

DATA ANALYSIS



Essential techniques for analysing and interpreting research data



Introduction to Data Analysis



Purpose and Importance of Data Analysis

Data Organisation

Data analysis organises collected information to make it understandable and manageable for researchers.



Purpose and Importance of Data Analysis

Summarising Information

Summarising data helps highlight key trends and patterns essential for research insights.



Purpose and Importance of Data Analysis

Supporting Research Conclusions

Accurate data analysis supports drawing valid conclusions and testing research hypotheses effectively.



Types of Research Data

Data Analysis Methods

Choosing the right analysis method depends on data type.





Descriptive Statistics



Role of Descriptive Statistics in Research

Summary of Data

Descriptive statistics summarise data to provide a clear and concise overview of research findings.



Role of Descriptive Statistics in Research

Central Tendency Measures

Measures like mean, median, and mode help identify the centre point of a data distribution.



Role of Descriptive Statistics in Research

Variability and Distribution

Statistics on variability and distribution describe data spread and patterns for comprehensive insight.





Common Measures: Mean, Median, Mode

Mean Definition

The mean is the arithmetic average of data values, calculated by summing and dividing by the count.



Common Measures: Mean, Median, Mode

Median Explanation

The median is the middle value in a sorted data set, representing the central point.



Common Measures: Mean, Median, Mode

Mode Overview

The mode is the most frequently occurring value in the data set, indicating common trends.

Range, Variance, and Standard Deviation Explained

Range

- Range represents the difference between the highest and lowest values in a data set, indicating overall spread.

Interquartile Range

- The interquartile range is another measure of spread, except that it has the added advantage of not being affected by large outlying values.

Range, Variance, and Standard Deviation Explained

Variance

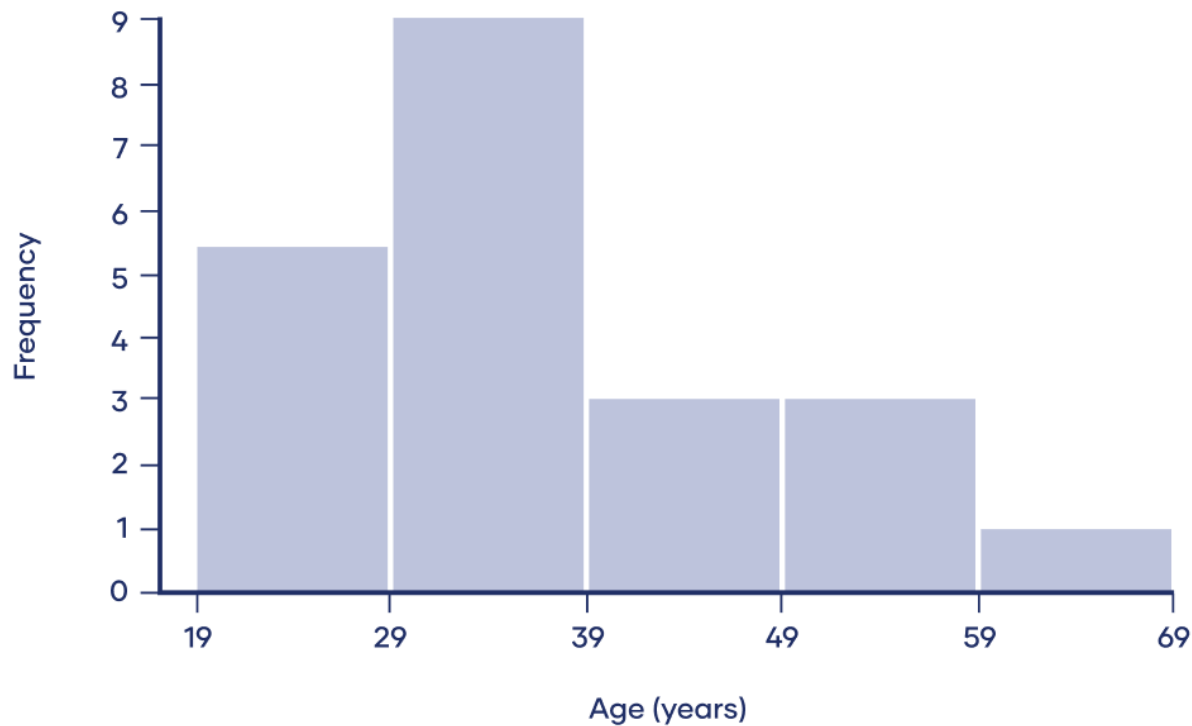
- Variance measures how much data points deviate from the mean, reflecting data dispersion.

Standard Deviation

- Standard deviation quantifies the average distance of data points from the mean, showing variability scale.

