

Math 343 - Homework 3

Preston Duffield

Western Washington University

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Question 1

- a)
- b)
- c)
- d)
- e)
- f)

Question 2

a)

H_0 : All means are equal.

H_a : Not all means are equal.

Performing an F test at we can see that the P-value= 0.000 < α = .05,

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Technique	3	489740	163247	12.73	0.000
Error	12	153908	12826		
Total	15	643648			

Figure 1: The output of the One-way ANOVA from Minitab.

therefore we can conclude the following. There is enough statistical evidence to support the hypothesis that not all means are equal.

b)

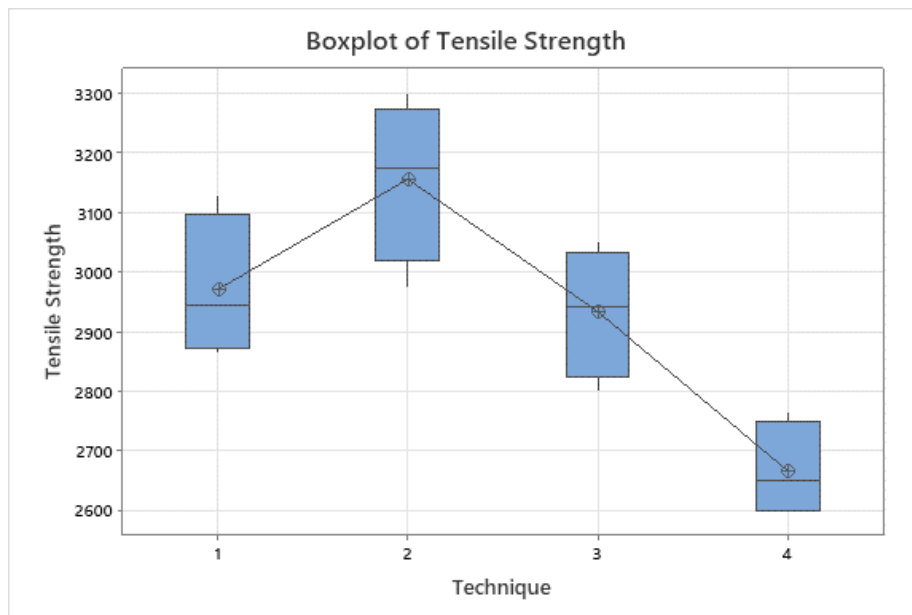


Figure 2: The Boxplot of tensile strength of the One-way ANOVA test from Minitab.

Judging by the boxplot alone, It would seem that the means are significantly different. This is consistent with the above hypothesis test. It looks as though the mean for treatment 1 and treatment 3 could be similar, in a pairwise comparison.

c)

The results of the Fisher's LSD test can be summarized in the graphical results below. Note that a line under the treatments indicate that they are not significantly different.

Mixing Technique	(4)	(3)	(1)	(2)
		<hr/>		

d)

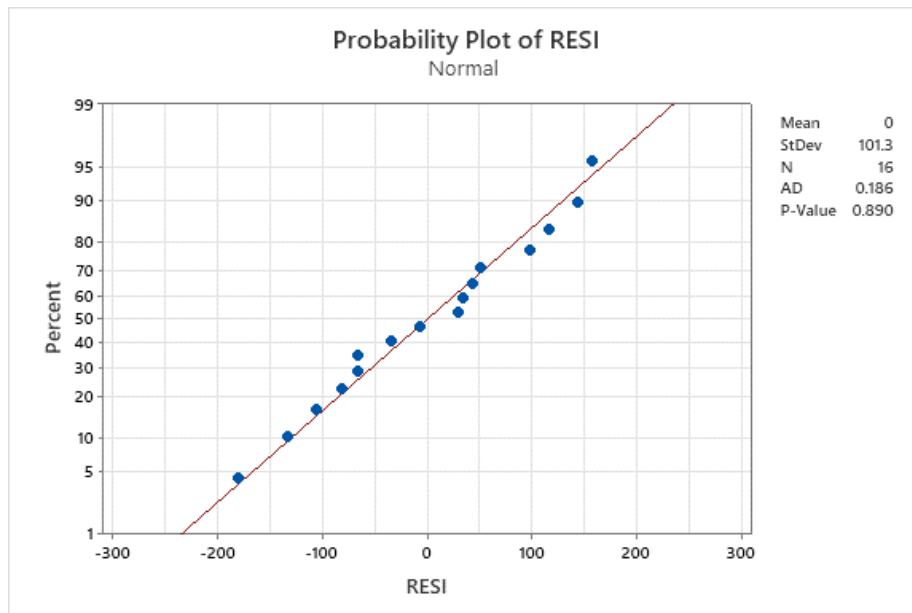


Figure 3: The normal probability plot of the residuals from Minitab.

H_0 : The data are drawn from a normal distribution.

H_a : The data are not drawn from a normal distribution.

Since the P-value is very large (0.890), we can conclude the following. The evidence of the data is consistent with the data being drawn from a normal distribution.

e)

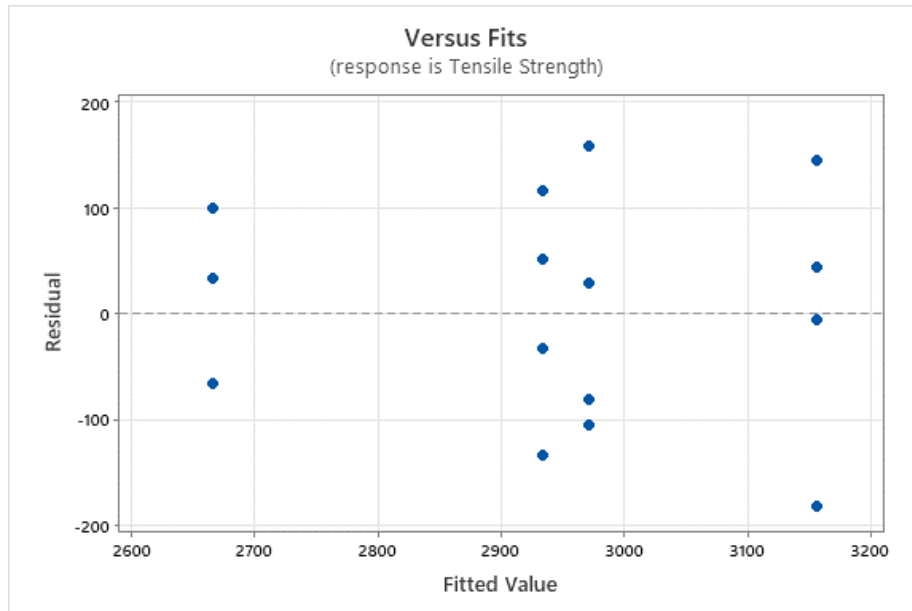


Figure 4: The residuals versus the predicted tensile strength from Minitab.

This graph indicates that there is not heteroskedasticity present, that along with the conclusion that the data is drawn from a normal distribution indicates that the model assumptions are verified and the hypothesis test is valid.

f)

Question 3

a)

Question 4

- a)
- b)
- c)
- d)
- e)

Question 5

- a)
- b)
- c)
- d)

Question 6

Question 7