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Supervisor
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Complete Block Diagram
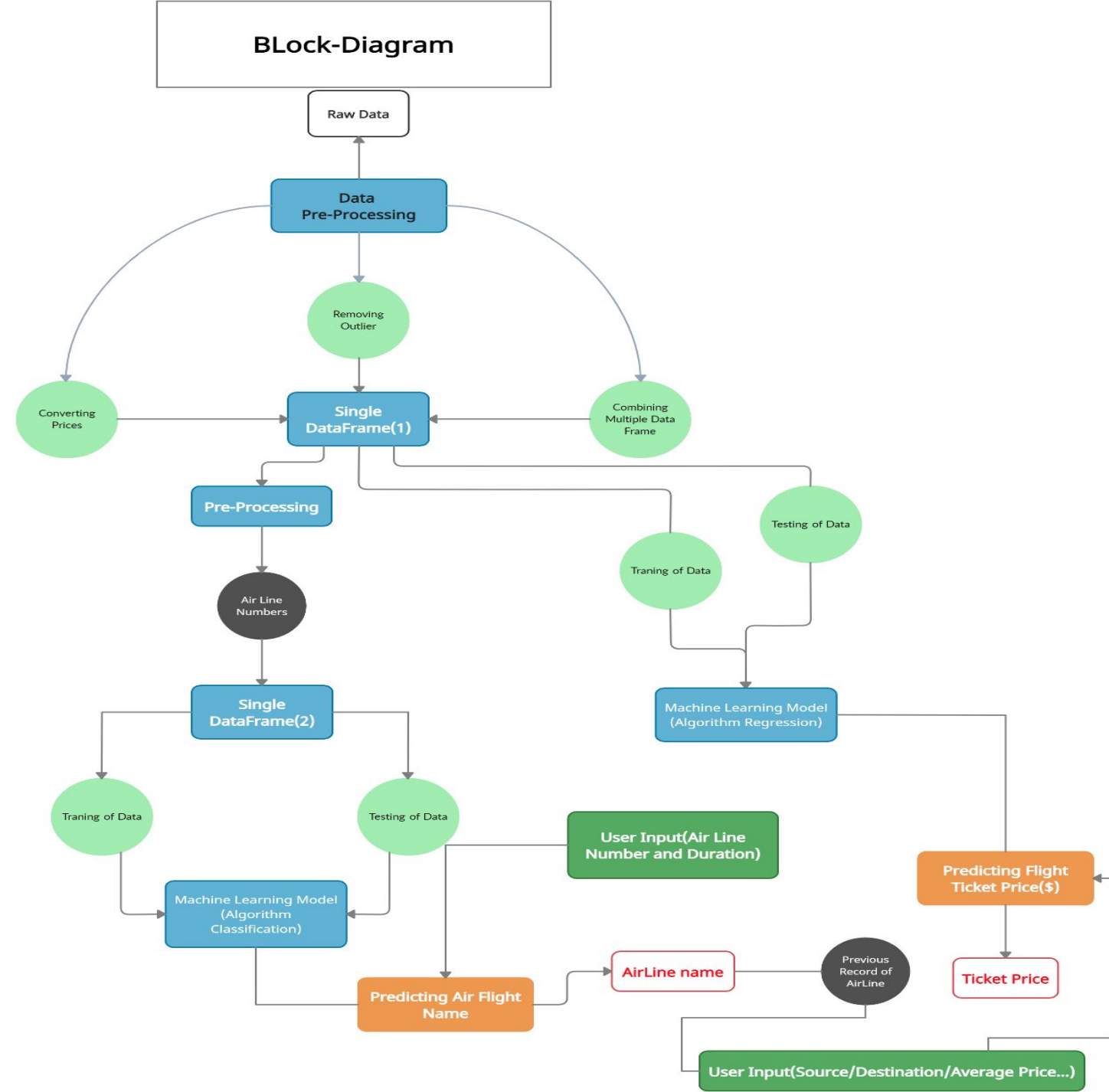
Bagging Decision Tree

```
confusion_matrix
default parameter
[[4 0 0 ... 0 0 0]
 [0 2 0 ... 0 0 0]
 [0 0 2 ... 0 0 0]
 ...
 [0 0 0 ... 3 0 0]
 [0 0 0 ... 0 0 0]
 [0 0 0 ... 0 0 1]]
...............................
classification_report
                                    precision    recall  f1-score   support

              Aegean Airlines         1.00      1.00      1.00         4
Aegean Airlines, Bulgaria Air         1.00      1.00      1.00         2
     Aegean Airlines, Finnair         1.00      1.00      1.00         2
        Aegean Airlines, LOT         1.00      1.00      1.00         1
```

```
      accuracy                         0.99     15030
     macro avg     0.80      0.82      0.80     15030
  weighted avg     0.99      0.99      0.99     15030
```

```
                    Airline Source Destination  Duration Total stops  \
3046     SAS, Pegasus Airlines    NYC         RUH      1300    2 stops
3047     Qatar Airways, SAUDIA    NYC         RUH      1420    2 stops
3048       Qatar Airways, MEA    NYC         RUH      1415    2 stops
3049  Emirates, Turkish Airlines  NYC        RUH      1100    2 stops
3050          Lufthansa, MEA    NYC         RUH      1115    3 stops

        Price       Date  Average Price  Airline Number  Source Number  \
3046   930.40 2022-04-13     838.732500             714              2
3047  1018.40 2022-04-13    1972.813714             303              2
3048  1049.87 2022-04-13    1133.548015             783              2
3049  1053.60 2022-04-13    1023.900221             784              2
3050  1139.73 2022-04-13    1023.714222             785              2
```

```
Enter the Airline number
........783
Enter time in minutes
------1415
Qatar Airways, MEA --Airline
                 Airline Source Destination  Duration Total stops    Price  \
3048  Qatar Airways, MEA    NYC         RUH      1415    2 stops  1049.87

           Date  Average Price  Airline Number  Source Number  \
3048  2022-04-13    1133.548015             783              2

      Destination Number  Stop Numbers  Source Numbers
3048                   2             1               2
```

