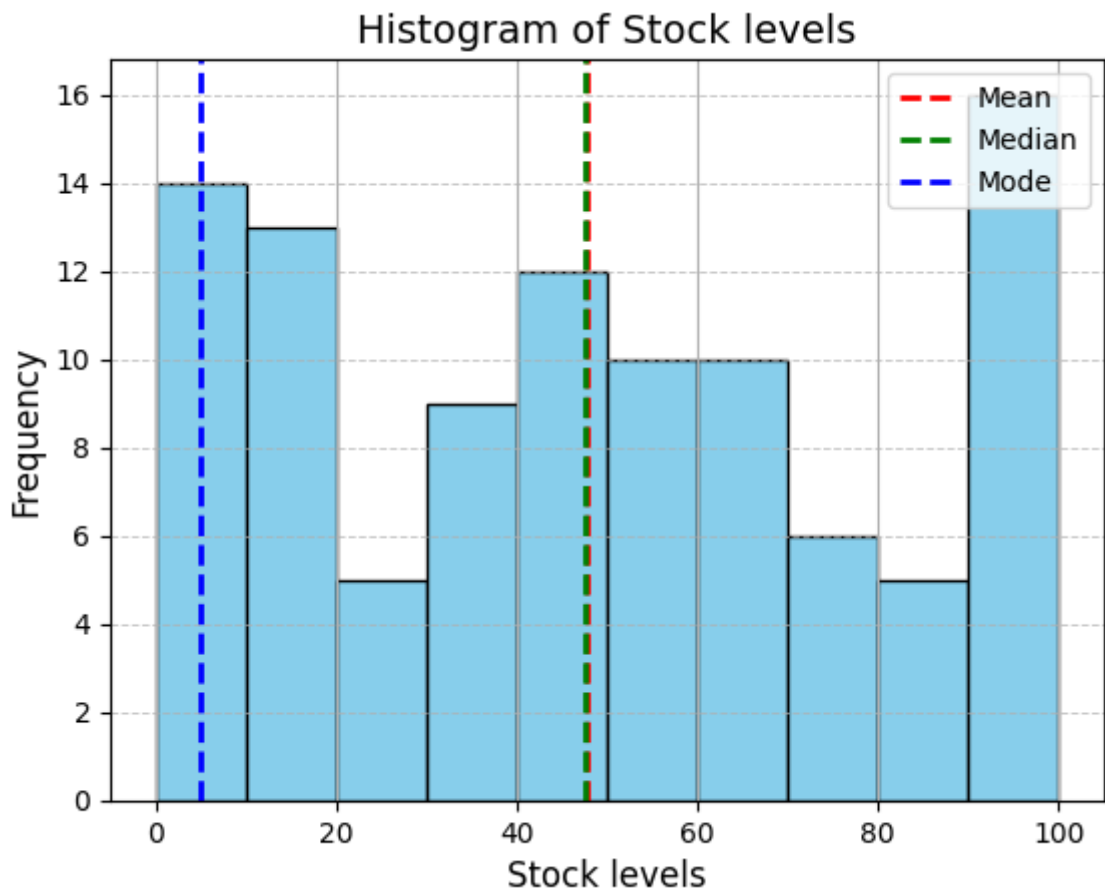
- **Mean:** \$5,776.05
- **Range:** \$1,061.62 - \$9,866.47
- Revenue distribution aligns closely with sales figures and product price variance.



