AS1: Assignment 1, ANOVA

RESEARCH SCENARIO:

1. A randomized study was conducted comparing 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? the number of repetitions per list of words (5 times, 10 times, 15 times, and 20 times.)

   (b) How many levels (if any) does (do) the factor(s) have? 4 levels

   (c) What is the dependent variable? recall

2. What is the research design? between-subjects design.

3. What is the appropriate hypothesis test to analyze these data?
   One-way analysis of variance.

4. In which source of variance would you expect the treatment effect?
   In this randomized study, the treatment effect would be expected in the within-group variance, which refers to the variation in performance within each repetition condition.

   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.

(a) What is the value of the variance between? 8.13

(b) What is the value of the variance within? 1.37

(c) What is the F value (I know it is not there, calculate it): 1.82

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

Answer: F(2,27)=1.82, p=.007

(e) Is your F test significant? Yes

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

The data indicate a significant difference between the 5mins and the 15mins conditions. However, there is no statistically significant difference between the 5mins and the 10mins group, nor between the 10mins and the 15mins group.

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 (10mins, 20mins, 30mins)

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

3. What is the research hypothesis?
the amount of time that a student reviews the quiz material immediately prior to the quiz has a significant effect on exam performance.

4. What is the null hypothesis?

There'll be no significant difference between the mean exam scores of participants who review the quiz material for 10 minutes, 20 minutes, and 30 minutes prior to the quiz.

5. What is the name of the research design?
between-subjects design

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			

7. Based on your SPSS results, what is MS between? 80.83

8. Based on your SPSS results, what is MS within? 239.02

9. What is the F value? .338

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

Answer: F(2,27)=.0338, p=.716

11. Were your results significant? No

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

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_____
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