Hypothesis Testing Quiz PDF

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What is the primary purpose of hypothesis testing?

- ◯ To prove a hypothesis
- ◯ To evaluate a hypothesis using sample data
- ◯ To collect data
- ◯ To determine the sample size

Which factors affect the power of a test? (Select all that apply)

- ☐ Sample size
- ☐ Significance level
- ☐ Effect size
- ☐ Population variance

Which test is typically used when the sample size is large and the population variance is known?

- ◯ T-test
- ◯ Z-test
- ◯ Chi-square test
- ◯ F-test

Which of the following represents the null hypothesis?

- ◯ H1
- ◯ Ha
- ◯ H0
- ◯ H2

What does the power of a test refer to?

- ◯ The probability of rejecting a true null hypothesis
- ◯ The probability of accepting a false null hypothesis

- ◯ The probability of correctly rejecting a false null hypothesis
- ◯ The probability of making a Type I error

What is the common significance level used in hypothesis testing?

- ◯ 0.01
- ◯ 0.05
- ◯ 0.10
- ◯ 0.50

What does a p-value represent in hypothesis testing?

- ◯ The probability of the null hypothesis being true
- ◯ The probability of obtaining a test statistic at least as extreme as the one observed
- ◯ The probability of a Type II error
- ◯ The probability of a Type I error

Which of the following is an assumption of hypothesis testing?

- ◯ Data must be categorical
- ◯ Data must be skewned
- ◯ Data should be normally distributed
- ◯ Data should be ordinal

Provide an example of a real-world scenario where hypothesis testing could be applied and explain the process.

- ◯ In clinical trials, hypothesis testing can determine if a new drug is more effective than a placebo by comparing outcomes.
- ◯ In market research, hypothesis testing can determine customer preferences.
- ◯ In quality control, hypothesis testing can assess product defects.
- ◯ In education, hypothesis testing can evaluate teaching methods.

Explain the difference between a one-tailed and a two-tailed hypothesis test.

- ◯ A one-tailed test looks for an effect in one direction, while a two-tailed test considers both directions.
- ◯ A one-tailed test considers both directions, while a two-tailed test looks for an effect in one direction.
- ◯ A one-tailed test is more powerful than a two-tailed test.
- ◯ A two-tailed test is only used for large sample sizes.

Describe the steps involved in conducting a hypothesis test.

- ◯ Formulate hypotheses, choose significance level, determine test statistic, calculate p-value, make a decision.
- ◯ Collect data, analyze results, draw conclusions.
- ◯ Choose significance level, conduct experiment, report findings.
- ◯ Determine sample size, formulate hypotheses, analyze data.

Why is it important to choose an appropriate significance level in hypothesis testing?

- ◯ It balances the risk of Type I errors and the sensitivity of the test.
- ◯ It determines the sample size needed for the test.
- ◯ It affects the type of test used.
- ◯ It has no impact on the results of the test.

What are potential outcomes of a hypothesis test? (Select all that apply)

- ☐ Reject the null hypothesis
- ☐ Accept the null hypothesis
- ☐ Fail to reject the null hypothesis
- ☐ Proved the alternative hypothesis

Which errors are possible in hypothesis testing? (Select all that apply)

- ☐ Type I error
- ☐ Type II error
- ☐ Type III error
- ☐ Type IV error

How can the assumptions of normality and independence impact the results of a hypothesis test?

- ◯ Violations can lead to inaccurate results, affecting the validity of the test.
- ◯ It has no impact on the results of the test.
- ◯ It only affects the power of the test.
- ◯ It can lead to underestimating the effect size.

Discuss the implications of making a Type II error in a medical research study.

- ◯ It could lead to missing a potentially effective treatment, affecting patient outcomes.
- ◯ It results in false positives, leading to unnecessary treatments.

- ◯ It has no impact on patient outcomes.
- ◯ It can lead to overestimating the effectiveness of a treatment.

In which scenarios would you use a chi-square test? (Select all that apply)

- ☐ Comparin means of two groups
- ☐ Testing independence in a contingency table
- ☐ Testing goodness of fit
- ☐ Analyzing categorical data

What is a Type I error in hypothesis testing?

- ◯ Accepts a false null hypothesis
- ◯ Rejects a true null hypothesis
- ◯ Accepts a true alternative hypothesis
- ◯ Rejects a false alternative hypothesis

What are the assumptions of a t-test? (Select all that apply)

- ☐ Normality
- ☐ Homogeneity of variances
- ☐ Independence of observations
- ☐ Large sample size

Which of the following are types of hypothesis tests? (Select all that apply)

- ☐ Z-test
- ☐ T-test
- ☐ Chi-square test
- ☐ Regression test