THE TRAGEDY OF FLIGHT: A COMPREHENSIVE CRASH ANALYSIS

TEAM MEMBERS:

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D. VARSHA

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INTRODUCTION:

* Air accident is caused due to pilot error, mechanical error, bed weather, sabotages or human

error. These error can happened anytime. Air accidents is also called flying mischance cases have a Great degree complexity. Aircraft crashes cause harm to the population as it may lead to the deaths of people or may even cause injuries to the people3. Crash investigations is a major research area and the major techniques used for this investigation are statistics. Grid computing, cloud computing, digital image processing and data mining with data mining, we can parse through extremely large amount of data and find out unknown pattern of air mischance. The Major of our project is to use data mining techniques to find out unknown patterns in the international flight crash datasets, the research is carried in aircraft crash and fatalities data collected from the year 1908 to 2009. This work is carried out using k-mean clustering data mining technique and cosine similarity measure.

The paper is further structured as follows theoretical background, methodology, experimental setup, analysis and conclusion Aircraft crashes are fundamental to weather (thunderstorm, strong winds, etc.), pilot error, etc. There is a necessity to study these issues. The study helps to understand who all are suffering, what is the reason for the crash and what harm is it causing to the general population

and how can we prevent them. The crashes may cause loss of
human life as well as loss of natural resources.

THEORETICAL BACKGROUND:

*The most common reasons for plane accidents are pilot
error, mechanical failure, human error, etc. These parameters are explained as follows:

1. Pilot Error – Roughly 50% of the aircraft losses incur due to pilot error. There are many chances for The pilots to cause errors from failing to program correctly to miscalculation of the required fuel.

2. Mechanical Failure -Despite developments in model and manufacturing standards of the aircraft, mechanical failures account for 20% of aircraft losses.

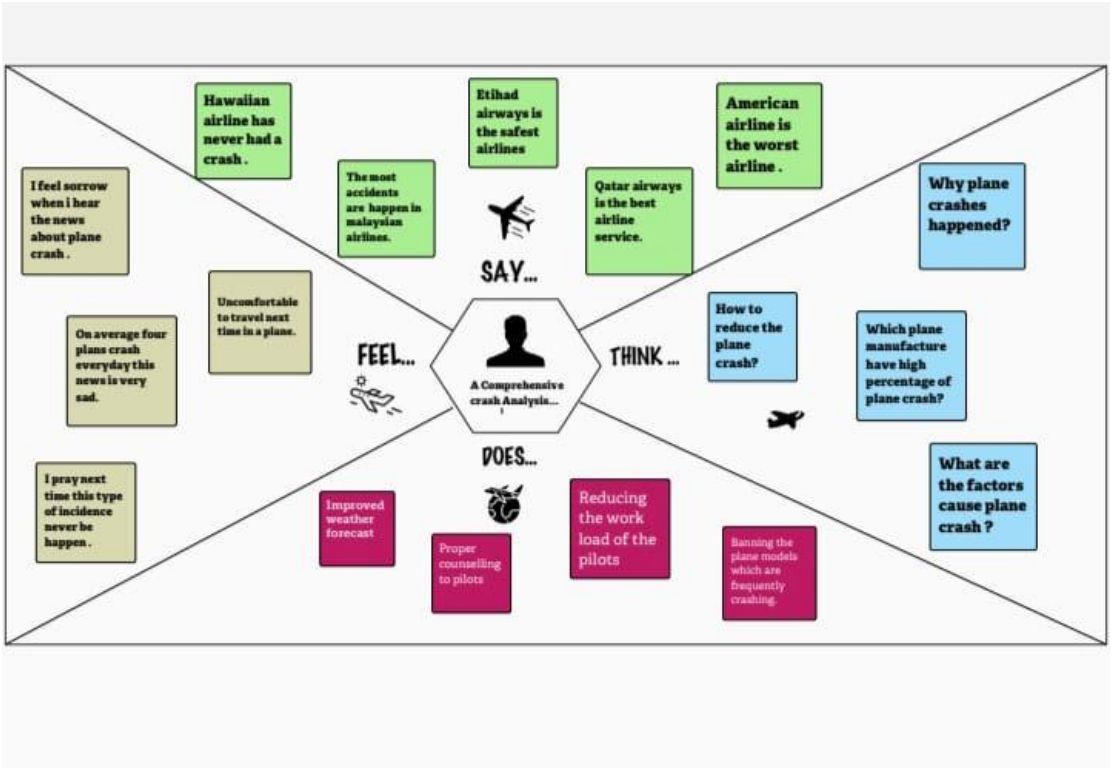
3. Weather - Despite of having multiple electronic aids, aircraft still struggle to function properly when the weather turns out to be unpleasant like in storms, snow and fog.

