LRG ARTS COLLEGE FOR WOMEN, TIRUPUR

DEPARTMENT OF MATHEMATICS

Course Name: Data Analytics with Tableau

Academic Year: 2023 – 2024

A project report entitled as

"Unlocking Insights into the Global Air Transportation Network with Tableau"

Work done by

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L.R.G. ATRS COLLEGE FOR WOMEN

UNLOCKING INSIGHTS INTO THE GLOBAL AIR TRANSPORTION NETWORK WITH TABLEAU

1.INTRODUCTION

1.1 Overview

Unlocking insights into the global air transportation network involves a data-driven exploration of the vast and interconnected world of aviation.

To gain insights, we gather data from various sources, including flight schedules, passenger records, cargo manifests, airport information, weather data, and more. The collected data is cleaned, structured, and prepared for analysis. This includes handling missing data, standardizing formats, and ensuring data. Analyzing safety records and incidents is crucial for highest safety standards in the aviation industry Analyzing safety records and incidents is crucial highest safety standards in the aviation industry Airlines can use these insights to the flight routes, schedule, leading to cost reductions and improved service. Understanding passenger data helps enhance the travel experience through tailored services and marketing strategies.

Analyzing safety records and incidents is crucial for maintaining the highest safety standards in the aviation industry. By analyzing the economic impact of air transportation, governments and organizations can make informed decisions on investments and policies. Insights drive innovation and research in aviation, guiding decisions on aircraft design, technology, and sustainability. Unlocking insights into the global air transportation network with Tableau enables stakeholders to make informed decisions, improve operational efficiency, enhance passenger experience, and ensure safety and sustainability in this essential industry. It empowers us to navigate the skies more efficiently and securely, connecting people and goods across the world.

1.2 Purpose

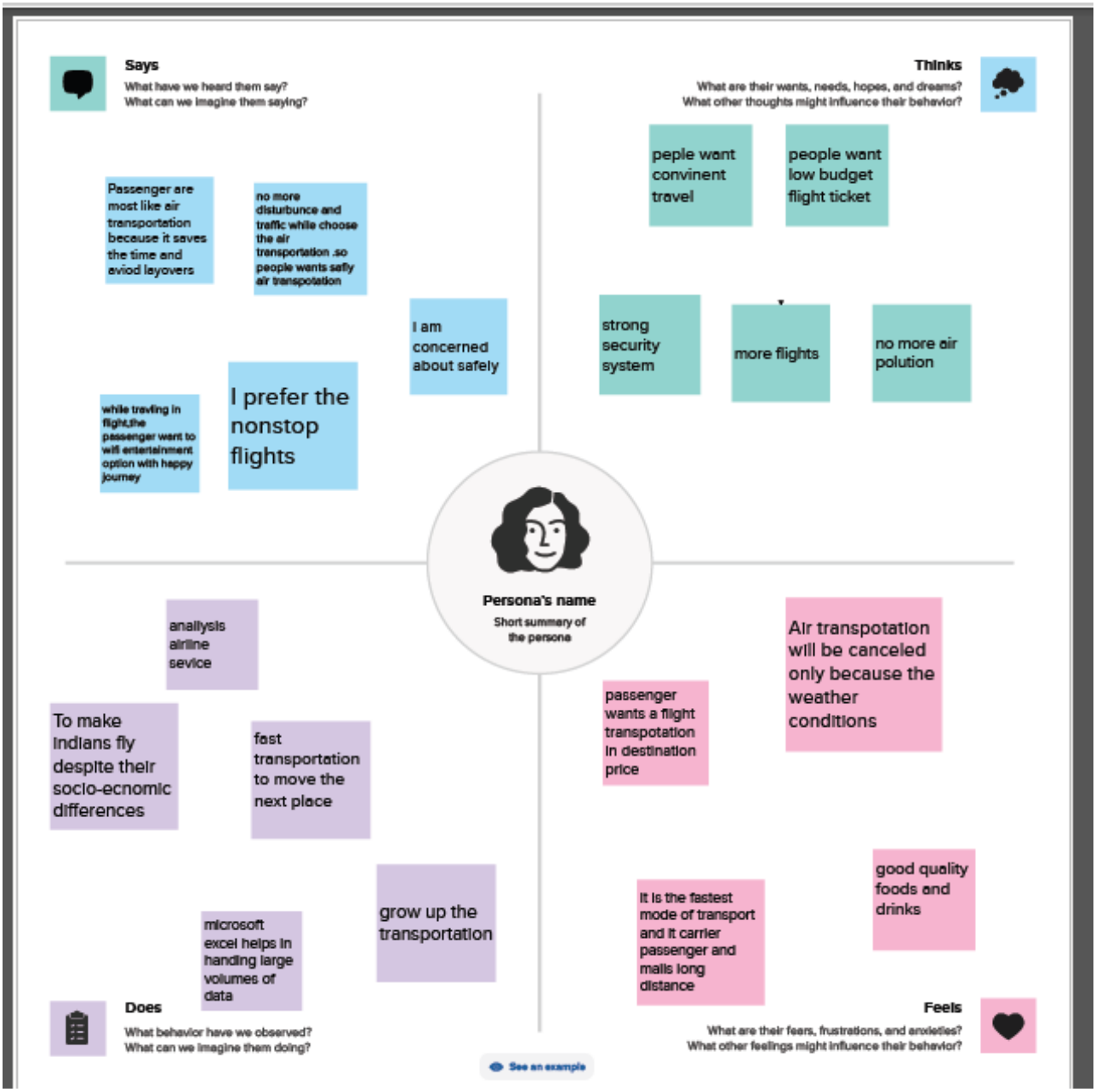
The purpose of analyzing the global air transportation network with Tableau is to gain valuable insights and make data-driven decisions in various domains, such as aviation, tourism, and government Polic Airline**s** can use Tableau to track flight routes, passenger loads, and on-time performance to optimize operations, reduce delays, and improve efficiency Airlines and airports can use Tableau to identify profitable routes, understand passenger demand, and plan new routes or adjust existing ones Tableau helps airlines understand passenger demographics, preferences, and behaviors, allowing for personalized marketing and service improvements. Government agencies and aviation authorities can use Tableau to check safety and security data, and safety compliance.

