1. In a random sample of 85 automobile engine crankshaft bearings, 7 have a surface finish roughness that exceeds the specifications. Does this data present sufficient evidence that the proportion of crankshaft bearings, say p, exhibiting excess surface roughness is greater than 0.06? We will address this using a hypothesis test.

   (a) State the null and alternative hypotheses.

   (b) Calculate the appropriate test statistic.

   (c) What is the p-value of the test?

   (d) What is your conclusion based on the p-value if we use $\alpha = 0.1$?

   (e) Calculate a 90% confidence interval for the population proportion. Interpret the confidence interval using the context of the question.

   (f) Compare the results in (d) and (e), are they similar?

   (g) What is the probability to make type I error?

2. You plan to hold a party for your friends, and you are interested to know at 95% confidence level, whether less than 60% of students will attend. Denote p to be the true percentage of students who will show up. We have

$$H_0 : p = 0.6$$
$$H_a : p < 0.6$$

   (a) What is the type I error here? What is the potential consequence for type I error?

   (b) What is the type II error here? What is the potential consequence for type II error?