4. Sabotage - The dangers posed by sabotage are much less than many people seem to believe. Approximately 10% of aircraft losses occur due to sabotage.

5. Human Error – Mistakes can be made by humans operating when required to work for longer hours. Air traffic controllers, dispatchers, loaders, etc are some of the jobs that are operated by humans.

PROBLEM DEFINITION & DESIGN THINKING:

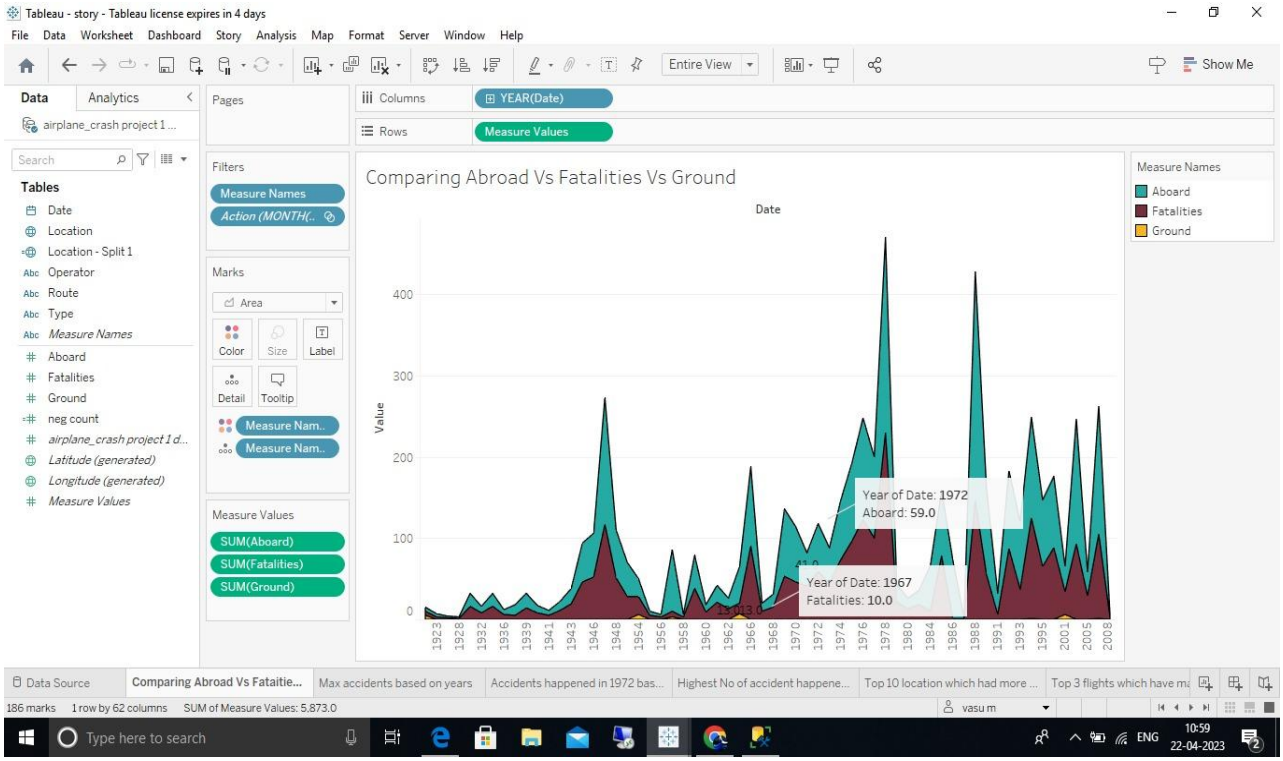
EMPATHY MAP:



