AS1: Assignment 1, ANOVA

RESEARCH SCENARIO:

1. A randomized study was conducted comparing the effects of repetition on recall. Conditions included the following number of repetitions per list of words: 5 times, 10 times, 15 times, and 20 times.

   (a) What is (are) the factor(s) in this study? number of repetitions per list of words

   (b) How many levels (if any) does (do) the factor(s) have? 4 levels (5 times, 10 times, 15 times, and 20 times)

   (c) What is the dependent variable? Recall

2. What is research design? One-Way Independent-Measures ANOVA

3. What is the appropriate hypothesis test to analyze these data? F- test

4. In which source of variance would you expect the treatment effect? The treatment effect should be larger, so we can differentiate if there was an effect on the different numbers of repetition on the recall.

   Below is an SPSS ANOVA: Based on these results, please answer a-f

ANOVA

VAR00001

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	16.267	2	8.133		.007
Within Groups	37.100	27	1.374		
Total	53.367	29			

Multiple Comparisons

Dependent Variable: VAR00001

Bonferroni

(I) VAR00002	(J) VAR00002	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
1.00	2.00	-1.00000	.52423	.201	-2.3381	.3381
	3.00	-1.80000*	.52423	.006	-3.1381	-.4619
2.00	1.00	1.00000	.52423	.201	-.3381	2.3381
	3.00	-.80000	.52423	.416	-2.1381	.5381
3.00	1.00	1.80000*	.52423	.006	.4619	3.1381
	2.00	.80000	.52423	.416	-.5381	2.1381

*. The mean difference is significant at the 0.05 level.

What is the value of the variance between? 8.133

What is the value of the variance within? 1.374

(a) What is the F value (I know it is not there, calculate it): 8.133/1.374= 5.919

(b) Please write the statistical statement for the above SPSS ANOVA results:

Answer: F (2,27)= 5.919, P= .007

(e) Is your F test significant? Yes _____ No_____

(f) If yes, please note where the significance is found:

The data indicates a significant difference between variable 1 and 3. However, there is not statistically difference between variable 1 and 2, and 2 and 3 groups. F (2,27) = 5.919, P=.007.

RESEARCH SCENARIO 2:

A researcher hypothesizes that exam performance is affected by the amount of time that a student reviews the quiz material immediately prior to the quiz. He randomizes his sample of n=30 participants to a 10 minutes condition, a 20 minutes condition, and a 30 minutes condition, after which all students take the quiz. The data are below:

10 m	20 m	30 m
86	94	92
78	91	91
55	82	68
88	15	65
77	85	78
65	72	81
60	78	83
64	74	69
72	70	74
84	83	83

l. What is the factor in this study? the amount of time that a student reviews the quiz material immediately prior to the quiz.

2. What is the dependent variable in this study? exam performance

3. What is the research hypothesis?
A researcher hypothesizes that exam performance is affected by the amount of time that a student reviews the quiz material immediately prior to the quiz.

4 What is the null hypothesis? A researcher hypothesizes that exam performance will not be affected by the amount of time that a student reviews the quiz material immediately prior to the quiz.

5. What is the name of the research design?
ANOVA (analysis of variance)

6. Run the appropriate SPSS test and cut and paste your SPSS results here:

Descriptives

VAR00001

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1.00	10	72.9000	11.52244	3.64372	64.6573	81.1427	55.00	88.00
2.00	10	74.4000	22.28702	7.04777	58.4568	90.3432	15.00	94.00
3.00	10	78.4000	9.35949	2.95973	71.7046	85.0954	65.00	92.00
Total	30	75.2333	15.10351	2.75751	69.5936	80.8731	15.00	94.00

ANOVA

VAR00001

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	161.667	2	80.833	.338	.716
Within Groups	6453.700	27	239.026		
Total	6615.367	29			

Multiple Comparisons

Dependent Variable: VAR00001

Scheffe

(I) VAR00002	(J) VAR00002	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1.00	2.00	-1.50000	6.91413	.977	-19.4078	16.4078
	3.00	-5.50000	6.91413	.731	-23.4078	12.4078
2.00	1.00	1.50000	6.91413	.977	-16.4078	19.4078
	3.00	-4.00000	6.91413	.847	-21.9078	13.9078
3.00	1.00	5.50000	6.91413	.731	-12.4078	23.4078
	2.00	4.00000	6.91413	.847	-13.9078	21.9078

7. Based on your SPSS results, what is MS between? 80.833

8. Based on your SPSS results, what is MS within? 239.026

9. What is the F value? .338

10. Please write the “statistical statement” for your SPSS analysis:

Answer: F(2,27)=.338,P=.716

11. Were your results significant? Yes _____ No _____

12. If yes, which groups showed a statistical difference?