

## Code & Output

Code:

### Tableau

No code

### Python

```
# Julia Cuellar
# DSC 640
# Infographic

import numpy as np
import pandas as pd
import matplotlib.pyplot as plt

# Will use in Infographic
def read_file():
    air = pd.read_csv('air-safety.csv')
    print("Display data with null:\n", air.isnull())
    print("Display counts of null from data:\n", air.isnull().sum())
    print('Data:\n', air)
    line = air['airline']
    fat_1 = air['fatalities_00_14']
    fat_2 = air['fatalities_85_99']
    plt.bar(line, fat_1, color='y')
    plt.bar(line, fat_2, bottom=fat_1, color='m')
    plt.xlabel('airline')
    plt.xticks(rotation=30, ha='right')
    plt.xticks(size=5)
    plt.legend(['fatalities_00_14', 'fatalities_85_99'])
    plt.title('Airline Fatalities', font='Tempus Sans ITC', fontsize=15)
    plt.grid()
    plt.show()

# Will use in Infographic
def read_file2():
    fin = pd.read_csv('Financials_Full_Data_data.csv')
    print("Display data with null:\n", fin.isnull())
    print("Display counts of null from data:\n", fin.isnull().sum())
    print('Data:\n', fin)
    fin.plot(x="Year", y=["Total Operating Expense", "Total Operating Revenue"], color='ym')
    plt.title('Airline Operating Expense & Revenue', font='Tempus Sans ITC', fontsize=15)
    plt.grid()
    plt.show()

# Will use in Infographic
def read_file3():
    safe = pd.read_csv('Safety Record of U.S. Air Carriers.csv')
    print("Display data with null:\n", safe.isnull())
```

```
print("Display counts of null from data:\n", safe.isnull().sum())
print('Data:\n', safe)

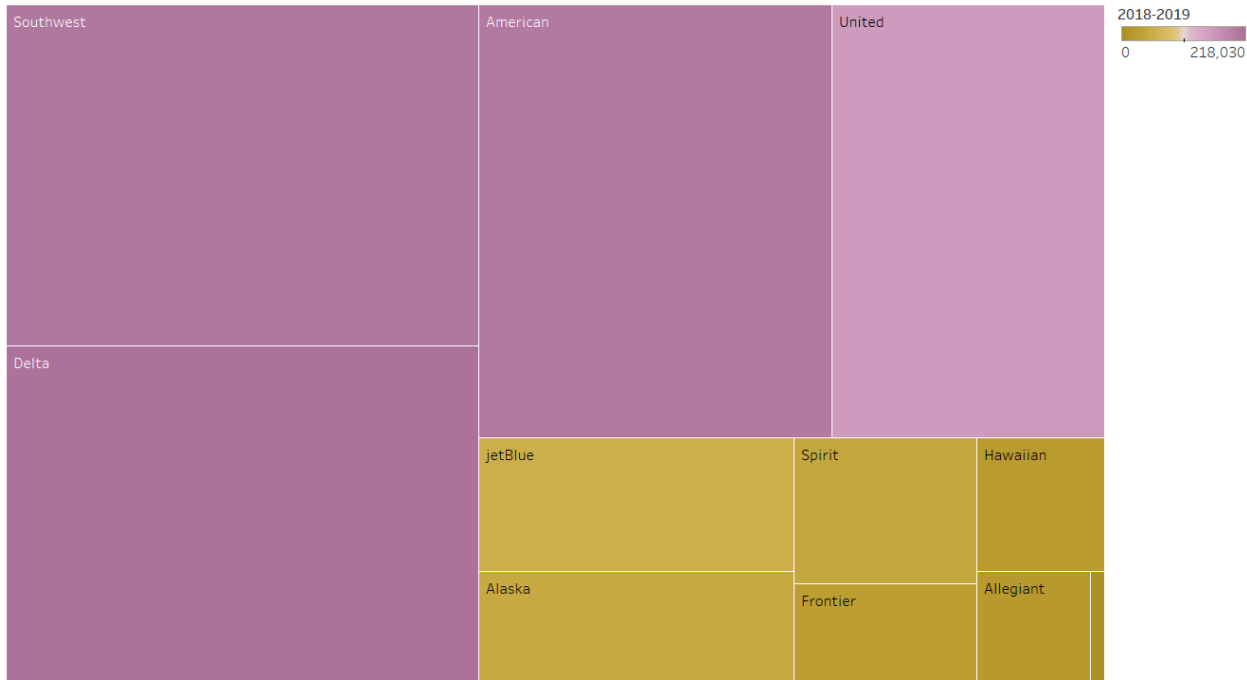
# Will use in Infographic
def read_file4():
    seat = pd.read_csv('Seat.csv')
    print("Display data with null:\n", seat.isnull())
    print("Display counts of null from data:\n", seat.isnull().sum())
    print('Data:\n', seat)

if __name__ == "__main__":
    read_file()
    read_file2()
    read_file3()
    read_file4()
```