IDEATUON & BRAINSTROMING MAP:


Fly on nonstop rountings
lesson to the flight attendants
Govt attention avoid the subtage
Pre checking of weather condition
let the flight attendant pour your hot drinks
keep your seat belt fastened while you are seated
Pre checking of the grounding path
Choose larger aircraft
Pay attention to the preflight briefing
Keep the overhead storage bin free of heavy articles
Pre checking of plane control
Keep your wits about you
Do not drink too much
Importance
Feasibility

RESULT: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Comparing Abroad Vs Fatalities Vs Ground
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Year of Date: 1972
Aboard: 59.0
Year of Date: 1967
Fatalities: 10.0
Measure Names
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Max accidents based on years
Accidents happened in 1972 bas...
Highest No of accident happene...
Top 10 location which had more ...
Top 3 flights which have ma
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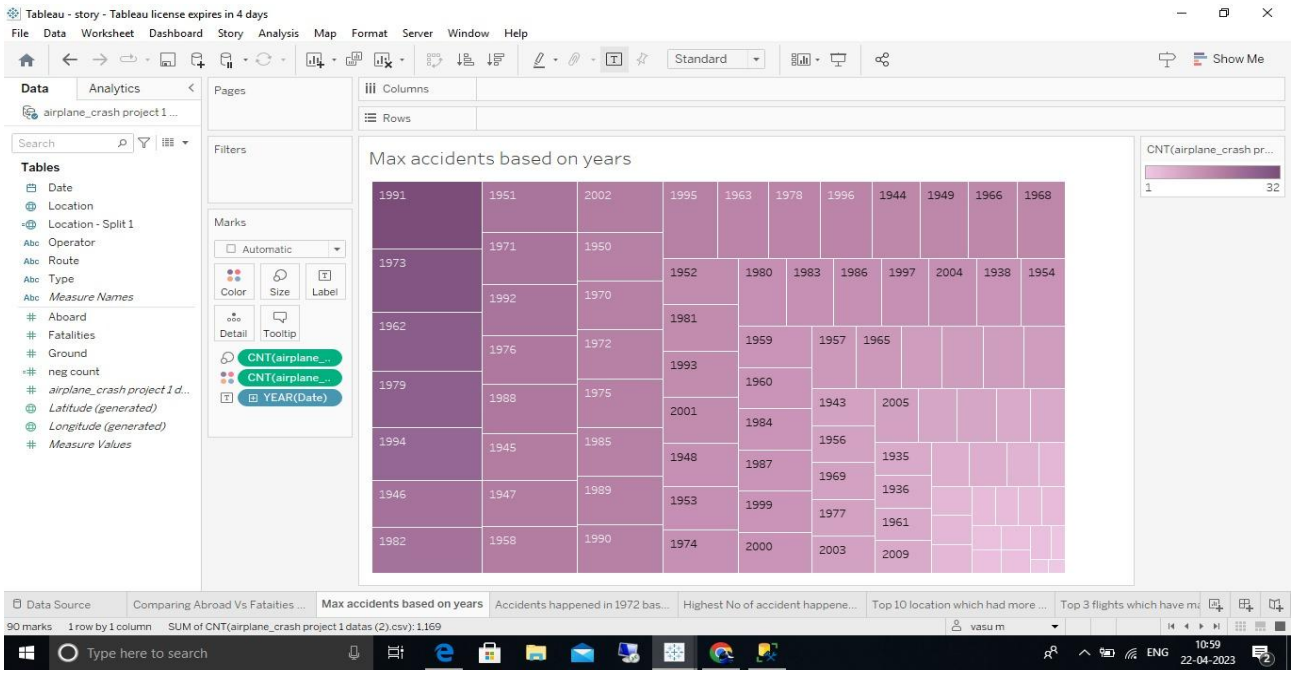
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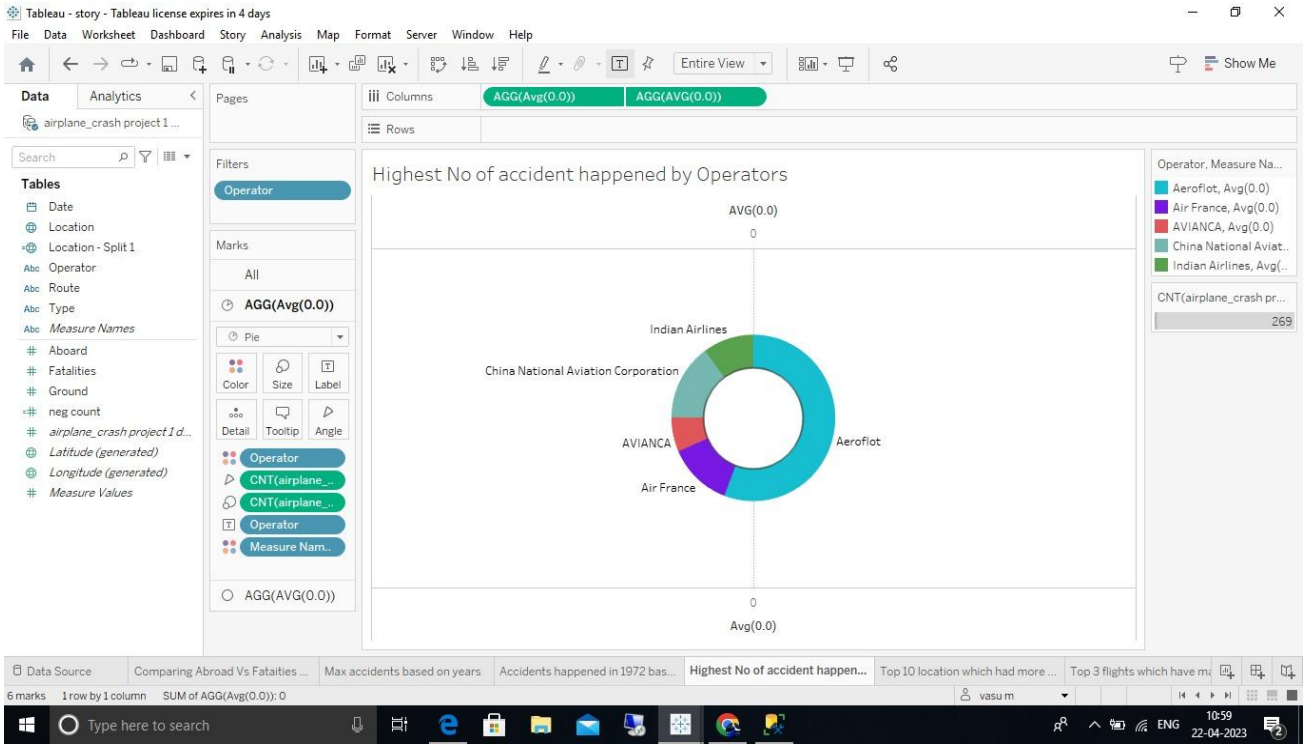
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China National Aviation Corporation
AVIANCA
Air France
Aeroflot
