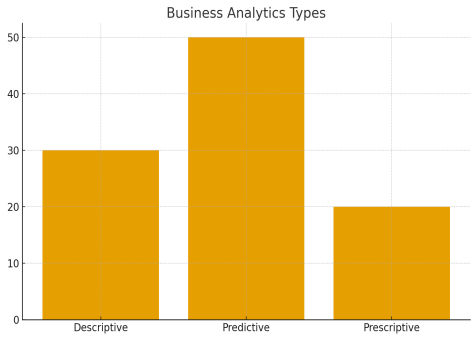
Business Analytics & Statistics Notes

What is Business Analytics?

Business Analytics uses data to make business decisions and improve performance.
■ **Descriptive Analytics** — Examines historical data to understand what happened.
■ **Predictive Analytics** — Uses data to predict future outcomes.
■ **Prescriptive Analytics** — Recommends actions to achieve best outcomes.



Case Studies

- Sales: Forecasting monthly sales using historical data.
- Marketing: Analyzing customer behavior and campaigns.
- Supply Chain: Predicting demand to reduce inventory cost.
- Finance: Risk scoring and fraud detection.

Summary Statistics

Mean: Average of values
Formula: Mean = (Sum of values) / (Number of values)
Example: Ex: (2+4+6+8)/4 = 5

Median: Middle value
Formula: Sort values → take middle
Example: Ex: [3,6,7,8,10] → Median=7

Mode: Most frequent value
Formula: Value appearing most times
Example: Ex: [2,2,3,4] → Mode=2

Variance: Spread from mean
Formula: Variance = $\Sigma(x\text{-mean})^2 / n$
Example: Higher variance = more spread

Standard Deviation: Square root of variance
Formula: Std Dev = √Variance
Example: Shows average deviation

Range: Max – Min
Formula: Range = Max - Min
Example: Ex: [2,9] → 9-2=7

IQR: Middle 50% spread
Formula: IQR = Q3 - Q1
Example: High IQR = more spread

Skewness: Measure of asymmetry
Formula: Right skew = tail right, Left skew = tail left
Example: Ex: Income data right skewed