UNIVERSITY OF TEXAS AT AUSTIN

Extra-Credit Quiz # 3

More hypothesis testing.

Provide your **final answers only** to the following questions.

Problem 3.1. (3 points) A materials scientist claims that his new curing process for a particular type of cement results in a mean compressive strength of at least 5000kg per square centimeter. You suspect that the figures are exaggerated. Formulate your null and alternative hypotheses for the needed test of significance.

Solution:

$$H_0 : \mu = 5000 \quad vs. \quad H_a : \mu < 5000.$$

Problem 3.2. (3 points) Guittard is busy filling up chocolate chip bags in anticipation of the baking season. Their bags are labeled to hold 12 oz of chocolate chips each. They want to make sure that their machinery is accurately calibrated. If they want to test for this, how will they set up their null and alternative hypotheses?

Solution:

$$H_0 : \mu = 12 \quad vs. \quad H_a : \mu \neq 12$$

Problem 3.3. (3 points) The *Perfect Pumpkin Patch* claims that their princess pumpkins have the mean weight of at least 12 lbs. You suspect they are embellishing the truth somewhat. Your plan is to bring a small child to find 40 pumpkins (at random, because small children are perfect random number generators) and weigh the pumpkins. How are you going to formulate your null and alternative hypotheses for this test of significance?

Solution:

$$H_0 : \mu = 12 \quad vs \quad H_a : \mu < 12.$$

Problem 3.4. (3 points) The *Electabuzz Electric Insitute (EEI)* studies the electricity consumption of a variety of appliances. The manufacturer of a particular type of leaf blower claims that the mean consumption is at most 36 kilowatt hours per year for a typical household. *EEI* suspects the contrary and they plan a study of randomly chosen households using that particular brand of leaf blower. How are they going to formulate their null and alternative hypotheses?

Solution:

$$H_0 : \mu = 36 \quad vs. \quad H_a : \mu > 36.$$

Problem 3.5. (3 points) The lifetime of a particular lighbulb is advertised to have the mean of at least 900 hrs. A consumer rights agency wants to test this claim. How is the consumer rights agency going to formulate the null and alternative hypotheses?

Solution:

$$H_0 : \mu = 900 \quad vs. \quad H_a : \mu < 900$$