Operational Metrics

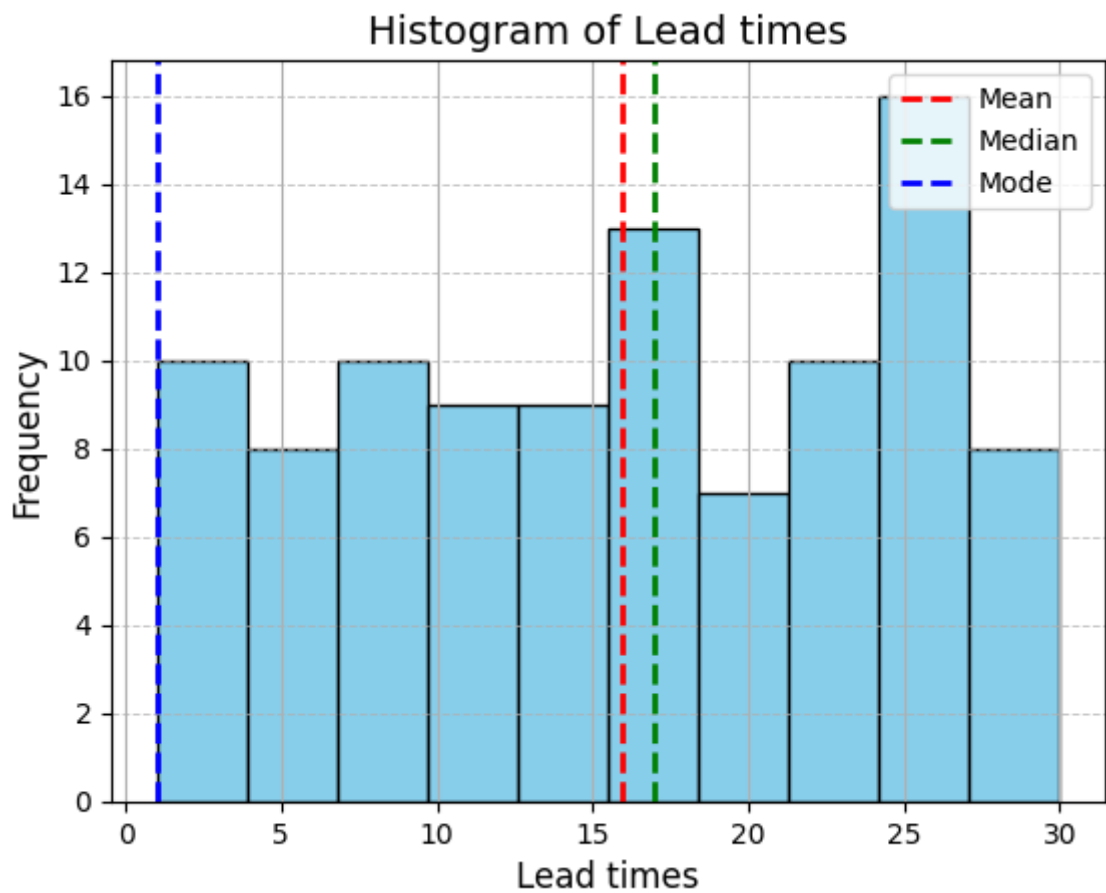
1. Stock Levels

- **Mean:** 47.77 units
- **Range:** 0 - 100 units
- Some items may be out of stock (minimum = 0), highlighting potential supply issues.



