

STAT 528 HOMEWORK #4 Due: Friday, September 25, 2015.

1. (4pt) Exercise 6.13 (b),(c),(d),(e), page 275 (6.19 (b),(c),(d),(e), 283-284). Assume $\hat{\sigma} = 1.56$.
2. (1pt) Exercise 6.36 (b), pages 279-280 (6.44(b), 288-289). You can assume that $\sigma_x = .40$ and $\sigma_y = .30$.
3. (1.5pt) Exercise 6.42, page 280 (6.50, 289). Assume $\sigma = 1.253$ is known. Provide both the C_p statistic and the probability that a unit is nonconforming to specifications.
4. (2pt) Exercise 6.44(a), page 280 (6.52(a), 289). You are told that the “charts are maintained on this dimension and have been in control for a long period of time.” You can interpret this as the given control limits are based on specified/known μ and σ values. You can also assume the control limits for the \bar{x} and s charts are 3σ control limits. Provide both the C_p statistic and the probability that a unit is nonconforming to specifications.
5. (3pt) Exercise 6.55 (b),(c), page 282 (6.63 (b),(c), 291).
6. (2pt) Redo Exercise 6.55 (b) (6.63 (b)), but using $\log(\text{viscosity})$ as the response. Would you recommend monitoring viscosity or $\log(\text{viscosity})$ as the response with control charts? Justify your choice.
7. The following data corresponds to the number of nonconforming yellow beads (from varying sample sizes) observed for a sequence of samples collected in class. The data set is posted online.

n	14	16	11	7	7	11	8	25	20	10	24	17	27	32	22	19	20	17	22	26	31	26	27	26	6	22	33
Defects	1	1	2	2	1	4	2	9	4	1	3	5	4	5	3	3	6	5	8	5	3	7	4	6	0	8	6

- (a) (1.5pt) Make a p -chart assuming p is unknown and must be estimated from the data.
- (b) (.5pt) What is the estimate of p ?
- (c) (1pt) Does the process appear to be in control? Explain your answer.
- (d) (1.5pt) Suppose the process is considered to be in control when $p = .12$. Assuming $p = .12$, does this process appear to be in control?