Homework Week 5

**All Excel Files found in Data Folder on Blackboard.**

Please show ALL your work when submitting your homework and work thru the problem completely. **You do not need to provide an excel sheet as part of your homework assignment**. However, if using excel, please list formulas and variables used. You can also upload an excel sheet if you want feedback on your work. **Round to two or four decimal places for final answer.**

**Excel File: Golf Test**

1. A golf association establishes rules that manufacturers of golf equipment must meet if their products are to be acceptable for golf events. GoingFar uses a high-technology manufacturing process to produce golf balls with a mean driving distance of 290 yards. Previous tests have formed the assumption that the standard deviation is 12 yards. Sometimes, however, the process gets out of adjustment and produces golf balls with a mean driving distance different from 290 yards. When the mean distance falls below 290, the company worries about losing sales. When the mean distance passes 290 yards, GoingFar’s golf balls may be rejected by the golf association exceeding overall distance standard concerning carry and roll. GoingFar’s quality control program involves taking periodic samples of 50 golf balls to monitor the manufacturing process.
   1. (2 pts) Develop the null and alternative hypothesis to measure whether or not the process has fallen out of adjustment.
   2. (2 pts) At α = 5%, what is your conclusion?
   3. (2 pts) At α = 1%, does your conclusion change?
2. JHU administrators are trying to under how long statistics professors stay on the job, a group of JHU administrators believe that the mean tenure for a statistics professor is at least nine years. A survey of business schools reported a sample mean tenure of 7.27 years for statistics professors and a standard deviation of the sample of 6.38 years.
   1. (2 pts) Develop a null and alternative hypothesis that can be used to challenge the validity of the claim made in the survey.
   2. (4 pts) Assume 85 business schools were included in the survey, at α = 1%, what is the conclusion to your test?

**Excel File: Store Sales**

1. A maker of fancy airpods cases examines the sales of 40 store in the Washington DC metropolitan area. It’s been reported in the past that the average sales are $130,000 of each store is per month.
   1. (2 pts) State the null and alternative hypothesis in order to test whether average sales differ from $130,000.
   2. (4 pts) At α= 5%, what is your conclusion to the test? Do average sales differ from $130,000?

**Excel File: ShopExp**

1. An entrepreneur trying to develop a business plan and understand the specialty food market wants to collect information from two different specialty food stores—Bobbie’s and Mikie’s. The research firm, using a standardized grocery list and makes identical purchases at several of their stores. The stores for each chain are randomly selected, and all purchases are made during a single week. The shopping expenses obtained at the two chains, along with box plots of the expenses can be found in the excel file **ShopExp**. Because the stores in each sample are different stores in different chains, it is reasonable to assume that the samples are independent, and we assume that weekly expenses at each chain are normally distributed.
   1. (2 pt) Set up the null and alternative hypothesis to test whether the mean weekly expenses differ between the two stores.
   2. (2 pts) Test the hypotheses at the 5% significance level. What is the conclusion?
   3. (2 pt) Set up the null and alternative hypotheses needed to attempt to establish that the mean weekly expense for the shopping plan at Bobbie’s exceeds the mean weekly expense at Mikie’s by more than $5
   4. (3 pts) Test the hypotheses at the 5% level of significance. What is the conclusion