**Business Statistics for Decision Making**

**September 2024 Examination**

**1. Conduct a regression model to predict the sales of fitness equipment for Ranveer Kaul, the fitness influencer. He wants to base the predictions on the number of YouTube shots views.**

|  |  |
| --- | --- |
| **Sales in Lakhs** | **Number of YouTube Shorts views** |
| **3** | **10484** |
| **4** | **10884** |
| **5** | **13372** |
| **6** | **14742** |
| **6** | **16141** |
| **7** | **17210** |
| **7** | **17303** |
| **8** | **18132** |
| **8** | **18208** |
| **10** | **19099** |

**a) Introduction (write the name of Independent and dependent variables).**

**b) Write the model statement (or equation form).**

**c) Using MS EXCEL write the hypothesis for ANOVA table and its interpretation.**

**d) Write the meaning of R-square value here.**

**e) Conclusion with meaning of b0 and b1. (10 Marks)**

**Ans 1.**

**Introduction**

In the burgeoning field of digital marketing, the effectiveness of online platforms in driving product sales has become a focal point for researchers and practitioners alike. This analysis seeks to elucidate the relationship between YouTube Shorts views and the corresponding sales of fitness equipment, leveraging the influence of Ranveer Kaul, a noted fitness influencer. Here, the number of views garnered by Kaul's YouTube Shorts is hypothesized to be a predictive indicator of his fitness equipment sales. In this context, the independent variable is the "Number of YouTube Shorts views," which represents the exposure and reach of the influencer's content. Conversely

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**2. For the organic food product data conduct the Weighted Moving Average and find the predicted value for the month of December.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Weight of last month** | **2nd last month** | **3rd last month** | **4th last month** |
| **4** | **3** | **2** | **1** |

**Data of organic food product**

|  |  |
| --- | --- |
| **Month** | **Sales in 000’ INR** |
| **Jan** | **4** |
| **Feb** | **5** |
| **March** | **7** |
| **April** | **8** |
| **May** | **9** |
| **June** | **11** |
| **July** | **13** |
| **August** | **15** |
| **September** | **12** |
| **October** | **16** |
| **November** | **18** |

**Note: Do not use EXCEL here, show the manual calculation steps. (10 Marks)**

**Ans 2.**

**Introduction**

The Weighted Moving Average (WMA) is a powerful forecasting tool used to predict future data points by assigning different weights to historical data, with more recent data usually given greater importance. This method is especially useful in time series analysis where it helps smooth out data to identify trends. For businesses dealing in products like organic food, forecasting sales using the WMA can optimize inventory management and marketing strategies by providing insights into expected future sales.

In this analysis, we

**3a. The growth rate of a ‘T-shirt4all’ start-up company increased at the rate of 15% and 25% for two successive years. In the next year, it decreased at the rate of 5%. We want to find the growth rate of this company based on Geometric mean. Assume that the initial growth rate is 100%. (5 Marks)**

**Ans 3a.**

**Introduction**

The growth rate of a company over a period is a vital metric used to understand its performance and trajectory. For ‘T-shirt4all,’ a startup company, analyzing the geometric mean of the growth rates over a series of years provides a smoothed average rate that accounts for compounding effects, unlike the arithmetic mean which might not accurately capture the effect of percentage changes over time. This analysis uses the growth rates of 15% and 25% in two successive years followed by a decrease of 5% to compute the geometric mean, assuming an initial

**3.b) Identify the measurement type of each column in the following data. This data has been collected by Arun Kaul, for his new brand of organic colored-cloths.**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Response** | **Colour** | **Fabric** | **Size** | **Weight** | **Price** | **pH** | **Durability** | **Dye** | **Comfort** |
| **Type** | **(inches)** | **(grams)** | **(USD)** | **Level** | **(months)** | **Fastness** | **Rating** |
| **1** | **Indigo** | **Cotton** | **38** | **200** | **25** | **6.5** | **12** | **High** | **8/10** |
| **2** | **Mustard** | **Silk** | **36** | **180** | **50** | **7.0** | **6** | **Medium** | **7/10** |
| **3** | **Teal** | **Linen** | **40** | **220** | **30** | **6.8** | **18** | **Low** | **9/10** |
| **4** | **Maroon** | **Hemp** | **34** | **190** | **40** | **6.2** | **24** | **High** | **7/10** |
| **5** | **Coral** | **Wool** | **42** | **240** | **60** | **7.5** | **9** | **Medium** | **8/10** |

**(5 Marks)**

**Ans 3b.**

**Introduction**

In the analysis of data, understanding the measurement type of each variable is crucial for determining the appropriate statistical methods for data analysis and interpretation. The data collected by Arun Kaul for his new brand of organic colored cloths contains several columns, each representing different attributes of the product. By classifying each column into the appropriate measurement scale—nominal, ordinal, interval, or ratio—we can better understand how to process and