

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? **Repetition**
 - (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? **One-way independent measures anova**
3. What is the appropriate hypothesis test to analyze these data? **ANOVA**
4. In which source of variance would you expect the treatment effect? **MS between**

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	Std. Error	Sig.	95% Confidence Interval	
		(I-J)			Lower Bound	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? **8.133**

(b) What is the value of the variance within? **1.374**

(c) What is the F value (I know it is not there, calculate it): **F= 5.919**

(d) 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**

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

The data indicates a significant difference between the first group and the third group. However, there is no statistically significant difference between the first group and the second group and the second group with the third 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:

<u>10 m</u>	<u>20 m</u>	<u>30 m</u>
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

1. What is the factor in this study? **Amount of review time before the quiz**
2. What is the dependent variable in this study? **Exam performance**
3. What is the research hypothesis? **Amount of review time before the quiz will have an impact on exam performance**
4. What is the null hypothesis? **Amount of review time before the quiz will not have an impact on exam performance**
5. What is the name of the research design? **One-way independent measures anova**
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		
10.00	10	72.9000	11.52244	3.64372	64.6573	81.1427	55.00	88.00
20.00	10	74.4000	22.28702	7.04777	58.4568	90.3432	15.00	94.00
30.00	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) min	(J) min	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
10.00	20.00	-1.50000	6.91413	.977	-19.4078	16.4078
	30.00	-5.50000	6.91413	.731	-23.4078	12.4078
20.00	10.00	1.50000	6.91413	.977	-16.4078	19.4078
	30.00	-4.00000	6.91413	.847	-21.9078	13.9078
30.00	10.00	5.50000	6.91413	.731	-12.4078	23.4078
	20.00	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? **no**

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