Governments and organizations can analyze the economic impact of the aviation industry on a regional or global scale, considering job creation and revenue generation. Understand travel patterns to promote tourism, such as showing popular destinations and understanding the seasonality of travel. Airlines and organization companies can use Tableau to perfect cargo routes, track shipments, and ensure the efficient movement of Goodtimes of pandemics or health crises, Tableau can be used to track passenger health data and assess safety measures. Ensure compliance with aviation regulations and standards, making sure that safety and operational protocols are During natural disasters or emergencies, airlines, government agencies, and relief organizations can use Tableau to check and respond to transportation needs. Airlines and manufacturers can use data analysis to drive innovation in plane design, technology, and

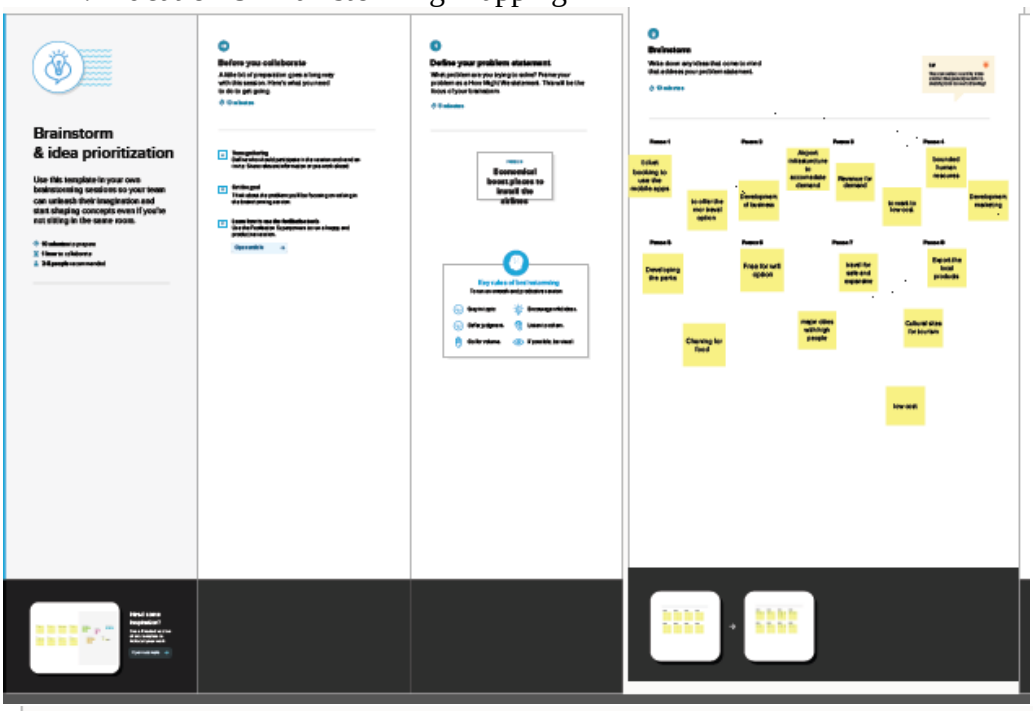
sustainability. Tableau allows stakeholders in the global air transportation network to visualize and understand complex data, show trends, make informed decisions, and improve various aspects of the industry, ranging from operational efficiency to passenger experience and safety.

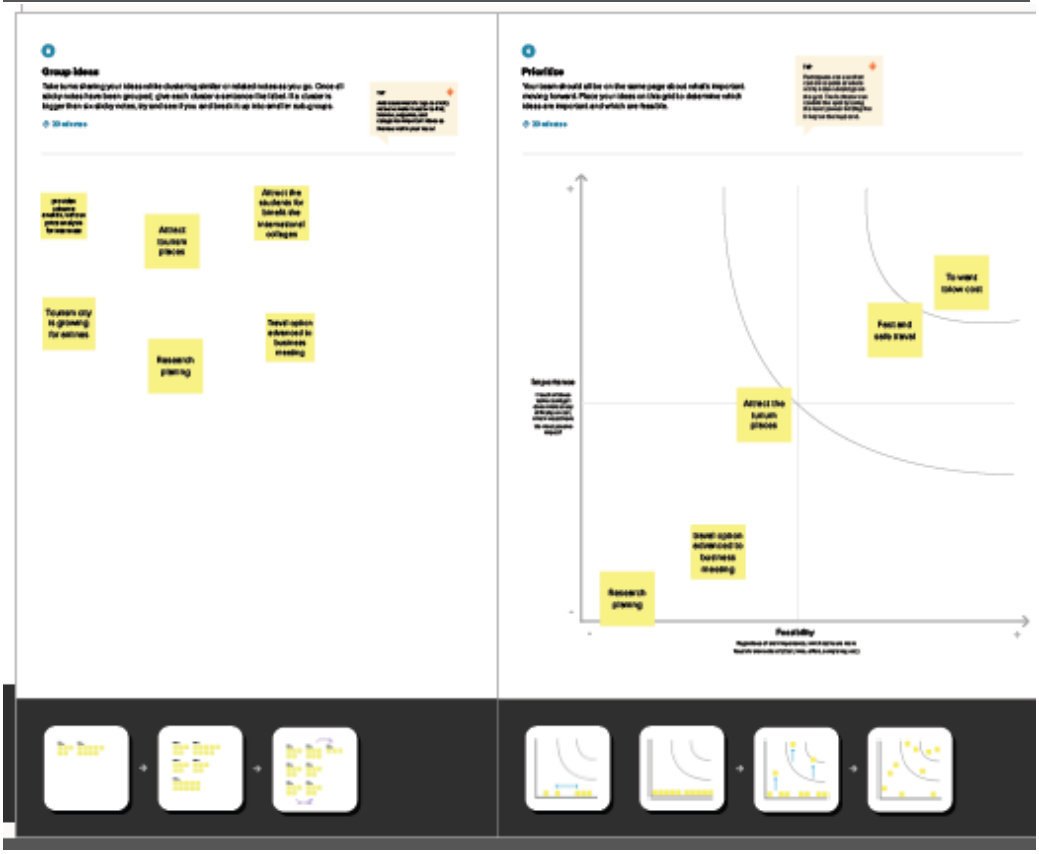
2.PROBLEM DEFINITION AND DESIGN THINKING

