Tutorial letter 012/0/2024

Multivariate Statistical Techniques

STA4814

Year module

Department of Statistics

ASSIGNMENT 02 QUESTIONS

Define tomorrow.

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Instruction:
Access all the data files in the Additional Resources folder of the module's website.

Question 1 [25 Marks]

Use the data "german_credit.sav" to answer this question.

(a) Perform the main effect only multivariate analysis of variance (MANOVA) test using the Duration and Credit amount as the Dependent Variables, with savings and bond, property owner, and employment type as Independent Variables. Ensure the homogeneity of covariances, and also conduct the Post Hoc Test for the Independent Variables, using the Tukey's HSD Test. (15 marks)

(b) Interpret completely all the outputs in (a). (10 marks)

Question 2 [35 Marks]

The "workprog.sav" is a hypothetical data file that concerns a government works program that tries to place disadvantaged people into better jobs. A sample of potential program participants were followed, some of whom were randomly selected for enrollment in the program, while others were not. Each case represents a separate program participant.

(a) Perform the main effect only multivariate analysis of variance (MANOVA) using the Income before the program and Income after the program as dependent variables, and program status and level of education as independent variables (include the Homogeneity test). Copy the output into your answer script. (10 marks)

(b) Based on the homogeneity of covariance matrices test result, if necessary, do the appropriate transformation(s) of the appropriate variable(s) and repeat the analysis as in (a) with a Post Hoc Test (using "Tukey's HSD") on level of education for both income before and after the program. (5+5+5 marks)

(c) Explain what you observed in the results of section (b) based on the transformation that you performed.

(3 marks)

(d) Interpret the results of the analysis in section (b) above. (7 marks)

Question 3 [10 Marks]

The "anorectic.sav" contains data generated while working toward a standardized symptomatology of anorectic/bulimic behavior. Researchers (Van der Ham, T., J. J. Meulman, D. C. Van Strien, and H. Van Engeland. 1997) conducted a study of 55 adolescents with known eating disorders. Each patient was seen four times over four years, for a total of 220 observations. At each observation, the patients were scored for each of 16 symptoms. Symptom scores are missing for patient 71 at time 2, patient 76 at time 2, and patient 47 at time 3, leaving 217 valid observations.
Using the two stage cluster analysis or otherwise:

(i) determine the number of clusters and the their qualities; and (3+3 marks)

(ii) determine the cluster distribution of the cases. (4 marks)

TOTAL [70 Marks]