Unlocking Insights into the Global Air Transportation Network with Tableau.

Project Report

1.**Introduction**

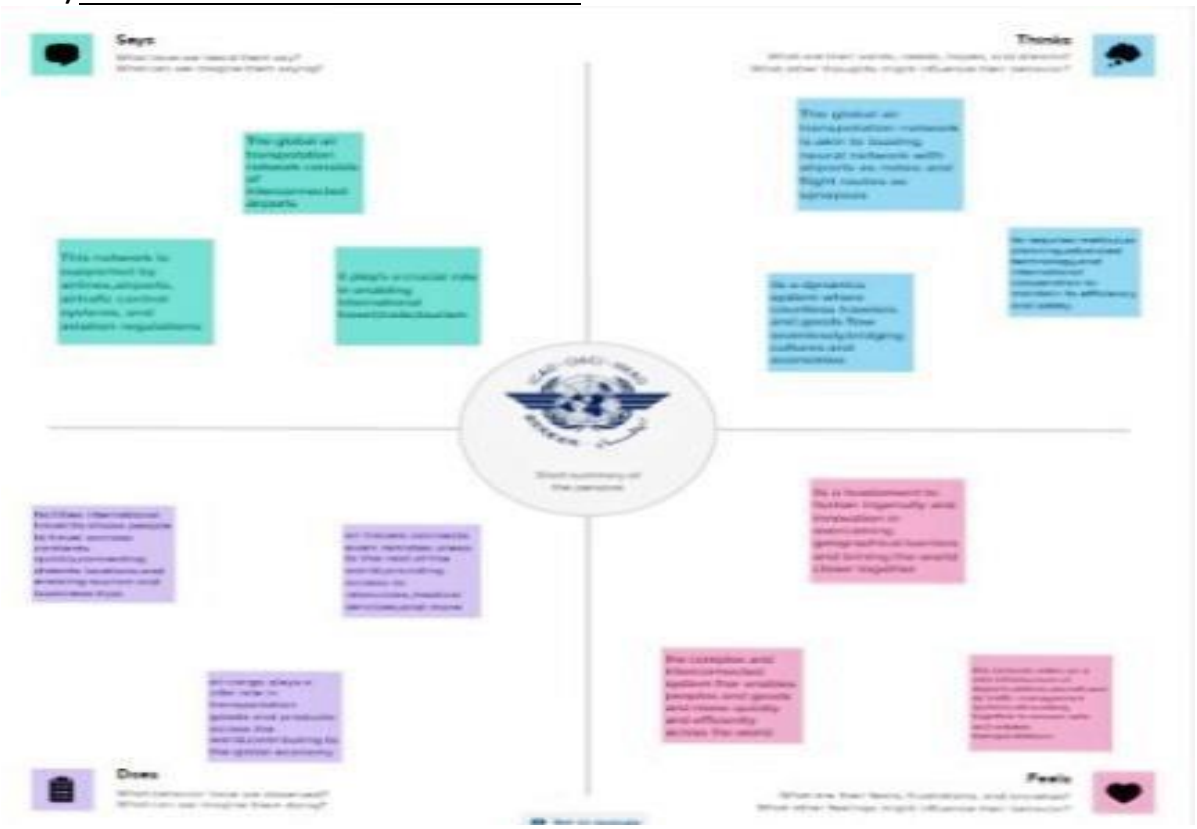
1.1 Overview:

1.2 The project, "Unlocking Insights into the Global Air Transportation Network with Tableau," aims to provide a comprehensive analysis of the global air transportation network using Tableau as a visualization tool.

