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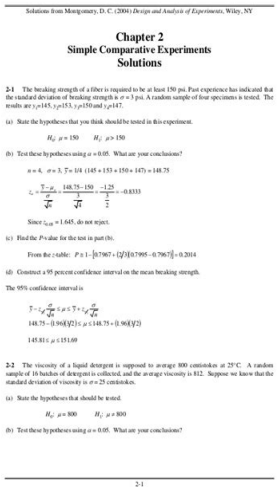
so many fake sites. this is the first one which worked! Many thanks



Solutions from Montgomery, D. C. (2004) *Design and Analysis of Experiments*, Wiley, NY

Chapter 2
Simple Comparative Experiments
Solutions

2-1 The breaking strength of a fiber is required to be at least 150 psi. Past experience has indicated that the standard deviation of breaking strength is $\sigma = 3$ psi. A random sample of four specimens is tested. The results are y_1=145, y_2=153, y_3=150 and y_4=147.

(a) State the hypotheses that you think should be tested in this experiment.

H_0: $\mu = 150$ H_1: $\mu > 150$

(b) Test these hypotheses using $\alpha = 0.05$. What are your conclusions?

$n = 4$, $\sigma = 3$, $\bar{y} = 1/4\ (145 + 153 + 150 + 147) = 148.75$

$$z_0 = \frac{\bar{y} - \mu_0}{\frac{\sigma}{\sqrt{n}}} = \frac{148.75 - 150}{\frac{3}{\sqrt{4}}} = \frac{-1.25}{\frac{3}{2}} = -0.8333$$

Since $z_{0.05} = 1.645$, do not reject.

(c) Find the P-value for the test in part (b).

From the z-table: $P \cong 1 - [0.7967 + (\frac{1}{2})(0.7995 - 0.7967)] = 0.2014$

(d) Construct a 95 percent confidence interval on the mean breaking strength.

The 95% confidence interval is

$$\bar{y} - z_{\frac{\alpha}{2}}\frac{\sigma}{\sqrt{n}} \le \mu \le \bar{y} + z_{\frac{\alpha}{2}}\frac{\sigma}{\sqrt{n}}$$

$$148.75 - [1.96](\frac{3}{2}) \le \mu \le 148.75 + [1.96](\frac{3}{2})$$

$$145.81 \le \mu \le 151.69$$

2-2 The viscosity of a liquid detergent is supposed to average 800 centistokes at 25°C. A random sample of 16 batches of detergent is collected, and the average viscosity is 812. Suppose we know that the standard deviation of viscosity is $\sigma = 25$ centistokes.

(a) State the hypotheses that should be tested.

H_0: $\mu = 800$ H_1: $\mu \neq 800$

(b) Test these hypotheses using $\alpha = 0.05$. What are your conclusions?

2-1

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