Frequency Distribution

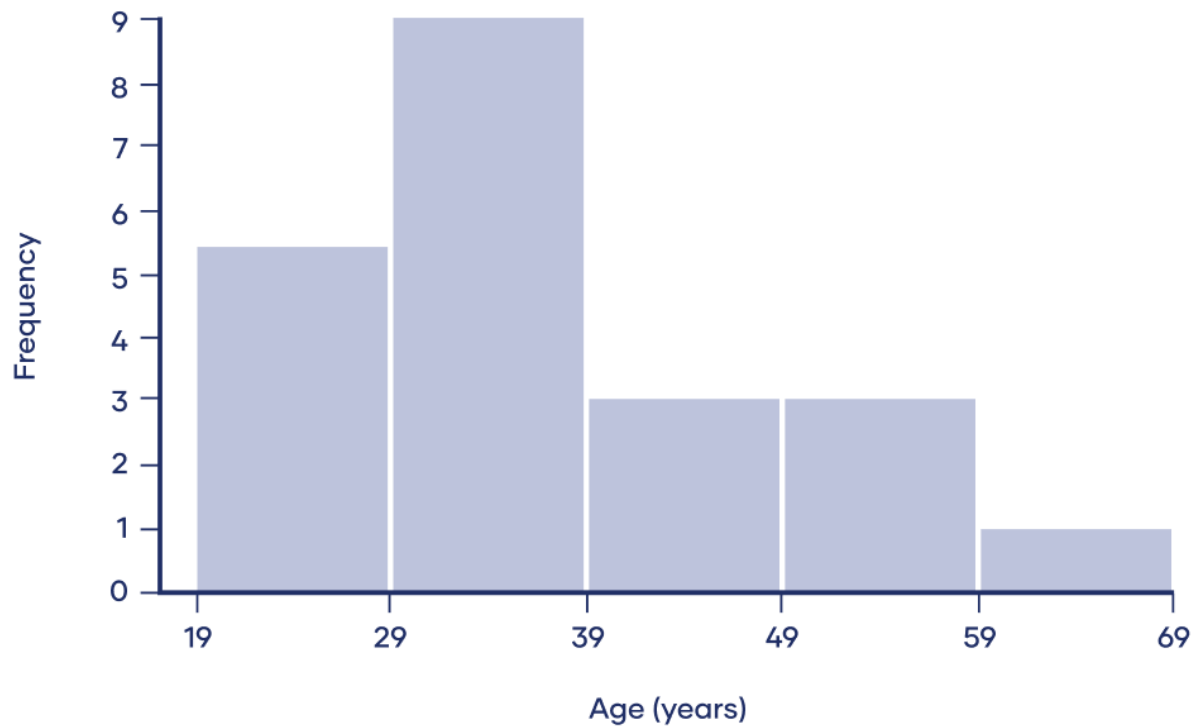
Histogram of the ages of survey participants



A frequency distribution describes the number of observations for each possible value of a variable.

Frequency Distribution

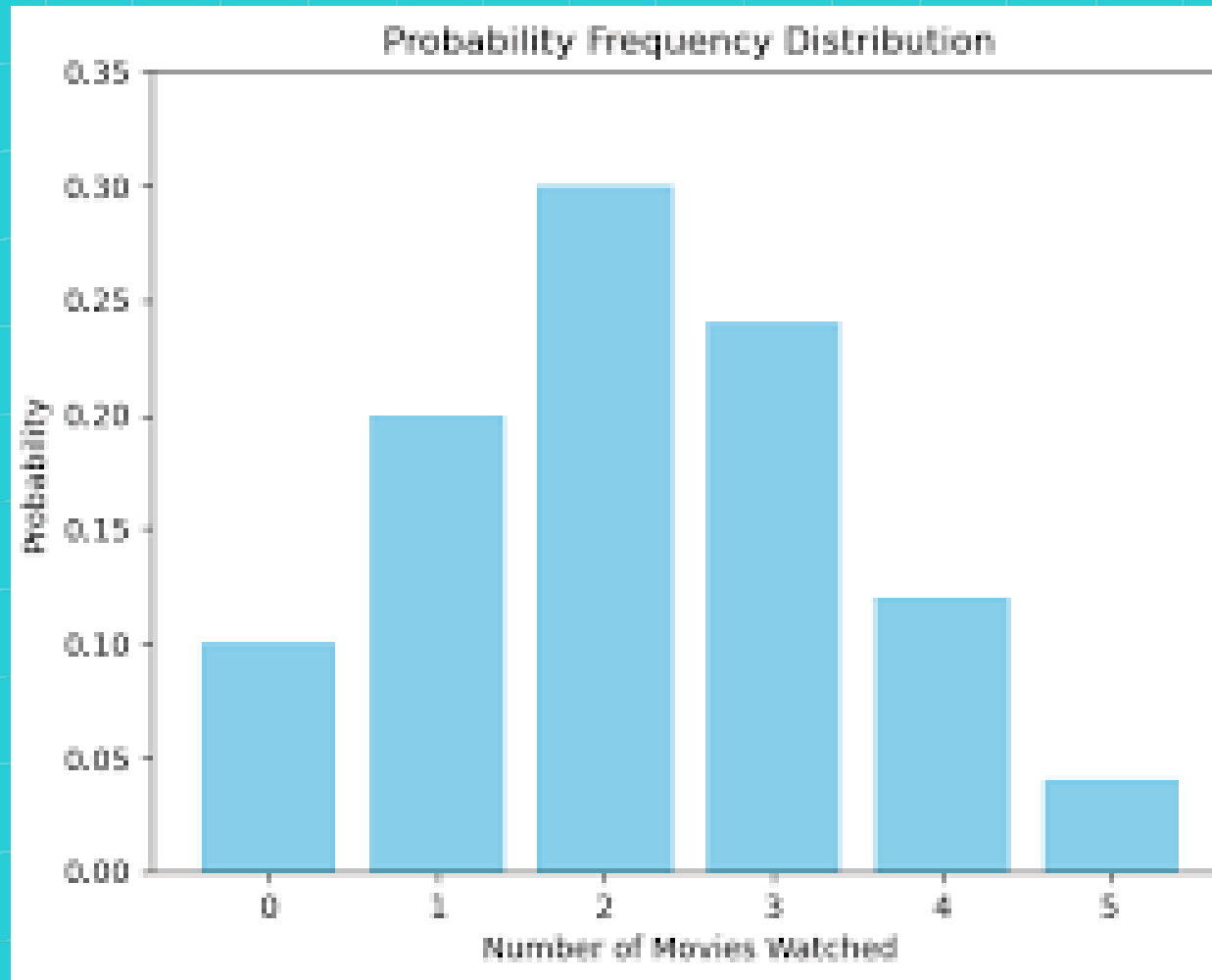
Histogram of the ages of survey participants



