THE TRAGEDY OF FLIGHT: A COMPREHENSIVE CRASH ANALYSIS

INTRODUCTION:

OVERVIEW:

An Airplane crash analysis is a detailed investigation into the causes of an aviation accident. The goal of an airplane crash analysis is to identify any factors that contributed to the accident, with the ultimate goal of improving safety and preventing future accidents. The process of conducting an airplane crash about the aircraft and its systems, the operators and any other relevant factors. This data is typically collected from Kaggle. Once the data has been collected, it is analysed through tableau, to identify any potential causes of the accident. The results of an airplane crash analysis are typically published in a report, which may include recommendations for improving safety and preventing similar accidents in the future. These recommendations may be implemented by the relevant authorities or industry organizations.

PURPOSE:

Data mining is defined as a process used to extract usable data from a larger set of any raw data. It is used in the many areas, like medicine, environment, education, crime, etc. In this research work crash investigation and analysis of the flights are done. Flight crashes may be caused due to pilot error, mechanical failure, bad weather, sabotages or human error. This research paper investigates international fight crashes since 1908 to 2009 through K-Means clustering data mining technique and LDA measure helps in finding similarity among different

texts. The research work is done for identifying aboard/ground/fatality rate with location as well as to find comparison among the flight crashes.

PROBLEM DEFINITION & DESIGN THINKING

EMPATHY MAPPING:

THE TRAGEDY OF FLIGHT:
A COMPREHENSIVE CRASH ANALYSIS

Team ID: NM2023TMID32964

IDEATION & BRAINSTORMING MAP

Template

Brainstorm & idea prioritization

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

10 minutes to prepare
1 hour to collaborate
2-8 people recommended

Share template feedback

Before you collaborate

A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

10 minutes

A **Team gathering**
Define who should participate in the session and send an invite. Share relevant information or pre-work ahead.

B **Set the goal**
Think about the problem you'll be focusing on solving in the brainstorming session.

C **Learn how to use the facilitation tools**
Use the Facilitation Superpowers to run a happy and productive session.

Open article →

1 Define your problem statement

What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

5 minutes

PROBLEM

1. Did fights crashes are regular in all regions ?
2. Can we minimize the number of accidents ?
3. Is it safe to travel in the flight ?

Key rules of brainstorming
To run an smooth and productive session

- Stay in topic.
- Encourage wild ideas.
- Defer judgment.
- Listen to others.
- Go for volume.
- If possible, be visual.

2

Brainstorm

Write down any ideas that come to mind that address your problem statement.

10 minutes

TIP

You can select a sticky note and hit the pencil [switch to sketch] icon to start drawing!

Flight crashes are regular in all regions

Deveop the right attitude about driving

Malfunctions are the reasons for the crashes in all regions

Limit your night driving

Anticipate your anxiety

Hiring the best pilots

Can we travel after bypass surgency

Emergency precautions

EDWIN RUBAN S

JOSHUA DASON JEBADURAI S

We can reduce the crashes by proper checkings

Appropriate inspection

CHANDRU T

Is it safe to travel during pregnancy

Fly on Nonstop Routings

JEYAPANDI S

SANJAY KUMAR G

Seperate fear from danger

Aways wear your safety belt

Value each flight

Limit your passengers

Educate fellow fliers how to help you

Listen to flight attendants

Train for poor weather conditions

Don't bring any hazardous material

3

Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.

20 minutes

TIP

Add customizable tags to sticky notes to make it easier to find, browse, organize, and categorize important ideas as themes within your mural.