Output:

Tableau

US Airline Departed Seats 2018-2019



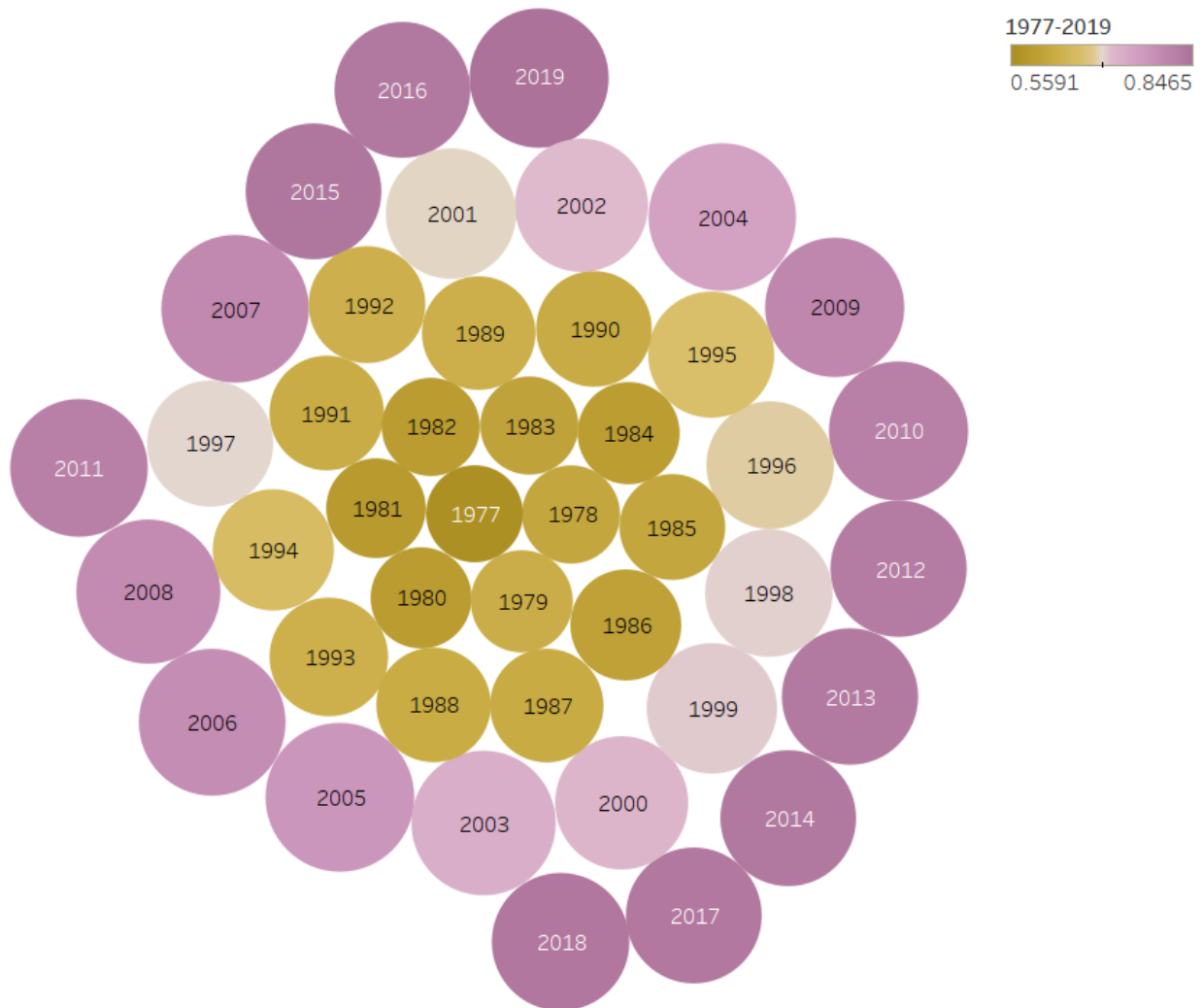
Departed Seats. Color shows sum of Unnamed: 25. Size shows sum of Unnamed: 24. The marks are labeled by Departed Seats. The view is filtered on Departed Seats and sum of Unnamed: 24. The Departed Seats filter excludes -- sub LCC, -- sub Other, --sub Network and Total All Sectors. The sum of Unnamed: 24 filter keeps non-Null values only.