Categories/Intervals:

These represent the values or ranges of values in the data.

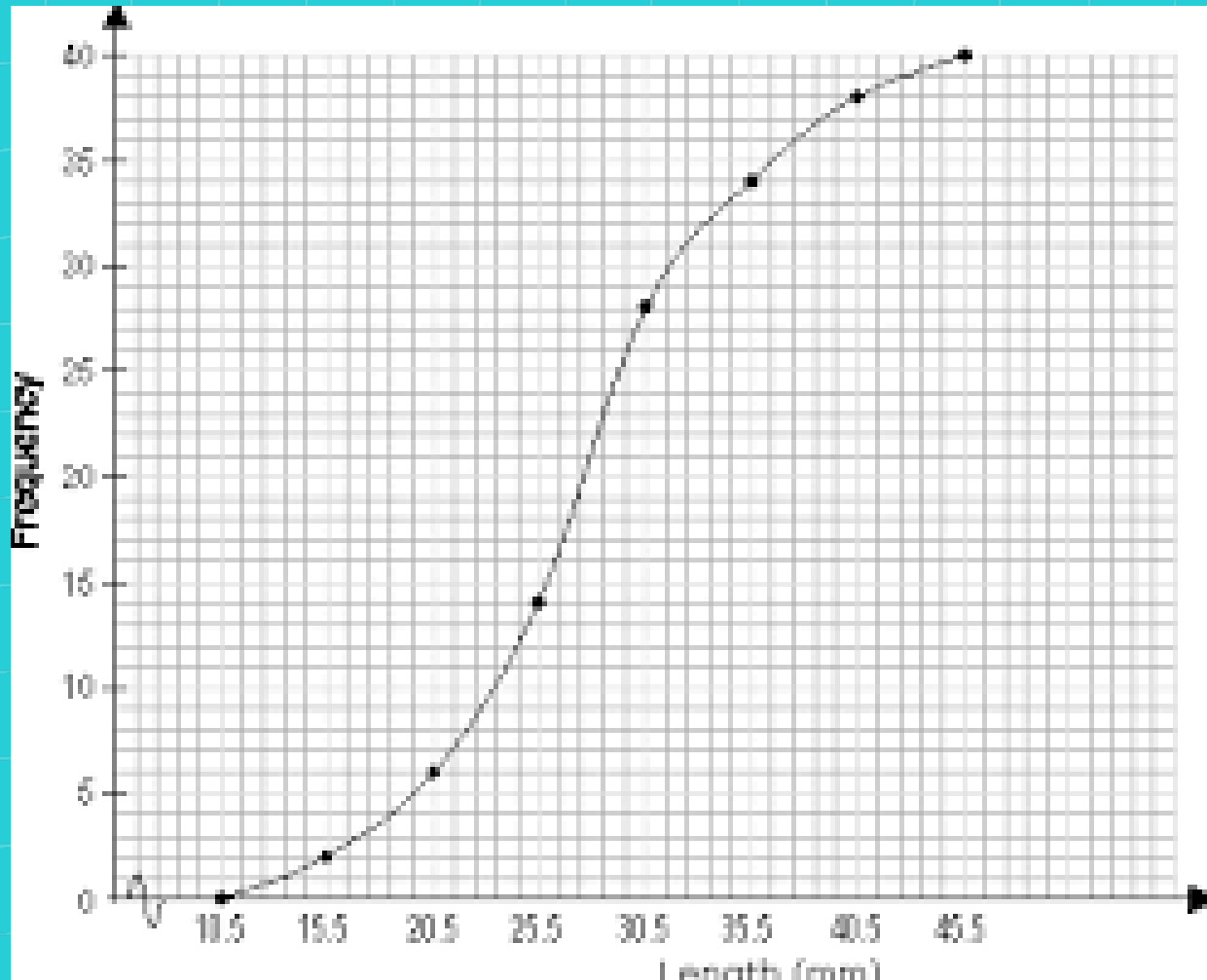
Frequency Distribution



Relative Frequency:

The proportion of total observations that fall into each category, often expressed as a percentage.

Frequency Distribution



Cumulative Frequency:

A running total of frequencies as you move through the categories or intervals.

Frequency Distribution

Job Role	Frequency
Labourer	7
Construction Manager	4
Civil Engineer	3
Quantity Surveyor	5
Architect	1
Total	20

Frequency distributions are often displayed using frequency tables.

A frequency table is an effective way to summarise or organize a dataset.

It's usually composed of two columns:

- The values or class intervals
- Their frequencies

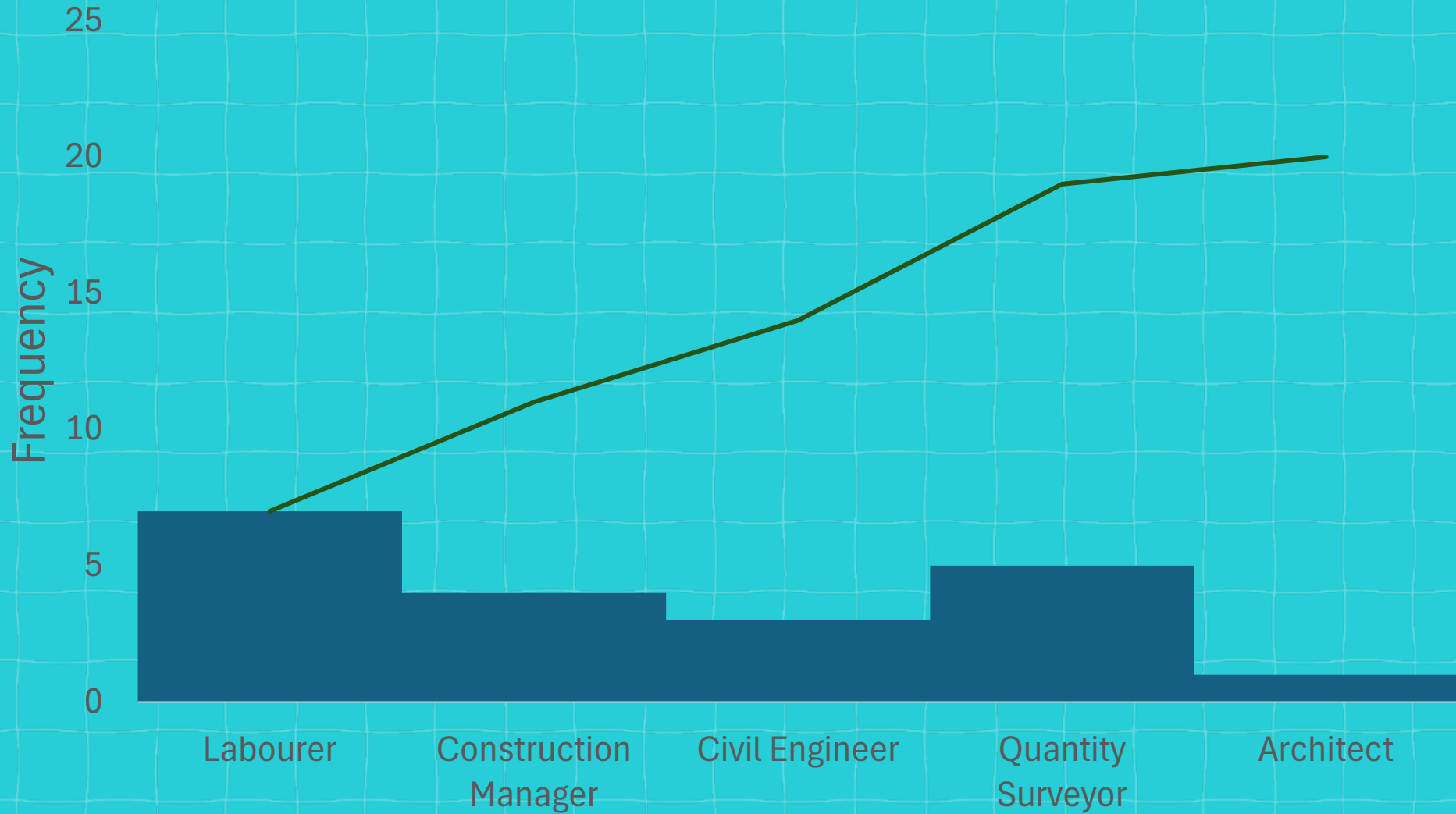
Frequency Distribution

Job Role	Frequency	Relative Frequency
Labourer	7	$7/20 = 0.35$
Construction Manager	4	$4/20 = 0.20$
Civil Engineer	3	$3/20 = 0.15$
Quantity Surveyor	5	$5/20 = 0.25$
Architect	1	$1/20 = 0.05$
Total	20	