2.1 Empathy Map



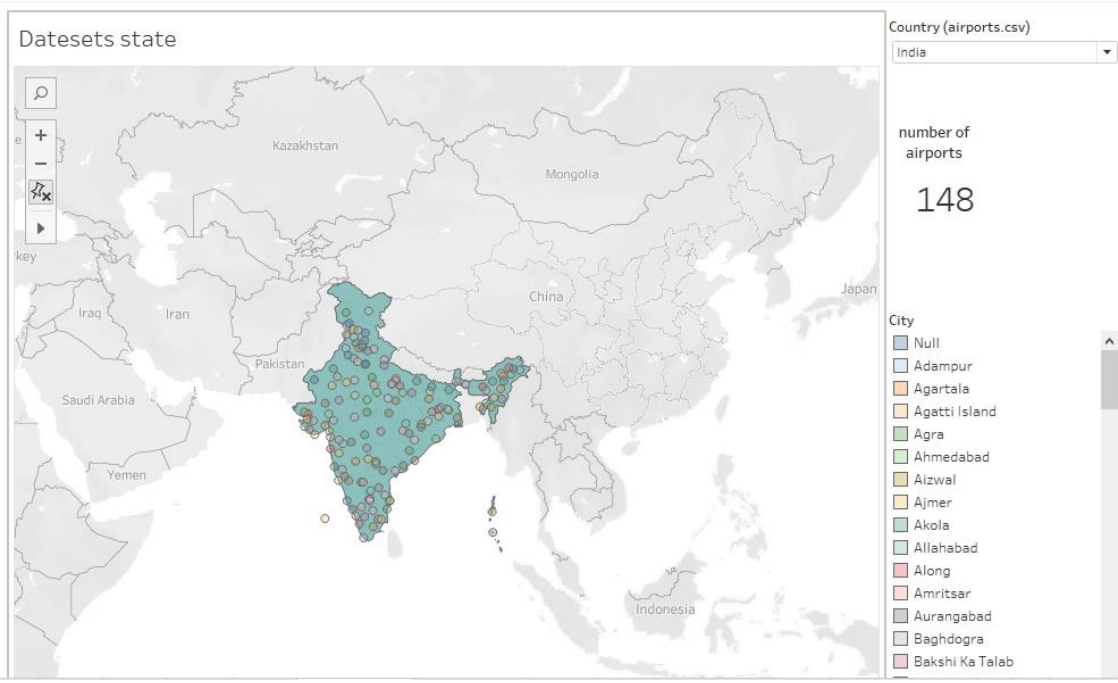
2.2 Ideation & Brainstorming Mapping



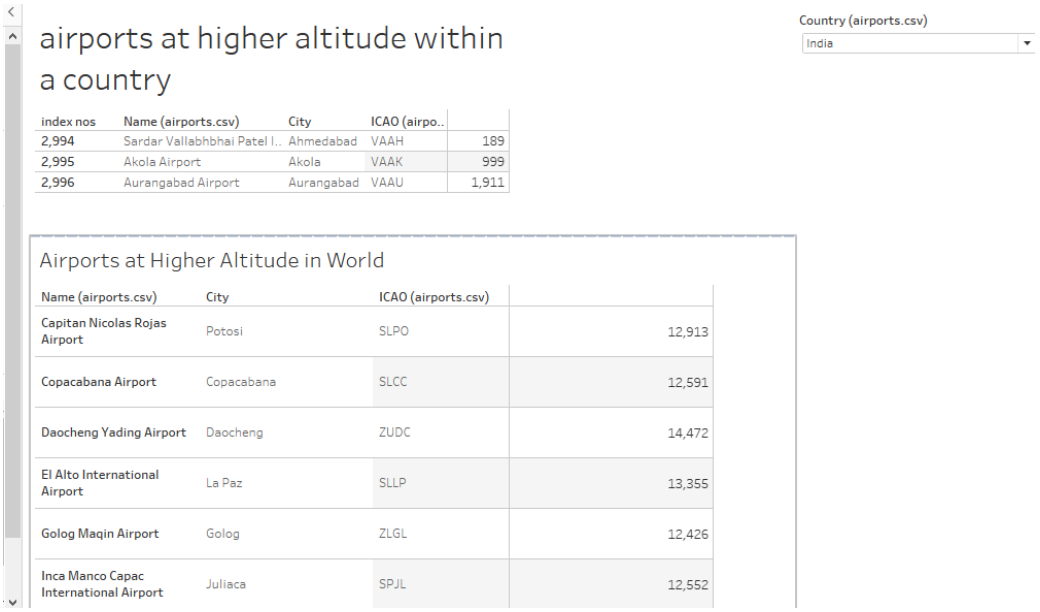


3.RESULT

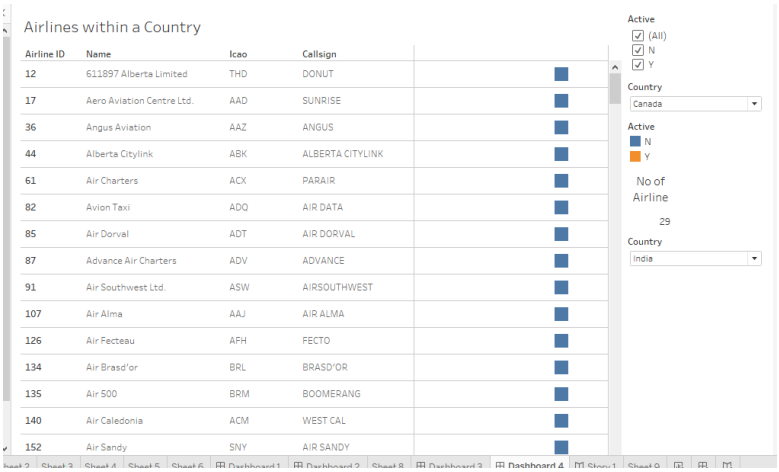
Dashboard 1



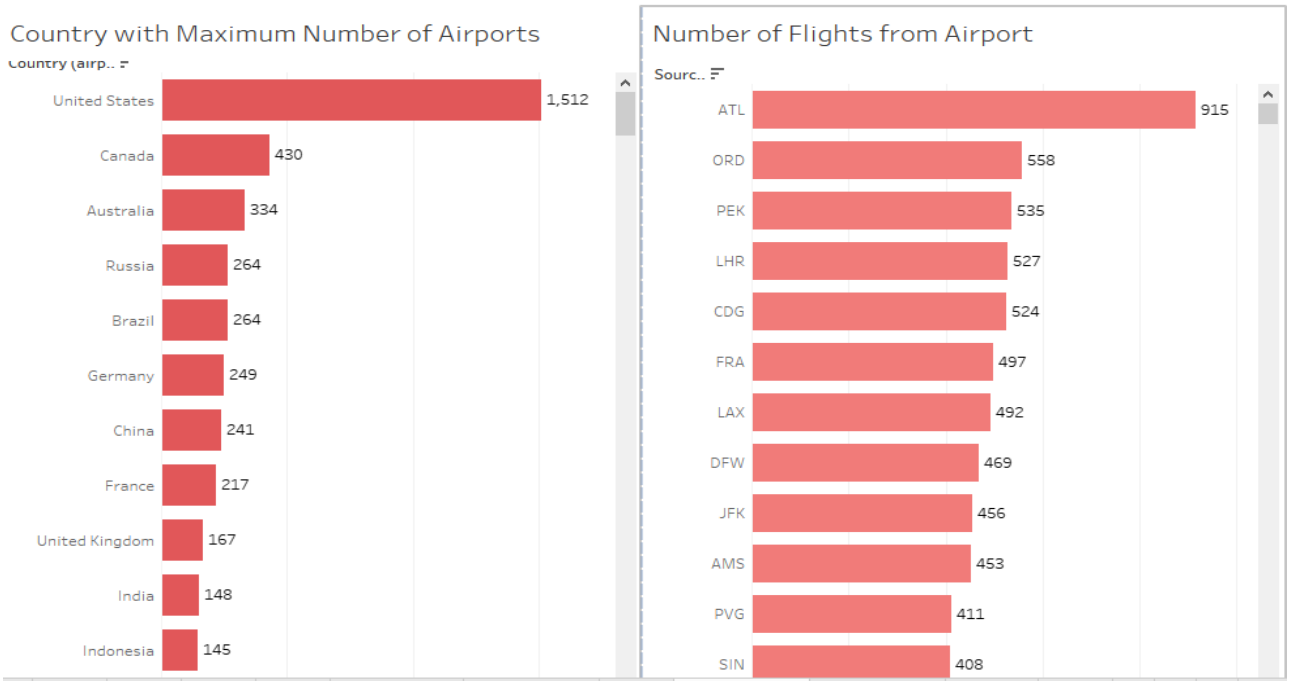
Dashboard 2



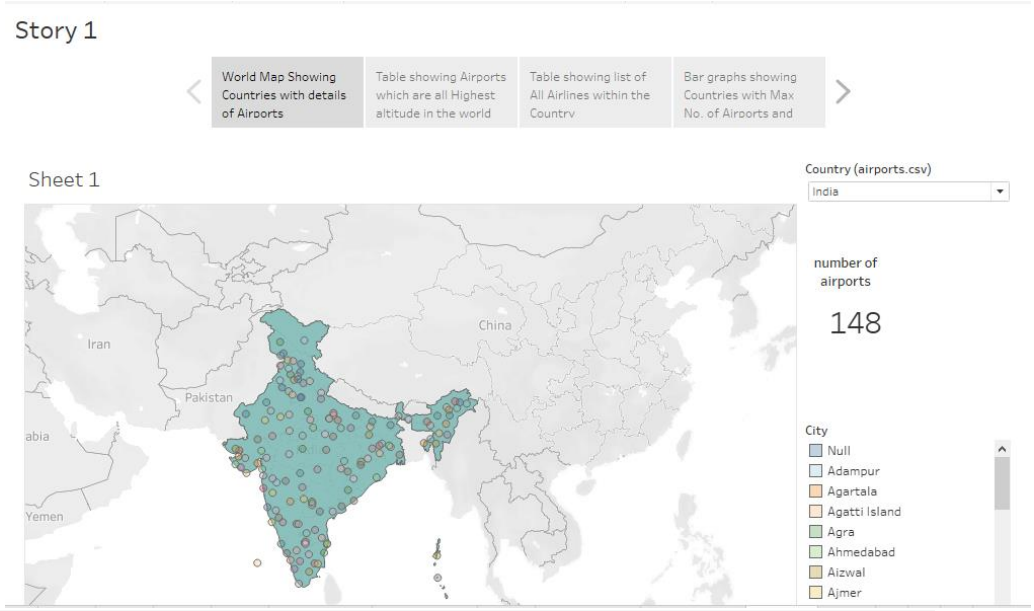
Dashboard 3



Dashboard 4



STORY


Story 1
World Map Showing Countries with details of Airports
Table showing Airports which are all Highest altitude in the world
Table showing list of All Airlines within the Country
Bar graphs showing Countries with Max No. of Airports and
Sheet 1
Country (airports.csv)
India
number of airports
148
China
Iran
Pakistan
Yemen
City
Null
Adampur
Agartala
Agatti Island
Agra
Ahmedabad
Aizwal
Ajmer

