BAN 602 Quantitative Fundamentals Fall 2019
Homework Assignment 3

1. Last year Marion Dairies decided to enter the yogurt market, and it began cautiously by producing, distributing, and marketing a single flavor—a blueberry-flavored yogurt that it calls Blugurt. The company's initial venture into the yogurt market has been very successful; sales of Blugurt are higher than expected, and consumers' ratings of the product have a mean of 80 and a standard deviation of 25 on a 100-point scale for which 100 is the most favorable score and zero is the least favorable score. Past experience has also shown Marion Dairies that a consumer who rates one of its products with a score greater than 75 on this scale will consider purchasing the product, and a score of 75 or less indicates that the consumer will not consider purchasing the product.
   Emboldened by the success and popularity of its blueberry-flavored yogurt, Marion Dairies management is now considering the introduction of a second flavor. Marion's marketing department is pressing to extend the product line through the introduction of a strawberry-flavored yogurt that would be called Strawgurt, but senior managers are concerned about whether or not Strawgurt will increase Marion's market share by appealing to potential customers who do not like Blugurt. That is, the goal in offering the new product is to increase Marion's market share rather than cannibalize existing sales of Blugurt. The marketing department has proposed giving tastes of both Blugurt and Strawgurt to a simple random sample of 50 customers and asking each of them to rate the two yogurts on the 100-point scale. If the mean score given to Blugurt by this sample of consumers is 75 or less, Marion's senior management believes the sample can be used to assess whether Strawgurt will appeal to potential customers who do not like Blugurt.
   a. Calculate the probability that the mean score of Blugurt given by the simple random sample of Marion Dairies customers will be 75 or less.
   b. If the Marketing Department increases the sample size to 150, what is the probability that the mean score of Blugurt given by the simple random sample of Marion Dairies customers will be 75 or less?
   c. Explain to Marion Dairies senior management why the probability that the mean score of Blugurt given by the simple random sample of Marion Dairies customers will be 75 or less is different for these two sample sizes.
   d. Develop a 95% confidence interval for a sample mean of 72 (Sample size 50)

2. Young Professional magazine was developed for a target audience of recent college graduates who are in their first 10 years in a business/professional career. In its two years of publication, the magazine has been fairly successful. Now the publisher is interested in expanding the magazine's advertising base. Potential advertisers continually ask about the demographics and interests of subscribers to Young Professional. To collect this information, the magazine commissioned a survey to develop a profile of its subscribers. The survey results will be used to help the magazine choose articles of interest and provide advertisers with a profile of subscribers. As a new employee of the magazine, you have been asked to help analyze the survey results. Use the data file Professional.csv

(Note that real estate purchases refer to plans in the next two years and transactions refer to stock/bond/mutual fund transactions made in the past year).

a. Develop appropriate descriptive statistics to summarize the data.
b. Develop 95% confidence intervals for the mean age and household income of subscribers.
c. Develop 95% confidence intervals for the proportion of subscribers who have broad- band access at home and the proportion of subscribers who have children.
d. Would Young Professional be a good advertising outlet for online brokers? Justify your conclusion with statistical data.
e. Would this magazine be a good place to advertise for companies selling educational software and computer games for young children?
f. Comment on the types of articles you believe would be of interest to readers of Young Professional.

3. Gulf Real Estate Properties, Inc., is a real estate firm located in southwest Florida. The com- pany, which advertises itself as "expert in the real estate market," monitors condominium sales by collecting data on location, list price, sale price, and number of days it takes to sell each unit. Each condominium is classified as Gulf View if it is located directly on the Gulf of Mexico or No Gulf View if it is located on the bay or a golf course, near but not on the Gulf. Sample data from the Multiple Listing Service in Naples, Florida, provided recent sales data for 40 Gulf View condominiums and 18 No Gulf View condominiums. Prices are in thousands of dollars. The data is available in the file GulfProp.csv

   a. Use appropriate descriptive statistics to summarize each of the three variables for the 40 Gulf View condominiums.
   b. Use appropriate descriptive statistics to summarize each of the three variables for the 18 No Gulf View condominiums.
   c. Compare your summary results. Discuss any specific statistical results that would help a real estate agent understand the condominium market
   d. Develop a 95% confidence interval estimate of the population mean sales price and population mean number of days to sell for Gulf View condominiums. Interpret your results.
   e. Develop a 95% confidence interval estimate of the population mean sales price and population mean number of days to sell for No Gulf View condominiums. Interpret results.
   f. Assume the branch manager requested estimates of the mean selling price of Gulf View condominiums with a margin of error of $40,000 and the mean selling price of No Gulf View condominiums with a margin of error of $15,000. Using 95% confidence, how large should the sample sizes be?
   g. Gulf Real Estate Properties just signed contracts for two new listings: a Gulf View condominium with a list price of $589,000 and a No Gulf View condominium with a list price of $285,000. What is your estimate of the final selling price and number of days required to sell each of these units?

Please also submit the R file (just one R file) in which you performed the analysis along with your answers in pdf. Good luck!