3

AdaBoost Decision Tree

```
confusion_matrix
default parameter
[[0 0 0 ... 0 0 0]
 [0 0 0 ... 0 0 0]
 [0 0 0 ... 0 0 0]
 ...
 [0 0 0 ... 0 0 0]
 [0 0 0 ... 0 0 0]
 [0 0 0 ... 0 0 0]]
....................................
classification_report
                             precision    recall  f1-score   support

          Aegean Airlines         0.00      0.00      0.00         4
```

```
      accuracy                                 0.27     15030
     macro avg         0.01      0.01      0.01     15030
  weighted avg         0.10      0.27      0.14     15030
```

KNN

```
default parameter
[[4 0 0 ... 0 0 0]
 [0 2 0 ... 0 0 0]
 [0 0 2 ... 0 0 0]
 ...
 [0 0 0 ... 0 0 0]
 [0 0 0 ... 0 3 0]
 [0 0 0 ... 0 0 0]]
...................................
classification_report
```

	precision	recall	f1-score	support
Aegean Airlines	0.67	1.00	0.80	4
Aegean Airlines, Bulgaria Air	1.00	1.00	1.00	2
Aegean Airlines, Finnair	1.00	1.00	1.00	0
accuracy			0.92	15030
macro avg	0.48	0.49	0.47	15030
weighted avg	0.91	0.92	0.91	15030