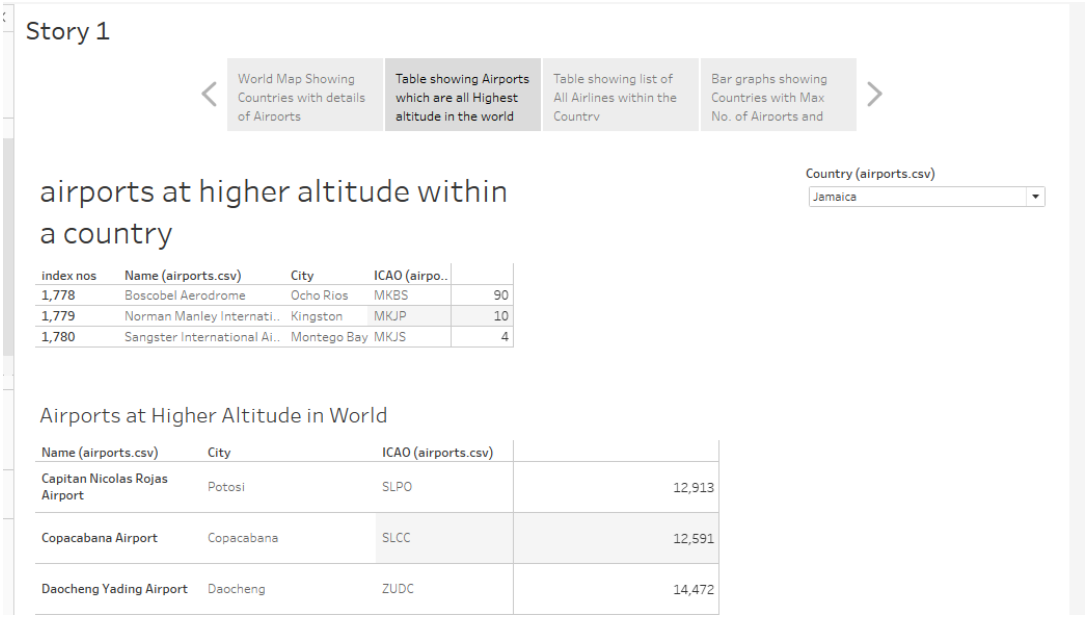

Story 1
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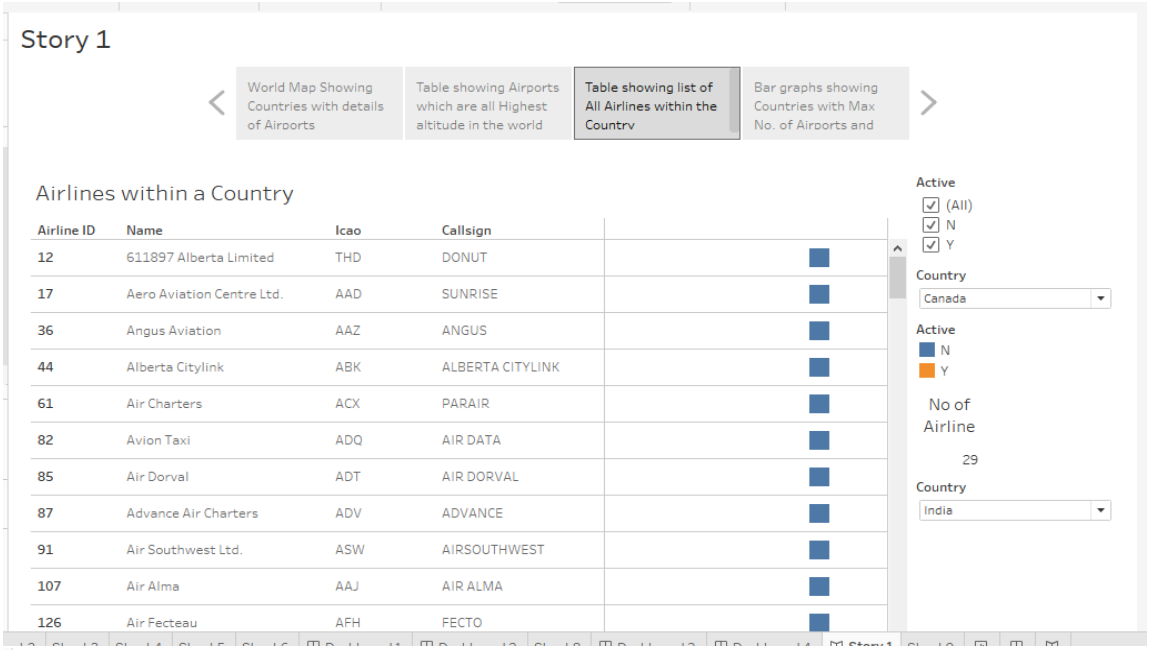
Table showing Airports which are all Highest altitude in the world
Table showing list of All Airlines within the Country
Bar graphs showing Countries with Max No. of Airports and
airports at higher altitude within a country
Country (airports.csv)
Jamaica
index nos
Name (airports.csv)
City
ICAO (airpo..
1,778
Boscobel Aerodrome
Ocho Rios
MKBS
90
1,779
Norman Manley Internati..
Kingston
MKJP
10
1,780
Sangster International Ai..
Montego Bay
MKJS
4
Airports at Higher Altitude in World
Name (airports.csv)
City
ICAO (airports.csv)
Capitan Nicolas Rojas Airport
Potosi
SLPO
12,913
Copacabana Airport
Copacabana
SLCC
12,591
Daocheng Yading Airport
Daocheng
ZUDC
