



ANALYSIS OF 100 YEARS OF PLANE CRASHES

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INTRODUCTION TO THE DATA

- History of **plane crashes from 1908 to 2009**
- Explore data to understand patterns utilizing:
 - Plane Crash Data set from Opendata
- Data set has 5268 crashes and 13 data points per crash
- Numpy, pandas, matplotlib and dateutil

QUESTIONS

- What was the most unsafe flights based on:
 - Operators
 - Plane types
- What were some of the reasons for plane crashes?
- Where did the most plane crashes occur?
- What decade had the most number of casualties?
- What percentage of total passengers who travelled died as a result of a plane crashes? (1970 to 2008)

DATA CLEANUP

Narrowed
down from 13
to 9 useful
columns

Generated new
columns to
usefully identify
the make of the
plane, flight
operators and
crash location

Generated
graphs using
matplotlib to
understand
correlations

CLEANED UP DATA COLUMNS

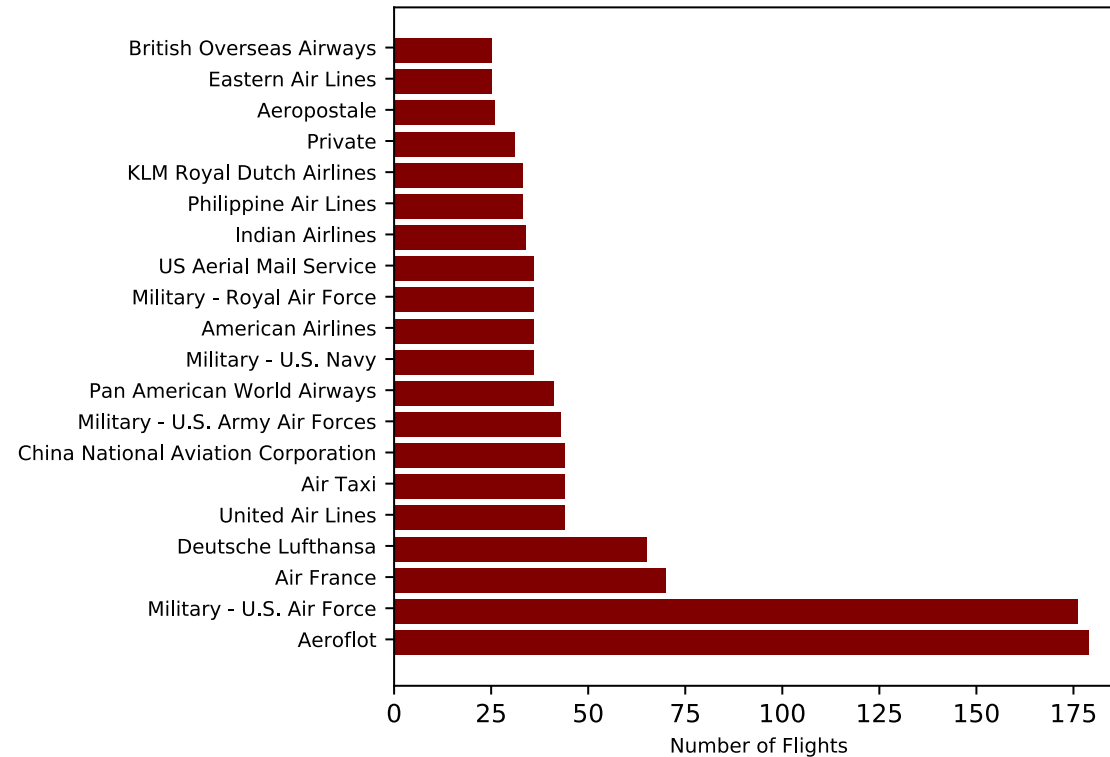
- Decade
- Year
- Operator (e.g. Air France)
- Operator Type (e.g. Military, Passenger)
- Plane Manufacturer (e.g. Boeing)
- Passengers aboard
- Fatalities
- Accident Reason (e.g. Machine Error, Weather)
- Location

LIMITATIONS OF THE DATA SET

- Original data set only looks at crashed flights causing fatalities
 - Does not include information about flights that did not crash
 - This would be important to compute safety rates
- Hence we augmented with another data set
 - Gives total number of passengers travelled per year
 - Data set starts from 1970 whereas original data set starts from 1908

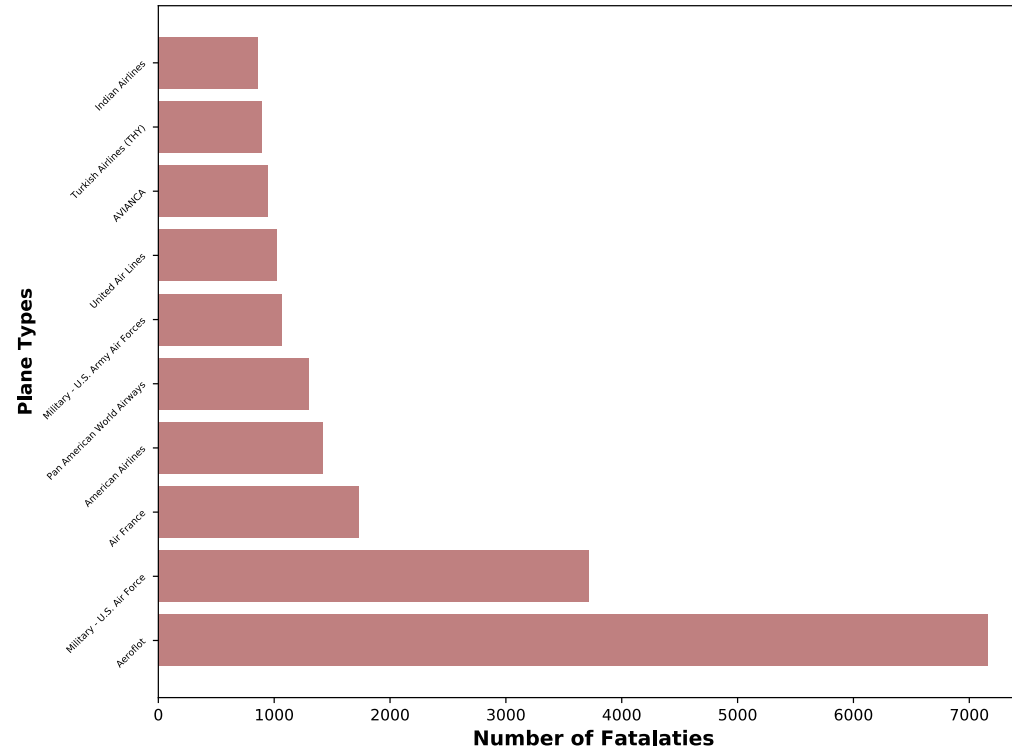
WHAT IS THE MOST UNSAFE OPERATORS BY NUMBER OF CRASHES?

- Aeroflot with 179 crashes
- The US Air Force is second with 176 cashes
- Best to compare Aeroflot with Air France



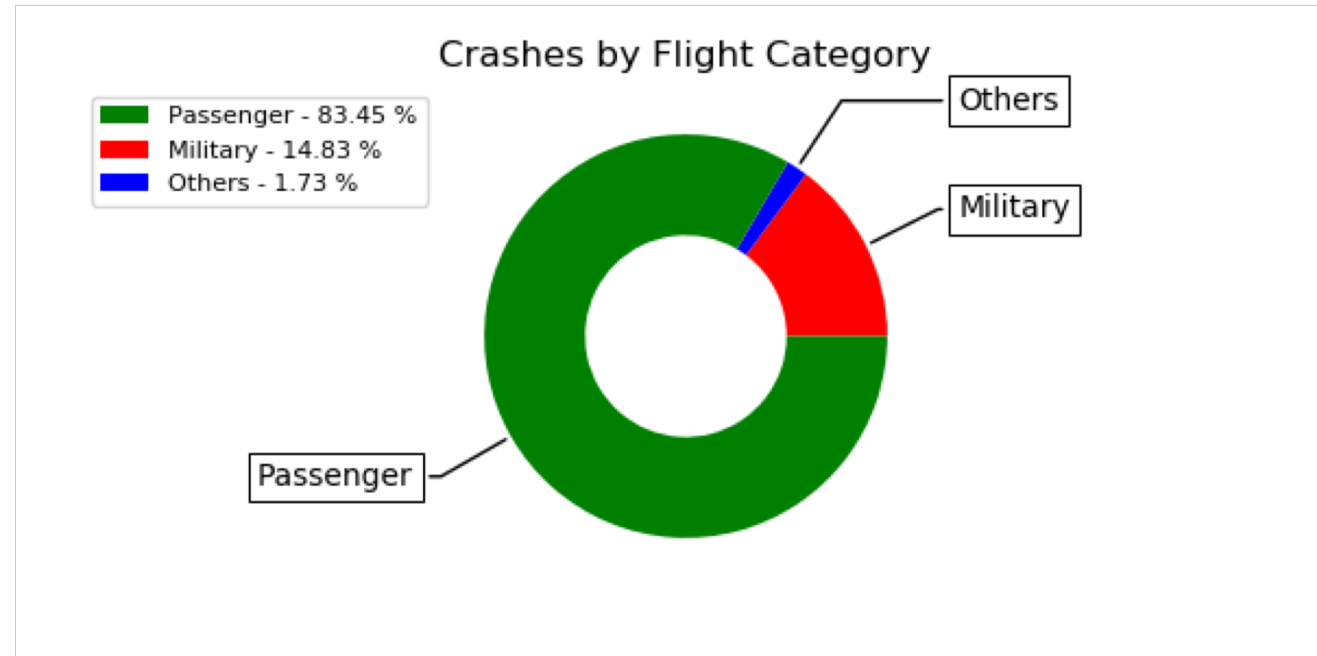
WHAT IS THE MOST UNSAFE OPERATORS BY NUMBER OF FATALITIES?

- Aeroflot has most number of fatalities



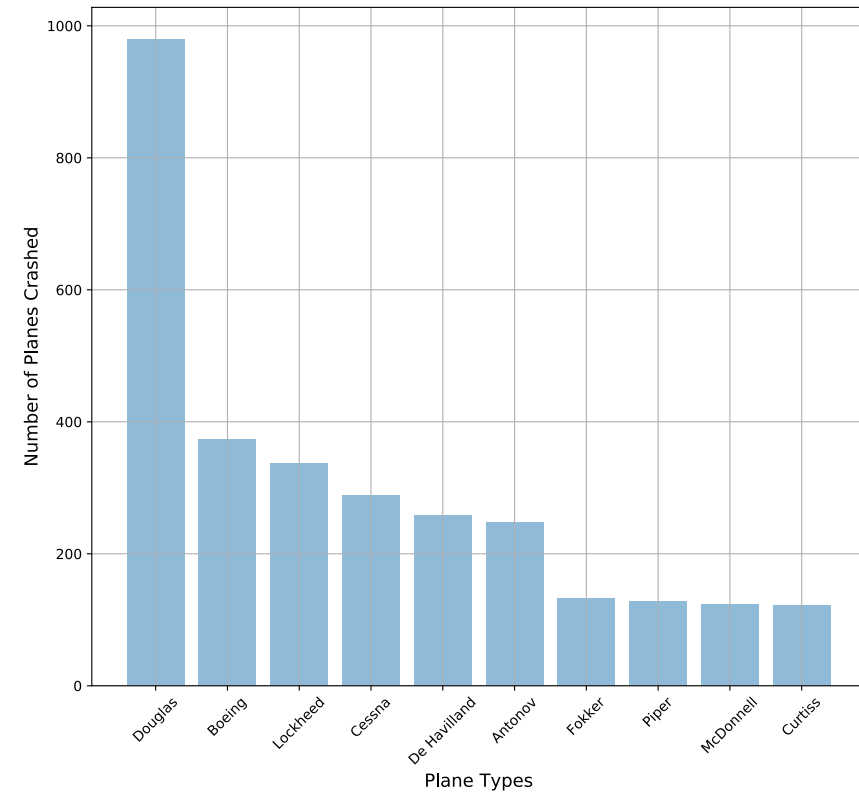
WHAT IS THE MOST UNSAFE OPERATOR TYPE BY CRASHES?

- Majority of plane crashes were passenger airlines



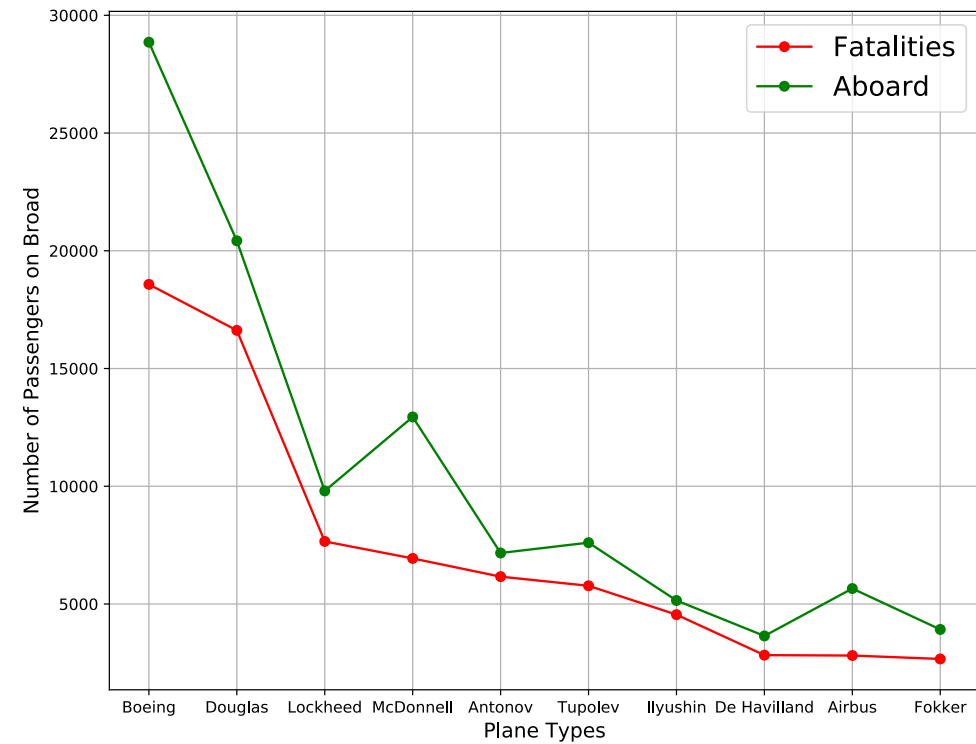
WHAT IS THE MOST UNSAFE PLANE TYPE BY NUMBER OF CRASHES?

- Douglas crashed most often



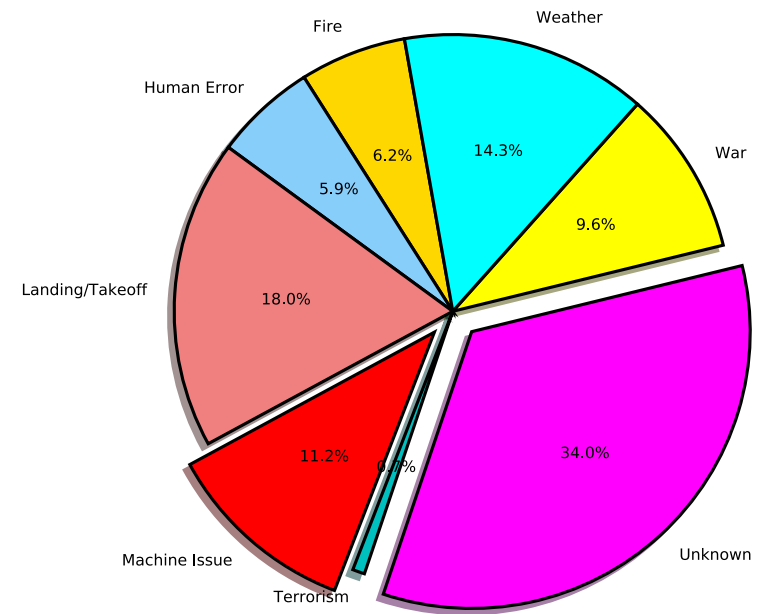
WHAT IS THE MOST UNSAFE PLANE TYPE BY NUMBER OF FATALITIES?

- Highest numbers of passengers aboard and casualties both were from Boeing airplanes
- Smallest number of casualties are in Fokker planes



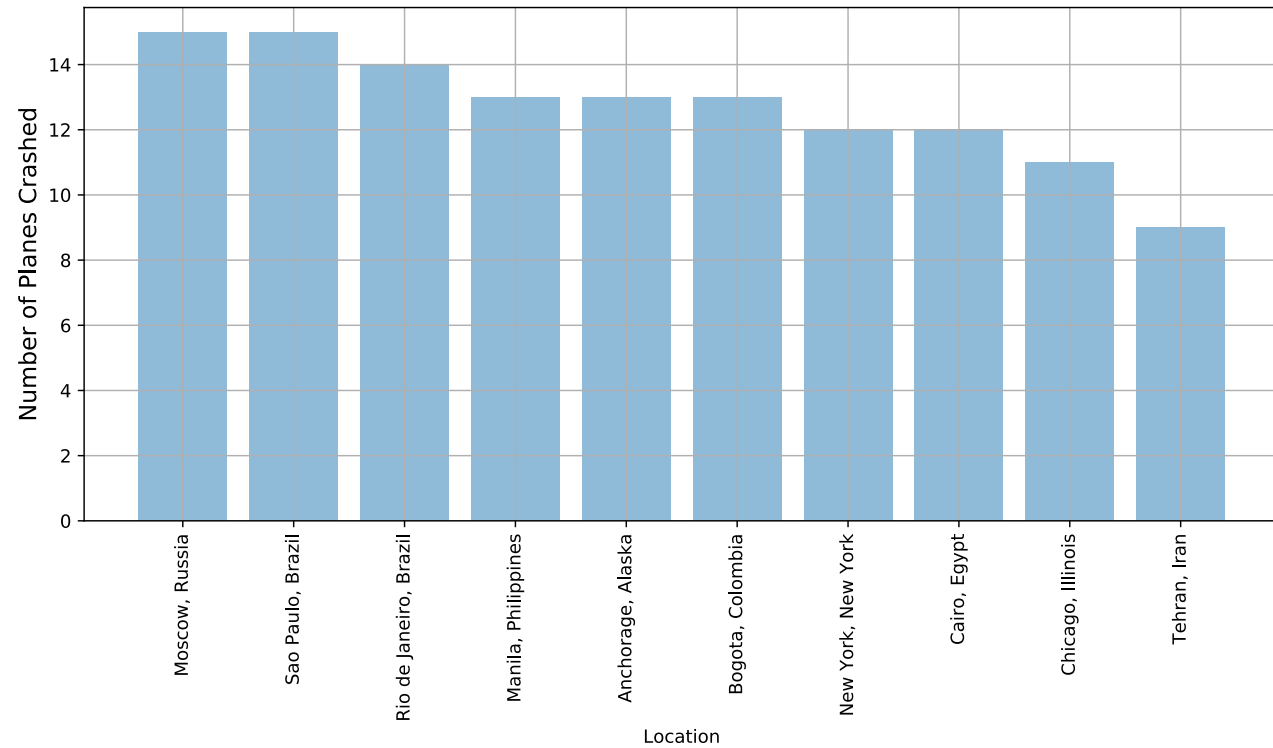
WHAT WERE SOME OF THE REASONS FOR PLANE CRASHES?

- Remains mostly unknown
- Weather, faulty take off and landing and machine issues, 43.5% of the reason

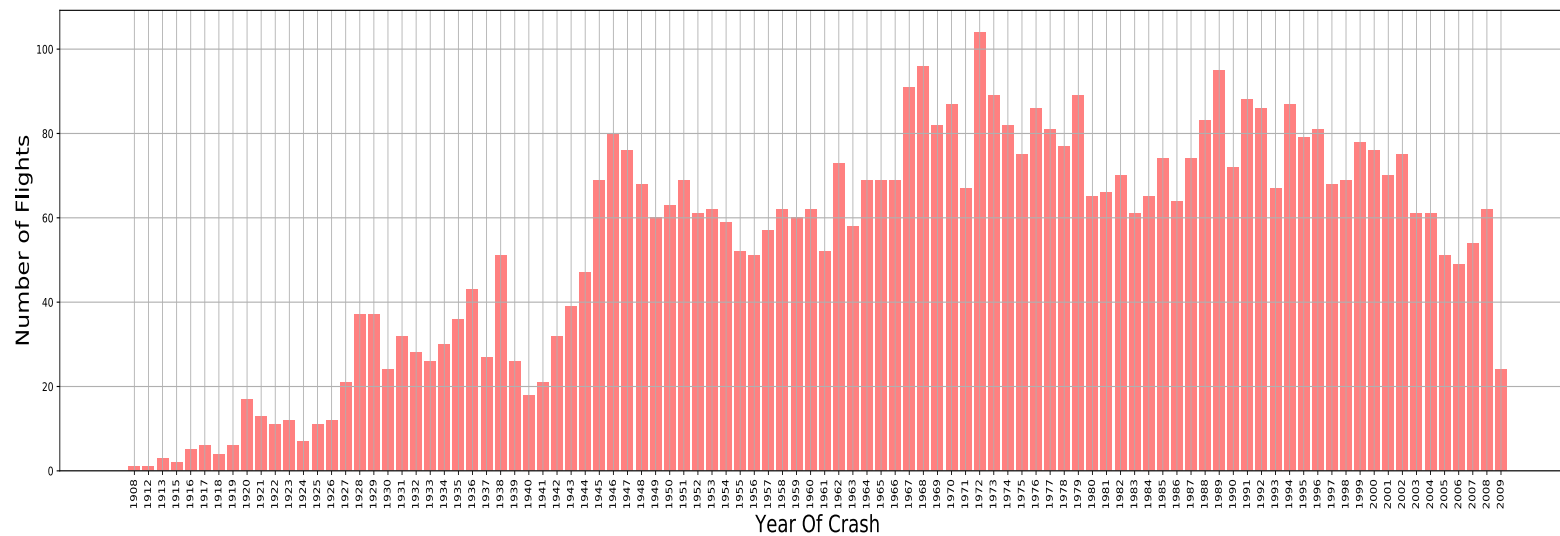


WHERE DID THE MOST PLANE CRASHES OCCUR?

- Moscow and Sao Paulo most common crash sites

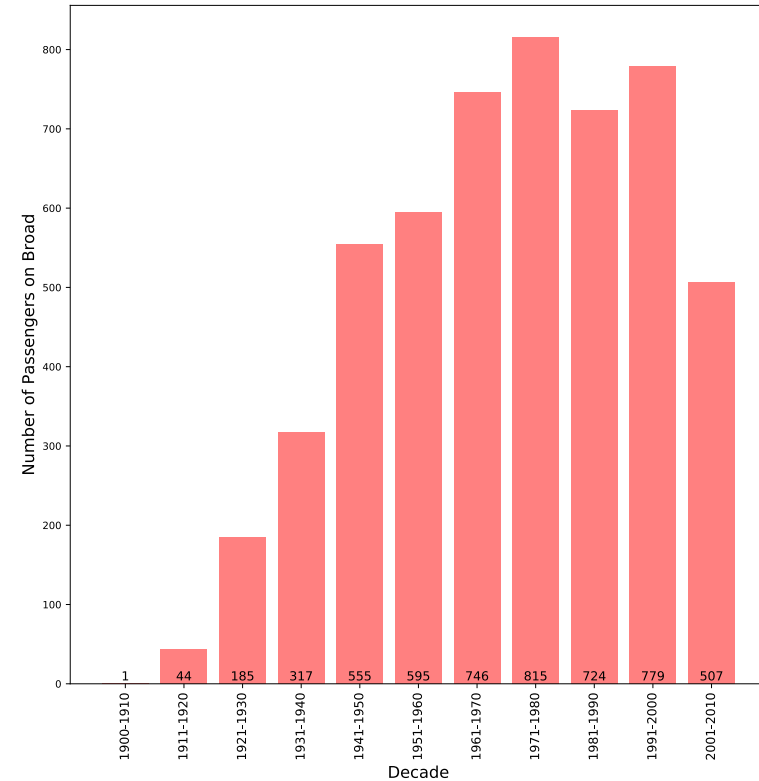


NUMBER OF FLIGHTS THAT CRASHED FROM 1908 TO 2009

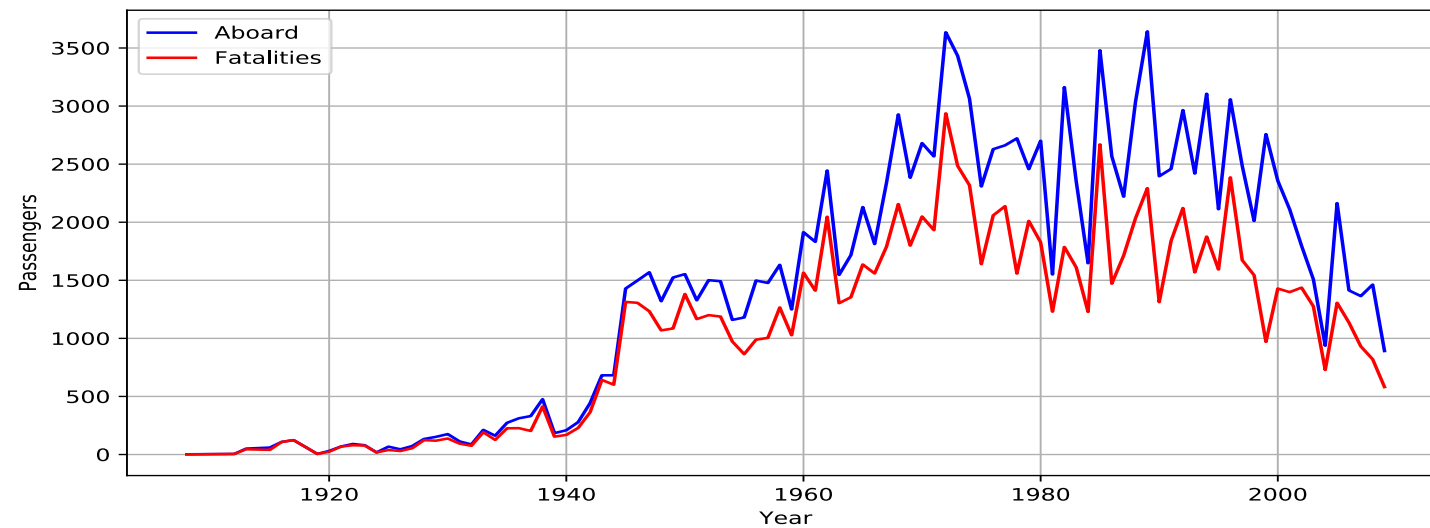


WHAT DECADE HAD THE MOST NUMBER OF CASUALTIES?

- Highest number of fatalities in the 1970s
- Closely behind are the 90s



HOW MANY PEOPLE SURVIVE CRASHES OVER TIME?

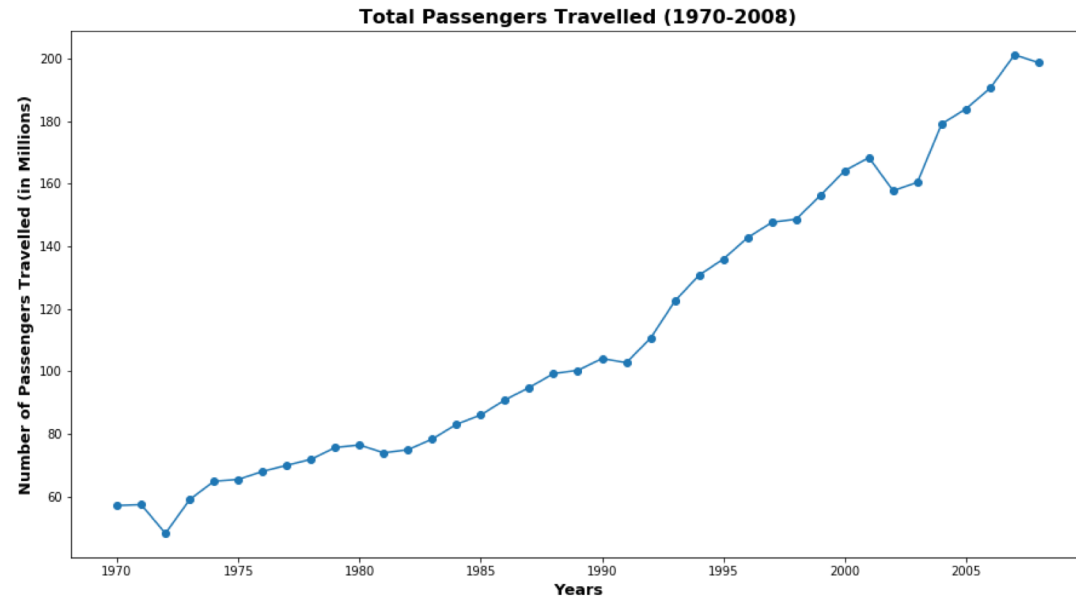


WORRIED ABOUT TRAVELLING BY AIR!

DON'T BE

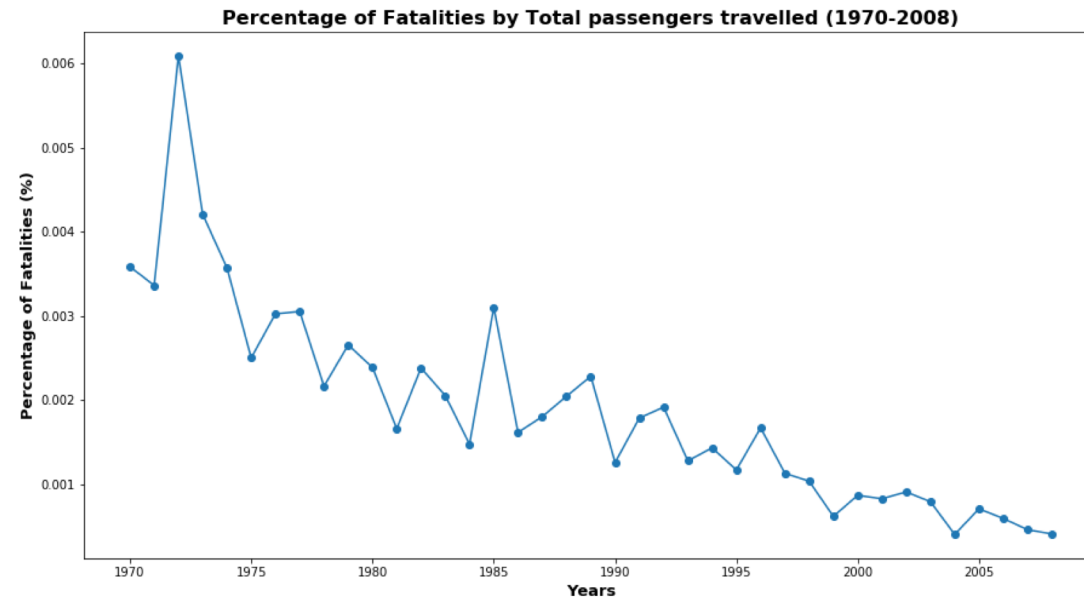
TOTAL NUMBER OF PASSENGERS TRAVELLED

- Steep increase in total number of passengers travelling by air



PERCENTAGE OF FATALITIES PER PASSENGERS TRAVELLED

- Reduction in fatalities as a percentage of total passengers travelled



OBSERVATIONS

- Aeroflot was seen to have the most crashes
- Moscow and Sao Paulo most common crash sites
- Douglas planes crashed most often
- Majority of plane crashes were passenger airlines
- Decade with the highest number of fatalities were 1970s
- Advancements in technology have helped improve aviation over the course of the last 100 years
- The world is much more at peace today than in the early 1900s or during WWII. This means fewer military or passenger plane crashes



WORKS CITED

- Original Data set
 - Airplane Crashes and Fatalities Since 1908
 - <https://opendata.socrata.com/Government/Airplane-Crashes-and-Fatalities-Since-1908/q2te-8cvq>
- Second Data set
 - Air transport, registered carrier departures worldwide
 - <https://data.worldbank.org/indicator/IS.AIR.DPR.T?end=2016&start=1970&view=chart>
- Statistics about plane safety quoted from Plane Crash: Forensics of aviation disaster by George Bibel