US Airline Accidents & Fatalities



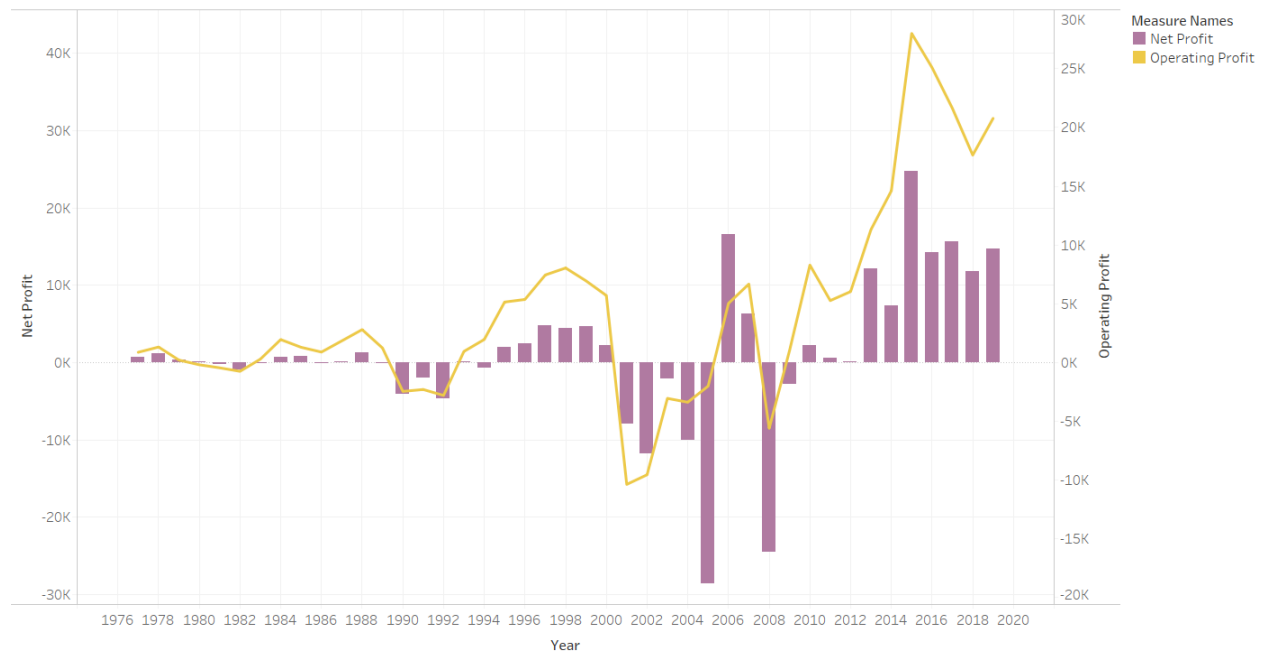
The trends of Accidents: Total and Fatalities: Total for Year. Color shows details about Accidents: Total and Fatalities: Total.

## Airline Departures & Load Factor



Year. Color shows sum of Load Factor. Size shows sum of Departures (000). The marks are labeled by Year.

## Airline Profit



The trends of Net Profit and Operating Profit for Year. Color shows details about Net Profit and Operating Profit.

