**Summary Report**

These are the inferences I could draw after doing box plots, bar charts, scatter plots, correlation tests, t-test and finally after fitting a linear regression model.

The below given inferences are best understood by running the R code sequentially given in Sonal Airline Analysis.R and following the outputs of the commands given there.

Inferences drawn -

1. Our dataset mostly contains British airlines with count around 175 out of 462.
2. Boeing takes the lead for the count of aircrafts with over 300 out of 462.
3. We only have data for Boeing and Airbus aircrafts with British and Jet Airlines preferring Boeing Aircrafts.
4. Only Delta has flights which fly domestic and rest all airlines fly international. Singapore Airlines median is pretty much towards the higher end of the data suggesting that it usually has flights with longer durations whereas Jet has flights with short durations with a couple outliers. British airlines have flights from short to long durations and by looking at its box plot, it seems to follow a normal distribution.
5. July has fewer flights than the other three months.
6. Less than 50 flights are domestic flights and rest all are international flights.
7. Virgin Airlines has 8 flights offering 66 premium seats which is the highest number of premium seats being offered in an aircraft.
8. Virgin airlines offer premium seats for a higher minimum rate than its competitors while British Airlines has a nice spread with an outlier. Jet & Delta offer their premium seats for lesser amounts than their competitors.
9. Jet offers the maximum legroom with 40 inches amongst its competitors which are giving 38 inches.
10. British and Air France provide 19 inches wide seats which is less than what the competitors are giving.
11. While linearity may not be supported for flight durations and economy prices but it may hold true for flight durations and premium prices.
12. While linearity may not be supported for economy seats and economy prices but it may hold true for premium seats and premium prices.
13. Since most flights has the pitch as 38, it is hard to say that pitch has a linear relationship with premium prices.
14. The scatter plot results do not give a clear picture of whether width shares a linear relationship with premium prices.
15. There is a positive correlation between cost of both the type of tickets and the flight duration.
16. Positive correlations are seen in case of Price\_Economy between quality and international flight and width\_economy and flight duration.
17. Positive correlations are seen between quality and pitch and width premium, width\_premium and international, pitch\_premium and international.
18. Positive correlation is seen between prices of each class and pitch and width.
19. Since the p-value is > 0.05, we fail to reject the null hypothesis. Thus, we can say that type of aircraft does not affect the premium prices.
20. As we can see from Linear Regression Model that Flight\_duration and Seats\_premium are statistically significant explanatory variables, we can say that these two play an important role in the variations we have seen in the premium prices.
21. We would go with the last model which suggests that flight\_duration and seats\_premium are the most significant explanatory variables for explaining the response variable premium\_price. Here, as the p-value for Flight\_Duration and Seats\_premium is less than 0.05 they are both statistically significant in the multivariate linear regression model for Price\_Premium response variable.
22. The model suggests that for every hour increase in the flight duration, we would see a 215.311 USD increase in the premium prices.
23. Also, we can see that the model has a p-value : < 2.2e-16 is also lower than the statistical significance level of 0.05, this indicates that we can safely reject the null hypothesis that the value for the coefficient is zero, or in other words, that the predictor variables have no explanatory relationship with the response variable.