

# Pandas - Assignment 01

October 14, 2020

## 1 Assignment 01: Evaluate the FAA Dataset

*The comments/sections provided are your cues to perform the assignment. You don't need to limit yourself to the number of rows/cells provided. You can add additional rows in each section to add more lines of code.*

*If at any point in time you need help on solving this assignment, view our demo video to understand the different steps of the code.*

Happy coding!

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### 1: View and import the dataset

```
[1]: #Import necessary libraries
import pandas as pd
```

```
[2]: #Import the FAA (Federal Aviation Authority) dataset
faa_dataset = pd.read_csv("faa_ai_prelim.csv")
```

### 2: View and understand the dataset

```
[8]: #View the dataset shape
faa_dataset.shape
```

```
[8]: (83, 42)
```

```
[9]: faa_dataset
```

```
[9]:   UPDATED ENTRY_DATE EVENT_LCL_DATE EVENT_LCL_TIME LOC_CITY_NAME \
0      No  19-FEB-16    19-FEB-16    00:45:00Z    MARSHVILLE
1      No  19-FEB-16    18-FEB-16    23:55:00Z    TAVERNIER
2      No  19-FEB-16    18-FEB-16    22:14:00Z    TRENTON
3      No  19-FEB-16    18-FEB-16    17:10:00Z    ASHEVILLE
4      No  19-FEB-16    18-FEB-16    00:26:00Z    TALKEETNA
..    ...          ...          ...          ...          ...
78     No  08-FEB-16    31-DEC-15    17:00:00Z    SAN ANTONIO
79     No  08-FEB-16    05-FEB-16    11:17:00Z    MARICOPA
```

80	No	08-FEB-16	05-FEB-16	23:02:00Z	SAN PEDRO
81	No	08-FEB-16	05-FEB-16	23:02:00Z	SAN PEDRO
82	Yes	02-FEB-16	02-FEB-16	01:52:00Z	MOBILE

	LOC_STATE_NAME	LOC_CNTRY_NAME	\
0	North Carolina	NaN	
1	Florida	NaN	
2	New Jersey	NaN	
3	North Carolina	NaN	
4	Alaska	NaN	
..	...	...	
78	Texas	NaN	
79	Arizona	NaN	
80	California	NaN	
81	California	NaN	
82	Alabama	NaN	

	RMK_TEXT	EVENT_TYPE_DESC	\
0	AIRCRAFT CRASHED INTO TREES, THE 1 PERSON ON B...	Accident	
1	AIRCRAFT ON LANDING WENT OFF THE END OF THE RU...	Incident	
2	AIRCRAFT ON FINAL SUSTAINED A BIRD STRIKE, LAN...	Incident	
3	AIRCRAFT ON LANDING, GEAR COLLAPSED, ASHEVILLE...	Incident	
4	AIRCRAFT ON LANDING, NOSE GEAR COLLAPSED, TALK...	Incident	
..	...	...	
78	AIRCRAFT ON LANDING, GROUND LOOPED, BULVERDE A...	Accident	
79	AIRCRAFT CRASHED UNDER UNKNOWN CIRCUMSTANCES, ...	Accident	
80	N9872R, BEECH M35 AIRCRAFT, AND N5057G, BELLAN...	Accident	
81	N9872R, BEECH M35 AIRCRAFT, AND N5057G, BELLAN...	Accident	
82	N784CP AIRCRAFT CRASHED INTO A WOODED AREA NEA...	Accident	

	FSDO_DESC	...	PAX_INJ_NONE	PAX_INJ_MINOR	PAX_INJ_SERIOUS	\
0	FAA Charlotte FSDO-68	...	NaN	NaN	NaN	
1	FAA Miami FSDO-19	...	NaN	NaN	NaN	
2	FAA Philadelphia FSDO-17	...	NaN	NaN	NaN	
3	FAA Charlotte FSDO-68	...	NaN	NaN	NaN	
4	FAA Anchorage FSDO-03	...	NaN	1.0	NaN	
..	...	...	...	...	...	
78	FAA San Antonio FSDO-17	...	NaN	NaN	NaN	
79	FAA Scottsdale FSDO-07	...	NaN	NaN	NaN	
80	FAA Long Beach FSDO-05	...	NaN	NaN	NaN	
81	FAA Long Beach FSDO-05	...	NaN	NaN	NaN	
82	FAA Birmingham FSDO-09	...	NaN	NaN	NaN	

	PAX_INJ_FATAL	PAX_INJ_UNK	GRND_INJ_NONE	GRND_INJ_MINOR	GRND_INJ_SERIOUS	\
0	NaN	NaN	NaN	NaN	NaN	
1	NaN	NaN	NaN	NaN	NaN	
2	NaN	NaN	NaN	NaN	NaN	

3	NaN	NaN	NaN	NaN	NaN	NaN
4	NaN	NaN	NaN	NaN	NaN	NaN
..	...	...	...	...	...	...
78	NaN	NaN	NaN	NaN	NaN	NaN
79	NaN	NaN	NaN	NaN	NaN	NaN
80	NaN	NaN	NaN	NaN	NaN	NaN
81	NaN	NaN	NaN	NaN	NaN	NaN
82	NaN	NaN	NaN	NaN	NaN	NaN

	GRND_INJ_FATAL	GRND_INJ_UNK
0	NaN	NaN
1	NaN	NaN
2	NaN	NaN
3	NaN	NaN
4	NaN	NaN
..	...	...
78	NaN	NaN
79	NaN	NaN
80	NaN	NaN
81	NaN	NaN
82	NaN	NaN

[83 rows x 42 columns]

```
[6]: faa_dataset.describe
```

```
[6]: <bound method NDFrame.describe of      UPDATED ENTRY_DATE EVENT_LCL_DATE
```

	EVENT_LCL_TIME	LOC_CITY_NAME	\
0	No	19-FEB-16	19-FEB-16 00:45:00Z MARSHVILLE
1	No	19-FEB-16	18-FEB-16 23:55:00Z TAVERNIER
2	No	19-FEB-16	18-FEB-16 22:14:00Z TRENTON
3	No	19-FEB-16	18-FEB-16 17:10:00Z ASHEVILLE
4	No	19-FEB-16	18-FEB-16 00:26:00Z TALKEETNA
..	...	...	...
78	No	08-FEB-16	31-DEC-15 17:00:00Z SAN ANTONIO
79	No	08-FEB-16	05-FEB-16 11:17:00Z MARICOPA
80	No	08-FEB-16	05-FEB-16 23:02:00Z SAN PEDRO
81	No	08-FEB-16	05-FEB-16 23:02:00Z SAN PEDRO
82	Yes	02-FEB-16	02-FEB-16 01:52:00Z MOBILE

	LOC_STATE_NAME	LOC_CNTRY_NAME	\
0	North Carolina	NaN	
1	Florida	NaN	
2	New Jersey	NaN	
3	North Carolina	NaN	
4	Alaska	NaN	
..	...	...	