Decision Tree

```
confusion_matrix
[[4 0 0 ... 0 0 0]
 [0 0 0 ... 0 0 0]
 [0 0 2 ... 0 0 0]
 ...
 [0 0 0 ... 3 0 0]
 [0 0 0 ... 0 0 0]
 [0 0 0 ... 0 0 1]]
..................................
classification_report
                                precision    recall  f1-score   support

              Aegean Airlines       1.00      1.00      1.00         4
   Aegean Airlines, Air Canada       0.00      0.00      0.00         0
 Aegean Airlines, Bulgaria Air       1.00      1.00      1.00         2
      Aegean Airlines, Finnair       1.00      1.00      1.00         2
```

```
    accuracy                           0.99     15030
   macro avg        0.81      0.83      0.81     15030
weighted avg        0.99      0.99      0.99     15030
```

```
                    Airline Source Destination  Duration Total stops  \
3046       SAS, Pegasus Airlines    NYC       RUH      1300     2 stops
3047      Qatar Airways, SAUDIA    NYC       RUH      1420     2 stops
3048        Qatar Airways, MEA    NYC       RUH      1415     2 stops
3049  Emirates, Turkish Airlines    NYC       RUH      1100     2 stops
3050            Lufthansa, MEA    NYC       RUH      1115     3 stops

        Price       Date  Average Price  Airline Number  Source Number  \
3046   930.40 2022-04-13     838.732500             714              2
3047  1018.40 2022-04-13    1972.813714             303              2
3048  1049.87 2022-04-13    1133.548015             783              2
3049  1053.60 2022-04-13    1023.900221             784              2
3050  1139.73 2022-04-13    1023.714222             785              2
```

```
..................................
Enter the Airline number

.......785
Enter time in minutes
------1115
Lufthansa, MEA --Airline
              Airline Source Destination  Duration Total stops    Price  \
3050  Lufthansa, MEA    NYC       RUH      1115     3 stops   1139.73

            Date  Average Price  Airline Number  Source Number  \
3050  2022-04-13    1023.714222             785              2

      Destination Number  Stop Numbers  Source Numbers
3050                    2             3               2
```

Extra Decision Tree

```
confusion_matrix
default parameter
[[4 0 0 ... 0 0 0]
 [0 2 0 ... 0 0 0]
 [0 2 0 ... 0 0 0]
 ...
 [0 0 0 ... 0 0 0]
 [0 0 0 ... 0 3 0]
 [0 0 0 ... 0 0 1]]
...........................
classification_report
                                 precision    recall  f1-score   support

              Aegean Airlines        0.67      1.00      0.80         4
 Aegean Airlines, Bulgaria Air       1.00      1.00      1.00         2
     Aegean Airlines, Finnair        1.00      1.00      1.00         2
```

```
      accuracy                                   0.98      15030
     macro avg        0.75      0.76      0.75      15030
  weighted avg        0.98      0.98      0.98      15030
```

	Airline	Source	Destination	Duration	Total stops	\
3046	SAS, Pegasus Airlines	NYC	RUH	1300	2 stops	
3047	Qatar Airways, SAUDIA	NYC	RUH	1420	2 stops	
3048	Qatar Airways, MEA	NYC	RUH	1415	2 stops	
3049	Emirates, Turkish Airlines	NYC	RUH	1100	2 stops	
3050	Lufthansa, MEA	NYC	RUH	1115	3 stops	

	Price	Date	Average Price	Airline Number	Source Number	\
3046	930.40	2022-04-13	838.732500	714	2	
3047	1018.40	2022-04-13	1972.813714	303	2	
3048	1049.87	2022-04-13	1133.548015	783	2	
3049	1053.60	2022-04-13	1023.900221	784	2	
3050	1139.73	2022-04-13	1023.714222	785	2	

```
Enter the Airline number

.......783
Enter time in minutes
------1415
Qatar Airways, MEA --Airline
```

	Airline	Source	Destination	Duration	Total stops	Price	\
3048	Qatar Airways, MEA	NYC	RUH	1415	2 stops	1049.87	

	Date	Average Price	Airline Number	Source Number	\
3048	2022-04-13	1133.548015	783	2	

	Destination Number	Stop Numbers	Source Numbers
3048	2	1	2

Random Forest

```
confusion_matrix
default parameter
[[4 0 0 ... 0 0 0]
 [0 2 0 ... 0 0 0]
 [0 0 2 ... 0 0 0]
 ...
 [0 0 0 ... 0 0 0]
 [0 0 0 ... 0 3 0]
 [0 0 0 ... 0 0 1]]
..............................
classification_report
                                    precision    recall   f1-score   support

              Aegean Airlines          1.00        1.00       1.00          4
 Aegean Airlines, Bulgaria Air         1.00        1.00       1.00          2


                      accuracy                                 0.98      15030
                     macro avg         0.70        0.70       0.69      15030
                  weighted avg         0.98        0.98       0.97      15030


..............
```

