NMIMS Centre for Distance and Online Education (NCDOE)

Course: Business Analytics

Internal Assignment Applicable for Jun 2025 Examination

Assignment Marks: 20

Instructions

- *All Questions carry equal marks*
- *All Questions are compulsory*
- *All answers to be explained in not more than 1000 words for question Q1 and for question Q2(A) and Q2(B) in not more than 500 words for each subsection. Use relevant examples,illustrations as far as possible*
- *All answers to be written individually. Discussion and group work is not advisable.*
- *Students are free to refer to any books/reference material/website/internet for attempting their assignments, but are not allowed to copy the matter as it is from the source of reference.*
- *Students should write the assignment in their own words. Copying of assignments from other students is not allowed*
- *Students should follow the following parameter for answering the assignment questions*

For Theoretical Answer	
Assessment Parameter	**Weightage**
Introduction	20%
Concepts and Application related to the question	60%
Conclusion	20%

For Numerical Answer	
Assessment Parameter	**Weightage**
Understanding and usage of the formula	20%
Procedure / Steps	60%
Correct Answer & Interpretation	20%

PLEASE NOTE: This assignment is application based, you have to apply what you have learnt in this subject into real life scenario. You will find most of the information through internet search and the remaining from your common sense. None of the answers appear directly in the textbook chapters but are based on the content in the chapter

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Q1 Given a dataset with missing values, apply appropriate data treatment techniques to handle the missing data. Justify your choice of method based on the nature of the dataset. Additionally, analyze a real-world scenario where missing data impacts decision-making, and implement suitable imputation methods to improve data quality

Student_ID	Name	Age	Gender	Math_Score	English_Score	Attendance (%)
101	Aarav	20	F	85	88	95
102	Bhavya	21	M	78		88
103	Charan	22	M		82	92
104	Deepak		M	92	91	
105	Esha	20	F	88	85	97
106	Farhan	21		76	79	85
107	Gauri		F	80	86	90
108	Harshita	22	F		90	93
109	Ishan	23	M	90		89
110	Jyoti	20	F	84	87	

(10 Marks)

Q2 (A) A pharmaceutical company is testing a new drug for reducing blood pressure. They conduct a clinical trial with two groups: one receiving the drug and the other receiving a placebo. The blood pressure levels are recorded before and after the trial.

1. Analyse the components of a two-sample hypothesis test and determine why it is appropriate or not for this study. *(1 Mark)*
2. Given that the obtained p-value is 0.08, break down the decision-making process for rejecting or failing to reject the null hypothesis at a 5% significance level. *(1 Mark)*
3. Examine the potential risks associated with Type I and Type II errors in this study and discuss how they could affect the interpretation of results. *(1 Mark)*
4. The company wants to check whether the drug's effectiveness varies across different age groups (e.g., 30-40, 41-50, 51-60). Analyse whether the Chi-

square test of independence is an appropriate test in this scenario. *(1 Mark)*

5. Differentiate between the Chi-square Goodness of Fit test and the Chi-square test of independence, and analyse how each applies to different types of pharmaceutical studies. *(1 Mark)*

(5 Marks)

Q2 (B) A company wants to predict sales based on advertising expenses using a **simple linear regression model**. The dataset for 5 months is given below:

Month	Advertising Expense (X in Rs 1000s)	Actual Sales (Y in Rs 1000s)	Predicted Sales (in Rs 1000s)
1	2	4	3.8
2	3	5	5.2
3	5	7	6.9
4	7	10	9.5
5	9	12	11.7

1. **Formulate the simple linear regression equation** based on the given data.
2. **Determine the regression coefficients** (: Intercept, : Slope) and interpret their impact on sales.
3. **Derive insights from the regression equation**, understanding the baseline performance and the impact of advertising expenses on sales.
4. **Suggest recommendations based on findings**, highlighting the effectiveness of advertising expenses.

Instructions:

- **Use Excel to compute** the regression equation, coefficients, and R^2 value.
- Paste the **Excel output with formulas** to demonstrate calculations.
- Insights should be based on data from Excel analysis

(5 Marks)

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