78	Texas	NaN
79	Arizona	NaN
80	California	NaN
81	California	NaN
82	Alabama	NaN

	RMK_TEXT	EVENT_TYPE_DESC	\
0	AIRCRAFT CRASHED INTO TREES, THE 1 PERSON ON B...	Accident	
1	AIRCRAFT ON LANDING WENT OFF THE END OF THE RU...	Incident	
2	AIRCRAFT ON FINAL SUSTAINED A BIRD STRIKE, LAN...	Incident	
3	AIRCRAFT ON LANDING, GEAR COLLAPSED, ASHEVILLE...	Incident	
4	AIRCRAFT ON LANDING, NOSE GEAR COLLAPSED, TALK...	Incident	
..	...	...	
78	AIRCRAFT ON LANDING, GROUND LOOPED, BULVERDE A...	Accident	
79	AIRCRAFT CRASHED UNDER UNKNOWN CIRCUMSTANCES, ...	Accident	
80	N9872R, BEECH M35 AIRCRAFT, AND N5057G, BELLAN...	Accident	
81	N9872R, BEECH M35 AIRCRAFT, AND N5057G, BELLAN...	Accident	
82	N784CP AIRCRAFT CRASHED INTO A WOODED AREA NEA...	Accident	

	FSDO_DESC	...	PAX_INJ_NONE	PAX_INJ_MINOR	PAX_INJ_SERIOUS	\
0	FAA Charlotte FSDO-68	...	NaN	NaN	NaN	
1	FAA Miami FSDO-19	...	NaN	NaN	NaN	
2	FAA Philadelphia FSDO-17	...	NaN	NaN	NaN	
3	FAA Charlotte FSDO-68	...	NaN	NaN	NaN	
4	FAA Anchorage FSDO-03	...	NaN	1.0	NaN	
..	...	...	...	...	...	
78	FAA San Antonio FSDO-17	...	NaN	NaN	NaN	
79	FAA Scottsdale FSDO-07	...	NaN	NaN	NaN	
80	FAA Long Beach FSDO-05	...	NaN	NaN	NaN	
81	FAA Long Beach FSDO-05	...	NaN	NaN	NaN	
82	FAA Birmingham FSDO-09	...	NaN	NaN	NaN	

	PAX_INJ_FATAL	PAX_INJ_UNK	GRND_INJ_NONE	GRND_INJ_MINOR	GRND_INJ_SERIOUS	\
0	NaN	NaN	NaN	NaN	NaN	
1	NaN	NaN	NaN	NaN	NaN	
2	NaN	NaN	NaN	NaN	NaN	
3	NaN	NaN	NaN	NaN	NaN	
4	NaN	NaN	NaN	NaN	NaN	
..	...	...	...	...	...	
78	NaN	NaN	NaN	NaN	NaN	
79	NaN	NaN	NaN	NaN	NaN	
80	NaN	NaN	NaN	NaN	NaN	
81	NaN	NaN	NaN	NaN	NaN	
82	NaN	NaN	NaN	NaN	NaN	

	GRND_INJ_FATAL	GRND_INJ_UNK
0	NaN	NaN

1	NaN	NaN
2	NaN	NaN
3	NaN	NaN
4	NaN	NaN
...	...	...
78	NaN	NaN
79	NaN	NaN
80	NaN	NaN
81	NaN	NaN
82	NaN	NaN

[83 rows x 42 columns]>

```
[7]: #View the first five observations
faa_dataset.head(5)
```

```
[7]:   UPDATED ENTRY_DATE EVENT_LCL_DATE EVENT_LCL_TIME LOC_CITY_NAME \
0      No  19-FEB-16      19-FEB-16      00:45:00Z    MARSHVILLE
1      No  19-FEB-16      18-FEB-16      23:55:00Z      TAVERNIER
2      No  19-FEB-16      18-FEB-16      22:14:00Z        TRENTON
3      No  19-FEB-16      18-FEB-16      17:10:00Z      ASHEVILLE
4      No  19-FEB-16      18-FEB-16      00:26:00Z      TALKEETNA
```

```
   LOC_STATE_NAME LOC_CNTRY_NAME \
0 North Carolina      NaN
1      Florida      NaN
2    New Jersey      NaN
3 North Carolina      NaN
4      Alaska      NaN
```

```
   RMK_TEXT EVENT_TYPE_DESC \
0 AIRCRAFT CRASHED INTO TREES, THE 1 PERSON ON B... Accident
1 AIRCRAFT ON LANDING WENT OFF THE END OF THE RU... Incident
2 AIRCRAFT ON FINAL SUSTAINED A BIRD STRIKE, LAN... Incident
3 AIRCRAFT ON LANDING, GEAR COLLAPSED, ASHEVILLE... Incident
4 AIRCRAFT ON LANDING, NOSE GEAR COLLAPSED, TALK... Incident
```

```
   FSDO_DESC ... PAX_INJ_NONE PAX_INJ_MINOR PAX_INJ_SERIOUS \
0 FAA Charlotte FSDO-68 ...      NaN      NaN      NaN
1 FAA Miami FSDO-19 ...      NaN      NaN      NaN
2 FAA Philadelphia FSDO-17 ...      NaN      NaN      NaN
3 FAA Charlotte FSDO-68 ...      NaN      NaN      NaN
4 FAA Anchorage FSDO-03 ...      NaN      1.0      NaN
```

```
   PAX_INJ_FATAL PAX_INJ_UNK GRND_INJ_NONE GRND_INJ_MINOR GRND_INJ_SERIOUS \
0      NaN      NaN      NaN      NaN      NaN
1      NaN      NaN      NaN      NaN      NaN
```

2	NaN	NaN	NaN	NaN	NaN
3	NaN	NaN	NaN	NaN	NaN
4	NaN	NaN	NaN	NaN	NaN

	GRND_INJ_FATAL	GRND_INJ_UNK
0	NaN	NaN
1	NaN	NaN
2	NaN	NaN
3	NaN	NaN
4	NaN	NaN

[5 rows x 42 columns]

```
[11]: #View all the columns present in the dataset
faa_dataset.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 83 entries, 0 to 82
Data columns (total 42 columns):
#   Column                Non-Null Count  Dtype
---  -
0   UPDATED                83 non-null    object
1   ENTRY_DATE             83 non-null    object
2   EVENT_LCL_DATE         83 non-null    object
3   EVENT_LCL_TIME         83 non-null    object
4   LOC_CITY_NAME          83 non-null    object
5   LOC_STATE_NAME         83 non-null    object
6   LOC_CNTRY_NAME         2 non-null     object
7   RMK_TEXT               83 non-null    object
8   EVENT_TYPE_DESC        83 non-null    object
9   FSDO_DESC              81 non-null    object
10  REGIST_NBR              83 non-null    object
11  FLT_NBR                 6 non-null     object
12  ACFT_OPRTR             7 non-null     object
13  ACFT_MAKE_NAME         78 non-null    object
14  ACFT_MODEL_NAME        79 non-null    object
15  ACFT_MISSING_FLAG      0 non-null     float64
16  ACFT_DMG_DESC          82 non-null    object
17  FLT_ACTIVITY           13 non-null    object
18  FLT_PHASE              82 non-null    object
19  FAR_PART               1 non-null     float64
20  MAX_INJ_LVL            80 non-null    object
21  FATAL_FLAG             8 non-null     object
22  FLT_CRW_INJ_NONE       64 non-null    float64
23  FLT_CRW_INJ_MINOR      6 non-null     float64
24  FLT_CRW_INJ_SERIOUS    1 non-null     float64
25  FLT_CRW_INJ_FATAL      8 non-null     float64
```

26	FLT_CRW_INJ_UNK	0 non-null	float64
27	CBN_CRW_INJ_NONE	0 non-null	float64
28	CBN_CRW_INJ_MINOR	0 non-null	float64
29	CBN_CRW_INJ_SERIOUS	0 non-null	float64
30	CBN_CRW_INJ_FATAL	0 non-null	float64
31	CBN_CRW_INJ_UNK	1 non-null	float64
32	PAX_INJ_NONE	17 non-null	float64
33	PAX_INJ_MINOR	1 non-null	float64
34	PAX_INJ_SERIOUS	3 non-null	float64
35	PAX_INJ_FATAL	1 non-null	float64
36	PAX_INJ_UNK	0 non-null	float64
37	GRND_INJ_NONE	0 non-null	float64
38	GRND_INJ_MINOR	0 non-null	float64
39	GRND_INJ_SERIOUS	0 non-null	float64
40	GRND_INJ_FATAL	0 non-null	float64
41	GRND_INJ_UNK	1 non-null	float64

dtypes: float64(22), object(20)

memory usage: 27.4+ KB

```
[12]: faa_dataset["ACFT_MAKE_NAME"]
```

```
[12]: 0          BEECH
      1          VANS
      2          CESSNA
      3          LANCAIR
      4          CESSNA
      ...
      78         AERONCA
      79  NORTH AMERICAN
      80         CHAMPION
      81         BEECH
      82         CESSNA
      Name: ACFT_MAKE_NAME, Length: 83, dtype: object
```

```
[13]: faa_dataset["LOC_STATE_NAME"]
```

```
[13]: 0    North Carolina
      1         Florida
      2    New Jersey
      3    North Carolina
      4         Alaska
      ...
      78         Texas
      79         Arizona
      80    California
      81    California
      82         Alabama
```

Name: LOC\_STATE\_NAME, Length: 83, dtype: object

```
[14]: faa_dataset["ACFT_MODEL_NAME"]
```

```
[14]: 0      36
      1     RV7
      2    172
      3    235
      4    172
```

```
      ...
      78   058B
      79   F51
      80  8KCAB
      81    35
      82   182
```

Name: ACFT\_MODEL\_NAME, Length: 83, dtype: object

```
[15]: faa_dataset["RMK_TEXT"]
```

```
[15]: 0      AIRCRAFT CRASHED INTO TREES, THE 1 PERSON ON B...
      1      AIRCRAFT ON LANDING WENT OFF THE END OF THE RU...
      2      AIRCRAFT ON FINAL SUSTAINED A BIRD STRIKE, LAN...
      3      AIRCRAFT ON LANDING, GEAR COLLAPSED, ASHEVILLE...
      4      AIRCRAFT ON LANDING, NOSE GEAR COLLAPSED, TALK...
```

```
      ...
      78      AIRCRAFT ON LANDING, GROUND LOOPED, BULVERDE A...
      79      AIRCRAFT CRASHED UNDER UNKNOWN CIRCUMSTANCES, ...
      80      N9872R, BEECH M35 AIRCRAFT, AND N5057G, BELLAN...
      81      N9872R, BEECH M35 AIRCRAFT, AND N5057G, BELLAN...
      82      N784CP AIRCRAFT CRASHED INTO A WOODED AREA NEA...
```

Name: RMK\_TEXT, Length: 83, dtype: object

```
[16]: faa_dataset["FLT_PHASE"]
```

```
[16]: 0      UNKNOWN (UNK)
      1      LANDING (LDG)
      2      APPROACH (APR)
      3      LANDING (LDG)
      4      LANDING (LDG)
```

```
      ...
      78      LANDING (LDG)
      79      UNKNOWN (UNK)
      80      UNKNOWN (UNK)
      81      UNKNOWN (UNK)
      82      UNKNOWN (UNK)
```

Name: FLT\_PHASE, Length: 83, dtype: object



```
[17]: faa_dataset["EVENT_TYPE_DESC"]
```

```
[17]: 0    Accident
      1    Incident
      2    Incident
      3    Incident
      4    Incident
      ...
      78   Accident
      79   Accident
      80   Accident
      81   Accident
      82   Accident
      Name: EVENT_TYPE_DESC, Length: 83, dtype: object
```

```
[18]: faa_dataset["FATAL_FLAG"]
```

```
[18]: 0     Yes
      1    NaN
      2    NaN
      3    NaN
      4    NaN
      ...
      78   NaN
      79   Yes
      80   Yes
      81   Yes
      82   Yes
      Name: FATAL_FLAG, Length: 83, dtype: object
```

```
[ ]:
```

### 3: Extract the following attributes from the dataset:

1. Aircraft make name
2. State name
3. Aircraft model name
4. Text information
5. Flight phase
6. Event description type
7. Fatal flag

```
[19]: #Create a new dataframe with only the required columns
new_data_frame = pd.DataFrame({
    "Aircraft_make_name":faa_dataset["ACFT_MAKE_NAME"],
    "State_name":faa_dataset["LOC_STATE_NAME"],
    "Aircraft_model_name":faa_dataset["ACFT_MODEL_NAME"],
```

```

    "Text_information":faa_dataset["RMK_TEXT"],
    "Flight_phase":faa_dataset["FLT_PHASE"],
    "Event_description_type":faa_dataset["EVENT_TYPE_DESC"],
    "Fatal_flag":faa_dataset["FATAL_FLAG"]
})

```

```
[20]: new_data_frame
```

```

[20]: Aircraft_make_name      State_name Aircraft_model_name \
0          BEECH  North Carolina          36
1           VANS    Florida          RV7
2        CESSNA  New Jersey          172
3       LANCAIR  North Carolina          235
4        CESSNA    Alaska          172
..          ...
78       AERONCA    Texas          058B
79  NORTH AMERICAN    Arizona          F51
80       CHAMPION    California          8KCAB
81          BEECH    California          35
82       CESSNA    Alabama          182

                                Text_information      Flight_phase \
0  AIRCRAFT CRASHED INTO TREES, THE 1 PERSON ON B...  UNKNOWN (UNK)
1  AIRCRAFT ON LANDING WENT OFF THE END OF THE RU...  LANDING (LDG)
2  AIRCRAFT ON FINAL SUSTAINED A BIRD STRIKE, LAN...  APPROACH (APR)
3  AIRCRAFT ON LANDING, GEAR COLLAPSED, ASHEVILLE...  LANDING (LDG)
4  AIRCRAFT ON LANDING, NOSE GEAR COLLAPSED, TALK...  LANDING (LDG)
..          ...
78  AIRCRAFT ON LANDING, GROUND LOOPED, BULVERDE A...  LANDING (LDG)
79  AIRCRAFT CRASHED UNDER UNKNOWN CIRCUMSTANCES, ...  UNKNOWN (UNK)
80  N9872R, BEECH M35 AIRCRAFT, AND N5057G, BELLAN...  UNKNOWN (UNK)
81  N9872R, BEECH M35 AIRCRAFT, AND N5057G, BELLAN...  UNKNOWN (UNK)
82  N784CP AIRCRAFT CRASHED INTO A WOODED AREA NEA...  UNKNOWN (UNK)

Event_description_type  Fatal_flag
0          Accident      Yes
1          Incident     NaN
2          Incident     NaN
3          Incident     NaN
4          Incident     NaN
..          ...
78         Accident     NaN
79         Accident     Yes
80         Accident     Yes
81         Accident     Yes
82         Accident     Yes

```

[83 rows x 7 columns]

```
[21]: #View the type of the object
type(new_data_frame)
```

```
[21]: pandas.core.frame.DataFrame
```

```
[23]: #Check if the dataframe contains all the required attributes
new_data_frame.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 83 entries, 0 to 82
Data columns (total 7 columns):
#   Column                Non-Null Count  Dtype
---  -
0   Aircraft_make_name     78 non-null    object
1   State_name             83 non-null    object
2   Aircraft_model_name    79 non-null    object
3   Text_information       83 non-null    object
4   Flight_phase          82 non-null    object
5   Event_description_type 83 non-null    object
6   Fatal_flag            8 non-null     object
dtypes: object(7)
memory usage: 4.7+ KB
```

```
[24]: new_data_frame.index
```

```
[24]: RangeIndex(start=0, stop=83, step=1)
```

#### 4. Clean the dataset and replace the fatal flag NaN with “No”

```
[25]: #Replace all Fatal Flag missing values with the required output
new_data_frame["Fatal_flag"] = new_data_frame["Fatal_flag"].fillna("No")
```

```
[26]: new_data_frame
```

```
[26]:   Aircraft_make_name  State_name Aircraft_model_name  \
0          BEECH   North Carolina             36
1           VANS     Florida             RV7
2          CESSNA   New Jersey             172
3          LANCAIR  North Carolina             235
4          CESSNA     Alaska             172
..          ...           ...           ...
78         AERONCA     Texas             058B
79  NORTH AMERICAN     Arizona             F51
80         CHAMPION   California             8KCAB
81          BEECH     California             35
```

	Text_information	Flight_phase \
0	AIRCRAFT CRASHED INTO TREES, THE 1 PERSON ON B...	UNKNOWN (UNK)
1	AIRCRAFT ON LANDING WENT OFF THE END OF THE RU...	LANDING (LDG)
2	AIRCRAFT ON FINAL SUSTAINED A BIRD STRIKE, LAN...	APPROACH (APR)
3	AIRCRAFT ON LANDING, GEAR COLLAPSED, ASHEVILLE...	LANDING (LDG)
4	AIRCRAFT ON LANDING, NOSE GEAR COLLAPSED, TALK...	LANDING (LDG)
..	...	...
78	AIRCRAFT ON LANDING, GROUND LOOPED, BULVERDE A...	LANDING (LDG)
79	AIRCRAFT CRASHED UNDER UNKNOWN CIRCUMSTANCES, ...	UNKNOWN (UNK)
80	N9872R, BEECH M35 AIRCRAFT, AND N5057G, BELLAN...	UNKNOWN (UNK)
81	N9872R, BEECH M35 AIRCRAFT, AND N5057G, BELLAN...	UNKNOWN (UNK)
82	N784CP AIRCRAFT CRASHED INTO A WOODED AREA NEA...	UNKNOWN (UNK)

	Event_description_type	Fatal_flag
0	Accident	Yes
1	Incident	No
2	Incident	No
3	Incident	No
4	Incident	No
..	...	...
78	Accident	No
79	Accident	Yes
80	Accident	Yes
81	Accident	Yes
82	Accident	Yes

[83 rows x 7 columns]

```
[28]: #Verify if the missing values are replaced
new_data_frame["Fatal_flag"].isnull().values.any()
```

[28]: False

```
[29]: new_data_frame["Fatal_flag"].isnull().any()
```

[29]: False

```
[30]: new_data_frame.isnull().values.any()
```

[30]: True

```
[32]: new_data_frame.sum().sum()
```

```
[32]: 'North CarolinaFloridaNew JerseyNorth
CarolinaAlaskaHawaiiFloridaFloridaFloridaFloridaVirginiaArizonaNew
```

YorkLouisianaCaliforniaFloridaLouisianaMissouriFloridaTexasWest  
 VirginiaTexasArizonaMichiganColoradoTennesseeCaliforniaNew HampshireCaliforniaCo  
 loradoOklahomaFloridaTexasArkansasFloridaMassachusettsAlaskaMichiganFloridaCalif  
 orniaCaliforniaCaliforniaNew YorkOregonCaliforniaAlaskaCaliforniaNevadaMinnesota  
 CaliforniaVirginiaCaliforniaTexasFloridaSouth DakotaCaliforniaFloridaIdahoCalifo  
 rniaArizonaPennsylvaniaCaliforniaArizonaOregonMontanaOregonRhode IslandKansasFlo  
 ridaOhioVirginiaGeorgiaMarylandCaliforniaArkansasMarylandKansasTexasTexasArizona  
 CaliforniaCaliforniaAlabamaAIRCRAFT CRASHED INTO TREES, THE 1 PERSON ON BOARD  
 WAS FATALLY INJURED, NEAR MARSHVILLE, NCAIRCRAFT ON LANDING WENT OFF THE END OF  
 THE RUNWAY, STRUCK A VEHICLE AND FLIPPED OVER, TAVERNIER, FLAIRCRAFT ON FINAL  
 SUSTAINED A BIRD STRIKE, LANDED WITHOUT INCIDENT WITH MINOR DAMAGE, TRENTON,  
 NJAIRCRAFT ON LANDING, GEAR COLLAPSED, ASHEVILLE, NCAIRCRAFT ON LANDING, NOSE  
 GEAR COLLAPSED, TALKEETNA, ALASKAN80918 BELL 206B ROTORCRAFT CRASHED INTO THE  
 WATER NEAR THE PEARL HARBOR ARIZONA MEMORIAL, THE 5 PERSONS ON BOARD WERE  
 RESCUED, 3 SUSTAINED SERIOUS INJURIES, 2 SUSTAINED MINOR INJURIES, FORD ISLAND,  
 HONOLULU, HAWAIIAIRCRAFT GEAR COLLAPSED ON LANDING, BROOKSVILLE, FLAIRCRAFT ON  
 LANDING GEAR COLLAPSED, WINTER HAVEN, FLN859GT ATLAS AIR FLIGHT GTI33 BOEING 747  
 AIRCRAFT ON DEPARTURE TIRES BLEW OUT, AIRCRAFT RETURNED AND LANDED WITHOUT  
 INCIDENT, INSPECTION REVEALED DAMAGE TO FUSELAGE, MIAMI, FLAIRCRAFT, LSA  
 PARADISE P1, ON LANDING NOSE GEAR COLLAPSED, FERNANDINA BEACH, FLAIRCRAFT ON  
 LANDING WENT OFF THE RUNWAY INTO A DITCH, NEWPORT NEWS, VAN2194X FIREFLY 9  
 BALLOON, ON LANDING STRUCK THE SIDE OF A PARKED VEHICLE, NO INJURIES, NEAR  
 PHOENIX, AZAIRCRAFT GEAR COLLAPSED ON LANDING, ELMIRA, NYAIRCRAFT ON LANDING  
 NOSE GEAR COLLAPSED, LAKEFRONT AIRPORT, NEW ORLEANS, LAAIRCRAFT ON TAKEOFF  
 STRUCK RUNWAY LIGHT AT THE DEPARTURE END OF THE RUNWAY, RIVERSIDE, CAAIRCRAFT  
 FORCE LANDED ON A HIGHWAY, NEAR PEMBROOK PINES, FLAIRCRAFT ON TAKEOFF WENT OFF  
 THE GRASS STRIP AND FLIPPED OVER, NEAR BELL CITY, LAAIRCRAFT ON LANDING GEAR  
 COLLAPSED, SPRINGFIELD-BRANSON AIRPORT, SPRINGFIELD, MOAIRCRAFT ON DEPARTURE  
 STRUCK A BIRD, RETURNED AND LANDED WITHOUT INCIDENT, VERO BEACH, FLAIRCRAFT ON  
 LANDING WENT OFF THE RUNWAY, THROUGH A FENCE AND INTO A FIELD, AUSTIN EXECUTIVE  
 AIRPORT, AUSTIN, TXN1107T HUGHES 369D ROTORCRAFT MADE A PRECAUTIONARY LANDING ON  
 A HIGHWAY, NEAR CHARLESTON, WVAIRCRAFT FORCE LANDED IN A FIELD 2 MILES FROM  
 BENCHLEY, TXAIRCRAFT, LIGHT SPORT EVOLUTION REVO, ON TAKEOFF CRASHED AND CAUGHT  
 FIRE, THE 1 PERSON ON BOARD WAS FATALLY INJURED, BUCKEYE, AZAMERICAN AIRLINES  
 FLIGHT AAL1241 BOEING 737 AIRCRAFT AND SOUTHWEST AIRLINES FLIGHT SWA9 BOEING 737  
 AIRCRAFT ON TAXI TO DEICING PAD WHEN RIGHT WING OF AAL1241 STRUCK THE TAIL OF  
 SWA9, NO INJURIES, DAMAGE TO BE DETERMINED, REGISTRATIONS NOT REPORTED,  
 DETROIT, MIAIRCRAFT LANDED AND THE GEAR COLLAPSED, CENTENNIAL AIRPORT, DENVER,  
 COAIRCRAFT FORCE LANDED ON A HIGHWAY, NEAR DAYTON, TNAIRCRAFT ON LANDING TIPPED  
 ONTO ITS NOSE, PALO ALTO, CAN70TH DELTA PRIVATE JET FLIGHT DPJ70 CESSNA C56XL  
 AIRCRAFT ON TAXI WING STRUCK A POST, BERLIN, NHAIRCRAFT ON TAXI STRUCK A PARKED  
 AIRCRAFT, CHINO, CAAIRCRAFT LANDED GEAR UP, DURANGO, COAIRCRAFT LANDED GEAR UP,  
 TULSA, OKAIRCRAFT ON LANDING STRUCK A RUNWAY LIGHT, DAYTONA BEACH, FLAIRCRAFT ON  
 TAXI STRUCK A PARKED AIRCRAFT, WEST HOUSTON AIRPORT, HOUSTON, TXAIRCRAFT ON TAXI  
 WING STRUCK THE PAVEMENT AND CAUGHT FIRE, FORT SMITH, ARN341AG SILVER AIRWAYS  
 FLIGHT SIL70 SAAB 340B AIRCRAFT WHILE AT THE GATE, NUMBER 1 ENGINE CAUGHT FIRE  
 AND WAS EXTINGUISHED, PERSONS ON BOARD DEPLANED VIA STAIRS, NO INJURIES, DAMAGE