14,472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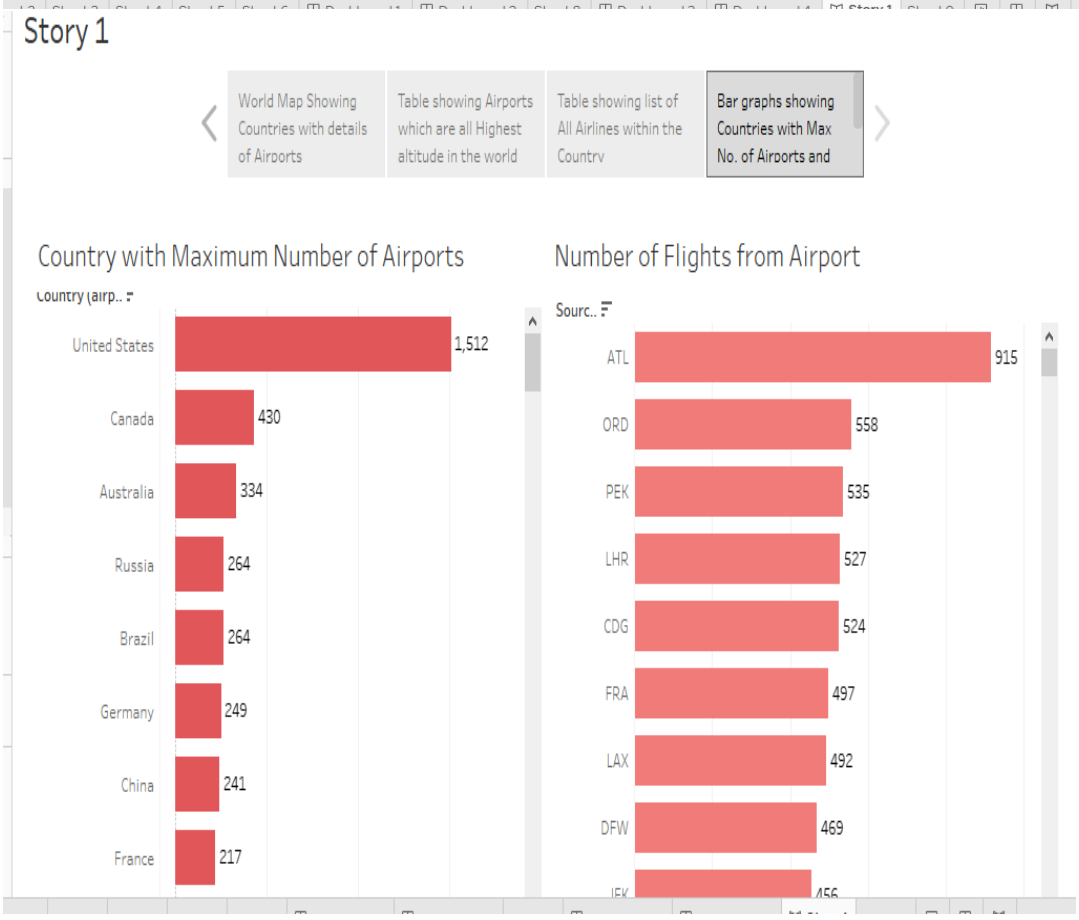
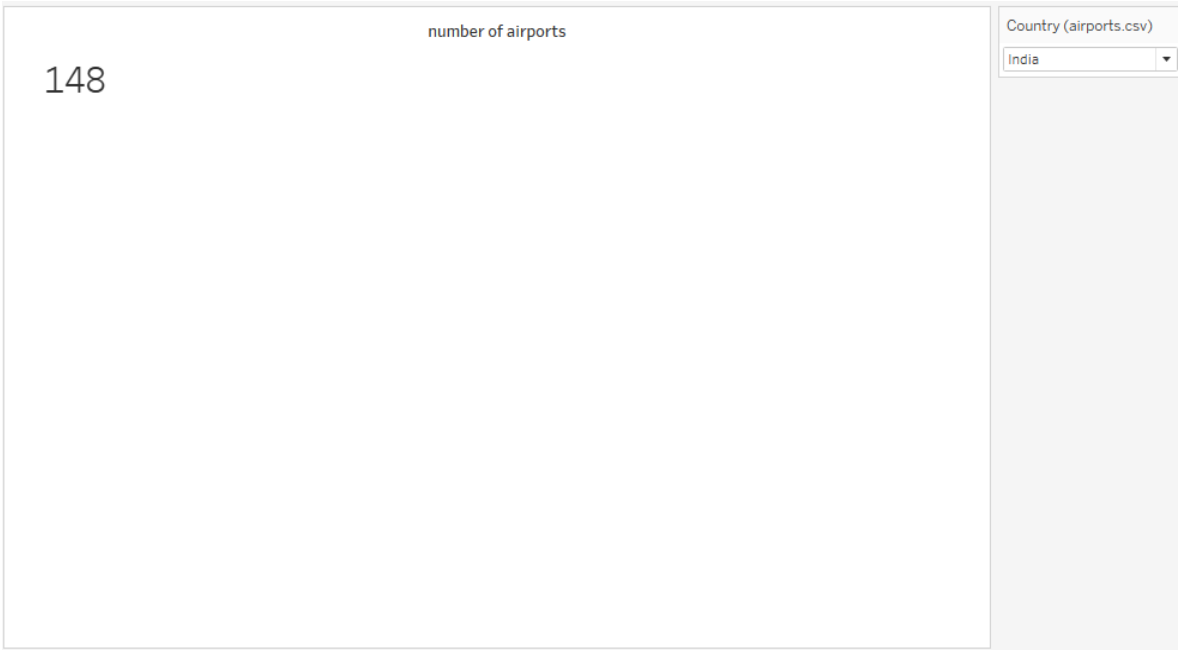
World Map Showing Countries with details of Airports
Table showing Airports which are all Highest altitude in the world
Table showing list of All Airlines within the Country
Bar graphs showing Countries with Max No. of Airports and
Airlines within a Country
Airline ID
Name
Icao
Callsign
12 611897 Alberta Limited THD DONUT
17 Aero Aviation Centre Ltd. AAD SUNRISE
36 Angus Aviation AAZ ANGUS
44 Alberta Citylink ABK ALBERTA CITYLINK
61 Air Charters ACX PARAIR
82 Avion Taxi ADQ AIR DATA
85 Air Dorval ADT AIR DORVAL
87 Advance Air Charters ADV ADVANCE
91 Air Southwest Ltd. ASW AIRSOUTHWEST
107 Air Alma AAJ AIR ALMA
126 Air Fecteau AFH FECTO
Active
(All)
N
Y
Country
Canada
Active
N
Y
No of Airline
29
Country
India


