Lab 07

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1. What is the difference between the Z and t distributions? Compare the shape, center and spread.

   Both the Z and t distributions are symmetric, unimodal with centers are zero. The spread of the t is dependent on the degrees of freedom, which are a function of the size of the sample(s). As the sample size(s) increases, the spread of the t distribution decreases. If the sample was the entire population, then the t would be exactly the Z distribution.

2. When do we use the t distribution instead of the Z?

   If we do not know the value of the population standard deviation, σ, we must estimate it with the sample standard deviation, s. To compensate for using this estimate, we use the t critical value which is larger than the Z. As our sample size increases, the t value decreases because our estimate of s is more precise (closer to σ).

5. What is the added assumption necessary to run a pooled t-test instead of a 2 sample t-test? What is the advantage to using the pooled t-test?

   The pooled t-test assumes that the true variances are the same for the 2 samples. This added assumption allows us to use both sample standard deviations to estimate the same σ. We pool them together giving us a larger sample hence a better estimate of σ. Since we have a larger sample, we have more degrees of freedom, and therefore, a more powerful test.

7. What conclusion can you make about whether the people who evacuated at least some of their pets are more committed to adult animals than those who did not evacuate any?

   Since the p-value < 0.0005, it is less than any usual α-level, so we reject H_0 and conclude that there is sufficient evidence to say that the people who evacuated at least some of their pets are more committed to adult animals than those who did not evacuate any.