

CSE 312: Foundations of Computing II

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Lecture Topics: 8.3 Introduction to Hypothesis Testing

[Tags: Hypothesis Testing]

1. Set up null and alternative hypotheses for the following scenarios. Some of the information is not relevant in setting these up.
 - a. Alex believes the average salary of software engineers in the Bay Area is higher than that of Seattle. Let μ_x denote the true average salary of software engineers in the Bay Area and \bar{x} the sample average of 312 samples, and μ_y denote the true average salary of software engineers in Seattle and \bar{y} the sample average of 211 samples.
 - b. Mitchell believes that the average temperature in Canada is different from -10 degrees Celsius. Let μ_x denote the true average temperature in Canada and \bar{x} the sample average of 111 samples.
 - c. Scott believes that there is less spread (variance) in height of corgis on CatIsland than DogIsland. Let σ_C^2 denote the true variance of corgi heights on CatIsland and S_C^2 the sample variance of 321 samples, and σ_D^2 denote the true variance of corgi heights on DogIsland and S_D^2 the sample average of 811 samples.

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2. Alex thinks that the typical CSE student spends 125 hours in the “labs” per quarter working on homework. Pemi thinks he is incorrect, but isn’t sure whether it is an overestimate or underestimate. After sampling 49 random CSE students, Pemi observes each of their true hours spent x_1, \dots, x_{49} and finds the sample mean to be $\bar{x} = \frac{1}{n} \sum_{i=1}^n x_i = 122$ (and sample variance of $s^2 = 12^2$). Help Pemi conduct a hypothesis test for his claim.