4

Prioritize

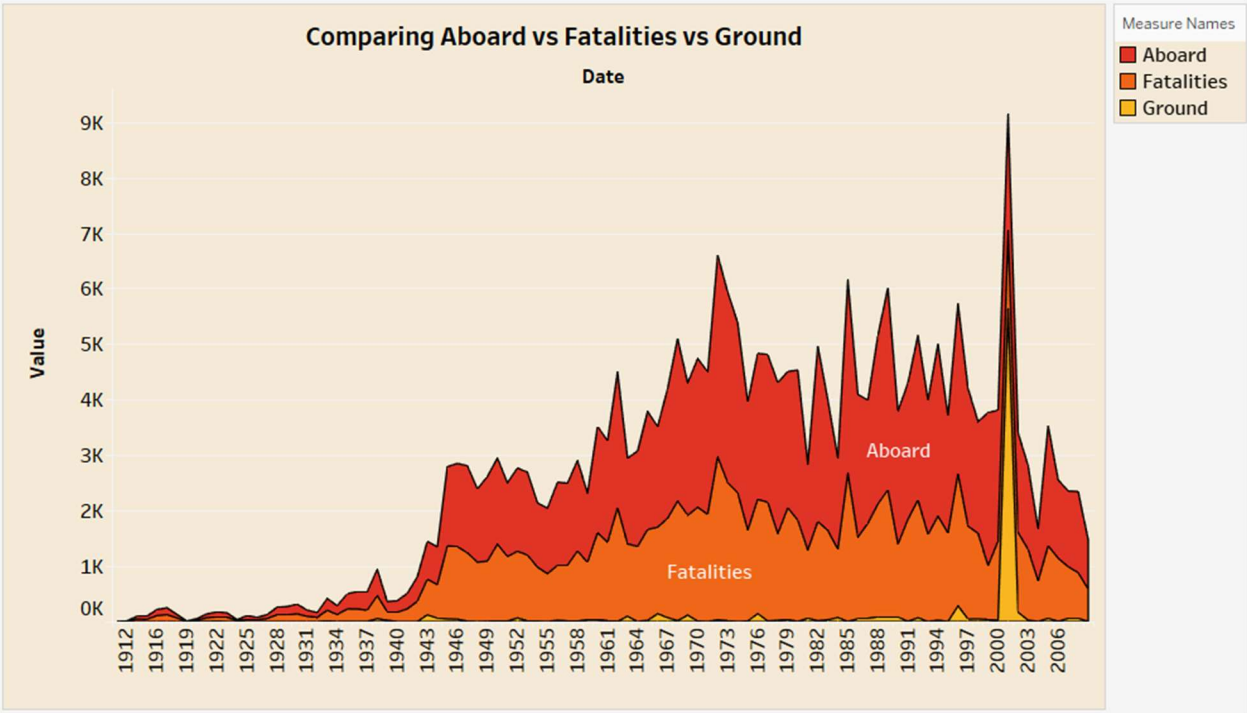
Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

20 minutes

RESULT

ACTIVITY 1:

COMPARING ABOARD VS FATALITIES VS GROUND



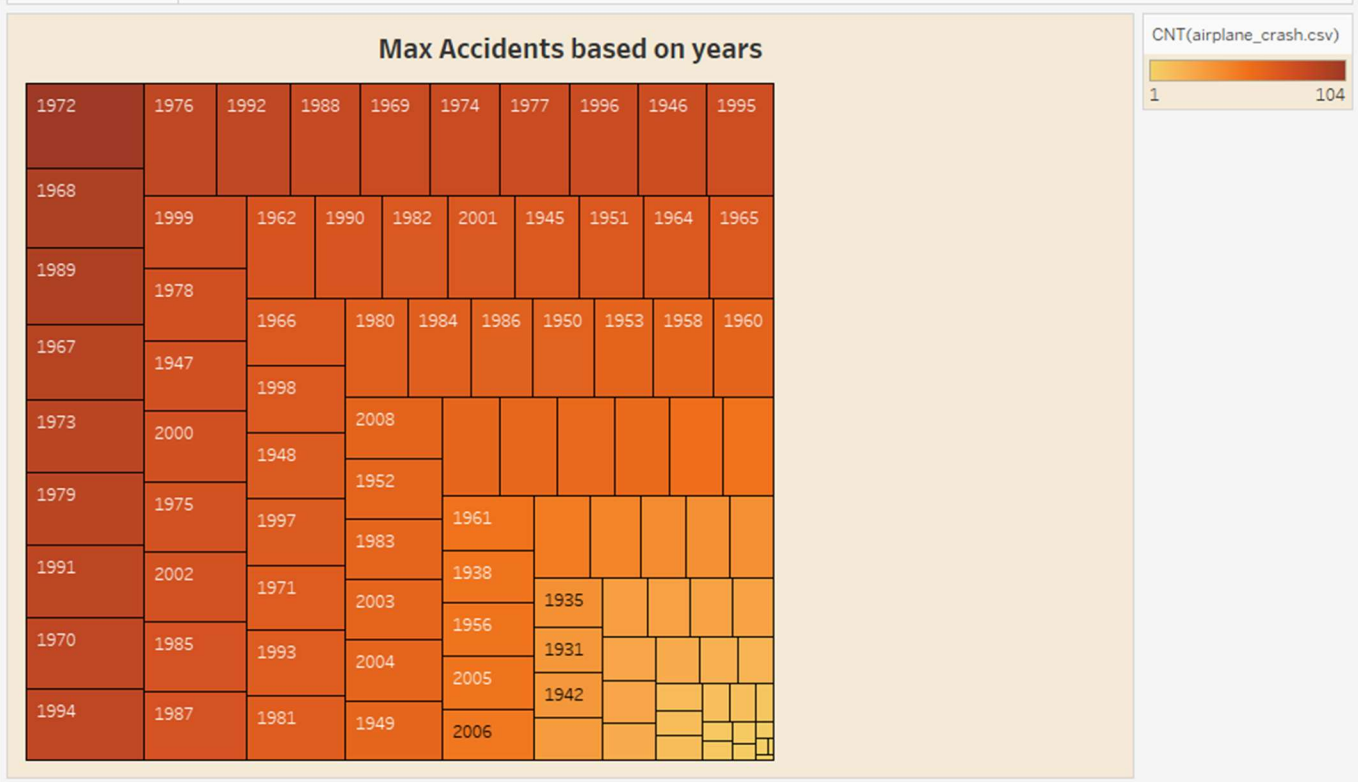
From this activity, we can understand the rate of aboard vs fatalities vs ground.

The greatest number of accidents are occurred in aboard when compared to ground.

The number of accidents occurred in ground is minimum when compared it to aboard.

ACTIVITY 2:

MAX ACCIDENTS BASED ON YEARS



The greatest number of accidents occurred in the year 1972.

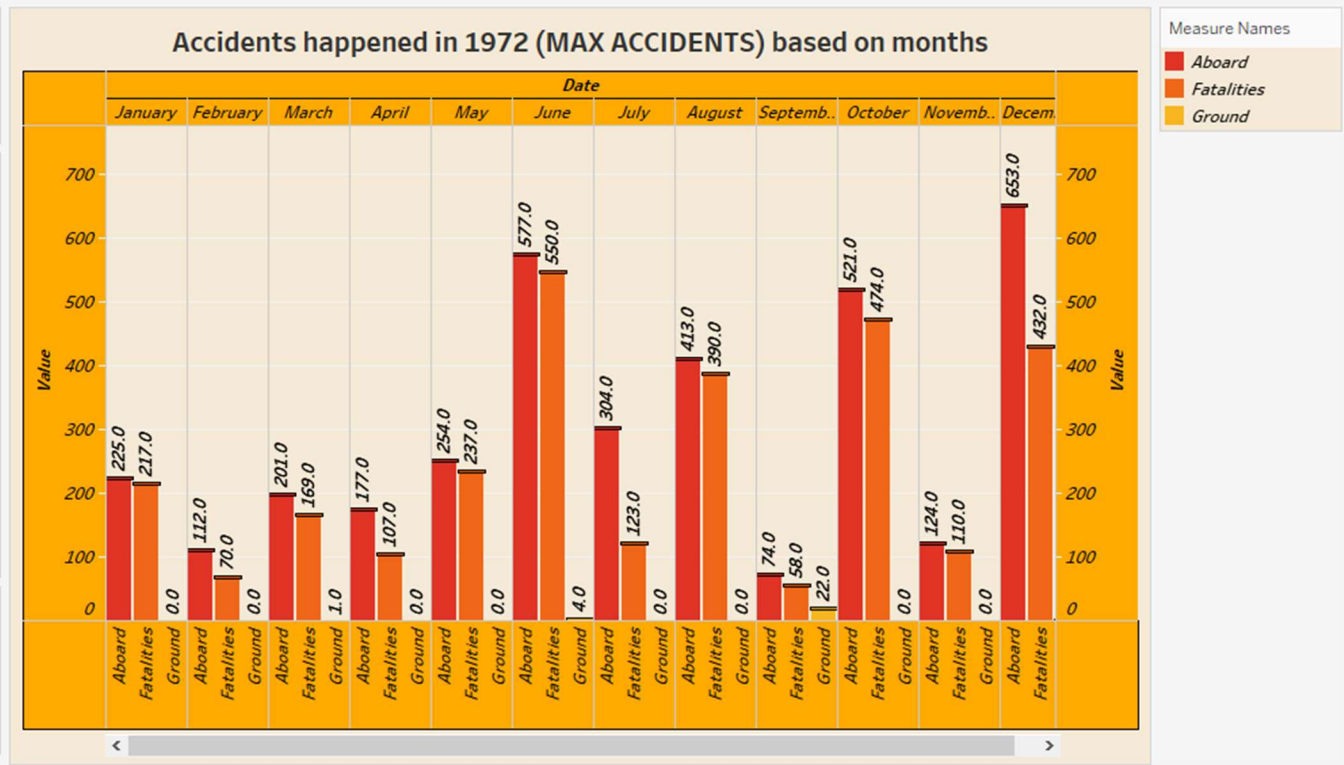
The number of accidents is minimum at the starting ages of flight transportation.

After the peak days of using the air transport it results in the maximum number of accidents.

Later advanced techniques are introduced and reduced the number of accidents.

ACTIVITY 3:

ACCIDENTS HAPPENED IN 1972 (MAX ACCIDENTS) BASED ON YEARS



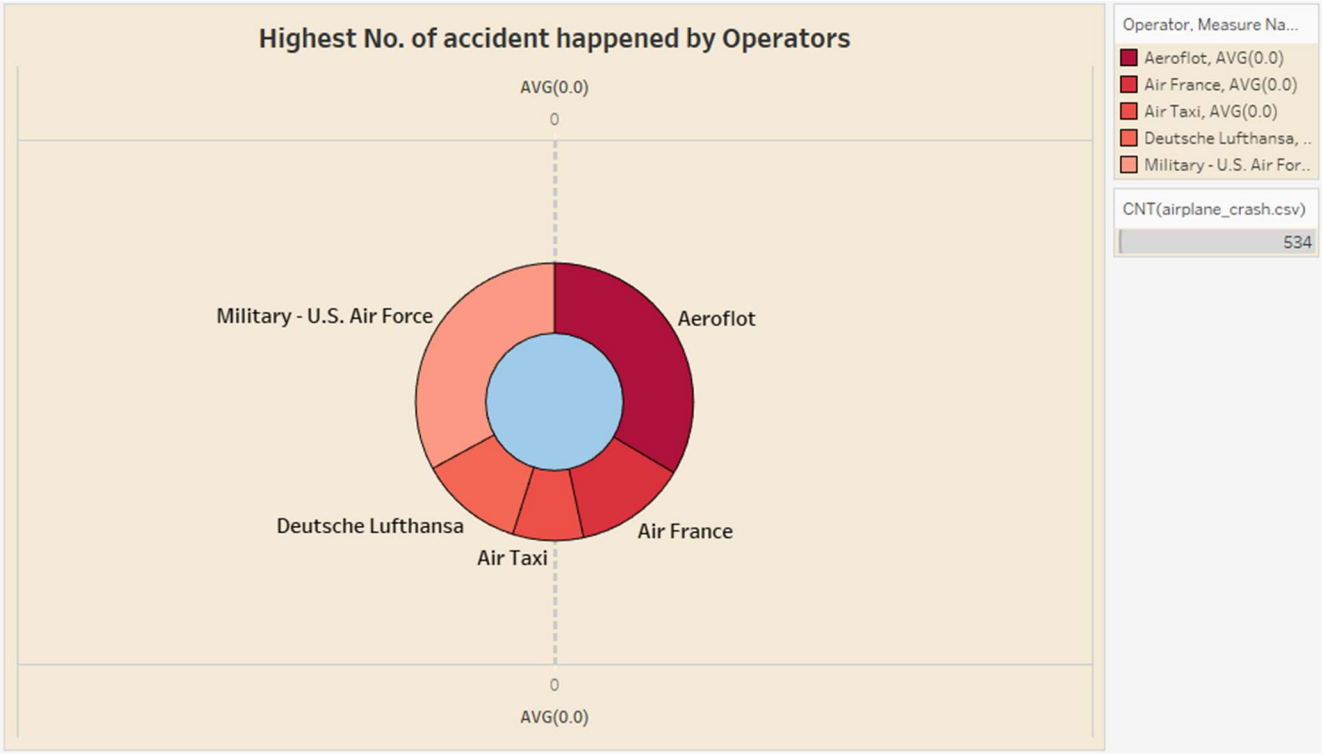
Highest number of accidents is occurred in the year 1972.

From this chart we can find the value of accidents based on the months of the year 1972.

December month of 1972 is the month with the greatest number of accidents in this year.

ACTIVITY 4:

HIGHEST NO. OF ACCIDENT HAPPENED BY OPERATORS

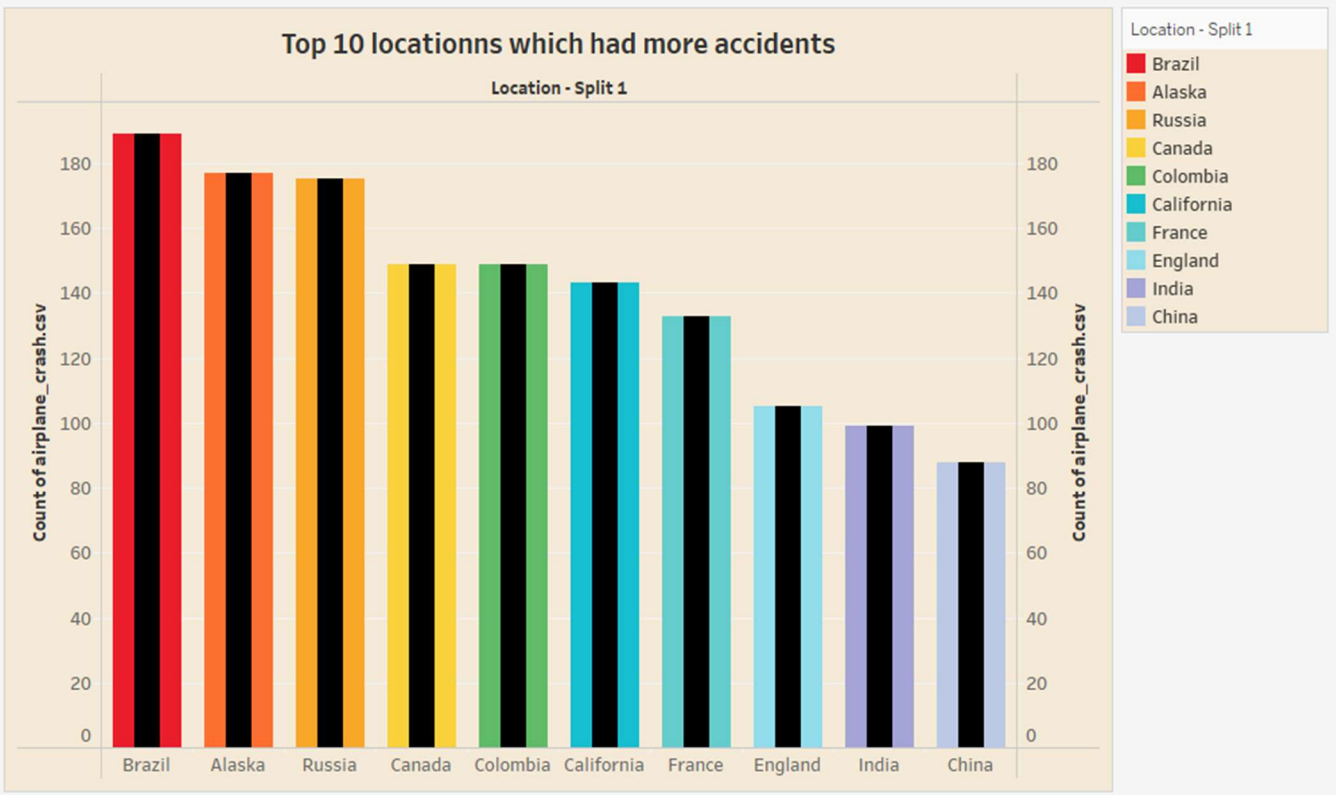


From this pie chart we can easily understand the highest number of accidents happened by operators.

Highest no. Of accidents happened by operators is Military U.S. Air force operators.

ACTIVITY 5:

TOP 10 LOCATIONS WHICH HAD MORE ACCIDENTS



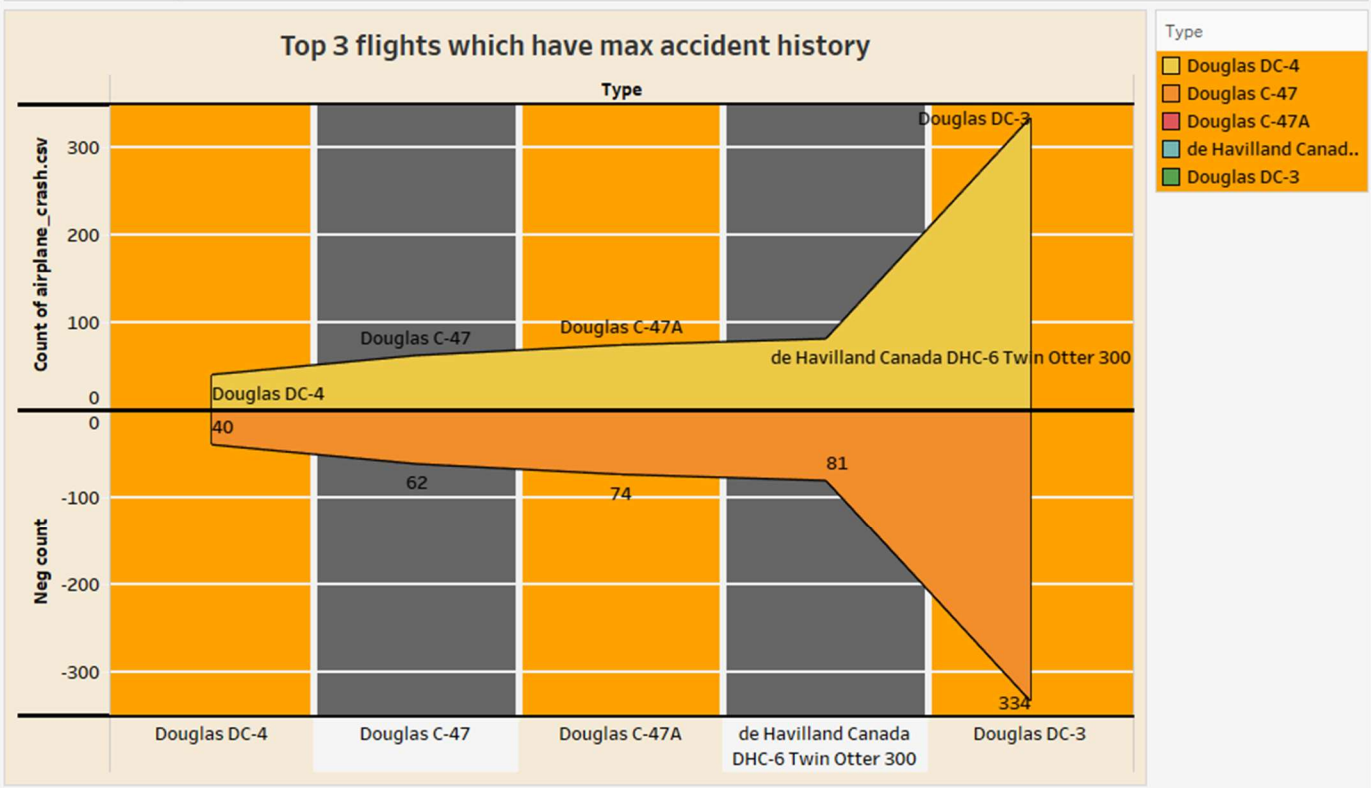
From this bar graph we can understand the accident rates among the countries.

Brazil has the huge number of accidents when compared with other countries.

Brazil, Alaska, Russia, Canada, Colombia, California, France, England, India, China are the top 10 countries with highest number of accidents.

ACTIVITY 6:

TOP 3 FLIGHTS WHICH HAVE MAX ACCIDENT HISTORY



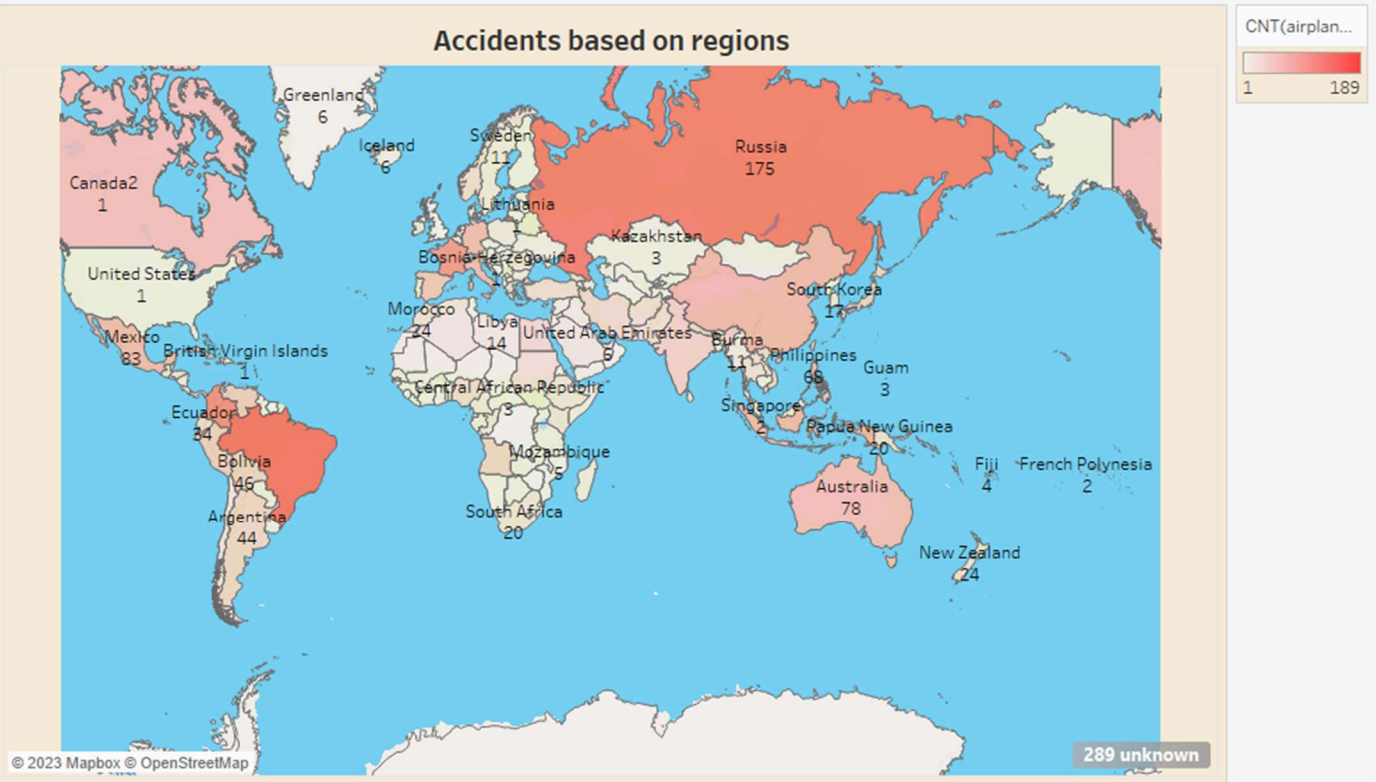
From this graph we find the flight with greatest number of accident history.

Douglas DC-3 is the flight with most accidents.

A design flaw in the original cargo doors caused a poor safety record in early operations.

ACTIVITY 7:

ACCIDENTS BASED ON REGIONS



From this geo graph we can easily say that Asia has the greatest number of accidents.

East countries also have number of accident history.

Brazil is the country with most accidents and Russia is second in number of accidents.

ADVANTAGES:

- High Speed
- Fast Service
- Send almost everywhere your freight
- High Standard of Security
- Natural Route
- There is less need for heavy packaging

DISADVANTAGES:

- Risky
- Cost
- Some Product Limitation
- Capacity for Small Carriage
- Enormous Investment

APPLICATIONS:

1. Seaplane Accident Analysis

It represents an area of genera aviation where targeted focus on training should reduce the number of occurrences. This report offers a detailed analysis of these accidents including accident causes and findings. It concludes with a training and prevention discussion and recommendations to reduce seaplane accidents.

2. Visual Flight Rules

Flying under visual flight rules into instrument meteorological conditions, commonly known as VFR into IMC, remains among the top five causes of fatal general aviation accidents and among the top with the highest

lethality. These largely preventable accidents impact pilots including those with an instrument rating. Learn from the pilots who survived the encounter and what makes these accidents so deadly. Prevention and escape come down to knowledge, good decision making, real-world training, and honing skills through ongoing proficiency.

3. Fatal Flight Training Accident

Loss of control in flight and midair collisions pose the two greatest risks in flight training. Although the accident rate is showing gradual improvement, the training industry must continue to focus time, energy, and resources on improving safety with targeted risk mitigations.

4. Stall and Spin Accidents

Stall and spins are leading causes of general aviation fatal accidents despite stall/spin recognition, recovery, and prevention training. Seemingly, some pilots fly closer to the critical angle of attack than they realize. These persistent accidents are discussed in detail in the report. The report offers guidance on recognition, recovery, and prevention to prepare pilots to better combat these types of accidents.

5. Aircraft Safety Highlights

These reports are aircraft specific reviews of the most popular airplanes in general aviation. Pilots will find information about safety records, technical details, and more.

CONCLUSION:

The four phases of accident investigations are: preparation (which begins now), data collection, analysis, and reporting. Aircraft accident investigation is a process that works best when it is used in its entirety. It cannot be emphasized enough: Conclusions must be supported by all of the factual information and evidence that is gathered utilizing the technique associated with the three W's of

aircraft accident investigation: What happened? Why did it happen? What can be done to prevent it?

We visualized the data with the help of tableau and the visualizations are,

- Comparing aboard vs fatalities vs ground
- Max accidents based on the years
- Accidents happened in 1972 (MAX ACCIDENTS) based on months
- Highest number of accidents happened by operators
- Top 10 locations which had more accidents
- Top 3 flights which have max accident history
- Accidents based on regions

FUTURE SCOPE:

The air transport industry is expanding and the future of aviation is a bright one. In 2017, airlines worldwide carried around 4.1 billion passengers. They transported 56 million tons of freight on 37 million commercial flights. Every day, airplanes transport over 10 million passengers and around USD 18 billion worth of goods. This indicates the significant economic impact of aviation on the world economy, which is also demonstrated by the fact that aviation represents 3.5 per cent of the gross domestic product (GDP) worldwide (2.7 trillion US dollars) and has created 65 million jobs globally. Aviation provides the only rapid worldwide transportation network, generating economic growth, creating jobs, and facilitating international trade and tourism.

Aviation has become the enabler of global business and is now also being recognized by the international community as an essential enabler to achieving the UN Sustainable Development Goals. The aviation sector is growing fast and will continue to grow.

APPENDIX:

SOURCE CODE:

The link below shows our project

file:///D:/Arsha/index.html

Dashboard 1:

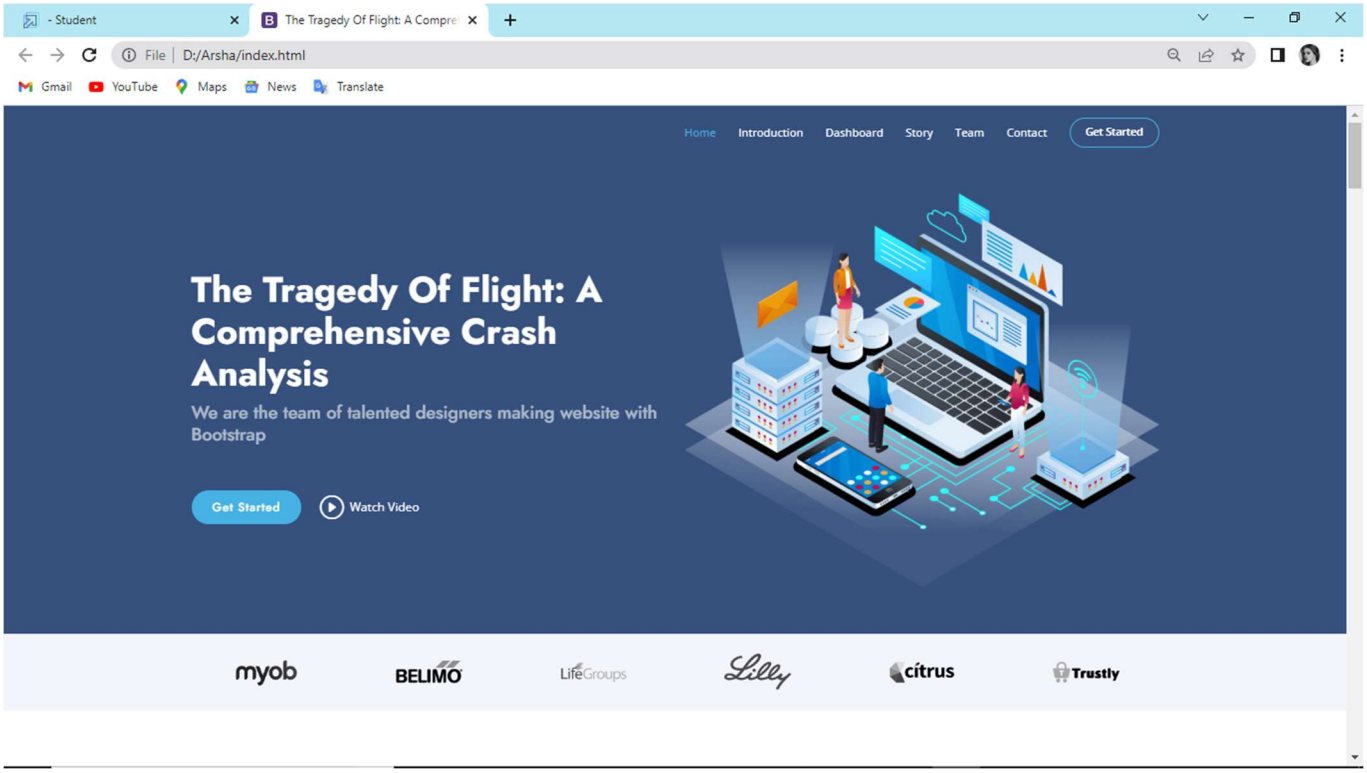
HTTPS://PUBLIC.TABLEAU.COM/VIEWS/AIRPLANE_CRASHPROJECTDASHBOARD1/DASHBOARD1?:LANGUAGE=EN-US&:DISPLAY_COUNT=N&:ORIGIN=VIZ_SHARE_LINK

Dashboard 2:

HTTPS://PUBLIC.TABLEAU.COM/VIEWS/AIRPLANE_CRASHPROJECTDASHBOARD2/DASHBOARD2?:LANGUAGE=EN-US&:DISPLAY_COUNT=N&:ORIGIN=VIZ_SHARE_LINK

Story:

HTTPS://PUBLIC.TABLEAU.COM/VIEWS/AIRPLANE_CRASHPROJECTSTORY/STORY1?:LANGUAGE=EN-US&:DISPLAY_COUNT=N&:ORIGIN=VIZ_SHARE_LINK



THANK YOU