Airline Forecasting.

Problem Description: We aim to forecast monthly footfalls for given airlines data. We identify the top 12 month passenger footfalls in 1995 as follows:

|  |  |
| --- | --- |
| Given month of Year | Passenger |
| 1995-01-01 | 112 |
| 1995-02-01 | 118 |
| 1995-03-01 | 132 |
| 1995-04-01 | 129 |
| 1995-05-01 | 121 |
| 1995-06-01 | 135 |
| 1995-07-01 | 148 |
| 1995-08-01 | 148 |
| 1995-09-01 | 136 |
| 1995-10-01 | 119 |
| 1995-11-01 | 104 |
| 1995-12-01 | 118 |

#As we can See 12 Month data are given So we will create 12 dummy variable.

Dumm\_var <- data.frame(outer(rep(month.abb,length = 96), month.abb,"==") + 0 )

1. **Time Series Plot.**



Trend = Up Trend, Sesonality = Multiplicative Sesonality.

Model Building

All Model RMSE.

|  |  |
| --- | --- |
| Model Name | RMSE |
| Linear | 47.54262 |
| Exponential | 43.79374 |
| Quadratic | 43.65440 |
| Additive Seasonality | 129.26648 |
| Additive Seasonality Linear | 33.04571 |
| Additive Seasonality Quadratic | 23.91098 |
| Multiplicative Seasonality | 135.32648 |
| Multiplicative Seasonality Linear | 9.46900 |

Least RMSE best Accuracy

Note : as we can see Multiplicative sesonality with linear trend RMSE is lowest so our final mode will be Multiplicative sesonality with linear.

#ACF Plot with Lag=10. #As we can see graph most of lag value cros +2 so we will build arima model. 

#Final plot with predicted value.

