Practice Problems

Problem 10.6:

The analysis of variance for a randomized block design produced the ANOVA table entries shown here.

Source	**df**	**SS**	**MS**	***F***
Treatments	3	28.2		
Blocks	5		13.80	
Error		34.1		
Total				

(a) Complete the ANOVA table.

(b) Do the data provide sufficient evidence to indicate a difference among the treatment means? Test using $\alpha = 0.01$.

(c) Do the data provide sufficient evidence to indicate that blocking was a useful design strategy for this experiment? Explain.

Problem 10.7:

Three anticoagulant drugs are studied to compare their effectiveness in dissolving blood clots. Each of five subjects receives the drugs at equally spaced time intervals and in random order. Time periods between drug applications permit a drug to be passed out of a subject's body before the subject receives the next drug. After each drug is in the bloodstream, the length of time (in seconds) required for a cut of specified size to stop bleeding is recorded. The results are shown in the following table.

	DRUG		
Person	***A***	***B***	***C***
1	127.5	129.0	135.5
2	130.6	129.1	138.0
3	118.3	111.7	110.1
4	155.5	144.3	162.3
5	180.7	174.4	181.8

(a) What type of experimental design was used in this study? Identify the response, factor(s), factor type(s), treatments, and experimental units.

(b) The SAS printout for this experiment is shown below. Is there evidence of a difference in mean clotting time among the three drugs? Test using $\alpha = 0.01$.

(c) What is the observed significance level of the test you conducted in part (b)? Interpret it.

(d) Was blocking effective in reducing the variation among the data? That is, do the data support the contention that the mean clotting time varies from person to person?

Analysis of Variance Procedure

Dependent Variable: TIME

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	6	7802.1746667	1300.3624444	64.97	0.0001
Error	8	160.1093333	20.0136667		
Corrected Total	14	7962.2840000			

R-Square	C.V.	Root MSE	TIME Mean
0.979892	3.1522433	4.4736637	141.92000000

Source	DF	Anova SS	Mean Square	F Value	Pr > F
DRUG	2	156.36400	78.18200	3.91	0.0655
PERSON	4	7645.81067	1911.45267	95.51	0.0001