TO AIRCRAFT MINOR, ORLANDO, FLN273JB JETBLUE FLIGHT JBU891 EMBRAER ERJ190 AIRCRAFT WHILE PARKED AT GATE, WAS STRUCK BY A VEHICLE, NO INJURIES, PERSONS ON BOARD DEPLANDED, DAMAGE TO AIRCRAFT UNKNOWN, EAST BOSTON, MA AIRCRAFT ON TAKEOFF STRUCK A TAXIWAY SIGN, ANCHORAGE, ALASKA UPDATE: MINOR DAMAGE INCIDENT N180TH ENTROM TH180 HELICOPTER, FORCE LANDED ON A STREET, MENOMINEE, MI AIRCRAFT ON TAXI, GEAR COLLAPSED, WEST PALM BEACH, FL AIRCRAFT ON LANDING GEAR COLLAPSED, NAPA, CA AIRCRAFT, N704SL CESSNA 150, AND N57BC AVIAT S2 AIRCRAFT, COLLIDED ON THE RAMP, SANTA PAULA, CA AIRCRAFT, N704SL CESSNA 150, AND N57BC AVIAT S2 AIRCRAFT, COLLIDED ON THE RAMP, SANTA PAULA, CA AIRCRAFT LANDED, STRUCK A SNOWBANK AND CAUGHT FIRE, BROOKHAVEN, SHIRLEY, NY AIRCRAFT ON LANDING, GEAR COLLAPSED AND GROUND LOOPED, INDEPENDENCE, ORN3647A AEROSTAR INTERNATIONAL RX8 BALLOON, ON LANDING IN A FIELD 1 PERSON ON BOARD SUSTAINED SERIOUS INJURIES, NEAR PETALUMA, CA AIRCRAFT ON LANDING ALONG RIVER, FLIPPED OVER, 145 MILES FROM BETHEL, NEAR SLEETMUTE, ALASKA AIRCRAFT ON LANDING GROUND LOOPED AND GEAR COLLAPSED, COSTA MESA, CAN1181W BELL 47G ROTORCRAFT LANDED OFF THE RUNWAY ONTO ITS SIDE, CARSON CITY, NV AMERICAN AIRLINES FLIGHT AAL476 AIRBUS A319 AIRCRAFT, REGISTRATION NOT REPORTED, ENCOUNTERED TURBULENCE, 1 PERSON ON BOARD SUSTAINED A SERIOUS INJURY, LANDED WITHOUT INCIDENT MINNEAPOLIS, MN AIRCRAFT ON LANDING NOSE GEAR COLLAPSED, SALINAS, CA AIRCRAFT ON TAXI COLLIDED WITH A VEHICLE, WASHINGTON DULLES AIRPORT, CHANTILLY, VA AIRCRAFT ON LANDING THE GEAR COLLAPSED, PETALUMA, CA AIRCRAFT CRASHED UNDER UNKNOWN CIRCUMSTANCES. WEATHERFORD, TX AIRCRAFT CRASHED UNDER UNKNOWN CIRCUMSTANCES. DESTIN, FL AIRCRAFT ON TAXI, PROP STRUCK THE GROUND, STURGIS, SD AIRCRAFT CRASHED UNDER UNKNOWN CIRCUMSTANCES AND CAUGHT FIRE, THE 2 PERSONS ON BOARD WERE FATALLY INJURED, NEAR TULARE AIRPORT, TULARE, CA HK4699G COLUMBIA REGISTRATION, PIPER PA34 AIRCRAFT, ON LANDING GEAR COLLAPSED, PEMBROKE PINES, HOLLYWOOD, FL AIRCRAFT ON LANDING GEAR COLLAPSED, HELLS CANYON, IDA AIRCRAFT, LIGHT SPORT DOVA AS SKYLARK, ON LANDING NOSE GEAR COLLAPSED AND THE PROP STRUCK THE RUNWAY, PALO ALTO, CA AIRCRAFT LANDED AND WENT OFF THE END OF THE RUNWAY, MESA, AZ AIRCRAFT ON APPROACH TO LAND, STRUCK TREES, LANDED WITHOUT INCIDENT, WILLIAMSPORT, PA AIRCRAFT FORCE LANDED IN THE WETLAND/SLOUGH AREA OFF THE AIRPORT, SANTA BARBARA, CA AIRCRAFT ON TAKEOFF, STRUCK A BIRD, RETURNED AND LANDED WITHOUT INCIDENT, GOODYEAR, AZ AIRCRAFT ON LANDING, GEAR COLLAPSED, EUGENE, OR AIRCRAFT ON LANDING, GEAR COLLAPSED AND STRUCK THE WING, BILLINGS, MT AIRCRAFT ON LANDING WENT OFF THE RUNWAY INTO A FENCE, AND FLIPPED, GOLD BEACH, OR AIRCRAFT ON LANDING STRUCK A BIRD, MIDDLETOWN, RI AIRCRAFT DURING FLIGHT, WINDOW SEPARATED FROM FUSelage, LANDED WITHOUT INCIDENT, GOODLAND, KS AIRCRAFT ON LANDING, NOSE GEAR COLLAPSED, CRYSTAL RIVER, FL AIRCRAFT ON LANDING, GEAR COLLAPSED, DEFIANCE, OH AIRCRAFT ON TAXI, GEAR RETRACTED, CHESAPEAKE, VA AIRCRAFT ON LANDING, GEAR COLLAPSED, GRIFFIN, GA AIRCRAFT ON LANDING WENT OFF THE END OF THE RUNWAY, GAITHERSBURG, MD AIRCRAFT ON LANDING, NOSE GEAR COLLAPSED, MONTEREY, CA AIRCRAFT ON LANDING, GEAR COLLAPSED, WEST MEMPHIS, AR AIRCRAFT ON LANDING, STRUCK A SIGN AND RUNWAY LIGHTS, EASTON, MD AIRCRAFT LANDED GEAR UP, EUREKA, KS SOUTHWEST AIRLINES FLIGHT SWA3817 BOEING 737 AIRCRAFT, REGISTRATION NOT REPORTED, ENCOUNTERED TURBULENCE AND 1 FLIGHT ATTENDANT SUSTAINED UNKNOWN INJURIES AND TRANSPORTED TO THE HOSPITAL, DIVERTED AND LANDED WITHOUT INCIDENT, EL PASO, TX AIRCRAFT ON LANDING, GROUND LOOPED, BULVERDE AIRPARK, SAN ANTONIO, TX AIRCRAFT CRASHED UNDER UNKNOWN CIRCUMSTANCES,

THE 2 PERSONS ON BOARD WERE FATALLY INJURED, NEAR MARICOPA, AZN9872R, BEECH M35 AIRCRAFT, AND N5057G, BELLANCE 8KCAB AIRCRAFT, COLLIDED MIDAIR OVER THE PACIFIC OCEAN OFF THE COAST, THE 2 PERSONS ON BOARD N9872R WERE FATALLY INJURED, THE 1 PERSON ON BOARD N5057G WAS FATALLY INJURED, WRECKAGE LOCATED OFF THE COAST NEAR SAN PEDRO, CAN9872R, BEECH M35 AIRCRAFT, AND N5057G, BELLANCE 8KCAB AIRCRAFT, COLLIDED MIDAIR OVER THE PACIFIC OCEAN OFF THE COAST, THE 2 PERSONS ON BOARD N9872R WERE FATALLY INJURED, THE 1 PERSON ON BOARD N5057G WAS FATALLY INJURED, WRECKAGE LOCATED OFF THE COAST NEAR SAN PEDRO, CAN784CP AIRCRAFT CRASHED INTO A WOODED AREA NEAR THE AIRPORT, THE 2 PERSONS ON BOARD WERE FATALLY INJURED, MOBILE, AL UPDATE REGISTRATION N784CP,AccidentIncidentIncidentIncidentIncidentAc  
cidentIncidentIncidentIncidentIncidentIncidentIncidentIncidentIncidentIncidentIn  
cidentAccidentIncidentIncidentIncidentIncidentIncidentAccidentAccidentIncidentIncidentIn  
cidentIncidentIncidentIncidentIncidentIncidentIncidentIncidentIncidentIncidentIn  
cidentIncidentIncidentIncidentIncidentAccidentAccidentAccidentAccidentAccidentAc  
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cidentIncidentIncidentIncidentIncidentAccidentAccidentIncidentIncidentAccidentAc  
cidentIncidentIncidentIncidentIncidentIncidentIncidentIncidentIncidentIncidentIn  
cidentIncidentIncidentAccidentAccidentAccidentAccidentAccidentYesNoNoNoNoNoNoNo  
oNo  
NoNoNoNoNoNoYesNoYesNoYesYesYesYes '

```
[33]: #Check the number of observations
new_data_frame.count()
```

```
[33]: Aircraft_make_name      78
      State_name             83
      Aircraft_model_name    79
      Text_information        83
      Flight_phase           82
      Event_description_type  83
      Fatal_flag             83
      dtype: int64
```

```
[34]: new_data_frame.Aircraft_model_name.count()
```

[34] : 79

```
[35]: new_data_frame["Aircraft_model_name"].count()
```

[35] : 79

```
[36]: new_data_frame.Aircraft_model_name.isnull().any()
```

```
[36]: True
```