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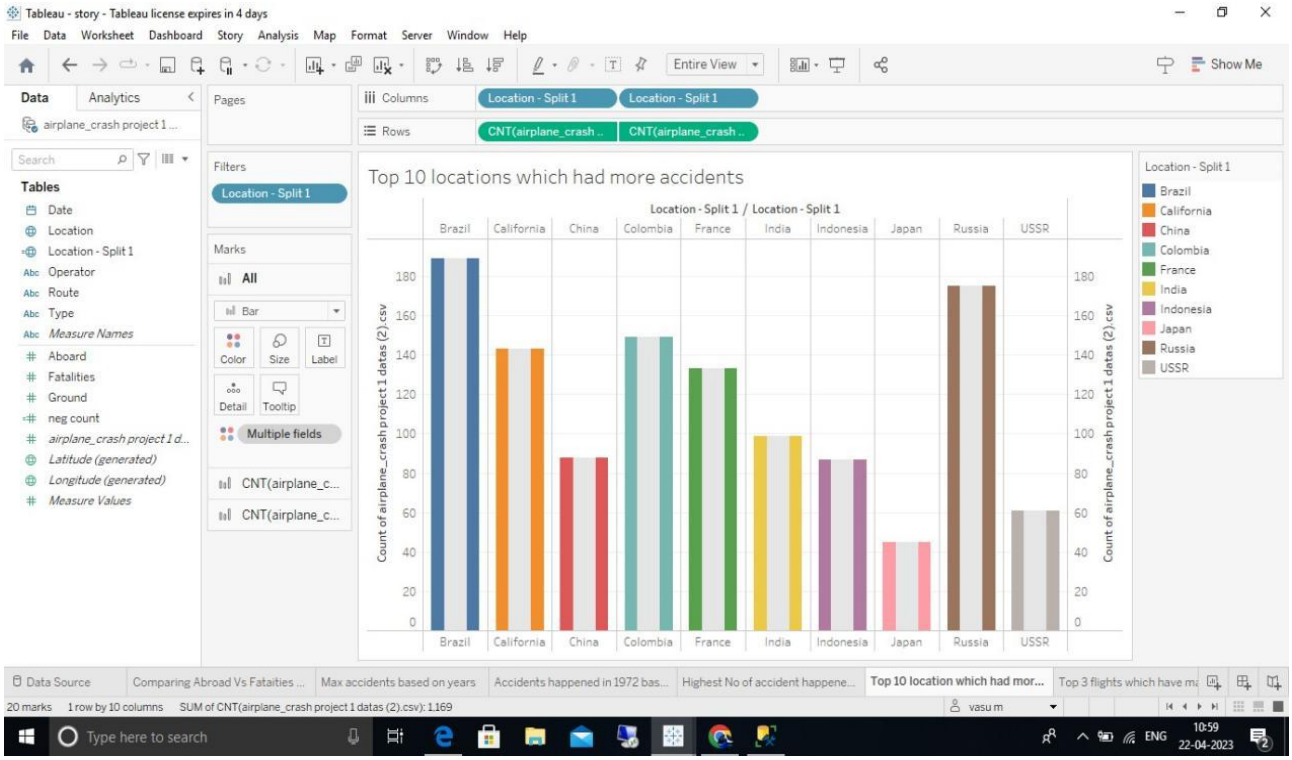
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Top 10 locations which had more accidents
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California
China
Colombia
France
India
Indonesia
Japan
Russia
USSR
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120
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180
Location - Split 1
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California
China
Colombia
France
India
Indonesia
Japan
Russia
USSR
Data Source
Comparing Abroad Vs Fatalities ...
Max accidents based on years
Accidents happened in 1972 bas...