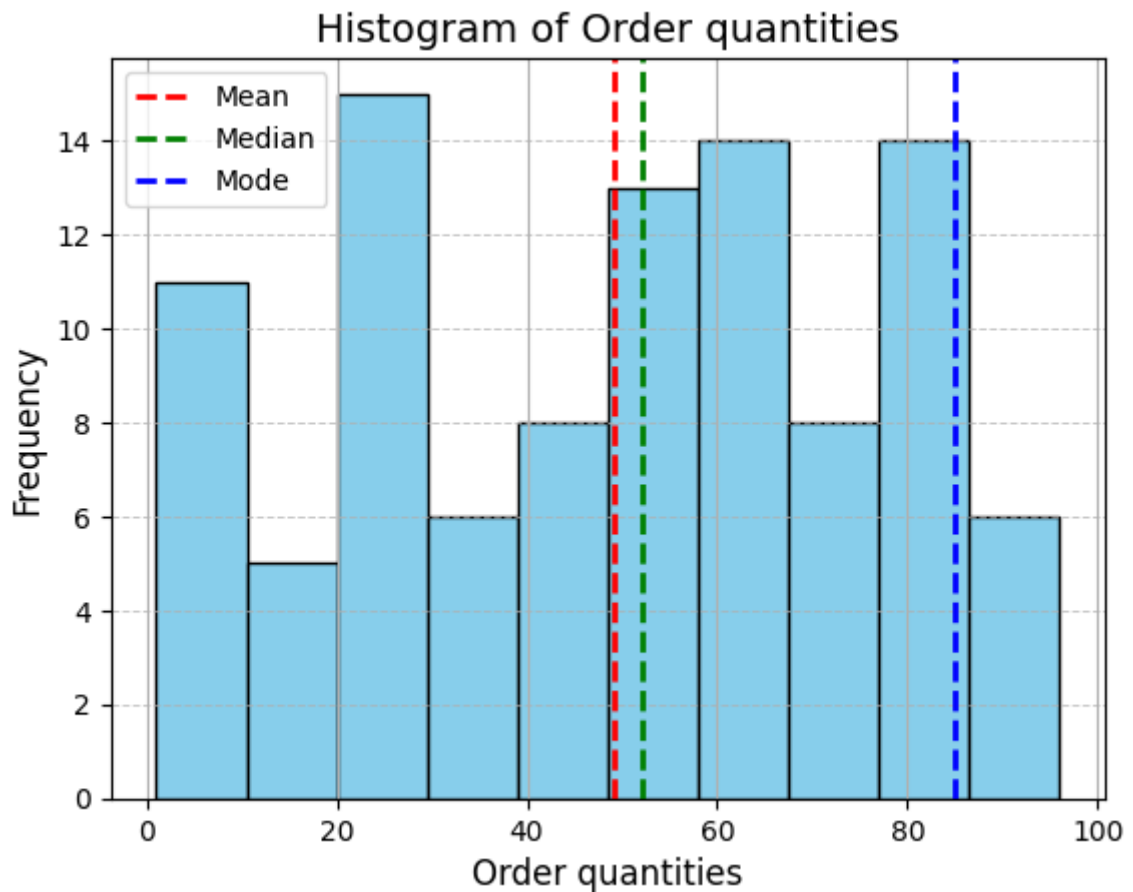
2. Lead Times

- **Average Lead Time:** 15.96 days
- **Manufacturing Lead Time:** 14.77 days
- Lead times vary significantly, with the upper quartile at 24-25 days.