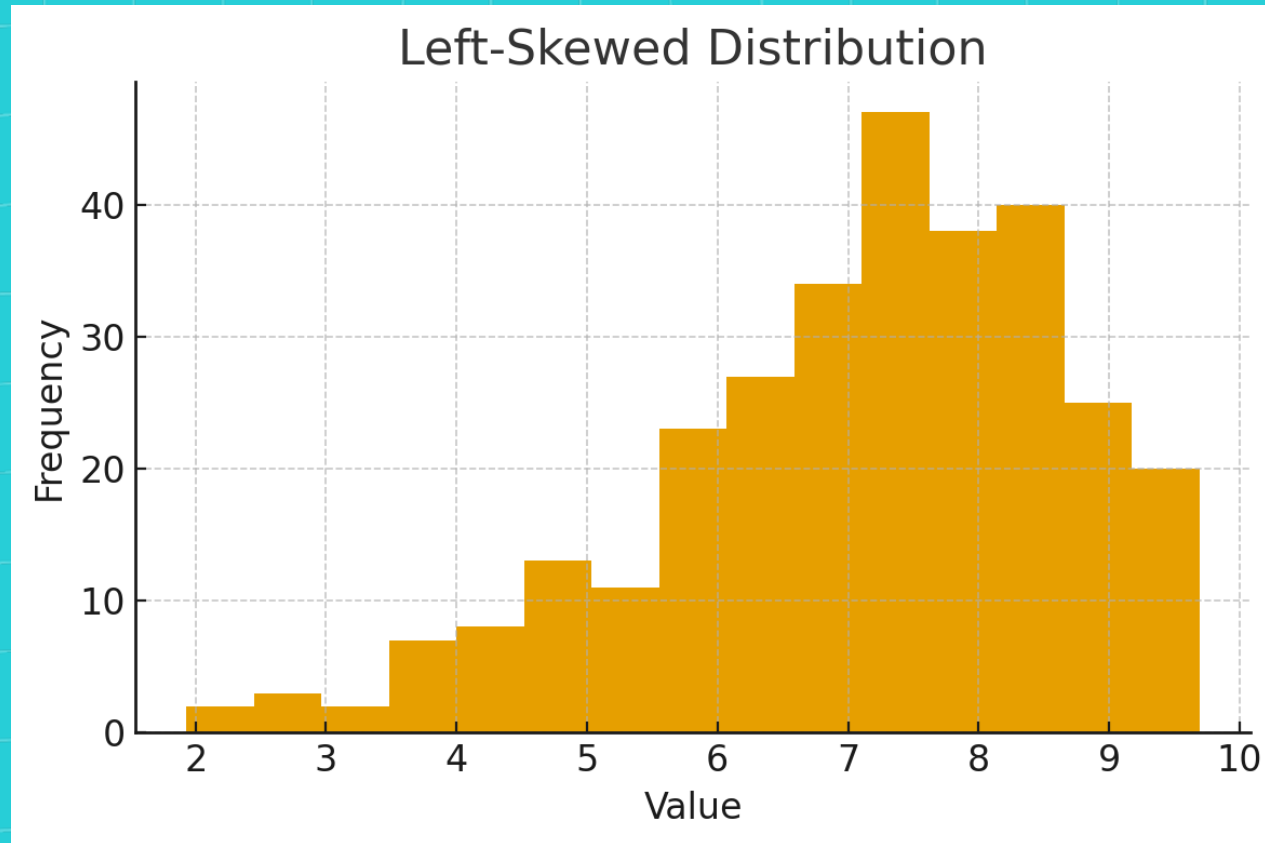
Frequency Distribution

Job Role	Frequency	Cumulative Frequency	Cumulative Relative Frequency
Labourer	7	7	$7/20=0.35$
Construction Manager	4	$7+4=11$	$11/20=0.55$
Civil Engineer	3	$7+4+3=14$	$14/20=0.70$
Quantity Surveyor	5	$7+4+3+5=19$	$19/20=0.95$
Architect	1	$7+4+3+5+1=20$	$20/20=1.00$
Total	20		