Story 1
World Map Showing Countries with details of Airports
Table showing Airports which are all Highest altitude in the world
Table showing list of All Airlines within the Country
Bar graphs showing Countries with Max No. of Airports and
Country with Maximum Number of Airports
Country (airp..
United States 1,512
Canada 430
Australia 334
Russia 264
Brazil 264
Germany 249
China 241
France 217
Number of Flights from Airport
Sourc..
ATL 915
ORD 558
PEK 535
LHR 527
CDG 524
FRA 497
LAX 492
DFW 469
456

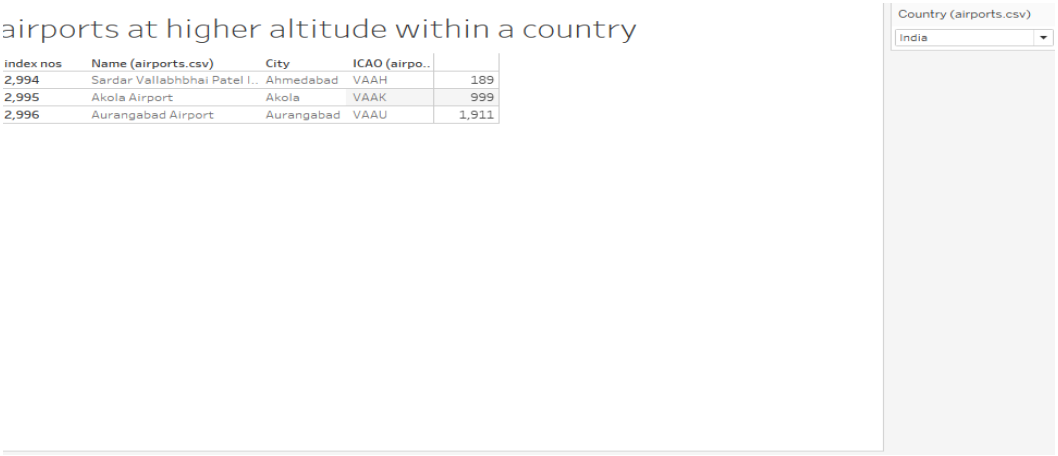
VISUALIZATIONS

1.World Map showing details of all airports within a country

