Uva Wellassa University of Sri Lanka
Faculty of Applied Sciences
Department of Computer Science and Informatics
200 level 1st Semester Examination – Jul. /Aug. 2019
CST 212-2 Statistical Methods I

Uva Wellassa University

Instructions to candidates:

No. of pages : Six (06)
No. of questions : Four (04) Structured questions and
Three (03) Essay questions
Time allocation : Two (02) hours and twenty (20) minutes
Marks allocation : 70 marks
Answer All Questions

Index No:

Part B- Structured Questions and Essay Questions

1. On the average, a certain computer part lasts ten (10) years. The length of time the computer part lasts is exponentially distributed.
   a. What is the probability that a computer part lasts more than seven (07) years? (3 mark)

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   b. On the average, how long would five (05) computer parts last if they are used one after another? (3 mark)

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   c. What is the probability that a computer part lasts between nine (09) and eleven (11) years? (4 mark)

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2. A bank has conducted a study to determine the efficiency of its transaction handling. The bank uses three different methods for handling customers' transactions: human tellers, automated tellers with keyboard and voice activated automatic tellers. The bank has collected information from 84 customers on the value of the transaction (in Dollars $), the type of teller used and the time taken for the transaction.

The following notation has been used:

Y = Transaction time in minutes

X_1 = Transaction value ($)

X_2 = Method of handling transaction, where: 1 = human teller,

0 = automated teller with keyboard.

The information was run through a multiple regression model and the following incomplete Tables are given below.

Table 01: Analysis of variance

Source of Variation	*Degrees of Freedom*	*Sums of Squares*	*Mean of Squared*	*F Test*
Regression		168.26		
Residual				
Total		242.83		

Table 02: Coefficient Values

Variable	*Coefficient*	*Standard Error*	*P- Values*
Constant	1.4279		0.015
X1	0.0147	0.0012	0.003
X2	0.3175	0.1162	0.000

a. What is the fitted regression model? (2 mark)

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b. Complete the ANOVA table in the above Table 01. (3 mark)

c. Write down the relevant hypothesis to test the model significance. (3 mark)

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d. Check the model significance using the corresponding F-table value at 95% significance level and make the final decision. (3 mark)

e. What are the significance estimated parameters in the model? Check them using the corresponding p-values at 95% significance level with suitable hypothesis and comment on your results. (5 mark)

f. Comment the appropriateness of fitted model using Coefficient of determination value(R^2). (2 mark)

3. A financial analyst is interested in computing the turnover rates, in percent, for shares of oil- related stocks versus other stocks, such as GE and IBM. She selected 32 oil-related stocks and 49 other stocks. The mean turnover rate of oil-related stocks is 31.4 percent and the standard deviation 5.1 percent. For the other stocks, the mean rate was computed to be 34.9 percent and the standard deviation 6.7 percent. The financial analyst is interested in testing whether there is significant difference in the turnover rates of the two types of stock.

a. Is this a one-tailed or a two-tailed test? (2 mark)

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b. What is the decision rule at the 0.01 level of significance? (2 mark)

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c. Determine the value of the test statistic, and arrive at a decision regarding H_0. Explain the meaning of your decision. (4 mark)

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4. The following table is a probability distribution for the Perera & Sons Company's projected profit (X- profit in Rs: 100000s) for the first six (6) months of operation (negative value denotes the loss).

X	-100	0	50	100	150	200
P(x)	0.1	0.2	0.3	0.25	0.1	0.05

Find CDF for this probability distribution and expected profit for first six (6) months.

(5 mark)

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