Frequency Distribution



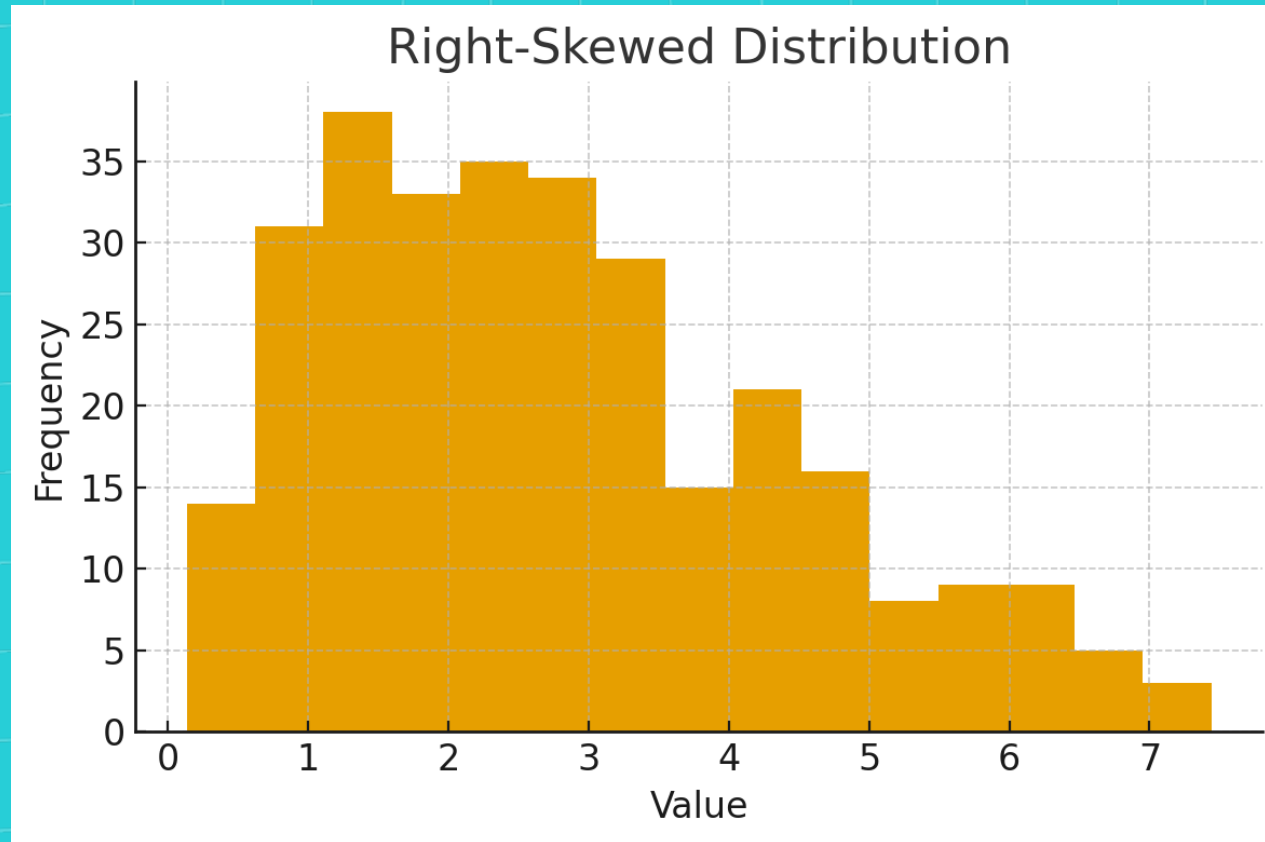
Distribution Shape



Skewness:

