Department of Public Administration, University of Karachi
First Year Morning SBM- 332 Sport Business Statistics Assignment 2

Max Marks: 25 Deadline: 15th Nov' 2024

Instructions

- Make sure to read each question thoroughly to understand what is being asked.
- For statistical calculations: use the appropriate formulas, for graphs: label all axes properly and mark the class intervals and frequencies clearly, for questions involving interpretation: provide a clear and concise explanation
- Ensure your name and roll number are written at the top of the first page.
- Assignment must be hand written.

Plagiarism Warning :All work submitted must be your own. Plagiarism will result in disciplinary action.

Problem 1

(a) Define Regression and correlation.

(b) A company wants to analyze the relationship between its advertising budget and product sales. It is assumed that an increase in advertising spending will lead to an increase in product sales. The following data were collected on monthly advertising expenses (in thousands of dollars) and corresponding sales revenue (in thousands of dollars:

Advertising cost ($000) *x*	Sales revenue ($000) y
15	35
20	40
25	50
30	55
35	60
40	65

a. Graph a scatterplot of the data. Interpret the pattern.

b. Find the correlation coefficient r. interpret 'r'

c. Find the equation of the best fit line/Regression model

d. Write the sentence that interprets the meaning of the slope of the line in the context of the data.

e. For the advertising of $45000, find the predicted value of sales revenue (response variable) $\hat{y}$.

Problem 2

Over a period of one year, a health clinic analyzes the effect of the cost of a consultation x (in dollars) on the average number of consultations y per month. The clinic offers consultations at six different price points and collects the following data:

$$\sum x = 450, \quad \sum y = 300, \quad \sum x^2 = 21000, \quad \sum y^2 = 16850, \quad \sum xy = 11250, \quad n = 6$$

a) Calculate the equation of least square regression line.

b) Interpret the intercept and slope in the above context.

c) Calculate the coefficient of correlation r and interpret its value in the context of the relationship between consultation cost and demand for medical consultations.