**Decision Science**

**NMIMS Solved Assignments for December 2024**

**1. Assuming a 4-yearly cycle, find the trend values for the following data by the method of moving average.**

|  |  |
| --- | --- |
| **Year** | **Sales** |
| **1987** | **74** |
| **1988** | **100** |
| **1989** | **97** |
| **1990** | **87** |
| **1991** | **90** |
| **1992** | **115** |
| **1993** | **126** |
| **1994** | **108** |
| **1995** | **100** |
| **1996** | **125** |
| **1997** | **118** |
| **1998** | **113** |
| **1999** | **122** |
| **2000** | **126** |

**Answer:**

**Introduction:**

This question involves analyzing a time series dataset of sales figures from 1987 to 2000, which covers a 14-year period. The primary objective is to identify trends within the sales data using the moving average method over a four-year cycle. Time series analysis is crucial in understanding underlying patterns, seasonality, and trends, helping businesses make informed decisions. The moving average technique smooths out short-term fluctuations and highlights longer-term trends, making it easier to assess the performance over time. By calculating the moving averages, we can derive trend values that provide insights into the overall sales trajectory, indicating periods of growth, stability, or decline. This analysis is essential for forecasting future sales and strategizing based on historical performance, ultimately aiding in effective business planning and resource allocation.

**This is partially solved sample answer**

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**2. Find the co efficient of correlation between price and sales from the following data.**

|  |  |
| --- | --- |
| **Price (Rs)** | **Sales (units)** |
| **103** | **500** |
| **98** | **610** |
| **85** | **700** |
| **92** | **630** |
| **90** | **670** |
| **84** | **800** |
| **88** | **800** |
| **90** | **750** |
| **93** | **700** |
| **95** | **680** |

**Answer:**

**Introduction:**

The relationship between price and sales is a critical aspect of business analysis, providing insights into how pricing strategies affect consumer behavior and overall sales performance. Understanding this correlation can help businesses optimize their pricing to maximize revenue and market share. In this context, the coefficient of correlation, often denoted as "r," quantifies the strength and direction of the linear relationship between two variables—in this case, price (in Rs) and sales (in units). A positive correlation indicates that as prices increase, sales tend to increase, while a negative correlation suggests the opposite. Analyzing the provided data of price and sales units allows us to calculate the correlation coefficient, helping businesses make informed decisions regarding pricing strategies and inventory management to enhance profitability and meet consumer demand effectively.

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**3a. From the following frequency distribution, find out mean wages of the workers.**

|  |  |
| --- | --- |
| **Wages** | **Number of Workers** |
| **70-80** | **12** |
| **80-90** | **18** |
| **90-100** | **35** |
| **100-110** | **42** |
| **110-120** | **50** |
| **120-130** | **45** |
| **130-140** | **20** |
| **140-150** | **8** |

**Answer:**

**Introduction:**

This question pertains to the calculation of the mean wages of workers based on a given frequency distribution. The data categorizes wages into intervals, with the corresponding number of workers in each range. By determining the mean, we can gain insights into the average earnings of the workforce, which is essential for understanding economic conditions and making informed decisions regarding wage policies and labor market analysis.

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**3b. Calculate standard Deviation from the following**

|  |  |
| --- | --- |
| **Age (in years)** | **Number of Persons** |
| **10-20** | **2** |
| **20-30** | **4** |
| **30-40** | **8** |
| **40-50** | **10** |
| **50-60** | **12** |
| **60-70** | **4** |

**Answer:**

**Introduction:**

The standard deviation is a statistical measure that quantifies the amount of variation or dispersion in a set of data values. In this context, we are analyzing the age distribution of a group of individuals, represented in age intervals and their corresponding frequencies. Understanding the dispersion of ages is crucial in various fields such as demographics, market research, and public health, as it can help identify trends and inform decisions based on the characteristics of the population.

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