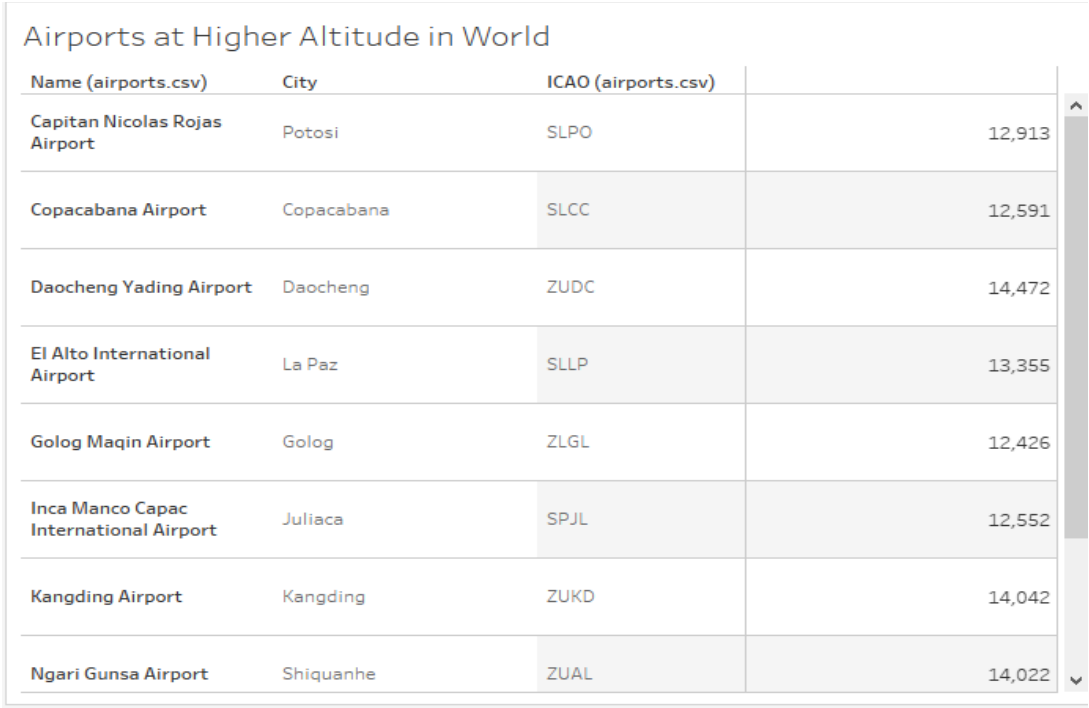
2.Number of Airports



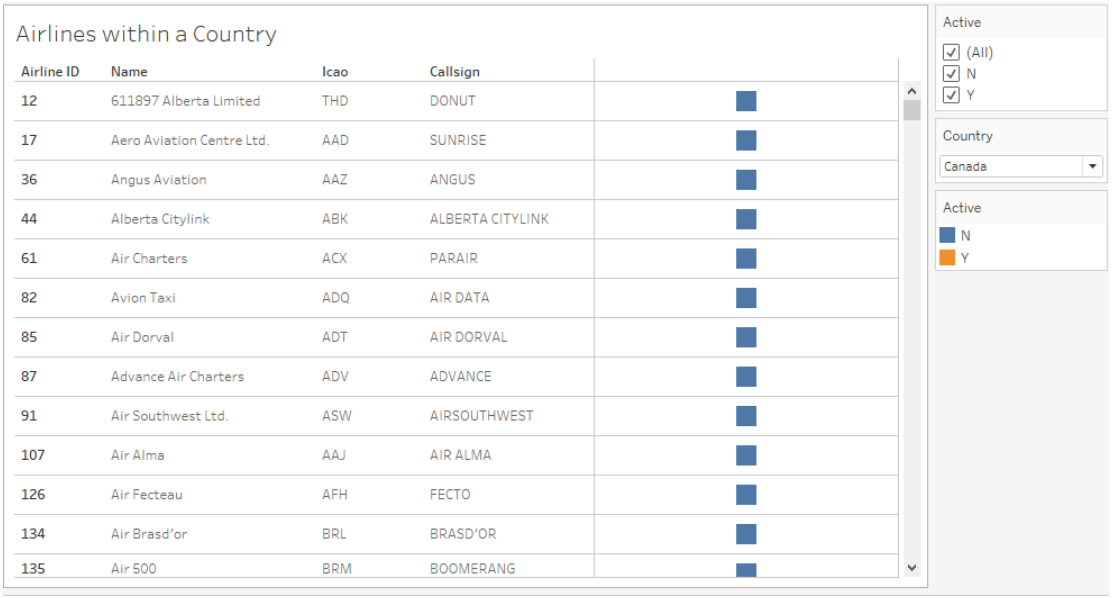
3.Airports at higher altitude within a country



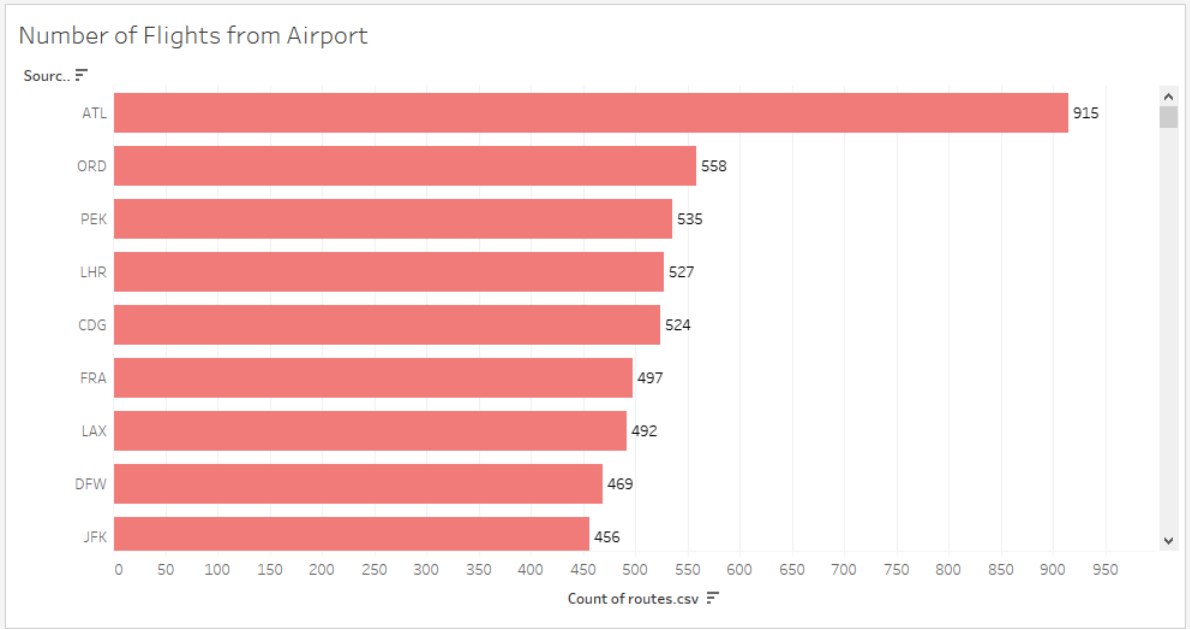
4.Airports at higher Altitude in World



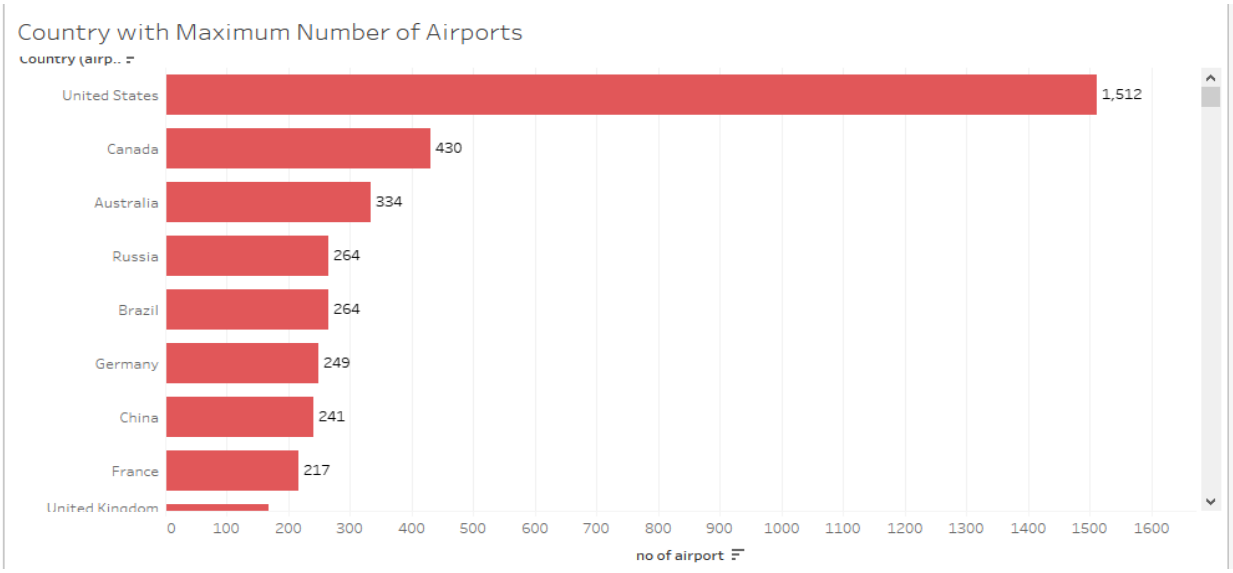
5.Airlines within a Country



6.Number of flights from Airport



7.Country with maximum number of Airports



4. ADVANTAGES &DISADVANTAGES

4.1 Advantages

1. Tableau can be a powerful tool for unlocking insights into the global air transportation network. Its data visualization capabilities allow you to analyze and display complex data in an intuitive and interactive way.

2. Tableau can connect to various data sources, including databases, spreadsheets, and cloud-based data, allowing you to bring together diverse datasets related to air transportation.

3. useful for understanding trends, routes, and passenger data in the global air transportation networkable supplies mapping capabilities, making it easy to visualize routes, airports, and destinations across the globe.

4. You can create heatmaps and geographic visualizations to highlight patterns and connections. Tableau can be used to analyze real-time data, which is crucial in the dynamic field of air transportation.

5. You can track flight status, delays, and other real-time information. With Tableau's integration with advanced analytics tools, you can perform predictive analysis to forecast demand, perfect routes, and improve operational efficiency.

6.Tebleau offers robust security features, ensuring that sensitive data related to air

transportation make data-driven decisions to improve the industry's efficiency and safet

4.2 Disadvantages

Unlocking insights into the global air transportation network with Tableau can be a valuable endeavor.

1.Air transportation data is often complex, with multiple sources and formats. Integrating and preparing this data for analysis in Tableau can be time-consuming and require expertis.

2. Tableau licenses and data storage costs can be significant, especially when dealing with large datasets. This cost can be a barrier for smaller organizations or projects.

3. This can lead to a lack of collaboration and understanding among team members.

4. Analyzing large datasets in Tableau can sometimes lead to performance issues, particularly if the Hardware is not optimized.

5. Tableau is not as well-suited for real-time data analysis.

5.APPLICATIONS

1. Airlines and logistics companies can use Tableau to analyze historical flight data to optimize routes, reduce fuel consumption, and minimize travel time.

2. Airlines can use Tableau to understand passenger demand patterns, helping them schedule flights more effectively and improve revenue management.

3. Government aviation authorities can use Tableau to monitor and manage air traffic, ensuring safety and baggage handling processes, leading to better passenger experience.

4. Logistics companies can use Tableau to optimize the transportation of cargo by air, improving supply chain efficiency.

5.Researchers and consultants can use Tableau to analyze trends in the aviation industry and provide valuable insights to stakeholder

The world's top 5 airports of 2023

1. Singapore Changi
2. Doha Hamad
3. Tokyo Haneda
4. Seoul Incheon
5. Pairs CDG

The world's top 5 airlines of 2023

1. Singapore Airlines
2. Qatar Airways
3. ANA All Nippon Airways
4. Emirates
5. Japan Airlines

6.CONCLUSION

Unlocking insights into the global air transportation network using Tableau has proven to be a valuable endeavor. Through data visualization and analysis, we've gained a deeper understanding of the intricacies of this complex system. Key takeaways include:

By visualizing flight routes and passenger traffic, we can identify opportunities for airlines to optimize their routes, leading to cost savings and improved efficiency. Through historical data, we can uncover seasonal patterns in air travel, which can help airlines adjust their schedules and staffing accordingly.

Analyzing passenger demographics and travel preferences can aid airlines in tailoring their services to better meet customer needs and expectations. Visualizing the environmental impact of air travel can drive discussions about sustainability and guide efforts to reduce carbon emissions.

In conclusion, Tableau provides a powerful platform for unlocking these insights, and its use in analyzing the global air transportation network is critical for enhancing the industry's efficiency, sustainability, and customer satisfaction. This tool equips us to make data-driven decisions that will shape the future of air travel.

7.FUTURE SCOPE

The future scope of unlocking insights into the global air transportation network with Tableau is promising and multiple.

1. The integration of real-time data feeds into Tableau dashboards will become more prevalent, enabling airlines and airports to make immediate decisions based on current conditions, such as weather disruptions or flight del Advanced predictive analytics models can be incorporated to forecast passenger demand, optimize pricing, and anticipate maintenance needs, enhancing operational efficiency.

2.As data privacy and security concerns grow, Tableau will evolve to incorporate robust security features to protect sensitive information while still enabling data sharing and collaboration. With an increasing focus on sustainability, Tableau will play a role in tracking and visualizing environmental impact metrics, allowing stakeholders to monitor progress toward reducing carbon emissions.

3. Machine learning algorithms can be seamlessly integrated into Tableau for more intelligent data analysis, providing deeper insights into passenger behavior, route planning, and operational efficiency. Air transportation networks are global, and Tableau can facilitate international collaborations and data sharing among airlines, airports, and regulatory bodies to improve safety, security, and efficiency.

4.Tableau can be used to analyze customer feedback and satisfaction data to continuously improve the passenger experience, from booking to baggage claim. Beyond passenger travel, Tableau can be applied to optimize the entire air cargo supply chain, from tracking shipments to warehouse management.

5. Given the evolving nature of aviation regulations, Tableau will support airlines and airports in staying compliant with changing safety and security requirements. Tableau can be a valuable tool for training and educating aviation professionals, offering a dynamic way to teach safety procedures, air traffic management, and other critical aspects of the industry.

8.APPENDIX

GitHub Link:

https://github.com/bru07A0092/NM2023TMID01976

Dashboard 1:

https://public.tableau.com/app/profile/santhamani.r/viz/AIRTRANSPORTATIONNETWORK_16972027744590/Dashboard1?publish=yes

Dashboard 2:

https://public.tableau.com/app/profile/santhamani.r/viz/AIRTRANSPORTATIONNETWORK_16972027744590/Dashboard2?publish=yes

Dashboard 3:

https://public.tableau.com/app/profile/santhamani.r/viz/AIRTRANSPORTATIONNETWORK_16972027744590/Dashboard3?publish=yes

Dashboard 4:

https://public.tableau.com/app/profile/santhamani.r/viz/AIRTRANSPORTATIONNETWORK_16972027744590/Dashboard4?publish=yes

Story 1:

https://public.tableau.com/app/profile/santhamani.r/viz/AIRTRANSPORTATIONNETWORK_16972027744590/Story1?publish=ye

Video demonstration link:

https://drive.google.com/file/d/15Fk-GnmMYfi0RF1okRI_geoVCtIVc4Mm/view?usp=drivesdk