**Introduction –**

This report deals with the analysis of monthly data for a small web based company that makes money from advertisement posting on its web pages. The purpose of this study is to analyze historical data and come up with the most appropriate forecast of total earnings for the first quarter of January, 2017. We aim to predict the website’s total earnings for the above mentioned period by analyzing one year of monthly revenue records from January 2016 to December, 2016.

**Data description –**

**Observations:** 12

**Data collection period:** January, 2016 – December, 2016

**Data description:** The following is monthly data of website’s revenues:

|  |  |
| --- | --- |
| t | Xt |
| January, 2016 | 873.16 |
| February,2016 | 1228.75 |
| March,2016 | 1468.01 |
| April,2016 | 1718.61 |
| May,2016 | 1247.12 |
| June, 2016 | 1170.73 |
| July, 2016 | 1198.82 |
| August, 2016 | 1125.32 |
| September, 2016 | 1254.32 |
| October, 2016 | 2037.15 |
| November, 2016 | 2300.62 |
| December, 2016 | 1840.58 |

**Data forecasting –**

To forecast the data, we have used two different models. One Is the dummy model and the second one is exponential smoothening which is used for smoothening the time series data. For the second model, we have assumed that our alpha is 0.1 and beta is 0.5.

After using the first model, we have our forecasted values for the first quarter of 2017 as:

|  |  |
| --- | --- |
| t | Xt |
| January, 2017 | 1660.902 |
| February, 2017 | 2014.912 |
| March, 2017 | 2191.852 |
| April, 2017 | 2097.538 |

The time series of the past data plus the forecasted data is as follows:

This time series has the monthly data that shows many troughs and peaks in the pattern which explains the variation in earnings for the given period of time. Hence, it is very important to use a model which eliminates these random variations and helps us predict our future values as accurately as possible. For that we used exponential smoothening.

The result of using index numbers and exponential smoothening is as follows:

|  |  |
| --- | --- |
| t | Xt |
| January, 2017 | 1726.658 |
| February, 2017 | 2000.788 |
| March, 2017 | 1920.8 |
| April, 2017 | 1844.398 |

**Conclusion –**

After performing our regression analysis and forecasting, we have come to the conclusion that the predicted values (using exponential smoothening) for the first quarter of the year 2017 are as shown in the above table. Therefore, the total earnings for the website from advertisements is $7492.64 in this quarter.