**PSG College of Technology**

**Department of Applied Mathematics and Computational Sciences**

**Exercise :2**

1.: Sam found how many hours of sunshine vs how many ice creams were sold at the shop from Monday to Friday:

|  |  |
| --- | --- |
| "x" Hours of Sunshine | "y" Ice Creams Sold |
| 2 | 4 |
| 3 | 5 |
| 5 | 7 |
| 7 | 10 |
| 9 | 15 |

Calculate y = mx + b using formula. Calculate the correlation coefficient between two variables. Find a linear regression equation line. Also find least squares of errors. Also check whether least squares is sensitive to outlier by introducing.  Draw box plot that is useful to detect outliers and give your inference on it.

32.The local ice cream shop keeps track of how much ice cream they sell versus the noon temperature on that day. Here are their figures for the last 12 days:

|  |  |
| --- | --- |
| Ice Cream Sales vs Temperature | |
| Temperature °C | Ice Cream Sales |
| 14.2° | $215 |
| 16.4° | $325 |
| 11.9° | $185 |
| 15.2° | $332 |
| 18.5° | $406 |
| 22.1° | $522 |
| 19.4° | $412 |
| 25.1° | $614 |
| 23.4° | $544 |
| 18.1° | $421 |
| 22.6° | $445 |
| 17.2° | $408 |

Give line of best fit using scatter plot. use that equation to interpolate a sales value at 21° and to extrapolate a sales value at 29°

3. Suppose that we are statistical consultants hired by a client to provide advice on how to improve sales of a particular product. The Advertising data set consists of the sales of that product in 200 different markets, along with advertising budgets for the product in each of those markets for three different media: TV, radio, and newspaper.

Dataset: <https://www.kaggle.com/datasets/ashydv/advertising-dataset>

What is the relationship between sales and TV budget?

Check whether Increasing sales through advertising is having impact or not. Construct a [confidence interval](https://stattrek.com/statistics/dictionary?definition=Confidence%20interval) around the [slope](https://stattrek.com/statistics/dictionary?definition=Slope) of a [regression](https://stattrek.com/statistics/dictionary?definition=Regression) line.