5. Remove all the observations where aircraft names are not available

```
[37]: #Drop the unwanted values/observations from the dataset
new_data_frame = new_data_frame[new_data_frame.Aircraft_model_name.
↳isnull()==False]
```

```
[38]: new_data_frame.count()
```

```
[38]: Aircraft_make_name      77
      State_name             79
      Aircraft_model_name    79
      Text_information        79
      Flight_phase           78
      Event_description_type  79
      Fatal_flag             79
      dtype: int64
```

```
[39]: new_data_frame.Aircraft_model_name.isnull().any()
```

```
[39]: False
```

## 6. Find the aircraft types and their occurrences in the dataset

```
[50]: #Check the number of observations now to compare it with the original dataset_
↳and see how many values have been dropped
dropped_values = faa_dataset.count() - new_data_frame.count()
dropped_values.count()
```

```
[50]: 0
```

```
[51]: faa_dataset.count()
```

```
[51]: UPDATED      83
      ENTRY_DATE   83
      EVENT_LCL_DATE 83
      EVENT_LCL_TIME 83
      LOC_CITY_NAME  83
      LOC_STATE_NAME 83
      LOC_CNTRY_NAME  2
      RMK_TEXT       83
      EVENT_TYPE_DESC 83
      FSDO_DESC       81
      REGIST_NBR      83
      FLT_NBR         6
      ACFT_OPRTR      7
      ACFT_MAKE_NAME  78
      ACFT_MODEL_NAME 79
      ACFT_MISSING_FLAG 0
      ACFT_DMG_DESC   82
```



```

FLT_ACTIVITY          13
FLT_PHASE             82
FAR_PART              1
MAX_INJ_LVL           80
FATAL_FLAG            8
FLT_CRW_INJ_NONE      64
FLT_CRW_INJ_MINOR     6
FLT_CRW_INJ_SERIOUS   1
FLT_CRW_INJ_FATAL     8
FLT_CRW_INJ_UNK        0
CBN_CRW_INJ_NONE      0
CBN_CRW_INJ_MINOR     0
CBN_CRW_INJ_SERIOUS   0
CBN_CRW_INJ_FATAL     0
CBN_CRW_INJ_UNK        1
PAX_INJ_NONE          17
PAX_INJ_MINOR          1
PAX_INJ_SERIOUS        3
PAX_INJ_FATAL          1
PAX_INJ_UNK            0
GRND_INJ_NONE          0
GRND_INJ_MINOR         0
GRND_INJ_SERIOUS       0
GRND_INJ_FATAL         0
GRND_INJ_UNK           1
dtype: int64

```

```
[52]: new_data_frame.count()
```

```

[52]: Aircraft_make_name      77
      State_name              79
      Aircraft_model_name     79
      Text_information         79
      Flight_phase             78
      Event_description_type    79
      Fatal_flag               79
      dtype: int64

```

```
[53]: dropped_values = faa_dataset.count() - new_data_frame.count()
      dropped_values.count()
```

```
[53]: 0
```

```

[56]: #Group the dataset by aircraft name
      new_data_frame.groupby(["Aircraft_model_name"]).count()

```

[56]:

	Aircraft_make_name	State_name	Text_information \
Aircraft_model_name			
140	1	1	1
150	3	3	3
152	2	2	2
172	4	4	4
175	1	1	1
180	1	1	1
182	2	2	2
206	3	3	3
210	4	4	4
235	1	1	1
2T1A	1	1	1
310	2	2	2
33	1	1	1
340	1	1	1
35	3	3	3
36	3	3	3
369	1	1	1
47G	1	1	1
500	1	1	1
55	1	1	1
560	1	1	1
737	2	2	2
747	1	1	1
8KCAB	2	2	2
A319	1	1	1
AA1	1	1	1
BT15	1	1	1
CTLS	1	1	1
EAGLE II	1	1	1
ERJ190	1	1	1
F51	1	1	1
FIREFLY	0	1	1
GC1B	1	1	1
GULFSTREAM200	1	1	1
IV	1	1	1
KITFOX	0	1	1
M20E	1	1	1
M20K	2	2	2
M20M	1	1	1
M4	1	1	1
NA265	1	1	1
O58B	1	1	1
PA20	1	1	1
PA24	2	2	2
PA28	3	3	3

PA31	1	1	1
PA34	3	3	3
PT19	1	1	1
RV7	1	1	1
RX8	1	1	1
S2	1	1	1
T34	1	1	1
TB21	1	1	1
TB9	1	1	1

Aircraft_model_name	Flight_phase	Event_description_type	Fatal_flag
140	1	1	1
150	3	3	3
152	2	2	2
172	4	4	4
175	1	1	1
180	1	1	1
182	2	2	2
206	3	3	3
210	4	4	4
235	1	1	1
2T1A	1	1	1
310	2	2	2
33	1	1	1
340	1	1	1
35	3	3	3
36	3	3	3
369	1	1	1
47G	1	1	1
500	1	1	1
55	1	1	1
560	1	1	1
737	1	2	2
747	1	1	1
8KCAB	2	2	2
A319	1	1	1
AA1	1	1	1
BT15	1	1	1
CTLS	1	1	1
EAGLE II	1	1	1
ERJ190	1	1	1
F51	1	1	1
FIREFLY	1	1	1
GC1B	1	1	1
GULFSTREAM200	1	1	1
IV	1	1	1

KITFOX	1	1	1
M20E	1	1	1
M20K	2	2	2
M20M	1	1	1
M4	1	1	1
NA265	1	1	1
O58B	1	1	1
PA20	1	1	1
PA24	2	2	2
PA28	3	3	3
PA31	1	1	1
PA34	3	3	3
PT19	1	1	1
RV7	1	1	1
RX8	1	1	1
S2	1	1	1
T34	1	1	1
TB21	1	1	1
TB9	1	1	1

```
[57]: #View the number of times each aircraft type appears in the dataset (Hint: use
      ↳ the size() method)
      new_data_frame.groupby(["Aircraft_make_name"]).count()
```

```
[57]:
```

	State_name	Aircraft_model_name	Text_information \
Aircraft_make_name			
AERO COMMANDER	1	1	1
AERONCA	1	1	1
AEROSTAR INTERNATIONAL	1	1	1
AIRBUS	1	1	1
BEECH	9	9	9
BELL	2	2	2
BOEING	3	3	3
CESSNA	23	23	23
CHAMPION	2	2	2
CHRISTEN	1	1	1
CONSOLIDATED VULTEE	1	1	1
EMBRAER	1	1	1
FAIRCHILD	1	1	1
FLIGHT DESIGN	1	1	1
GLOBE	1	1	1
GREAT LAKES	1	1	1
GRUMMAN	1	1	1
GULFSTREAM	1	1	1
HUGHES	1	1	1
LANCAIR	2	2	2
MAULE	1	1	1

