

ANCOVA & MANOVA WORKSHEET

Remember to conduct any necessary checks before running the analysis.

ANCOVA

Students were assigned to three different groups, which used different types of teaching methods.

Group 1: an hour of the traditional teaching method

Group 2: an hour interactive teaching method

Group 3: an hour of group work with little input from the teacher

To account for group variance on IQ, a standard IQ test was administered prior to each of the classes taking place. The scores (out of 20) are presented below. In order to discover which method of teaching worked the best, once the class had finished, students were given a test to see which group had retained the most material from the one-hour session.

Group	Test Score	IQ
1	20	10
1	19	17
1	15	9
1	14	12
1	20	13
2	15	11
2	12	14
2	13	13
2	11	15
2	9	12
3	12	16
3	10	10
3	8	11
3	7	10
3	9	18

- A. Plot a chart of the regression lines for the three groups.
- B. Conduct an ANCOVA on the data using SPSS.
- C. In the space below, write-up your findings as you would for a report.

Remember to conduct any necessary checks before running the analysis.

MANOVA

An oil company has invented 2 new forms of fuel that are compatible with petrol engine cars. One is made from carrot juice and the other is made from water. Before the company markets the fuel, it wants to find out which one is better. The company conducts road trials with 12 cars running on the carrot juice and 12 cars running on the water. Each car is driven non-stop for 12 hours at a constant rate of 40 miles p/h. The company decides to compare 2 indices: ratings out of 10 for damage to the engine and number of miles travelled per litre of fuel. Below is the data from the study:

Carrot Juice Fuel		Water Fuel	
Engine Condition Rating	Miles per litre	Engine Condition Rating	Miles per litre
4	10	3	14
5	10	6	14
8	9	4	14
5	9	5	12
6	7	5	12
2	11	9	11
4	12	6	11
7	11	2	9
3	10	7	15
6	6	7	15
7	12	8	16
5	13	6	17

Enter the data into SPSS

- Is the assumption of variance-covariance violated?
- What is the F-value as calculated by Wilk's lambda?
- Is there a multivariate difference, beyond that attributable to sampling error, between the 2 types of fuel?
- According to the univariate F-tests, which DV(s) is/are contributing to sampling error, between the 2 types of fuel?
- What is the effect of each DV separately?
- In the space below, write-up the results as you would for a report.