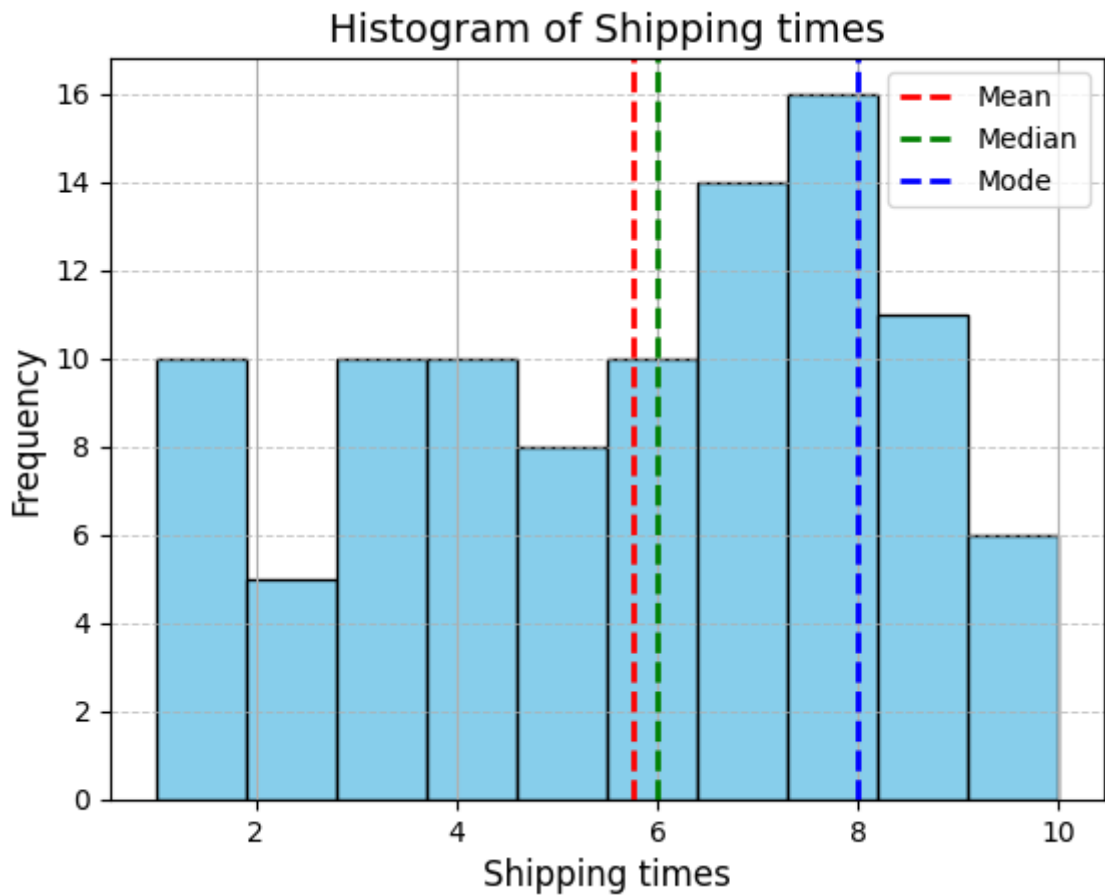
3. Order Quantities

- **Mean:** 49.22 units per order
- **Range:** 1 - 96 units
- Smaller orders are evident (1 unit minimum), likely for high-value products.



4. Shipping Times and Costs

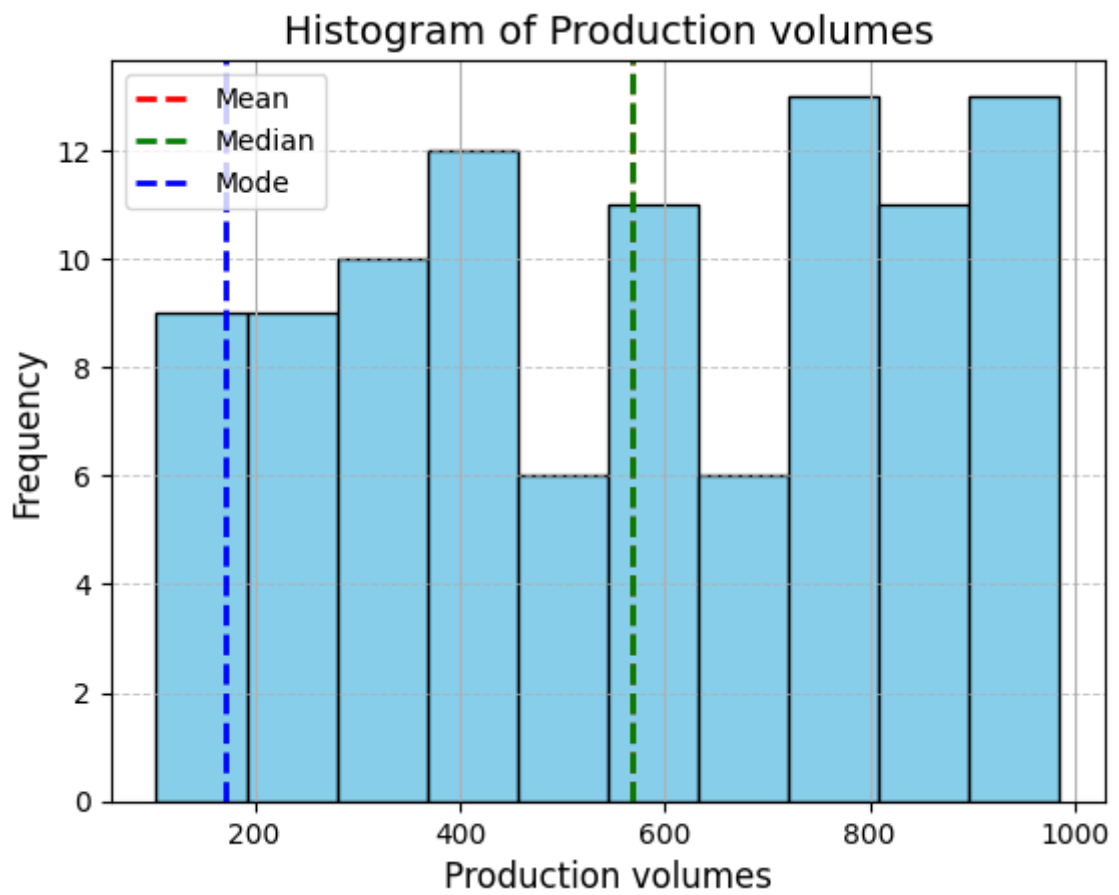
- **Shipping Times:** 1 - 10 days (mean = 5.75 days)
- **Shipping Costs:** \$1.01 - \$9.93 (mean = \$5.55)
- There's a strong correlation between costs and shipping times, potentially due to expedited delivery options.



Manufacturing Insights

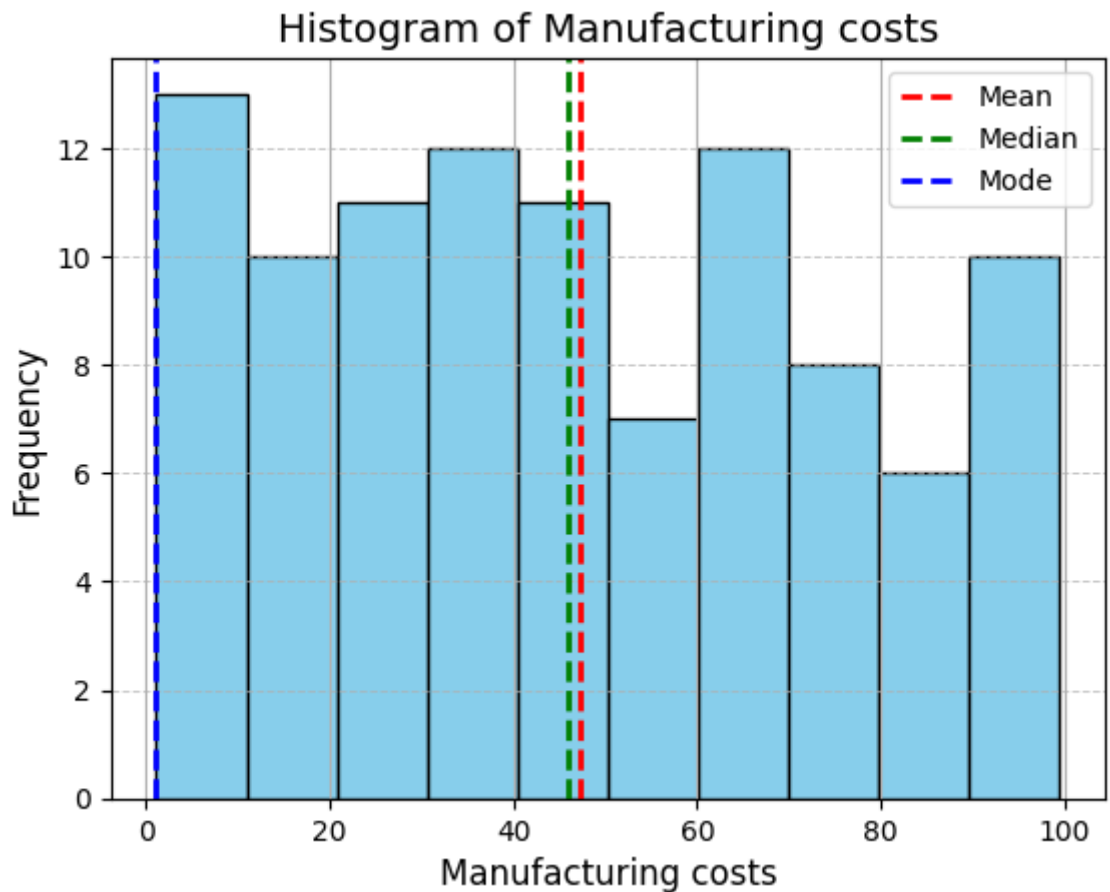
1. Production Volumes

- **Mean:** 567.84 units
- **Range:** 104 - 985 units
- Production aligns closely with demand patterns.



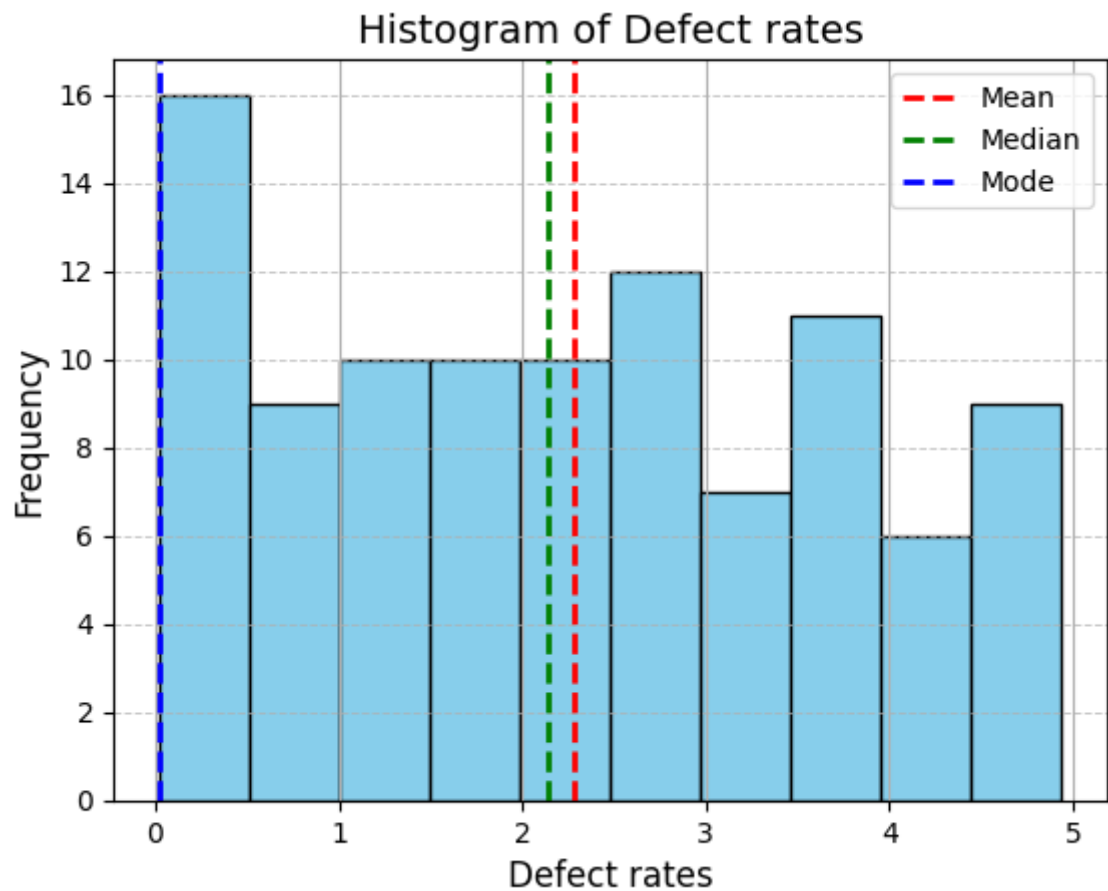
2. Manufacturing Costs

- **Mean:** \$47.27
- **Range:** \$1.09 - \$99.47
- Higher production costs align with premium or low-volume products.



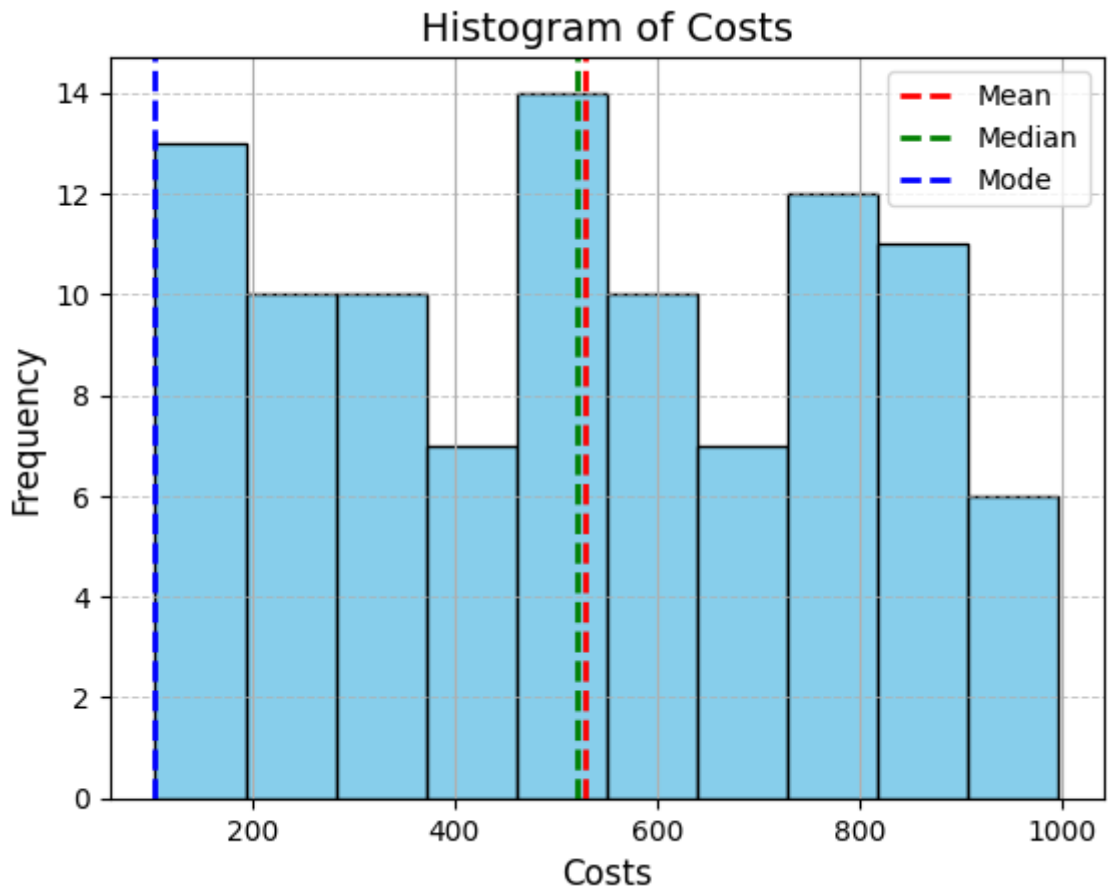
3. Defect Rates

- **Mean:** 2.28%
- **Range:** 0.02% - 4.94%
- The defect rate suggests room for improvement in quality control.



4. Costs

- **Mean:** \$529.25
- **Range:** \$103.92 - \$997.41
- Total cost reflects a combination of manufacturing, logistics, and defect management.



Key Observations and Recommendations

1. Inventory Management

- Stock levels and availability need optimization to reduce out-of-stock incidents and overstock situations.

2. Efficiency in Lead Times

- Lead times could be optimized, especially for products exceeding the 75th percentile in delays.

3. Cost Control

- High manufacturing costs for certain items warrant an investigation into alternative production methods or materials.

4. Quality Assurance

- Reducing defect rates can enhance customer satisfaction and reduce waste.

5. Revenue Maximization

- Focus marketing and operational efficiency on high-revenue products to maximize returns.

6. Shipping Optimization

- Analyze whether shipping costs can be reduced without affecting delivery times significantly.