Measures the degree of asymmetry in the distribution

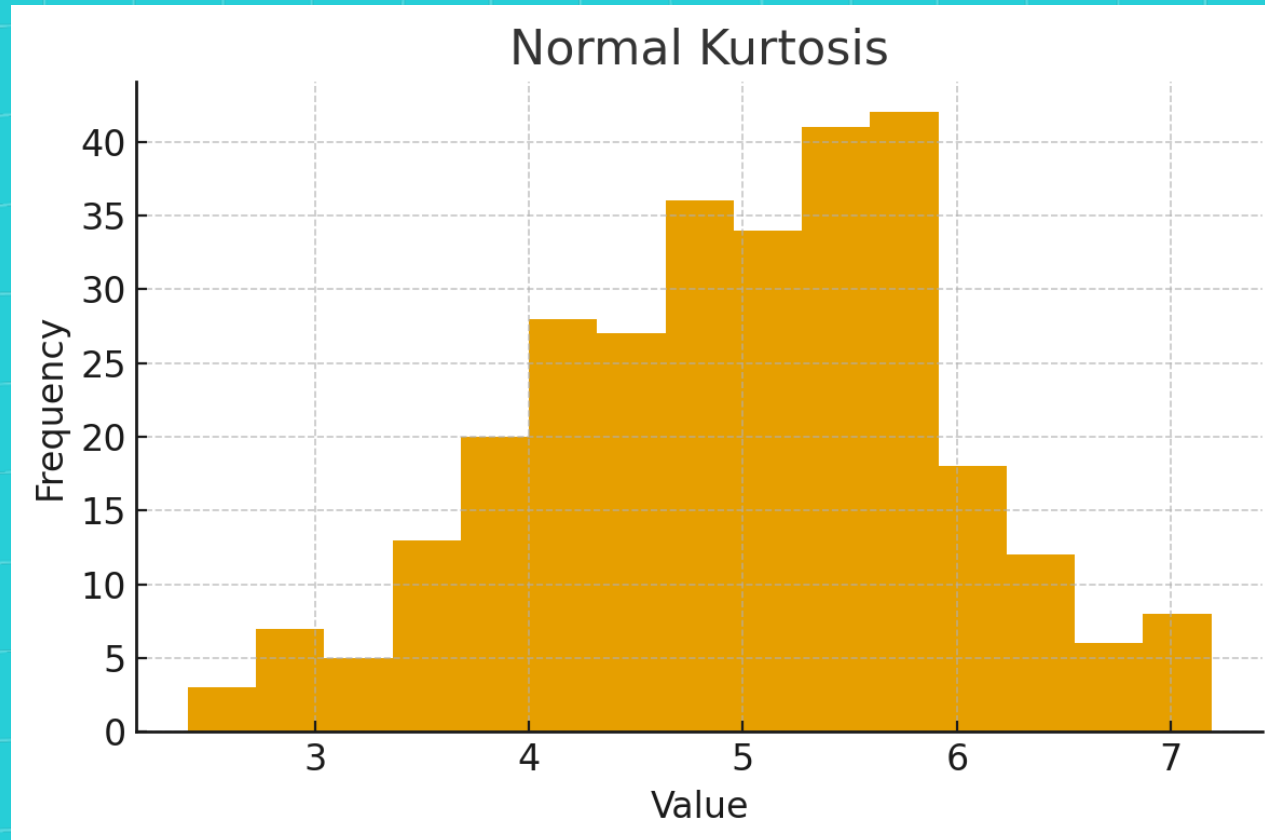
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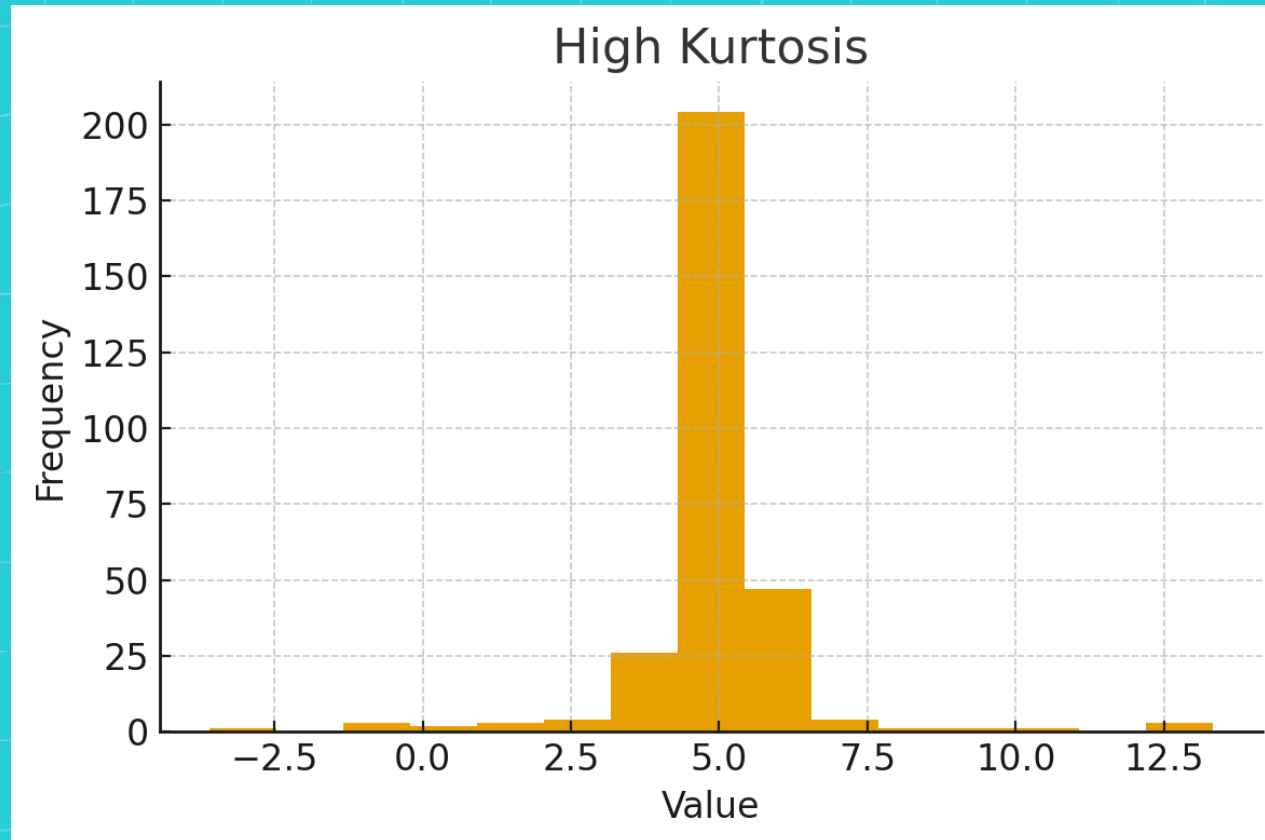
Distribution Shape



