**ANALYSIS REPORT**

**INTRODUCTION**

The data set that was provided to us was of six different Airlines who have different parameters ranging from the pitch and width size to the rates of premium and economy ticket.

A little preface was provided to us to understand of the topic.

Excerpt from the Wikipedia:

Positioning in price, comfort, and amenities, this travel class is leveled between economy class and business class

The assumption:-Limited to the leg room

:-Other services

**Air New Zealand** and **Qantas** Premium economy and **Virgin America** first

: - prioritized check-in, large customized seats (some for couples, others targeting solo travelers), seat pitch up to 41 inches (104 cm) with 50% more recline, premium meals, a self-service bar for drinks and snacks, a personal in-flight entertainment center with remote control, noise-cancelling headphones and choices in games and movies for children and adults, skin care products in the lavatory, and an amenities pouch containing items such as socks, sleep masks, earplugs, and toothbrushes

These were just assumptions and not based on any data.

**BIG QUESTION-*What factors explain the difference in price between an economy ticket and a premium-economy airline ticket?***

Thus to explain the difference and knowing what all factors would affect it the following are the takeaways of the analysis

1. The economy price was left skewed when compared to all the air lines with the mean at 1317$ and the Premium price was central barring one or two values that were costly with mean being at 1832$.

2. The highest no. of flights are for British Airways with 175 airlines.

3. Most of the Airlines are International hence Flight Duration may be considered as a parameter for the difference of the rates as longer flights need extra comfort.

4. Another interesting factor would be the no. of seats as the lower the no. of seats of premium more would be the cost of them.

5. Low range Economy tickets are more frequent.

6. Positive correlations are seen in case of Price\_Economy between quality and international flight and width\_economy and flight duration.

7.Positive correlations are seen between, quality and pitch and width premium, width\_premium and international, pitch\_premium and international.

8.Positive correlation is seen between prices of each class and pitch and width.

9.Most important predictor for price Economy is Flight duration and price relative.

10.Most important predictor for price Premium is Flight duration and price relative.

11.The t value of Pitch economy and quality is positive indicating that these predictors are associated with Price economy. A larger t-value indicates that that it is less likely that the coefficient is not equal to zero purely by chance.

Again, as the p-value for Flight Duration and Price Relative is less than 0.05 they are both statistically significant in the multiple linear regression model for Price Economy response variable.

The model’s, 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

12. Creating a boxplot helped in determining that there was no relationship between the month of travel and price relative.

13. Most of the scatterplots created had a linear weak relationships

14.The regression model that was created had a r-square value of 76% which is quite better as for a good fit a model should be greater than 70%.

15.Keeping all the variables it is shown that the lm.fit model has R^2 of 0.78 which is quite good but it does contain multilinearity and other overlapping variables.

16.Hence,for calculation of the most significant once lm.fit5 model was created. This model had R^2 of 0.76 and Adjusted R^2 of 0.7606.

17. On applying the anova analysis in these 2 models the F-statistic came out to be 4.1992 and P<0.05 which implies that the variables that were removed were less significant and had no impact on that analysis. visreg function plots function of each variable.