	Airline	Source	Destination	Duration	Total stops	\
3046	SAS, Pegasus Airlines	NYC	RUH	1300	2 stops	
3047	Qatar Airways, SAUDIA	NYC	RUH	1420	2 stops	
3048	Qatar Airways, MEA	NYC	RUH	1415	2 stops	
3049	Emirates, Turkish Airlines	NYC	RUH	1100	2 stops	
3050	Lufthansa, MEA	NYC	RUH	1115	3 stops	

	Price	Date	Average Price	Airline Number	Source Number	\
3046	930.40	2022-04-13	838.732500	714	2	
3047	1018.40	2022-04-13	1972.813714	303	2	
3048	1049.87	2022-04-13	1133.548015	783	2	
3049	1053.60	2022-04-13	1023.900221	784	2	
3050	1139.73	2022-04-13	1023.714222	785	2	

```
Enter the Airline number

.......303
Enter time in minutes
------1420
SAS --Airline
```
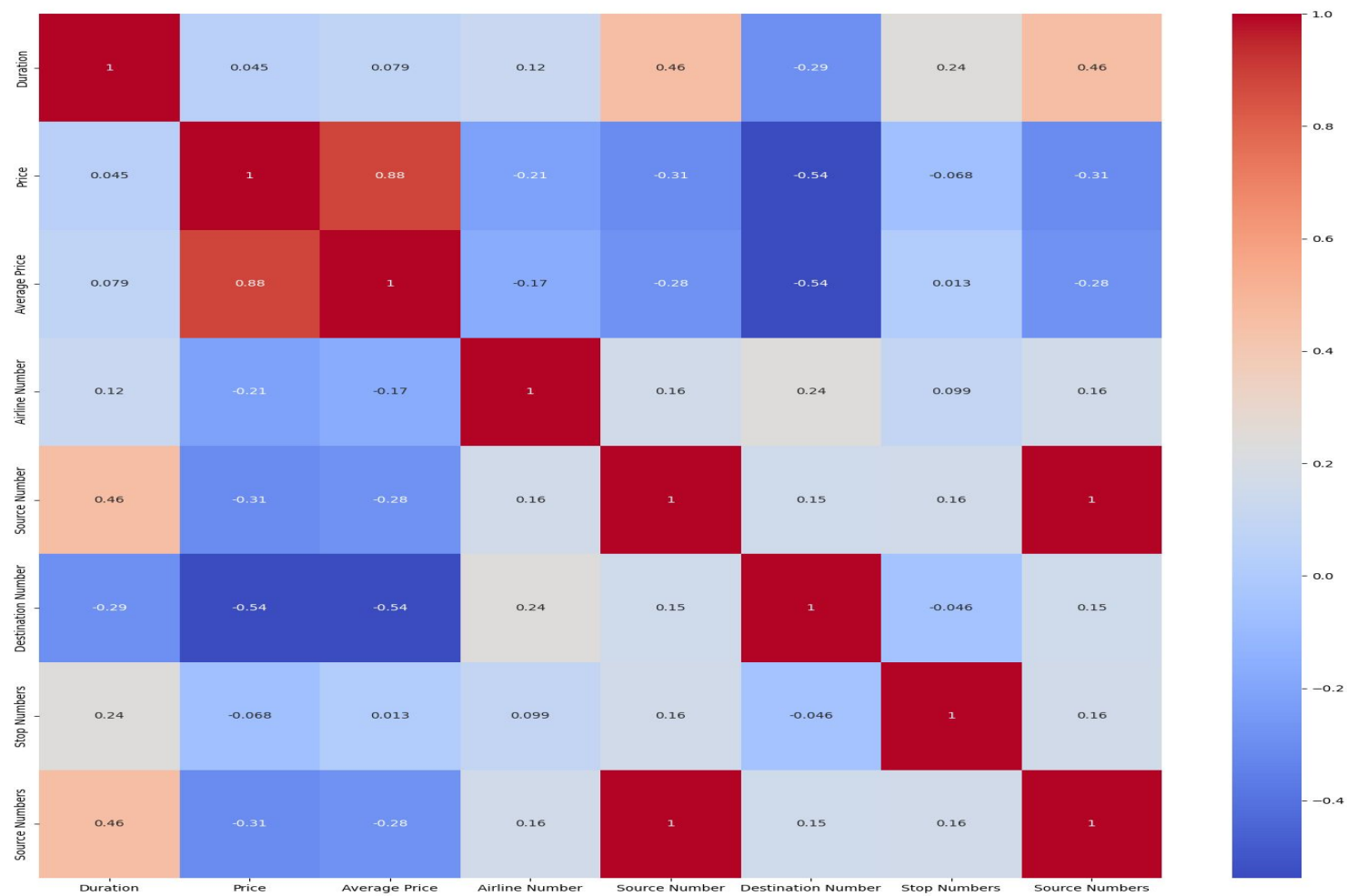
	Airline	Source	Destination	Duration	Total stops	Price	Date	\
13496	SAS	PAR	NYC	1450	1 stop	1405.87	2022-02-02	
13497	SAS	PAR	NYC	1420	2 stops	1481.60	2022-02-03	
13498	SAS	PAR	NYC	1360	1 stop	1405.33	2022-02-06	
13499	SAS	PAR	NYC	1350	2 stops	1475.73	2022-02-06	
13500	SAS	PAR	NYC	1420	2 stops	1481.60	2022-02-08	