## Python

Display data with null:

	airline	avail_seat_km_per_week	...	fatal_accidents_00_14	fatalities_00_14
0	False	False ...		False	False
1	False	False ...		False	False
2	False	False ...		False	False
3	False	False ...		False	False
4	False	False ...		False	False
5	False	False ...		False	False
6	False	False ...		False	False
7	False	False ...		False	False
8	False	False ...		False	False
9	False	False ...		False	False
10	False	False ...		False	False
11	False	False ...		False	False
12	False	False ...		False	False

13	False	False ...	False	False
14	False	False ...	False	False
15	False	False ...	False	False
16	False	False ...	False	False
17	False	False ...	False	False
18	False	False ...	False	False
19	False	False ...	False	False
20	False	False ...	False	False
21	False	False ...	False	False
22	False	False ...	False	False
23	False	False ...	False	False
24	False	False ...	False	False
25	False	False ...	False	False
26	False	False ...	False	False
27	False	False ...	False	False
28	False	False ...	False	False
29	False	False ...	False	False
30	False	False ...	False	False
31	False	False ...	False	False
32	False	False ...	False	False
33	False	False ...	False	False
34	False	False ...	False	False
35	False	False ...	False	False
36	False	False ...	False	False
37	False	False ...	False	False
38	False	False ...	False	False
39	False	False ...	False	False
40	False	False ...	False	False

41	False	False ...	False	False
42	False	False ...	False	False
43	False	False ...	False	False
44	False	False ...	False	False
45	False	False ...	False	False
46	False	False ...	False	False
47	False	False ...	False	False
48	False	False ...	False	False
49	False	False ...	False	False
50	False	False ...	False	False
51	False	False ...	False	False
52	False	False ...	False	False
53	False	False ...	False	False
54	False	False ...	False	False
55	False	False ...	False	False

[56 rows x 8 columns]

Display counts of null from data:

```

airline          0
avail_seat_km_per_week  0
incidents_85_99    0
fatal_accidents_85_99  0
fatalities_85_99    0
incidents_00_14    0
fatal_accidents_00_14  0
fatalities_00_14    0
dtype: int64

```

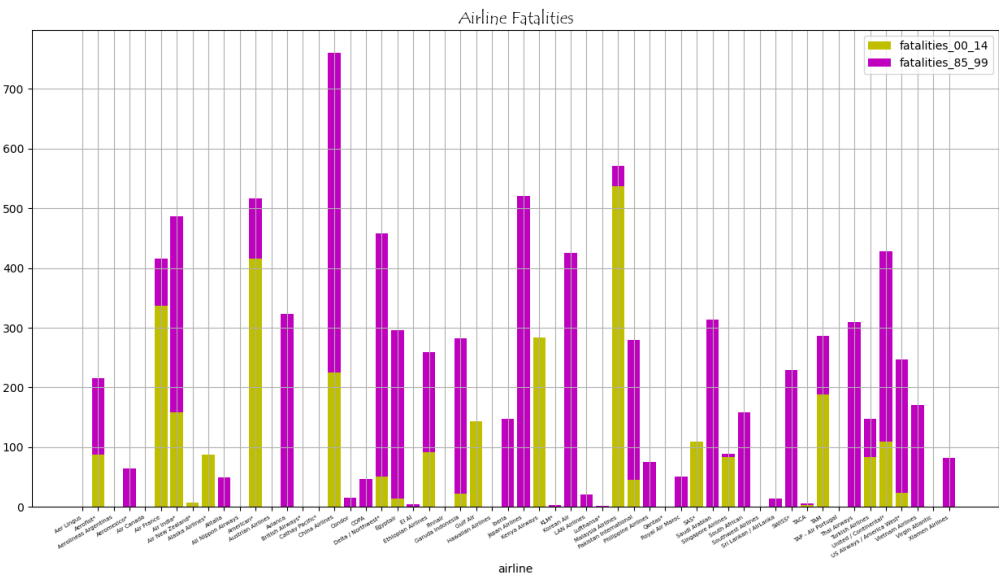
Data:

	airline ... fatalities_00_14	
0	Aer Lingus ...	0
1	Aeroflot* ...	88
2	Aerolineas Argentinas ...	0
3	Aeromexico* ...	0
4	Air Canada ...	0
5	Air France ...	337
6	Air India* ...	158
7	Air New Zealand* ...	7
8	Alaska Airlines* ...	88
9	Alitalia ...	0
10	All Nippon Airways ...	0
11	American* ...	416
12	Austrian Airlines ...	0
13	Avianca ...	0
14	British Airways* ...	0
15	Cathay Pacific* ...	0
16	China Airlines ...	225
17	Condor ...	0
18	COPA ...	0
19	Delta / Northwest* ...	51
20	Egyptair ...	14
21	El Al ...	0
22	Ethiopian Airlines ...	92
23	Finnair ...	0
24	Garuda Indonesia ...	22
25	Gulf Air ...	143
26	Hawaiian Airlines ...	0



