Hw8: Stat355, F 2016, Due November 21

1. Suppose 250 out of 1000 customers reported "Yes" to a survey question about product satisfaction for a particular product. Find a 90% upper confidence interval for the true proportion of satisfied customers of that product.

2. Allowable mechanical properties for structural design of metallic aerospace vehicles requires an approved method for statistically analyzing empirical test data. One of the test data for developing such method consisted of 153 measurements of ultimate tensile strength (ksi) and the summary statistics for the data are

n	Mean	Median	Std. Dev.	Min	Max
153	135.39	130.41	4.89	120.11	162

   (a) Provide a 95% lower confidence interval for the true population mean tensile strength.

   (b) What are the assumptions that you are making in using this particular form of the confidence interval? Briefly discuss.

3. A sample of 14 joint specimens of a particular type save a sample mean proportional limit stress of 8.48 MPa and a sample standard deviation of 0.79 MPa.

   (a) Calculate and interpret a 95% lower confidence interval for the true average proportional limit stress of all such joints. What, if any, assumptions did you make about the distribution of proportional limit stress.

   (b) Calculate and interpret a 95% lower prediction interval for the proportional limit stress of a single joint of that type.

4. The amount of lateral expansion (mils) was determined for a sample of $n = 9$ pulsed-power gas metal arc welds used in LNG ship containment tanks. The resulting standard deviation was $s = 2.81$ mils. Assuming normality, derive 95% confidence intervals for σ^2 and σ.