	Average Price	Airline Number	Source Number	Destination Number	\
13496	1452.06129	55	0	0	
13497	1452.06129	55	0	0	

GRAPH
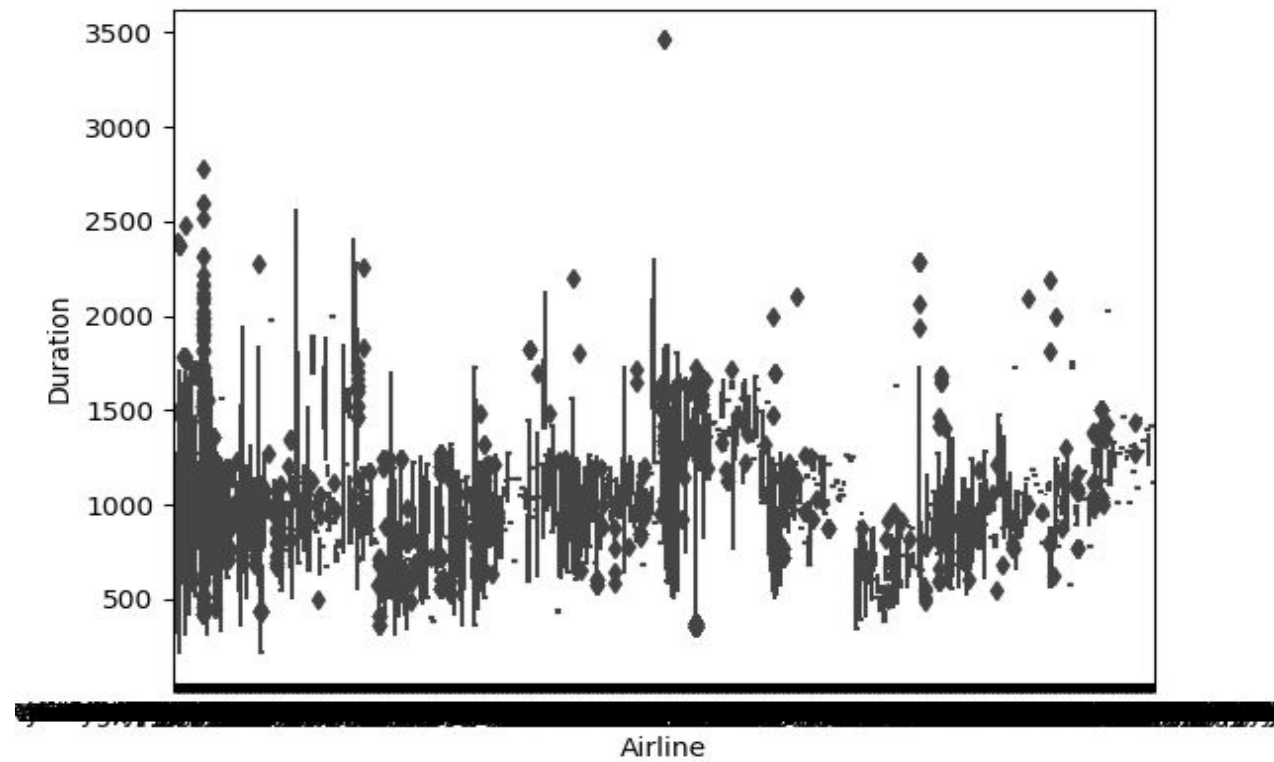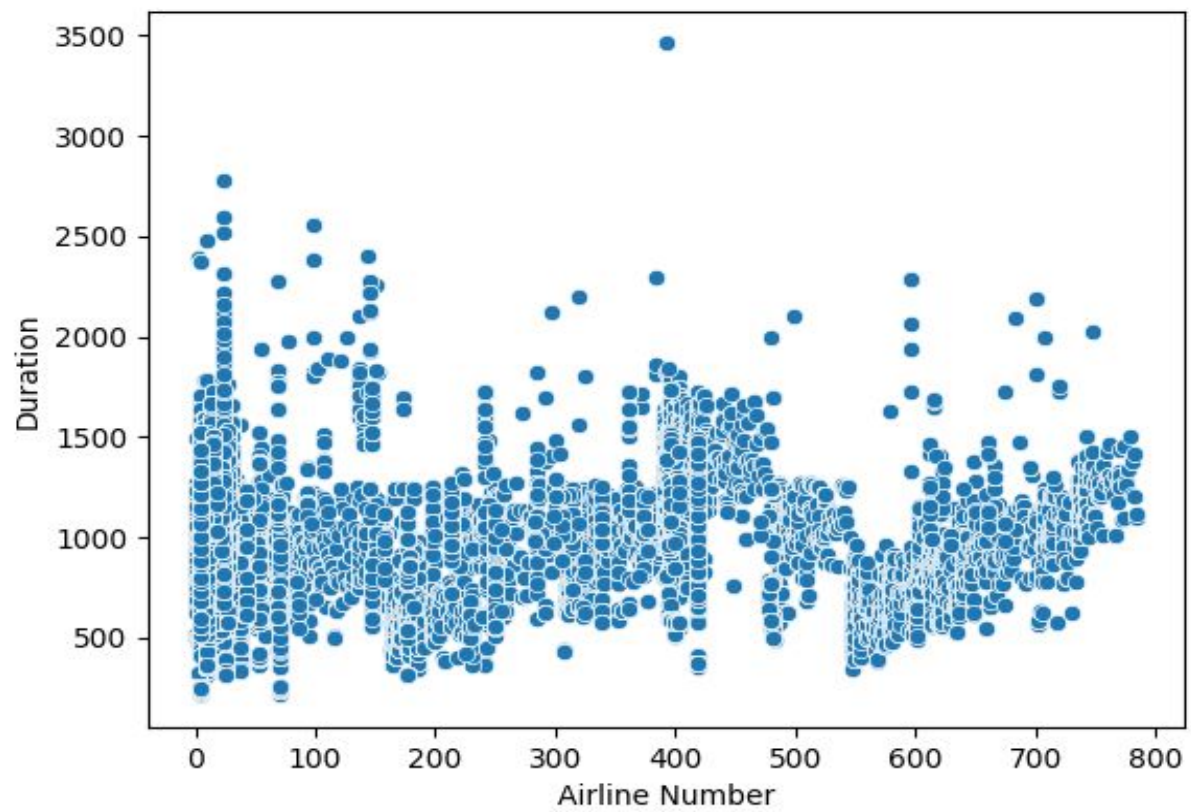
CO-RELATION BETWEEN FEATURES

Final Result

Algorithm Names	Variance	Accuracy
Random Forest + Decision Tree(with tuning)	94.52	98
<u>Random Forest + Decision Tree(with out tuning)</u>	94.55	99

Schedule(Weekly)

Weeks(1 to 8)	Day And Time	Target	Completed
(10-Nov)	Thursday	Data Preprocessing/ Regression Algorithms	Done
(17-Nov)	Thursday	Comparison between Algorithms(R)	Done
(24-Nov)	Thursday	Classification Algorithms/ Comparison between Algorithms(C)	Done
(01-Dec)	Thursday	Combining both (R) and (C)	Done
(08-Dec)	Thursday	Research Paper writing	Remaining

Thanks For Listening