Kurtosis:

Measures the “tailedness” or the heaviness of the tails compared to a normal distribution.

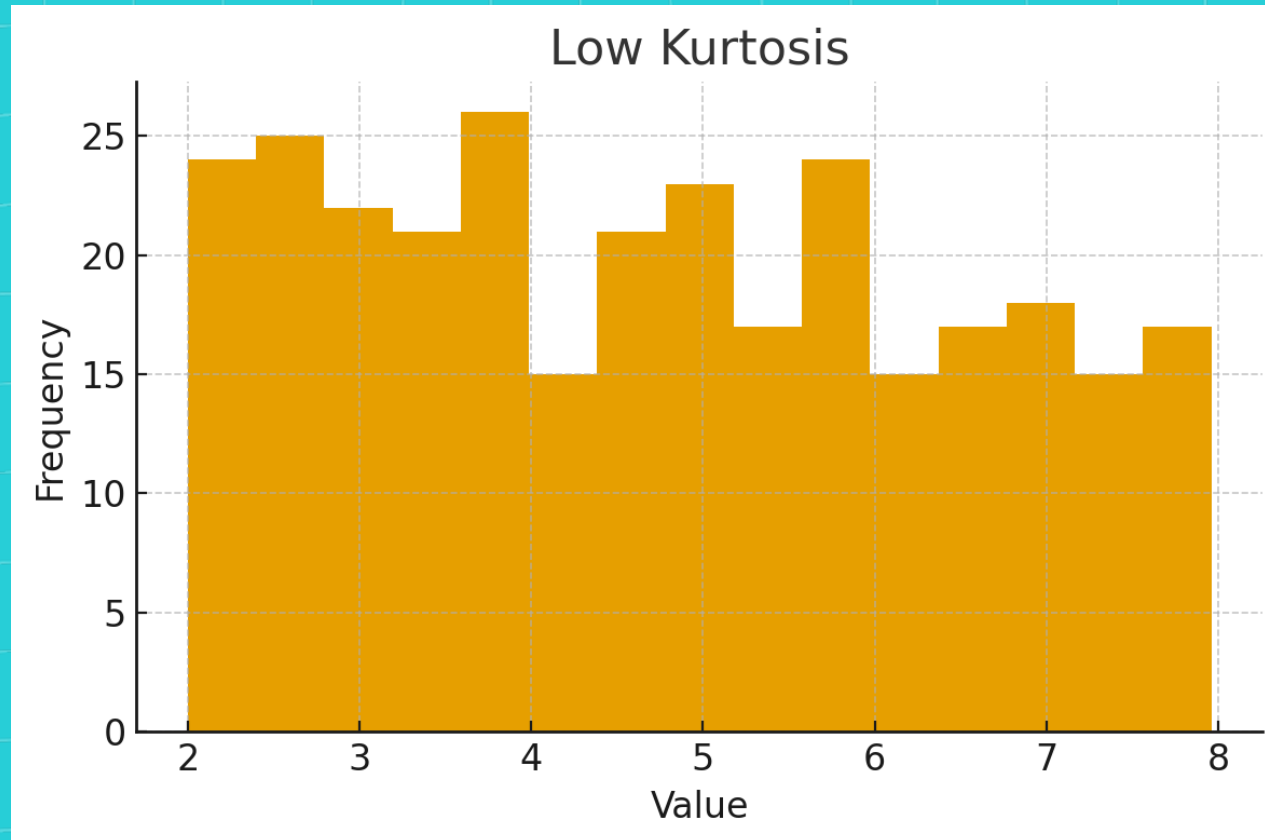
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