

# Statistics Cheat Sheet for Interviews

## 1. Basics

- Population = entire dataset | Sample = subset of population
- Parameter = population measure | Statistic = sample measure

## 2. Types of Data

- Qualitative → Nominal (colors), Ordinal (ranks)
- Quantitative → Discrete (counts), Continuous (height, weight)

## 3. Descriptive Statistics

- Mean, Median, Mode
- Variance, Standard Deviation ( $\sigma$ ), Range, IQR

## 4. Probability Basics

- $P(A \cup B) = P(A) + P(B) - P(A \cap B)$  |  $P(A \cap B) = P(A)P(B|A)$
- Bayes:  $P(A|B) = P(B|A)P(A)/P(B)$

## 5. Distributions

- Normal (bell curve), Bernoulli (0/1), Binomial (#successes),
- Poisson (rare events), Uniform (equal chance), Exponential (time to event)

## 6. Hypothesis Testing

- Null ( $H_0$ ): no effect | Alternative ( $H_1$ ): effect exists
- $p$ -value  $< 0.05 \rightarrow$  reject  $H_0$
- Type I Error (false positive) | Type II Error (false negative)

## 7. Confidence Intervals

- CI = estimate  $\pm$  margin of error
- 95% CI  $\rightarrow$  95% intervals contain true parameter

## 8. Correlation & Regression

- Correlation ( $r$ : -1 to 1), Covariance
- Linear Regression:  $y = \beta_0 + \beta_1 x + \epsilon$  |  $R^2$  = variance explained