

Case 3



**ASSIGN
BUSTER**

Case Problem Set 3: Problem 1: 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 has 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. Some of the survey questions follow: 1. What is your age? 2. Are you: Male _____ Female _____ 3. Do you plan on making any real estate purchases in the next two years? Yes ____ No ____ 4. What is the approximate total value of financial investments, exclusive of your home, owned by you or members of your household? . How many stock/bond/mutual fund transactions have you made in the past year? 6. Do you have broadband access at your home? Yes ____ No _____ 7. Please indicate your annual household income last year. 8. Do you have children? Yes ____ No _____ The file titled " Professional" has the responses to these questions. Prepare a managerial report summarizing the results of this survey. In addition to statistical summaries discuss how the magazine might use these results to attract advertisers.

You might also comment on how the survey results could be used by the magazine's editors to identify topics that would be of interest to readers.

Your report should address the following issues, but do not limit your analysis to just these areas. 1. Develop appropriate descriptive and graphical summaries for each variable. 2. Develop 95% confidence intervals for the mean age and household income of subscribers. 3. Develop 95% confidence intervals for the proportion of subscribers who have broadband access at home and proportion of subscribers who have children. 4. Would Young Professional be a good advertising outlet for online brokers?

Justify your answer. 5. Would Young Professional be a good place to advertise for companies selling educational software and computer games for young children? 6. Comment on the type of articles you believe would be of interest to readers of Young Professional. Problem 2: Quality Associates, Inc. , a consulting firm advises its clients about sampling and statistical procedures that can be used to control their manufacturing processes. In one particular application a client gave Quality Associates a sample of 800 observations taken during a time in which the client's process was operating satisfactorily.

The sample standard deviation of this data was 0.21; hence with so much data, the population standard deviation was assumed to be 0.21. Quality Associates then suggested that random samples of size 30 be taken periodically to monitor the process on an ongoing basis. By analyzing the new samples, the client could quickly learn whether the process was operating satisfactorily. When the process was not operating satisfactorily, corrective action could be taken to eliminate the problem. The design specification indicated the mean for the process should be 12.

The hypothesis test suggested by Quality Associates follows. $H_0: \mu = 12$
 $H_a: \mu \neq 12$ Corrective action will be taken anytime H_0 is rejected. The file titled "Quality" contains samples collected at hourly intervals during the first day of operation of the new statistical process control procedure. Managerial Report: 1. Conduct a hypothesis test for each sample at a significance level of 0.01 and determine what action, if any, should be taken. Provide the test statistic and p-value for each test. 2. Compute the standard deviation for each of the four samples. Does the assumption of 0.1 for the population standard deviation appear reasonable? 3. Compute the limits for the sample mean around $\mu = 12$ such that, as long as a new sample mean is within those limits, the process will be considered to be operating satisfactorily. If the sample mean exceeds the upper limit or is below the lower limit, corrective action will be taken. These limits are referred to as control limits for quality control purposes. 4. Discuss the implications of changing the level of significance to a larger value. What mistake or error could increase if the level of significance is increased?