

Bus 274: Further Statistics for Business

Spring 2015

PROBLEM SHEET # 9

Problem 1: A fund manager manages a portfolio of common stocks. The manager relies on various statistics, such as mean and variance, to assess the overall risk of stocks in an economic sector. The manager's staff reported that for a sample of 12 utility company stocks the mean annualized return was 14% and that the standard deviation was 3%.

- a) Why are both mean and standard deviation important in this context? Give separate reasons for mean and standard deviation.
- b) The manager will invest if and only if the mean return is higher than 12%. Construct the null hypothesis and its alternative for testing this condition.
- c) Set up the correct test statistic for testing the hypothesis in (b).
- d) Give the critical region for this test when using a significance level of $\alpha = 0.05$.
- e) If the test statistic equals 2.31, what is your result and conclusion in terms of investing in this portfolio related to the hypothesis in (b)?
- f) What error could you have made?

Problem 2: An industrial designer wants to determine the average amount of time it takes an adult to assemble an "easy to assemble" toy. A sample of 16 times yielded an average time of 20 minutes, with a sample standard deviation of 5 minutes.

- a) Assuming normality of assembly times, construct a 95% confidence interval for the expected assembly time.
- b) What happens to the confidence interval if we change the confidence level to 99%, does it get wider or narrower? Determine the margin of error for both confidence levels.