Highest No of accident happene...
Top 10 location which had mor...
Top 3 flights which have ma
20 marks
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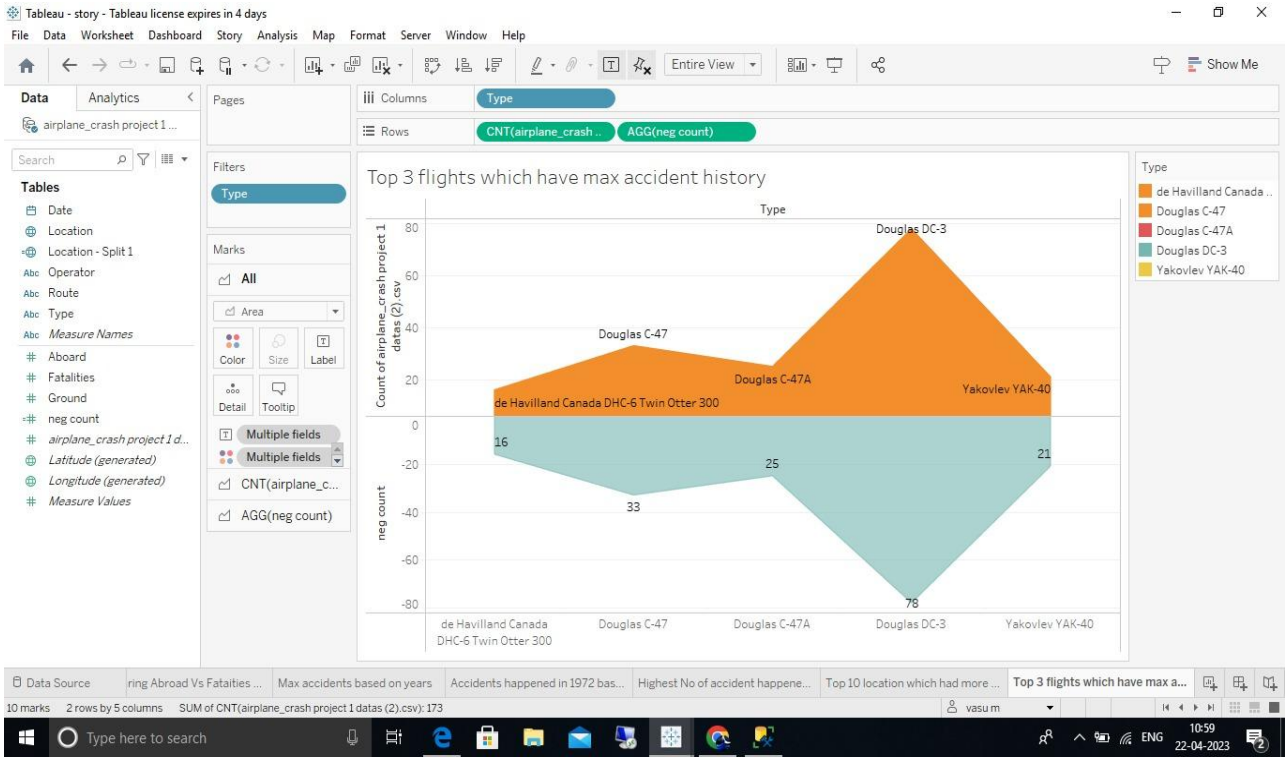
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Multiple fields
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Top 3 flights which have max accident history
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Douglas DC-3
Douglas C-47
Douglas C-47A
Yakovlev YAK-40
de Havilland Canada DHC-6 Twin Otter 300
16
33
25
78
21
de Havilland Canada DHC-6 Twin Otter 300
Douglas C-47
Douglas C-47A
Douglas DC-3
Yakovlev YAK-40