27	Iberia ...	0	
28	Japan Airlines ...	0	
29	Kenya Airways ...	283	
30	KLM* ...	0	
31	Korean Air ...	0	
32	LAN Airlines ...	0	
33	Lufthansa* ...	0	
34	Malaysia Airlines ...	537	
35	Pakistan International ...	46	
36	Philippine Airlines ...	1	
37	Qantas* ...	0	
38	Royal Air Maroc ...	0	
39	SAS* ...	110	
40	Saudi Arabian ...	0	
41	Singapore Airlines ...	83	
42	South African ...	0	
43	Southwest Airlines ...	0	
44	Sri Lankan / AirLanka ...	0	
45	SWISS* ...	0	
46	TACA ...	3	
47	TAM ...	188	
48	TAP - Air Portugal ...	0	
49	Thai Airways ...	1	
50	Turkish Airlines ...	84	
51	United / Continental* ...	109	
52	US Airways / America West* ...		23
53	Vietnam Airlines ...	0	
54	Virgin Atlantic ...	0	

[56 rows x 8 columns]



Display data with null:

	Year	Aircraft Ownership	...	Total Operating Revenue	Transport-Related
0	False	False	...	False	False
1	False	False	...	False	False
2	False	False	...	False	False
3	False	False	...	False	False
4	False	False	...	False	False
5	False	False	...	False	False
6	False	False	...	False	False
7	False	False	...	False	False
8	False	False	...	False	False
9	False	False	...	False	False
10	False	False	...	False	False
11	False	False	...	False	False
12	False	False	...	False	False

13	False	False ...	False	False
14	False	False ...	False	False
15	False	False ...	False	False
16	False	False ...	False	False
17	False	False ...	False	False
18	False	False ...	False	False
19	False	False ...	False	False
20	False	False ...	False	False
21	False	False ...	False	False
22	False	False ...	False	False
23	False	False ...	False	False
24	False	False ...	False	False
25	False	False ...	False	False
26	False	False ...	False	False
27	False	False ...	False	False
28	False	False ...	False	False
29	False	False ...	False	False
30	False	False ...	False	False
31	False	False ...	False	False
32	False	False ...	False	False
33	False	False ...	False	False
34	False	False ...	False	False
35	False	False ...	False	False
36	False	False ...	False	False
37	False	False ...	False	False
38	False	False ...	False	False
39	False	False ...	False	False
40	False	False ...	False	False

41	False	False ...	False	False
42	False	False ...	False	False

[43 rows x 19 columns]

Display counts of null from data:

Year	0
Aircraft Ownership	0
Airport Rents and Fees	0
Cargo RTMs (mil)	0
Departures (000)	0
Fuel Expense	0
Labor Expense	0
Load Factor	0
Net Profit	0
Operating Profit	0
Other Expense	0
Other Expense*	0
Passenger Enplanements (000) - Scheduled	0
Pre-Tax Profit	0
Scheduled ASMs (000)	0
Scheduled RPMs (000)	0
Total Operating Expense	0
Total Operating Revenue	0
Transport-Related	0