MOONEY	4	4	4
NORTH AMERICAN	1	1	1
PIPER	10	10	10
PITTS	1	1	1
SAAB	1	1	1
SABRELINER	1	1	1
SOCATA	2	2	2
VANS	1	1	1

Aircraft_make_name	Flight_phase	Event_description_type	Fatal_flag
AERO COMMANDER	1	1	1
AERONCA	1	1	1
AEROSTAR INTERNATIONAL	1	1	1
AIRBUS	1	1	1
BEECH	9	9	9
BELL	2	2	2
BOEING	2	3	3
CESSNA	23	23	23
CHAMPION	2	2	2
CHRISTEN	1	1	1
CONSOLIDATED VULTEE	1	1	1
EMBRAER	1	1	1
FAIRCHILD	1	1	1
FLIGHT DESIGN	1	1	1
GLOBE	1	1	1
GREAT LAKES	1	1	1
GRUMMAN	1	1	1
GULFSTREAM	1	1	1
HUGHES	1	1	1
LANCAIR	2	2	2
MAULE	1	1	1
MOONEY	4	4	4
NORTH AMERICAN	1	1	1
PIPER	10	10	10
PITTS	1	1	1
SAAB	1	1	1
SABRELINER	1	1	1
SOCATA	2	2	2
VANS	1	1	1

## 7: Display the observations where fatal flag is “Yes”

```
[58]: #Group the dataset by fatal flag
new_data_frame.groupby(["Fatal_flag"]).count()
```

```
[58]:      Aircraft_make_name  State_name  Aircraft_model_name  \
Fatal_flag
No                70                72                72
Yes                7                 7                 7
```

```
      Text_information  Flight_phase  Event_description_type
Fatal_flag
No                72                71                72
Yes                7                 7                 7
```

```
[64]: #View the total number of fatal and non-fatal accidents
new_data_frame[new_data_frame.Fatal_flag=="Yes"]
```

```
[64]:      Aircraft_make_name      State_name Aircraft_model_name  \
0          BEECH  North Carolina          36
53         PIPER      Florida          PA28
55    FLIGHT DESIGN    California          CTLS
79   NORTH AMERICAN      Arizona          F51
80        CHAMPION    California      8KCAB
81         BEECH    California          35
82        CESSNA      Alabama      182

      Text_information  Flight_phase  \
0  AIRCRAFT CRASHED INTO TREES, THE 1 PERSON ON B...  UNKNOWN (UNK)
53  AIRCRAFT CRASHED UNDER UNKNOWN CIRCUMSTANCES. ...  UNKNOWN (UNK)
55  AIRCRAFT CRASHED UNDER UNKNOWN CIRCUMSTANCES A...  UNKNOWN (UNK)
79  AIRCRAFT CRASHED UNDER UNKNOWN CIRCUMSTANCES, ...  UNKNOWN (UNK)
80  N9872R, BEECH M35 AIRCRAFT, AND N5057G, BELLAN...  UNKNOWN (UNK)
81  N9872R, BEECH M35 AIRCRAFT, AND N5057G, BELLAN...  UNKNOWN (UNK)
82  N784CP AIRCRAFT CRASHED INTO A WOODED AREA NEA...  UNKNOWN (UNK)

      Event_description_type  Fatal_flag
0          Accident        Yes
53          Accident        Yes
55          Accident        Yes
79          Accident        Yes
80          Accident        Yes
81          Accident        Yes
82          Accident        Yes
```

```
[65]: new_data_frame[new_data_frame.Fatal_flag=="No"]
```

```
[65]:      Aircraft_make_name      State_name Aircraft_model_name  \
1          VANS      Florida          RV7
2        CESSNA    New Jersey          172
3    LANCAIR  North Carolina          235
4        CESSNA      Alaska          172
```

5	BELL	Hawaii	206
..	...	...	...
74	SABRELINER	Arkansas	NA265
75	MOONEY	Maryland	M20K
76	PIPER	Kansas	PA24
77	BOEING	Texas	737
78	AERONCA	Texas	058B

	Text_information	Flight_phase \
1	AIRCRAFT ON LANDING WENT OFF THE END OF THE RU...	LANDING (LDG)
2	AIRCRAFT ON FINAL SUSTAINED A BIRD STRIKE, LAN...	APPROACH (APR)
3	AIRCRAFT ON LANDING, GEAR COLLAPSED, ASHEVILLE...	LANDING (LDG)
4	AIRCRAFT ON LANDING, NOSE GEAR COLLAPSED, TALK...	LANDING (LDG)
5	N80918 BELL 206B ROTORCRAFT CRASHED INTO THE W...	UNKNOWN (UNK)
..	...	...
74	AIRCRAFT ON LANDING, GEAR COLLAPSED, WEST MEMP...	LANDING (LDG)
75	AIRCRAFT ON LANDING, STRUCK A SIGN AND RUNWAY ...	LANDING (LDG)
76	AIRCRAFT LANDED GEAR UP, EUREKA, KS	LANDING (LDG)
77	SOUTHWEST AIRLINES FLIGHT SWA3817 BOEING 737 A...	NaN
78	AIRCRAFT ON LANDING, GROUND LOOPED, BULVERDE A...	LANDING (LDG)

	Event_description_type	Fatal_flag
1	Incident	No
2	Incident	No
3	Incident	No
4	Incident	No
5	Accident	No
..	...	...
74	Incident	No
75	Incident	No
76	Incident	No
77	Incident	No
78	Accident	No

[72 rows x 7 columns]

```
[66]: #Create a new dataframe to view only the fatal accidents (Fatal Flag values = Yes)
```

```
fatal_accidents = new_data_frame[new_data_frame.Fatal_flag=="Yes"]
```

```
[68]: fatal_accidents
```

```
[68]: Aircraft_make_name    State_name Aircraft_model_name \
0          BEECH    North Carolina          36
53         PIPER      Florida          PA28
55    FLIGHT DESIGN    California          CTLS
79    NORTH AMERICAN    Arizona          F51
```

80	CHAMPION	California	8KCAB
81	BEECH	California	35
82	CESSNA	Alabama	182

	Text_information	Flight_phase	\
0	AIRCRAFT CRASHED INTO TREES, THE 1 PERSON ON B...	UNKNOWN	(UNK)
53	AIRCRAFT CRASHED UNDER UNKNOWN CIRCUMSTANCES. ...	UNKNOWN	(UNK)
55	AIRCRAFT CRASHED UNDER UNKNOWN CIRCUMSTANCES A...	UNKNOWN	(UNK)
79	AIRCRAFT CRASHED UNDER UNKNOWN CIRCUMSTANCES, ...	UNKNOWN	(UNK)
80	N9872R, BEECH M35 AIRCRAFT, AND N5057G, BELLAN...	UNKNOWN	(UNK)
81	N9872R, BEECH M35 AIRCRAFT, AND N5057G, BELLAN...	UNKNOWN	(UNK)
82	N784CP AIRCRAFT CRASHED INTO A WOODED AREA NEA...	UNKNOWN	(UNK)

	Event_description_type	Fatal_flag
0	Accident	Yes
53	Accident	Yes
55	Accident	Yes
79	Accident	Yes
80	Accident	Yes
81	Accident	Yes
82	Accident	Yes

[ ]:

[ ]: