Bird Strikes Analysis

In the field of transportation and communication, particularly in aviation, bird strikes pose a significant safety concern. A bird strike occurs when a bird collides with an aircraft during flight, takeoff, or landing, potentially causing damage to the aircraft structure and posing a risk to passengers and crew. Despite efforts to mitigate this threat, bird strikes remain a persistent issue, leading to fatal accidents and financial losses for airlines. The objective of this project is to analyze and understand the data collected on bird strikes by the Federal Aviation Administration (FAA) between 2000-2011,by examining trends, patterns, and factors associated with bird strikes.

In [1]:
```
# importing libraries
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

import warnings
warnings.filterwarnings("ignore")
```

In [2]:
```
# reading the data
bird = pd.read_csv("Bird Strikes.csv")
```

In [3]:
```
bird.head()
```

Out[3]:

	Record ID	Aircraft: Type	Airport: Name	Altitude bin	Aircraft: Make/Model	Wildlife: Number struck	Wildlife: Number Struck Actual	Effect: Impact to flight	FlightDate	Effect: Indicated Damage	...	Remains of wildlife sent to Smithsonian	Remarks	Wildlife: Size	Conditions: Sky	Wildlife: Species	Pilot warned of birds or wildlife?	Cost: Total $	Fee above ground
0	202152	Airplane	LAGUARDIA NY	> 1000 ft	B-737-400	Over 100	859	Engine Shut Down	11/23/00 0:00	Caused damage	...	False	FLT 753. PILOT REPTD A HUNDRED BIRDS ON UNKN T...	Medium	No Cloud	Unknown bird - medium	N	30,736	1,500
1	208159	Airplane	DALLAS/FORT WORTH INTL ARPT	< 1000 ft	MD-80	Over 100	424	NaN	7/25/01 0:00	Caused damage	...	False	102 CARCASSES FOUND. 1 LDG LIGHT ON NOSE GEAR ...	Small	Some Cloud	Rock pigeon	Y	0	0
2	207601	Airplane	LAKEFRONT AIRPORT	< 1000 ft	C-500	Over 100	261	NaN	9/14/01 0:00	No damage	...	False	FLEW UNDER A VERY LARGE FLOCK OF BIRDS OVER AP...	Small	No Cloud	European starling	N	0	50
3	215953	Airplane	SEATTLE-TACOMA INTL	< 1000 ft	B-737-400	Over 100	806	Precautionary Landing	9/5/02 0:00	No damage	...	False	NOTAM WARNING. 26 BIRDS HIT THE A/C, FORCING A...	Small	Some Cloud	European starling	Y	0	50
4	219878	Airplane	NORFOLK INTL	< 1000 ft	CL-RJ100/200	Over 100	942	NaN	6/23/03 0:00	No damage	...	False	NO DMG REPTD.	Small	No Cloud	European starling	N	0	50

5 rows × 26 columns

In [4]:
```
bird.shape
```

Out[4]:
```
(25558, 26)
```

In [ ]:
```
## data set contains 25558 rows and 26 columns
```

In [6]:
```
## Checking info of data
bird.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 25558 entries, 0 to 25557
Data columns (total 26 columns):
 #   Column                                 Non-Null Count  Dtype 
---  ------                                 --------------  ----- 
 0   Record ID                              25558 non-null  int64 
 1   Aircraft: Type                         25429 non-null  object
 2   Airport: Name                          25429 non-null  object
 3   Altitude bin                           25429 non-null  object
 4   Aircraft: Make/Model                   25558 non-null  object
 5   Wildlife: Number struck                25429 non-null  object
 6   Wildlife: Number Struck Actual         25558 non-null  int64 
 7   Effect: Impact to flight               2078 non-null   object
 8   FlightDate                             25429 non-null  object
 9   Effect: Indicated Damage               25558 non-null  object
 10  Aircraft: Number of engines?           25291 non-null  object
 11  Aircraft: Airline/Operator             25429 non-null  object
 12  Origin State                           25109 non-null  object
 13  When: Phase of flight                  25429 non-null  object
 14  Conditions: Precipitation              2015 non-null   object
 15  Remains of wildlife collected?         25558 non-null  bool  
 16  Remains of wildlife sent to Smithsonian  25558 non-null  bool  
 17  Remarks                                20787 non-null  object
 18  Wildlife: Size                         25429 non-null  object
 19  Conditions: Sky                        25558 non-null  object
 20  Wildlife: Species                      25558 non-null  object
 21  Pilot warned of birds or wildlife?     25429 non-null  object
 22  Cost: Total $                          25558 non-null  object
 23  Feet above ground                      25429 non-null  object
 24  Number of people injured               25558 non-null  int64 
 25  Is Aircraft Large?                     25429 non-null  object
dtypes: bool(2), int64(3), object(21)
memory usage: 4.7+ MB
```

In [8]:
```
##Checking for missing values
bird.isnull().sum()
```

Out[8]:
```
Record ID                                  0
Aircraft: Type                           129
Airport: Name                            129
Altitude bin                             129
Aircraft: Make/Model                       0
Wildlife: Number struck                  129
Wildlife: Number Struck Actual             0
Effect: Impact to flight               23480
FlightDate                               129
Effect: Indicated Damage                   0
Aircraft: Number of engines?             267
Aircraft: Airline/Operator               129
Origin State                             449
When: Phase of flight                    129
Conditions: Precipitation              23543
Remains of wildlife collected?             0
Remains of wildlife sent to Smithsonian    0
Remarks                                 4771
Wildlife: Size                           129
Conditions: Sky                            0
Wildlife: Species                          0
Pilot warned of birds or wildlife?       129
Cost: Total $                              0
Feet above ground                        129
Number of people injured                   0
Is Aircraft Large?                       129
dtype: int64
```

In [9]:
```
bird.isnull().mean()*100
```

Out[9]:
```
Record ID                               0.000000
Aircraft: Type                          0.504734
Airport: Name                           0.504734
Altitude bin                            0.504734
Aircraft: Make/Model                    0.000000
Wildlife: Number struck                 0.504734
Wildlife: Number Struck Actual          0.000000
Effect: Impact to flight               91.869473
FlightDate                              0.504734
Effect: Indicated Damage                0.000000
Aircraft: Number of engines?            1.044683
Aircraft: Airline/Operator              0.504734
Origin State                            1.756788
When: Phase of flight                   0.504734
Conditions: Precipitation              92.115972
Remains of wildlife collected?          0.000000
Remains of wildlife sent to Smithsonian    0.000000
Remarks                                18.667345
Wildlife: Size                          0.504734
Conditions: Sky                         0.000000
Wildlife: Species                       0.000000
Pilot warned of birds or wildlife?      0.504734
Cost: Total $                           0.000000
Feet above ground                       0.504734
Number of people injured                0.000000
Is Aircraft Large?                      0.504734
dtype: float64
```

In [ ]:
```
## Removing the null values
```

In [7]:
```
bird_cleaned = bird.dropna(subset=['Aircraft: Type','Airport: Name','Altitude bin','Wildlife: Number struck','FlightDate','Aircraft: Number of engines?','Origi
```

In [8]:
```
bird_cleaned.isnull().sum()
```

Out[8]:
```
Record ID                                  0
Aircraft: Type                             0
Airport: Name                              0
Altitude bin                               0
Aircraft: Make/Model                       0
Wildlife: Number struck                    0
Wildlife: Number Struck Actual             0
Effect: Impact to flight               22752
FlightDate                                 0
Effect: Indicated Damage                   0
Aircraft: Number of engines?               0
Aircraft: Airline/Operator                 0
Origin State                               0
When: Phase of flight                      0
Conditions: Precipitation              22771
Remains of wildlife collected?             0
Remains of wildlife sent to Smithsonian    0
Remarks                                 4605
Wildlife: Size                             0
Conditions: Sky                            0
Wildlife: Species                          0
Pilot warned of birds or wildlife?         0
Cost: Total $                              0
Feet above ground                          0
Number of people injured                   0
Is Aircraft Large?                         0
dtype: int64
```

In [13]:
```
bird['Conditions: Precipitation'].unique()
```

Out[13]:
```
array([nan, 'Snow', 'Fog', 'Rain', 'Fog, Rain', 'Rain, Snow',
       'Fog, Rain, Snow', 'Fog, Snow'], dtype=object)
```

In [20]:
```
# create a Pandas Excel writer using XlsxWriter as the engine
bird_cleaned.to_csv("bird_cleaned_dataset.csv", index=False)
```

In [ ]:
```

```

We will use this dataset to peform the data visualization of Bird strike Analysis in Power BI

In [ ]:
```

```