dtype: int64

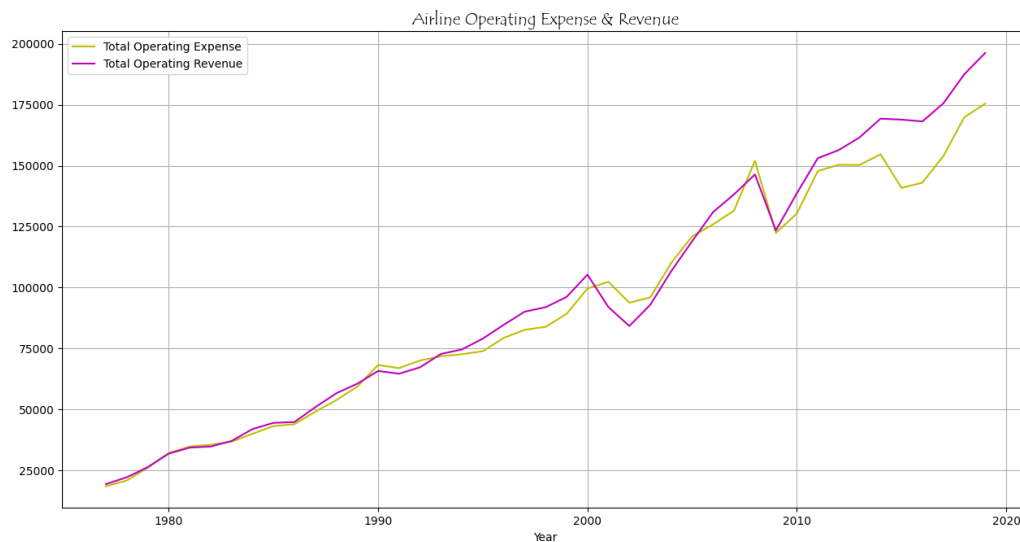
Data:

	Year	Aircraft Ownership ...	Total Operating Revenue	Transport-Related
0	1977	1309.986787 ...	19423.189822	444.721644

1	1978	1300.781563 ...	22244.524955	624.912835
2	1979	1399.176618 ...	26411.246006	624.608911
3	1980	1585.431658 ...	31950.494785	681.886651
4	1981	1706.651661 ...	34390.155130	661.857945
5	1982	1904.429109 ...	34819.529349	676.592429
6	1983	2116.988966 ...	37124.284829	745.055554
7	1984	2413.753214 ...	41998.424794	815.990696
8	1985	2786.120746 ...	44537.198193	891.357307
9	1986	3123.037292 ...	44867.074694	891.964231
10	1987	3536.982041 ...	50957.331942	1094.115349
11	1988	4130.832209 ...	56657.281188	1208.239793
12	1989	4639.063966 ...	60577.084691	1283.104717
13	1990	5407.866273 ...	65817.160180	1399.739016
14	1991	5714.750355 ...	64687.719272	1215.166491
15	1992	6255.759329 ...	67307.909583	1123.971481
16	1993	6585.691600 ...	72801.484125	1193.327554
17	1994	6883.721606 ...	74632.276964	1441.888811
18	1995	7087.987269 ...	79081.478638	1609.829691
19	1996	7686.799645 ...	84733.354615	1973.612027
20	1997	7543.407241 ...	90142.867217	2297.589953
21	1998	7836.391168 ...	91949.406798	2400.591763
22	1999	8666.676286 ...	96163.206985	2712.254698
23	2000	9620.986817 ...	105310.768099	3303.480147
24	2001	9756.205466 ...	92011.562431	3809.540147
25	2002	9625.034475 ...	84254.838096	4010.829153
26	2003	9638.787055 ...	92949.783354	7803.975598
27	2004	10152.149541 ...	106734.055168	13211.553209
28	2005	9882.208514 ...	119010.006048	16297.738793

29	2006	9582.559609 ...	130961.304939	17470.493839
30	2007	9294.450927 ...	138221.429247	17942.646243
31	2008	8977.311286 ...	146392.299174	20997.289352
32	2009	8920.487208 ...	123455.192484	17135.976352
33	2010	9004.872272 ...	138641.575267	17708.751814
34	2011	9074.711307 ...	153049.358928	20806.862381
35	2012	8982.599188 ...	156373.972558	20289.316813
36	2013	9405.997205 ...	161595.499584	20960.615347
37	2014	9602.753571 ...	169276.541196	20710.983703
38	2015	9942.298549 ...	168874.498994	18172.544284
39	2016	10715.168612 ...	168129.458305	17956.503295
40	2017	10880.833845 ...	175552.931352	19009.023852
41	2018	11321.146435 ...	187473.715422	21492.551810
42	2019	11857.440156 ...	196214.618159	22462.580380

[43 rows x 19 columns]



Display data with null:

Year Accidents: Total ... Fatalities: Total Fatalities: Onboard

0	False	False ...	False	False
1	False	False ...	False	False
2	False	False ...	False	False
3	False	False ...	False	False
4	False	False ...	False	False
5	False	False ...	False	False
6	False	False ...	False	False
7	False	False ...	False	False
8	False	False ...	False	False
9	False	False ...	False	False
10	False	False ...	False	False
11	False	False ...	False	False
12	False	False ...	False	False
13	False	False ...	False	False
14	False	False ...	False	False
15	False	False ...	False	False
16	False	False ...	False	False
17	False	False ...	False	False
18	False	False ...	False	False
19	False	False ...	False	False

[20 rows x 6 columns]

Display counts of null from data:

Year	0
Accidents: Total	0
Accidents: Fatal	0
Fatal Accidents per 100,000 Departures	0
Fatalities: Total	0

Fatalities: Onboard 0

dtype: int64

Data:

	Year	Accidents: Total	...	Fatalities: Total	Fatalities: Onboard
0	2000	49	...	89	89
1	2001	41	...	531	525
2	2002	34	...	0	0
3	2003	51	...	22	21
4	2004	23	...	13	13
5	2005	34	...	22	20
6	2006	26	...	50	49
7	2007	26	...	0	0
8	2008	19	...	0	0
9	2009	26	...	50	49
10	2010	28	...	0	0
11	2011	29	...	0	0
12	2012	23	...	0	0
13	2013	18	...	0	0
14	2014	29	...	0	0
15	2015	27	...	0	0
16	2016	26	...	0	0
17	2017	29	...	0	0
18	2018	27	...	1	1
19	2019	36	...	1	1

[20 rows x 6 columns]

Display data with null:

Departed Seats Unnamed: 1 ... Unnamed: 24 Unnamed: 25



0	False	False ...	False	False
1	True	False ...	False	False
2	False	False ...	False	False
3	False	False ...	False	False
4	False	False ...	False	False
5	False	False ...	False	False
6	False	False ...	False	False
7	False	False ...	False	False
8	False	False ...	False	False
9	False	False ...	False	False
10	True	False ...	False	False
11	False	False ...	False	False
12	False	False ...	False	False
13	False	False ...	False	False
14	False	False ...	False	False
15	False	False ...	False	False
16	False	False ...	False	False
17	True	False ...	False	False
18	False	False ...	False	False
19	False	False ...	False	False
20	False	False ...	False	False
21	False	False ...	False	False
22	False	False ...	False	False
23	True	False ...	False	False
24	True	False ...	False	False
25	False	False ...	False	False
26	True	False ...	False	False
27	False	False ...	False	False

28      False    False ...    False    False

[29 rows x 26 columns]

Display counts of null from data:

Departed Seats    6

Unnamed: 1       0

Unnamed: 2       0

Unnamed: 3       0

Unnamed: 4       0

Unnamed: 5       0

Unnamed: 6       0

Unnamed: 7       0

Unnamed: 8       0

Unnamed: 9       0

Unnamed: 10       0

Unnamed: 11       0

Unnamed: 12       0

Unnamed: 13       0

Unnamed: 14       0

Unnamed: 15       0

Unnamed: 16       0

Unnamed: 17       0

Unnamed: 18       0

Unnamed: 19       0

Unnamed: 20       0

Unnamed: 21       0

Unnamed: 22       0

Unnamed: 23       0

Unnamed: 24 0

Unnamed: 25 0

dtype: int64

Data:

	Departed Seats ...	Unnamed: 25
0	thousands ...	
1	NaN ...	2019.0
2	American ...	206966.75669190535
3	Continental ...	0.0
4	Delta ...	218030.15184293757
5	Northwest ...	0.0
6	United ...	158584.0114297764
7	US Airways ...	0.0
8	America West ...	0.0
9	--sub Network ...	583580.9199646193
10	NaN ...	
11	Southwest ...	210160.90348859888
12	jetBlue ...	56134.610025919574
13	AirTran ...	0.0
14	Frontier ...	26755.38157501579
15	Virgin America ...	0.0
16	-- sub LCC ...	293050.8950895342
17	NaN ...	
18	Alaska ...	45954.98783794109
19	Hawaiian ...	21395.618670285392
20	Spirit ...	41450.00377022788
21	Allegiant ...	18206.2763068781
22	-- sub Other ...	127006.88658533245

23	NaN ...
24	NaN ...
25	Total All Sectors ... 1003638.701639486
26	NaN ...
27	* system departures times average seat size ...
28	Data Source: US DOT Form 41, Schedules P52 ...

[29 rows x 26 columns]