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Yakovlev YAK-40
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Top 10 location which had more ...
Top 3 flights which have max a...
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SUM of CNT(airplane_crash project 1 datas (2).csv): 173
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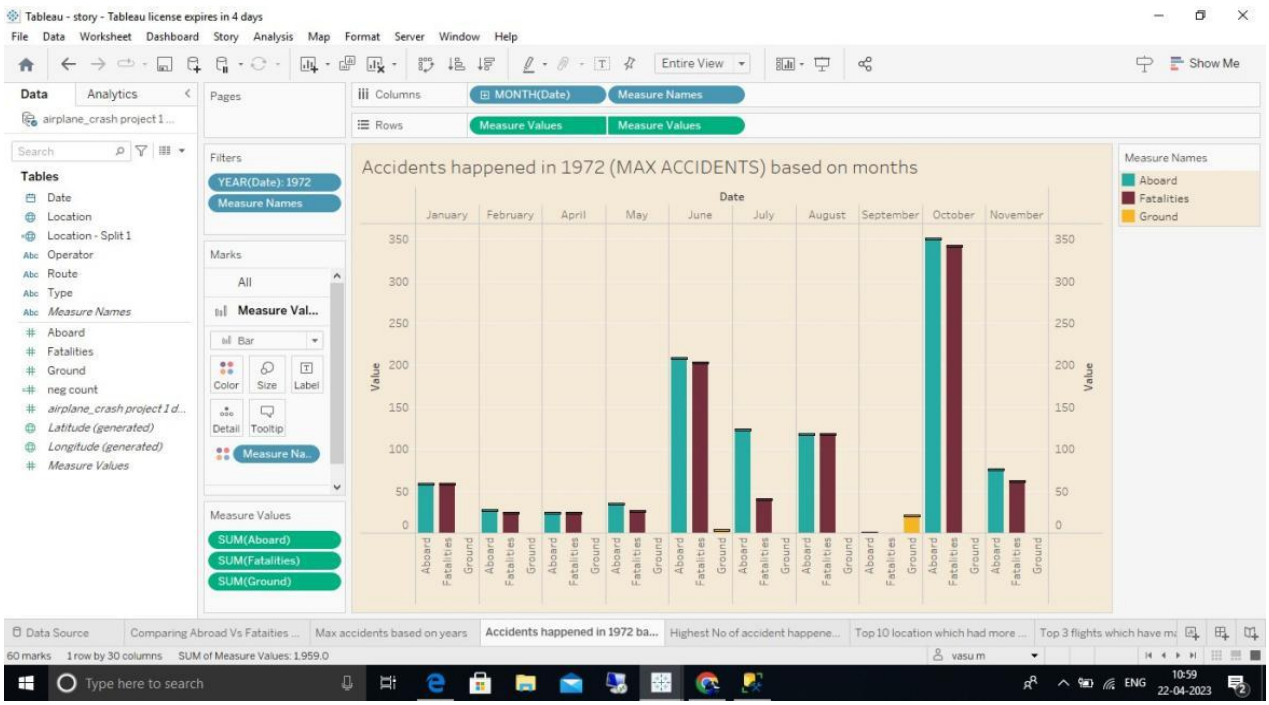
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Accidents happened in 1972 (MAX ACCIDENTS) based on months
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Top 3 flights which have ma
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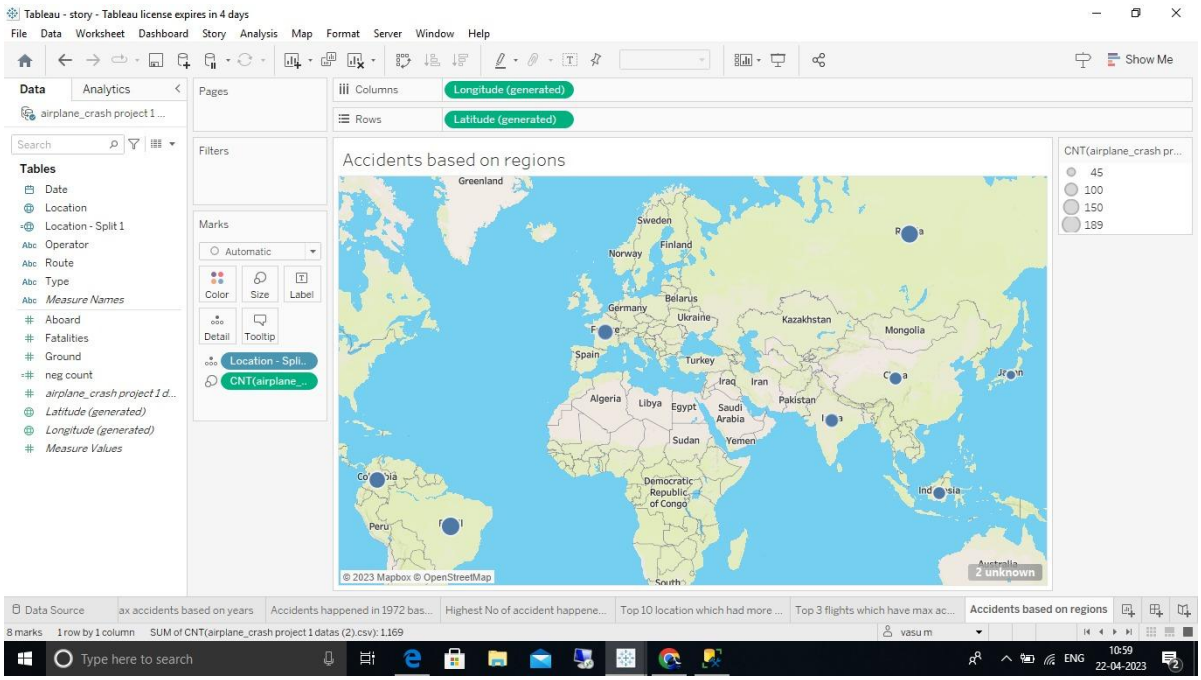

