Chapter 14 Examples

Ex 1: In recent years the mean score on the SAT verbal test was 505. A random sample of 100 students who have taken a course to improve their SAT verbal score yields a sample mean of $\bar{x} = 528$. Is this evidence that the mean SAT verbal score of the population of students who take this course is greater than 505? Assume the population distribution is Normal, and that the population standard deviation is $\sigma = 110$.

Ex 2: The mean level of calcium on the blood of healthy young adults is 10 mg per deciliter. A clinic measures the blood calcium of 30 healthy young pregnant women at their first visit for prenatal care. The mean of these 30 measurements is $\bar{x} = 9.8$. Is this evidence that the mean calcium level in the population from which these women come is less than 10? Assume the population distribution is Normal, and that the population standard deviation is $\sigma = 0.04$.

Ex 3: The Survey of Study Habits and Attitudes (SSHA) is a psychological test that measures the motivation, attitude, and study habits of college students. Scores range from 0 to 200 with a mean of 115. The SSHA is given to 25 students who are incoming freshmen. Their mean score on the test is $\bar{x} = 116.2$. Is this evidence that the population of incoming freshman have a mean that is different from 115? Assume the population distribution is Normal, and that the population standard deviation is $\sigma = 25$.

Ex 4: The labels on boxes of a certain brand of granola indicate a net weight of 16 ounces. Wishing to check whether the machine that fills the packages is properly calibrated, the production company takes a random sample of 64 boxes. The mean weight of the sampled boxes is 15.7 ounces. Is this evidence that the machine is out of calibration, and that the true mean weight of the boxes is different from the advertised weight of 16 ounces? Assume the population distribution is Normal, and that the population standard deviation is $\sigma = 1$.

Ex 5: A poultry farmer raises chickens that have an advertised mean weight of 3.5 pounds. A processing plant believes the supplier is shortchanging them, so they compute the sample mean of the next delivery of 100 chickens. The mean weight of the sampled chickens is 3.33 pounds. Is this evidence that the supplier is shortchanging the processing plant? Assume the population distribution is Normal, and that the population standard deviation is $\sigma = 1$.