

# Sales Data Analysis for Retail Store using statistics

This application analyzes sales data for various product categories.

## Sales Data

	product_id	product_name	category	units_sold	sale_date
0	1	Product 1	Home	25	2023-01-01 00:00:00
1	2	Product 2	Sports	15	2023-01-02 00:00:00
2	3	Product 3	Electronics	17	2023-01-03 00:00:00
3	4	Product 4	Home	19	2023-01-04 00:00:00
4	5	Product 5	Home	21	2023-01-05 00:00:00
5	6	Product 6	Sports	17	2023-01-06 00:00:00
6	7	Product 7	Electronics	19	2023-01-07 00:00:00
7	8	Product 8	Electronics	16	2023-01-08 00:00:00
8	9	Product 9	Home	21	2023-01-09 00:00:00
9	10	Product 10	Clothing	21	2023-01-10 00:00:00

## Descriptive Statistics

	units_sold
count	20
mean	18.8
std	3.3023
min	13
25%	17
50%	18.5
75%	21
max	25

## The mean of the dataset

18.8

## The median of the dataset

18.5

## The standard deviation of the dataset

3.302311789927586

## Category Statistics

	Category	Total Units Sold	Average Units Sold	Std Dev of Units Sold
0	Clothing	21	21	None
1	Electronics	73	18.25	2.2174
2	Home	181	20.1111	3.7231
3	Sports	101	16.8333	2.7142

# Inferential Statistics

confidence level:0.95

degrees of freedom:19

sample mean:18.8

sample standard error:0.7384193645177087

t-score:2.093024054408263

margin of error:1.5455294921764278

confidence interval:(np.float64(17.254470507823573), np.float64(20.34552949217643))

## Hypothesis Testing

Let's test the hypothesis that the average units sold is greater than 20

we fail to reject the null hypothesis

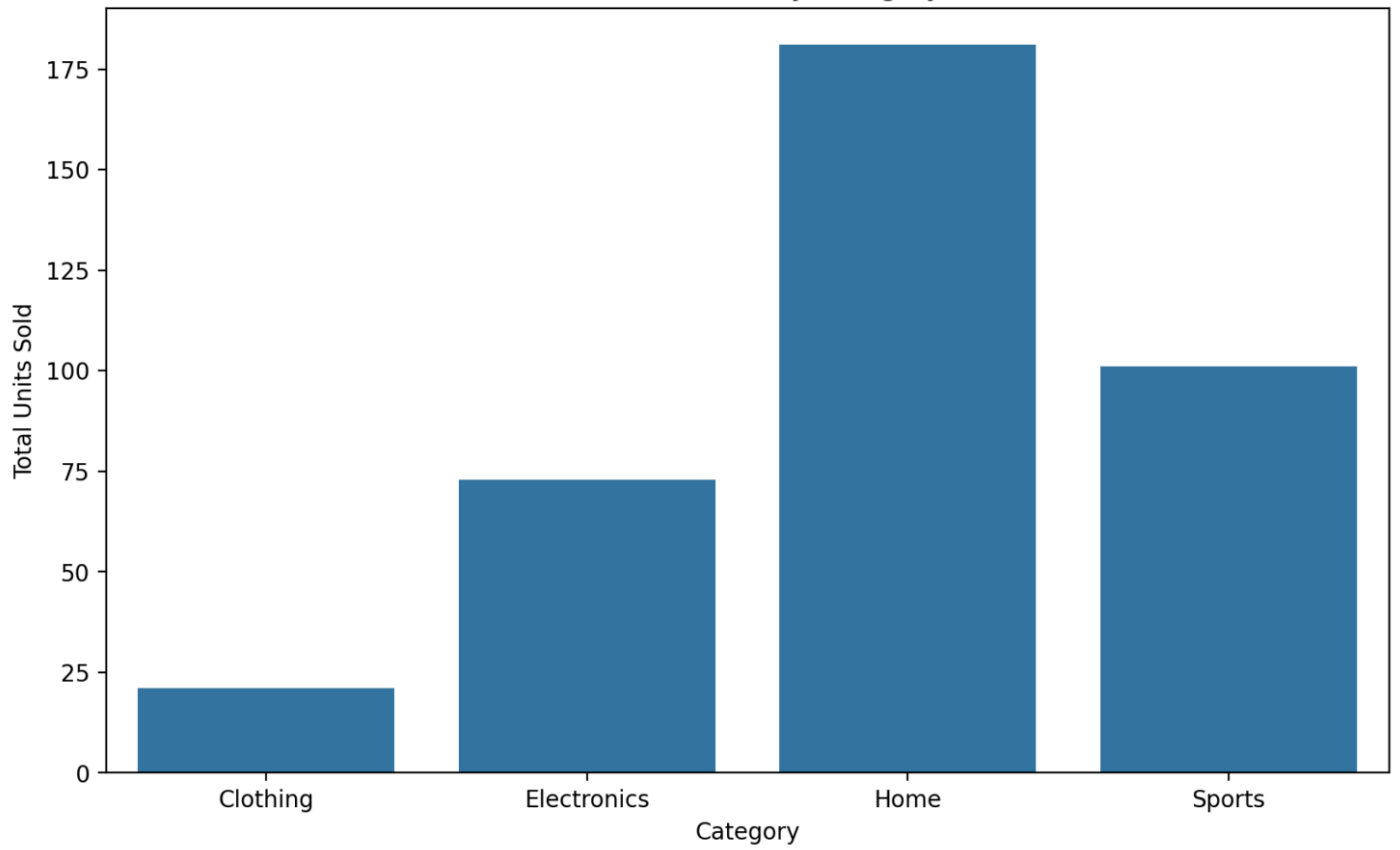
t-score:-1.6250928099424466

p-value:0.12061572226781002

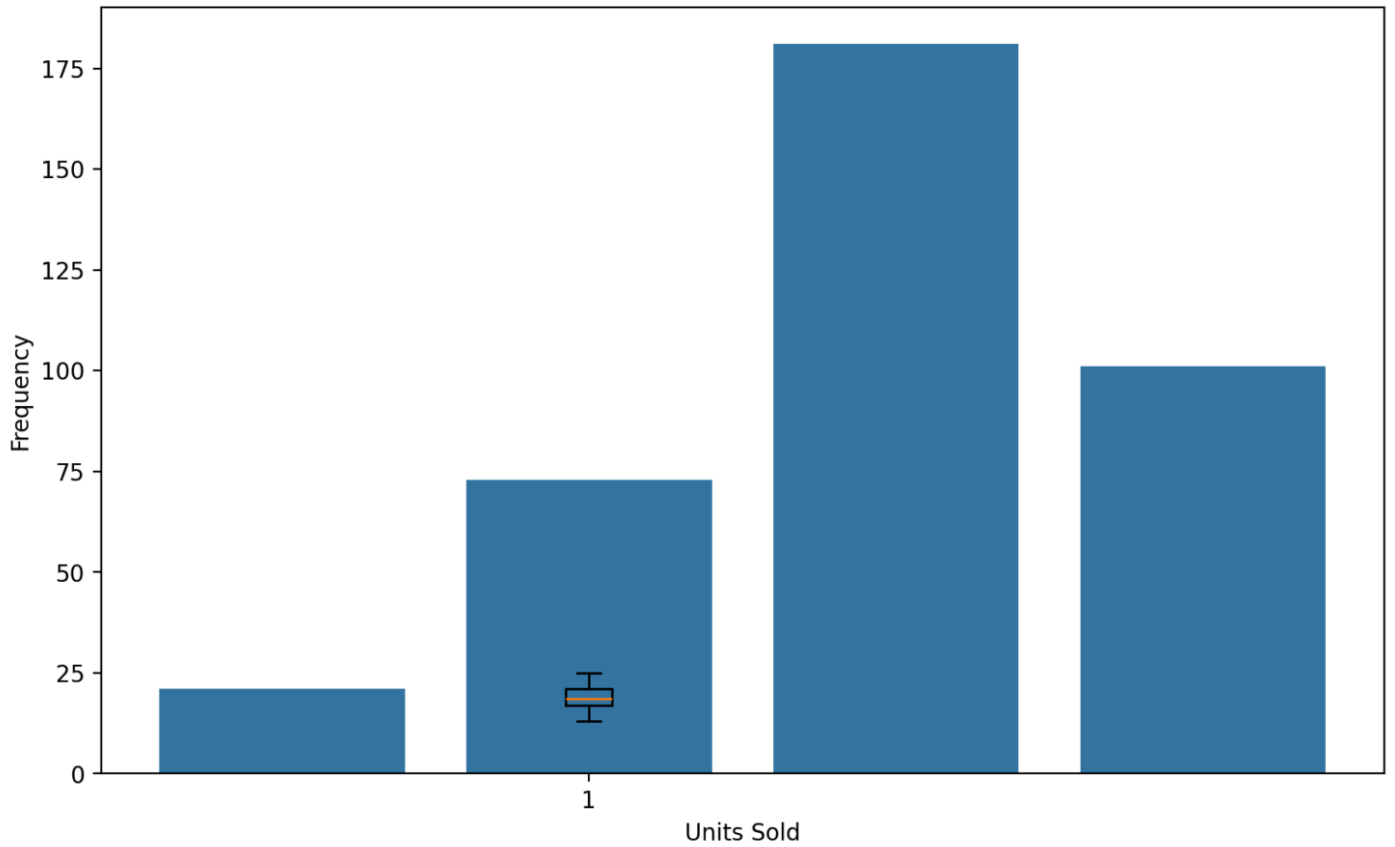
## Data Visualization

Let's visualize the total units sold by category

Total Units Sold by Category

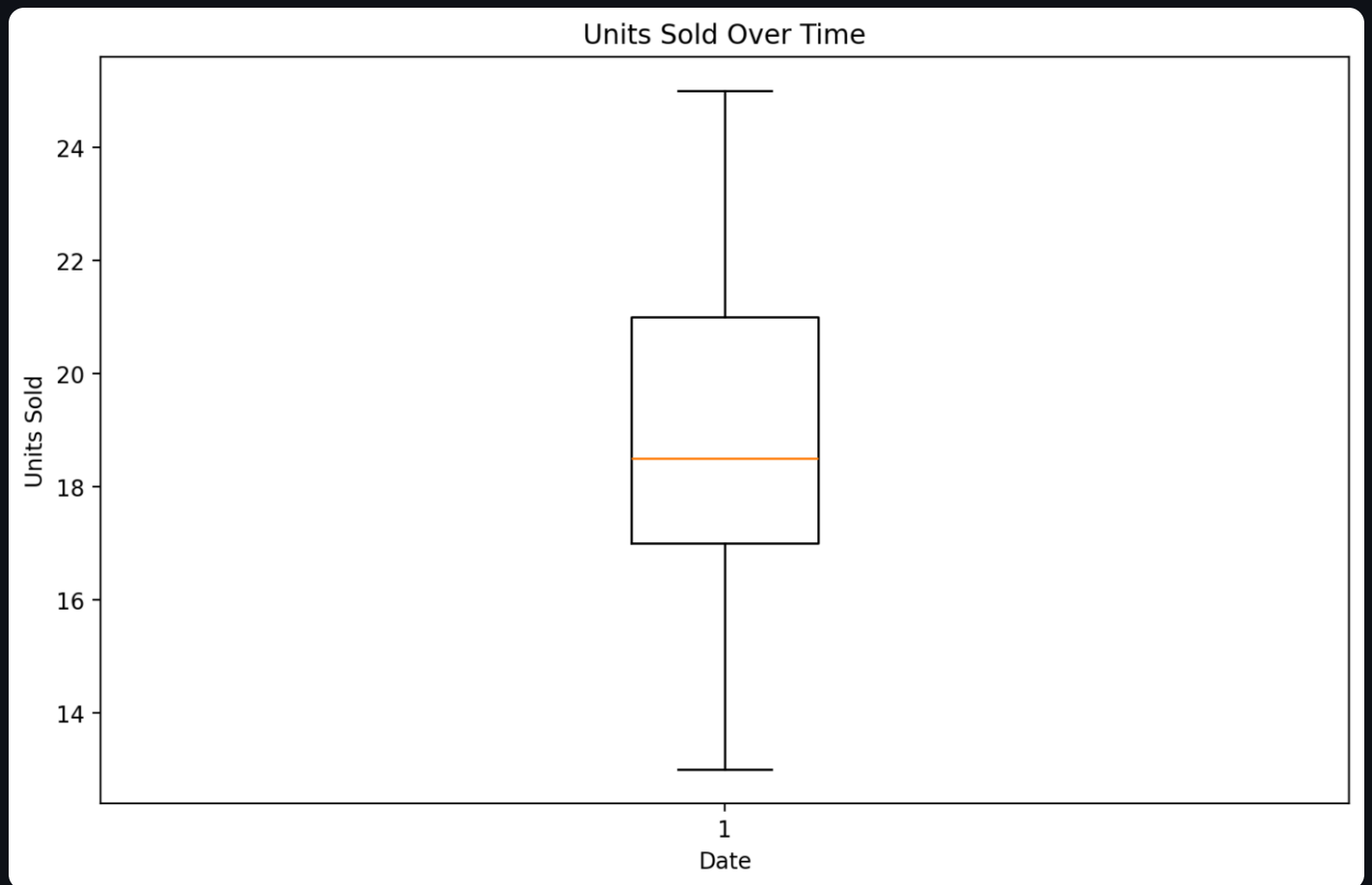


Units Sold Distribution



# Time Series Analysis

Let's analyze the trend of units sold over time



## Conclusion

In this analysis, we explored the sales data for a retail store. We calculated descriptive statistics, category statistics, and performed inferential statistics to test a hypothesis. We also visualized the data to gain insights into the sales performance. The analysis provides valuable information for decision-making and future planning.

Thank you for using this application!

