



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – STATISTICS

SECOND SEMESTER – APRIL 2017

16PST2MC04- CATEGORICAL DATA ANALYSIS

Date: 26-04-2017
01:00-04:00

Dept. No.

Max. : 100 Marks

PART - A

ANSWER ALL THE QUESTIONS

(2X10=20 Marks)

1. Define Categorical response
2. Define any two measures of association between categorical variables
3. Define odds ratio
4. State any one measure to detect outliers based on Binary Logistic Regression
5. Provide any two drawbacks of Linear Probability model when used for binary classification problem
6. What is the need for model validation?
7. Provide any two real life applications of ordinal logistic regression model
8. Provide any two real life application of multinomial logistic regression
9. Define McNemar test and state its use
10. State the use of Conditional Logit model

PART - B

ANSWER ANY FIVE QUESTIONS

(5X8=40 Marks)

11. Explain General Linear Model (GLM) and provide any two model performance measures for GLM
12. Explain any eight real life applications of binary logistic model
13. Explain Complete separation and Quasi complete separation problem and state the methods to deal with these problems
14. Explain Probit Model and explain the method to determine the predicted probability based on Probit model equation
15. Explain Loglinear Analysis and state its use
16. Explain model validation methods
17. Consider the problem of predicting the brand preference based on age and gender. Determine the predicted probability for each class of the dependent variable and also determine the predicted class based on maximum probability rule

shoe_brand	age	gender	Predictor	Coef
A	32	1	Logit 1: (B/C)	
B	31	0	Constant	21.9682
B	26	1	age	-0.640252
C	41	0	gender	-4.73964
C	38	1		
A	21	1	Logit 2: (A/C)	
C	28	1	Constant	11.9675
B	32	0	age	0.02832
A	34	0	gender	-1.00390

18. Explain Conditional Logistic regression

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PART - C

ANSWER ANY TWO QUESTIONS

(2X20=40 Marks)

19. Explain the following in the context of Binary Logistic Regression

- i) Model form (3 marks)
 - ii) Expression to obtain predicted probability(2 marks)
 - iii) Classification rule (1 mark)
 - iv) Classification table (3 marks)
 - v) Sensitivity and Specificity(2 marks)
 - vi) Optimal cut value (1 mark)
 - vii) Method to determine optimal cut value (5 marks)
 - viii) ROC and AUC (3 marks)
20. a) Explain Poisson regression model (12 marks)
- b) Explain Zero inflated poisson regression model (8 Marks)
21. a) Explain Ordinal logistic regression (12 marks)
- b) Explain the construction of Gains chart and state its use (8 Marks)
22. a) Explain Multinomial logistic regression (10 marks)
- b) Explain Negative Binomial regression (10 marks)

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