

Statistics I, Fall 2012

Homework 14

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Note. For each problem, define the notations you use, if any.

1. (15 points; modified from Problem 9.25) The Independent Insurance Agents of America conducted a survey of insurance consumers and discovered that 46% of them always reread their insurance policies, 27% sometimes do, 20% rarely do, and 7% never do. Suppose a large insurance company invests considerable time and money in rewriting policies so that they will be more attractive and easy to read and understand. After using the new policies for a year, company managers want to determine whether rewriting the policies significantly changed the proportion of policyholders who always reread their insurance policy. They contact 400 of the company's insurance consumers who purchased a policy in the past year and ask them whether they always reread their insurance policies. One hundred and seventy-four respond that they do. Use a 1% level of significance to test the hypothesis.
2. (15 points; modified from Problem 9.26) A study by Hewitt Associates showed that 76% of companies offer employees flexible scheduling. Suppose a researcher believes that in accounting firms this percentage is lower. The researcher randomly selects 315 accounting firms and through interviews determines that 223 of these firms have flexible scheduling. With a 1% level of significance, does the test show enough evidence to conclude that a significantly lower proportion of accounting firms offer employees flexible scheduling?
3. (15 points; modified from Problem 9.33) A manufacturing company produces bearings. One line of bearings is specified to be 2.65 centimeters (cm) in diameter. A major customer requires that the variance of the bearings be no more than 0.001 cm^2 . The producer is required to test the bearings before they are shipped, and so the diameters of 20 bearings are measured with a precise instrument, resulting in the sheet "9.33" of the MS Excel file "StatFa12_hw14.xlsx". Assume bearing diameters are normally distributed. Use the data and $\alpha = 0.01$ to test to determine whether the variance is too high.
4. (15 points; modified from Problem 9.34) In a bank, the average amount of deposit is around \$100,000 per week. However, because of the way pay periods fall, seasonality, and erratic fluctuations in the local economy, deposits are subject to a wide variability. In the past, the variance for weekly deposits has been about \$199,996,164. In terms that make more sense to managers, the standard deviation of weekly deposits has been \$14,142. In the sheet "9.34" of the MS Excel file "StatFa12_hw14.xlsx" are data from a random sample of 13 weekly deposits for a recent period. Assume weekly deposits are normally distributed. Use these data and $\alpha = .10$ to test to determine whether the variance for weekly deposits has changed.
5. (40 points) Please work hard on your final project. For this homework, these 40 points are given to you for free. Happy New Year!