LITERATURE SURVEY :

*Flight Crash Investigation Using Data Mining Techniques". The research work is done for identifying aboard/ground fatality rate with operators and locations well as to find similarity among the plane crashes [3].

*Analyzing relationship and incidents. In proceedings of the international conference on research in air transportation. In this research he employed a data mining technique to conduct the holistic analysis of aircraft incident data in relation to the accident data. The analysis

identifies the relation between the accident and incident data and finds the patterns of casual and contributory factors which are significantly evocatively with the aircraft accident [4].

*Improvement of aircraft accident investigation through expert systems. In this research presented in this paper shown that expert system methodology is a robust approach to analyzing the aircraft accident investigation [3].

*Data clustering algorithm applications CRC press. In this research the data clustering algorithm and application provides complete coverage of area of clustering from the basic method to more refined and data clustering approaches.it pays special attention to the in graphs, social networks [6].

METHODOLOGY :

* In allocation natural language processing latent Dirichlet (LDA)is a generative statistical model that allows sets of observations to be explained by unobserved groups that explain why some parts of the data are similar.

CONCLUSION:

*The K-Mean clustering technique was used to find the clusters and fatality for the flight crash investigation. The fatality of ground is more than aboard. Aeroflot has the maximum fatality,I.e. 4266 all the other operators. The route Terrine - Las Pal-mas has got the maximum number of fatalities. The research work can be extended using other clustering techniques like Density Based, Hierarchical clustering. The summary report of the datasets is used to identify better clusters using distance measures like cosine similarity. Cosine similarity is used for finding the similarity among the crashes. Majority is used for finding crashed in USA.

The flights with id This study covered accidents and incidents pertaining to commercial flights within the United States. A similar study could be conducted on the General Aviation (GA). Depending on the availability of the data, the studies could be extended to regions in other countries.

FUTURE SCOPE:

*Transmission - Top mounted antenna communicate with satellites at higher altitudes, at lower altitudes, data can be sent directly to the ground receivers.

*Bandwidth-To save money, aircraft could flash data intermittently, switching to streaming ways in an emergency.

*Satellite - By 2015, a castellations of desiccate search towards technology, rescue satellites will track aeroplane exact location more quickly globally.

*Storage Servers-
Today uncountable servers
around the world stores & send real time flights recorded data. Eventually, in coming future every airline would have its own server.

APPENDIX:

Source code:

https://drive.google.com/file/d/1--5goHu7iDrtr_M8u0eTIMFHcUultQm/view?usp=drivesdk