

AP Statistics Cheat Sheet

Practice AP Statistics [↗](#)

Unit 1: Exploring One-Variable Data

- **Variation in categorical and quantitative variables:** Understand the difference between categorical and quantitative data and how variation occurs in each.
- **Representing data using tables or graphs:** Use tables, bar charts, histograms, dot plots, and box plots to represent data visually.
- **Calculating and interpreting statistics:** Calculate measures of central tendency (mean, median, mode) and spread (range, IQR, standard deviation).
- **Describing and comparing distributions of data:** Use terms like shape, center, spread, and outliers to describe distributions.
- **The normal distribution:** Recognize and use the properties of the normal distribution, including empirical rule (68-95-99.7%).

Additional Notes:

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Unit 2: Exploring Two-Variable Data

- **Comparing representations of 2 categorical variables:** Use two-way tables and segmented bar charts to compare categorical variables.
- **Calculating statistics for 2 categorical variables:** Calculate and interpret marginal and joint probabilities.
- **Representing bivariate quantitative data using scatter plots:** Plot and interpret scatter plots to explore relationships between two quantitative variables.
- **Describing associations in bivariate data and interpreting correlation:** Describe associations using direction, form, and strength; interpret the correlation coefficient (r).
- **Linear regression models:** Fit a linear model to data and interpret the slope and y-intercept in context.
- **Residuals and residual plots:** Analyze residuals to assess the fit of a linear model.
- **Departures from linearity:** Identify and describe non-linear patterns in data.

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Unit 3: Collecting Data

- **Planning a study:** Develop a plan for collecting data, including defining the population and sampling methods.
- **Sampling methods:** Understand simple random sampling, stratified sampling, and cluster sampling.
- **Sources of bias in sampling methods:** Identify and describe potential biases, including undercoverage, nonresponse, and voluntary response bias.
- **Designing an experiment:** Distinguish between observational studies and experiments; understand random assignment and control.
- **Interpreting the results of an experiment:** Draw valid conclusions based on experiment design, considering causality and generalizability.

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Unit 4: Probability, Random Variables, and Probability Distributions

- **Using simulation to estimate probabilities:** Use random simulations to estimate the likelihood of events.
- **Calculating the probability of a random event:** Apply probability rules, including addition and multiplication rules, to calculate event probabilities.
- **Random variables and probability distributions:** Understand discrete and continuous random variables and their probability distributions.
- **The binomial distribution:** Recognize and apply the binomial probability formula.
- **The geometric distribution:** Calculate probabilities using the geometric distribution for trials until the first success.

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Unit 5: Sampling Distributions

- **Variation in statistics for samples collected from the same population:** Understand how sample statistics vary and how they relate to the population parameters.
- **The central limit theorem:** Use the CLT to justify that sampling distributions of the sample mean are approximately normal for large sample sizes.
- **Biased and unbiased point estimates:** Distinguish between biased and unbiased estimators.
- **Sampling distributions for sample proportions:** Describe and calculate standard error for sampling distributions of sample proportions.
- **Sampling distributions for sample means:** Understand and calculate the standard error for sampling distributions of sample means.

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Unit 6: Inference for Categorical Data: Proportions

- **Constructing and interpreting a confidence interval for a population mean:** Calculate confidence intervals for means using sample data.
- **Setting up and carrying out a test for a population mean:** Conduct hypothesis tests for population means.
- **Interpreting a p-value and justifying a claim about a population mean:** Use p-values to justify claims about population means.
- **Confidence intervals and tests for the difference of 2 population means:** Compare two population means using confidence intervals and hypothesis tests.

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Unit 7: Inference for Quantitative Data: Means

- **Constructing and interpreting a confidence interval for a population mean:** Calculate confidence intervals for means using sample data.
- **Setting up and carrying out a test for a population mean:** Conduct hypothesis tests for population means.
- **Interpreting a p-value and justifying a claim about a population mean:** Use p-values to justify claims about population means.
- **Confidence intervals and tests for the difference of 2 population means:** Compare two population means using confidence intervals and hypothesis tests.

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Unit 8: Inference for Categorical Data: Chi-Square

- **The chi-square test for goodness of fit:** Test how well observed categorical data fit an expected distribution.
- **The chi-square test for homogeneity:** Compare distributions of categorical variables across different populations.
- **The chi-square test for independence:** Assess whether two categorical variables are independent.
- **Selecting an appropriate inference procedure for categorical data:** Choose the correct test (goodness of fit, homogeneity, independence) based on the context.

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Unit 9: Inference for Quantitative Data: Slopes

- **Confidence intervals for the slope of a regression model:** Construct and interpret confidence intervals for the slope of a regression line.
- **Setting up and carrying out a test for the slope of a regression model:** Perform hypothesis tests for the slope, interpreting the significance of the relationship.
- **Selecting an appropriate inference procedure:** Choose the right test or confidence interval based on the data type and research question.

Additional Notes: