**프롬프트**

Generate four diverse multiple-choice questions based on the given concept:

concept: [1종 오류와 2종 오류 ▪ 늑대와 양치기 소년 • 처음에는 늑대가 없는데도 “늑대가 나타났어요!”라는 말에 마을 사람들이 달려감 • 두 번째도 늑대가 없는데도 “늑대가 나타났어요!”라는 말에 마을 사람들이 달려감 • 세 번째는 늑대가 나타났는데도 “늑대가 나타났어요!”라는 말을 마을 사람들이 믿지 않음 →마을 사람들은 세 번의 판단을 했고, 세 번 다 틀림 ▪ 귀무가설과 대립가설 • 대립가설(alternative hypothesis): 데이터를 보고, 기존과 특별한 차이(평균이 다르다거나)가 있다고 생각하는 가설 • 귀무가설(null hypothesis): 기존과 특별한 차이가 없다고 생각하는 가설 • 마을 사람들이 양치기 소년의 듣고, ‘늑대가 있다’라고 생각하는 것이 대립가설, ‘늑대가 없다’라고 생각하는 것이 귀무가설이 됨 ▪ 마을 사람들의 오류 • 첫 번째와 두 번째 경우: 늑대가 있다(positive)고 예측했는데 틀림(실제는 negative) → 1종 오류 (Type I error), 오경보(false alarm) • 세 번째 경우: 늑대가 없다(negative)라고 예측했는데 틀림(실제는 positive) → 2종 오류(Type II error), 탐지 누락(missed detection) • 통계학의 p-value는 1종 오류의 확률로 정의]

Please ensure that the questions cover different aspects of the provided text and vary in complexity. Additionally, provide only one answer corresponding to one of the questions. Thank you!

1. What is the primary difference between Type I and Type II errors in hypothesis testing?

a) Type I error occurs when the null hypothesis is rejected incorrectly, while Type II error occurs when the null hypothesis is accepted incorrectly.

b) Type I error occurs when the alternative hypothesis is rejected incorrectly, while Type II error occurs when the alternative hypothesis is accepted incorrectly.

c) Type I error occurs when the sample size is too small, while Type II error occurs when the sample size is too large.

d) Type I error occurs when the significance level is too high, while Type II error occurs when the significance level is too low.

**Correct answer:** a) Type I error occurs when the null hypothesis is rejected incorrectly, while Type II error occurs when the null hypothesis is accepted incorrectly.

1. In the context of the "Boy Who Cried Wolf" scenario, what hypothesis would represent the belief that there is a wolf present?

a) Null hypothesis

b) Alternative hypothesis

c) Type I hypothesis

d) Type II hypothesis

**Correct answer:** b) Alternative hypothesis

1. Which scenario in the "Boy Who Cried Wolf" story corresponds to a Type II error?

a) When the villagers rush to the scene despite there being no wolf present.

b) When the villagers ignore the boy's warning, and a wolf is indeed present. c) When the villagers ignore the boy's warning, and there is no wolf present. d) When the villagers rush to the scene, and there is indeed a wolf present.

**Correct answer:** c) When the villagers ignore the boy's warning, and there is no wolf present.

1. How is the p-value defined in statistics?

a) It represents the probability of committing a Type I error.

b) It represents the probability of committing a Type II error.

c) It represents the probability of obtaining a test statistic as extreme as, or more extreme than, the observed value under the assumption that the null hypothesis is true.

d) It represents the probability of obtaining a test statistic as extreme as, or less extreme than, the observed value under the assumption that the null hypothesis is false.

**Correct answer:** c) It represents the probability of obtaining a test statistic as extreme as, or more extreme than, the observed value under the assumption that the null hypothesis is true.