1.3 Purpose:

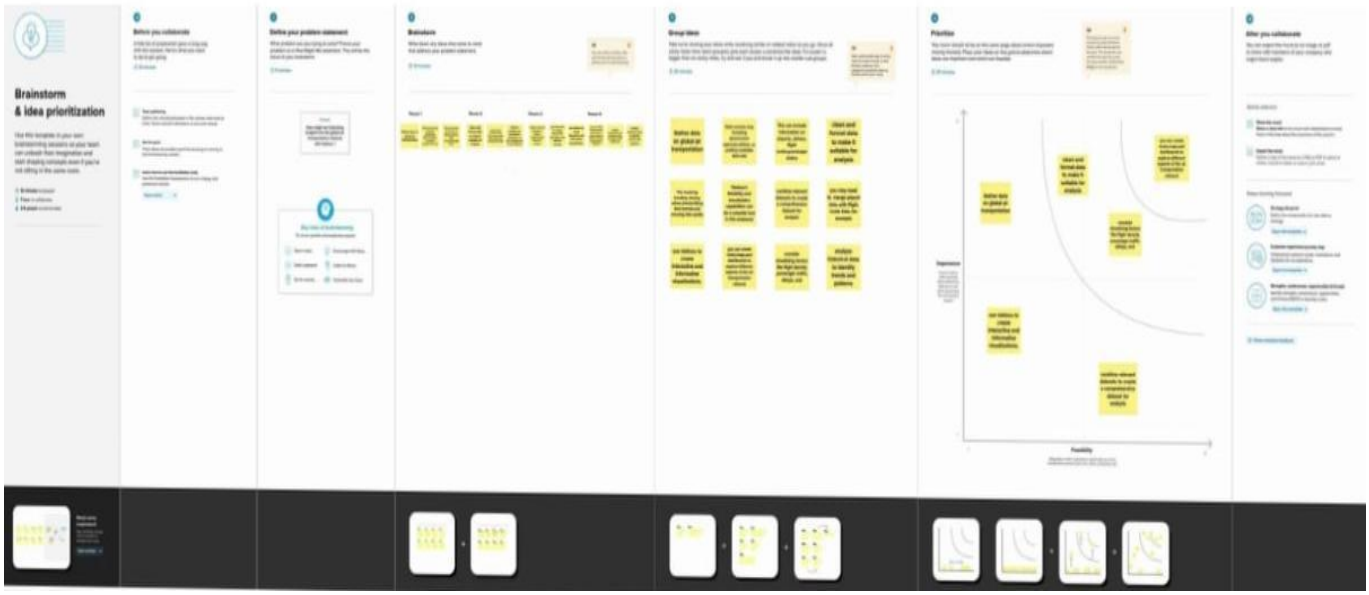
This project allows users to gain valuable insights into the dynamics of the global air transportation system. By leveraging Tableau's capabilities, it enables the exploration of factors such as flight routes, passenger trends, and geographical connections. The project's purpose is to facilitate data-driven decision-making and enhance our understanding of air travel on a global scale.

2) PROBLEM DEFINITION & DESIGN THINKING:



2.1 Empathy map:

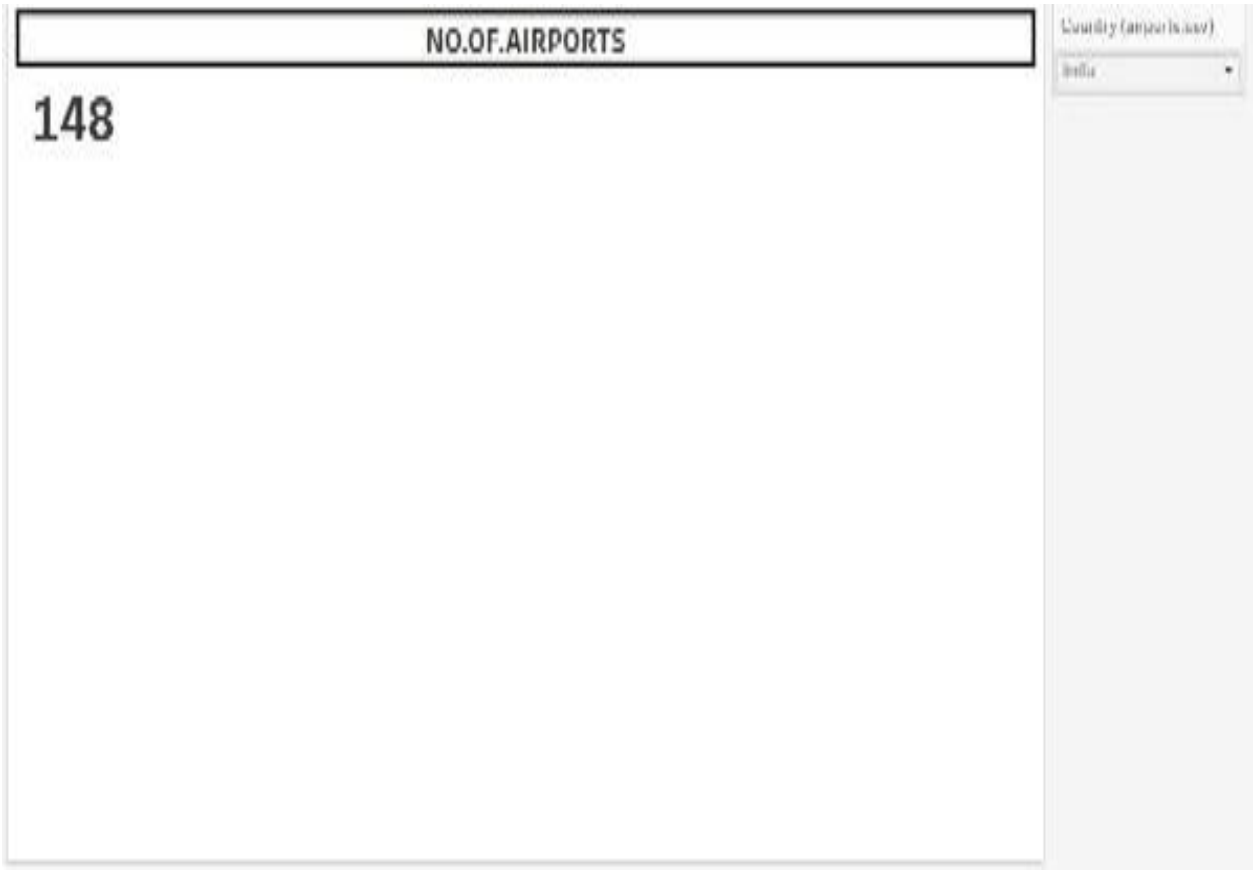
2.2)**Brainstorming map:**



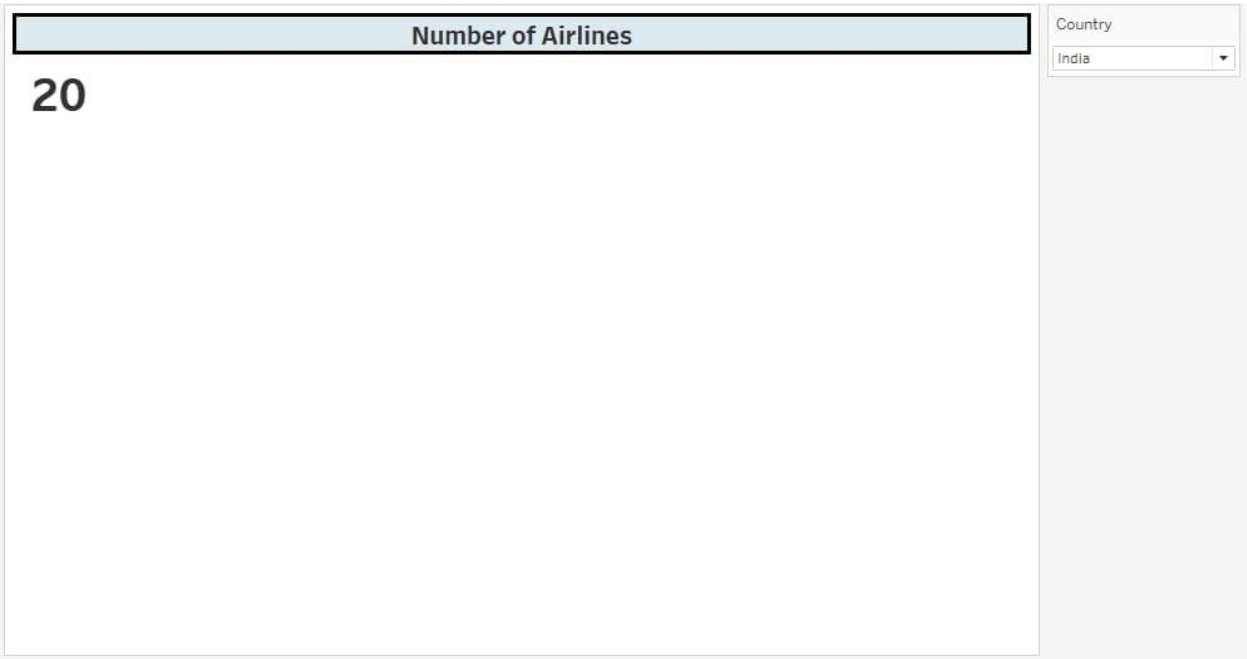
3) RESULT:

3.1) SHEETS:

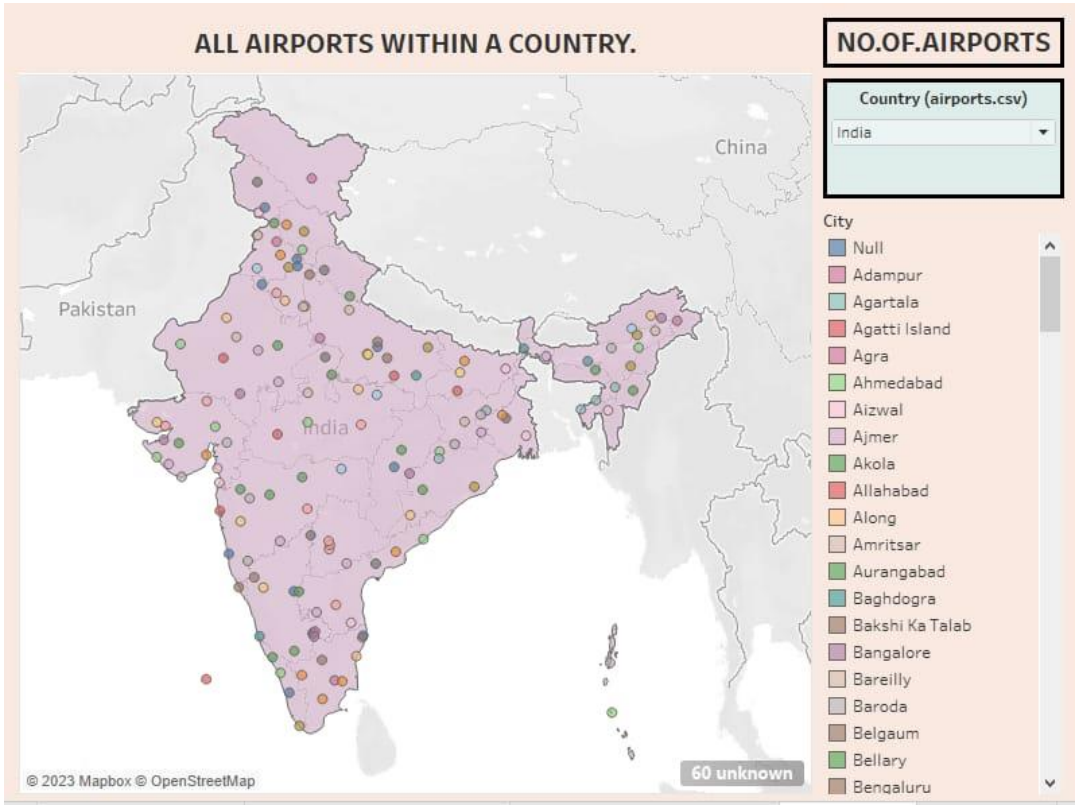
3.1.1 No.of.airports



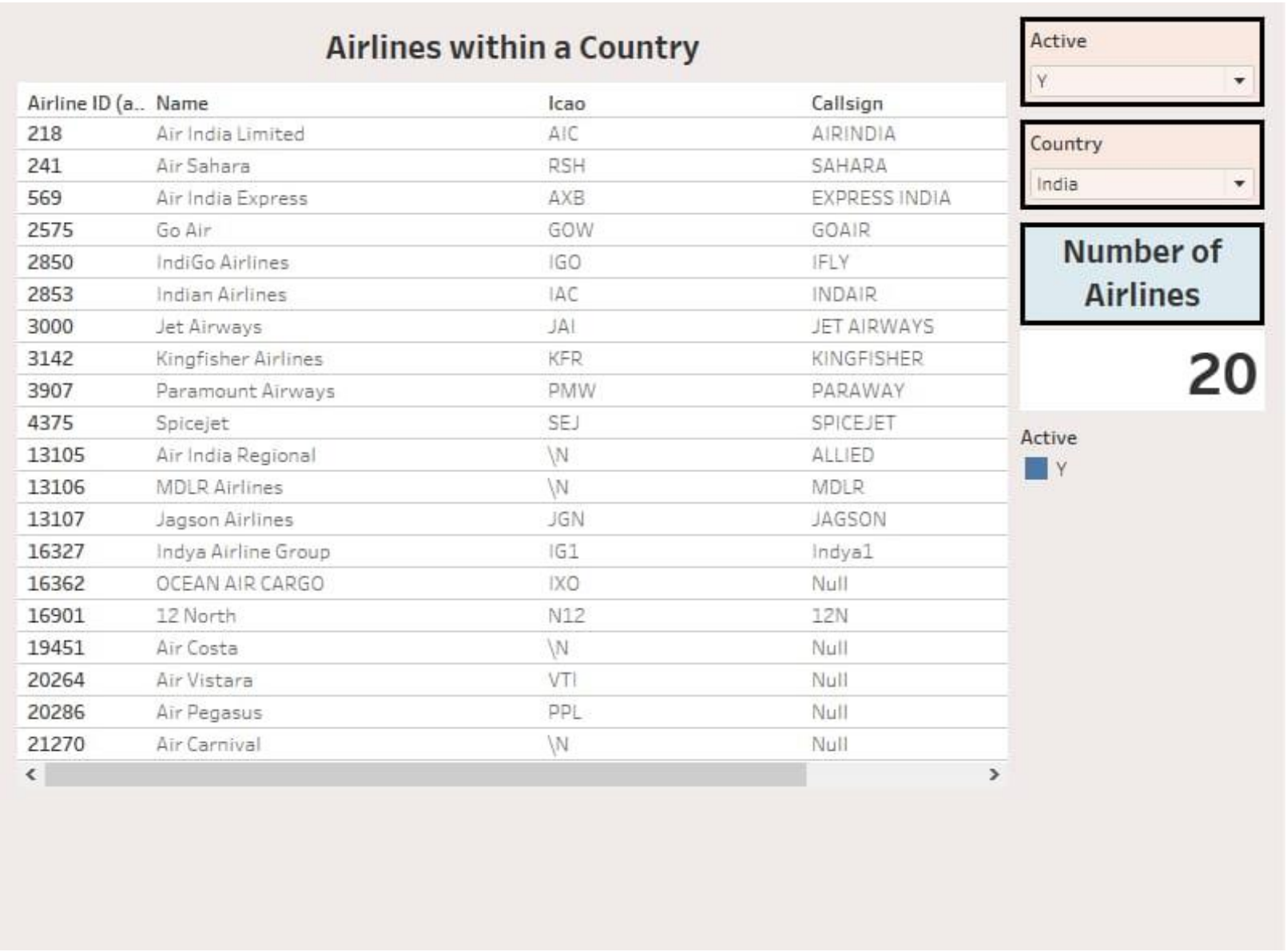
3.1.2 Number of Airlines



3.1.3 All Airports within a country



3.1.4. Airlines within a COUNTRY:



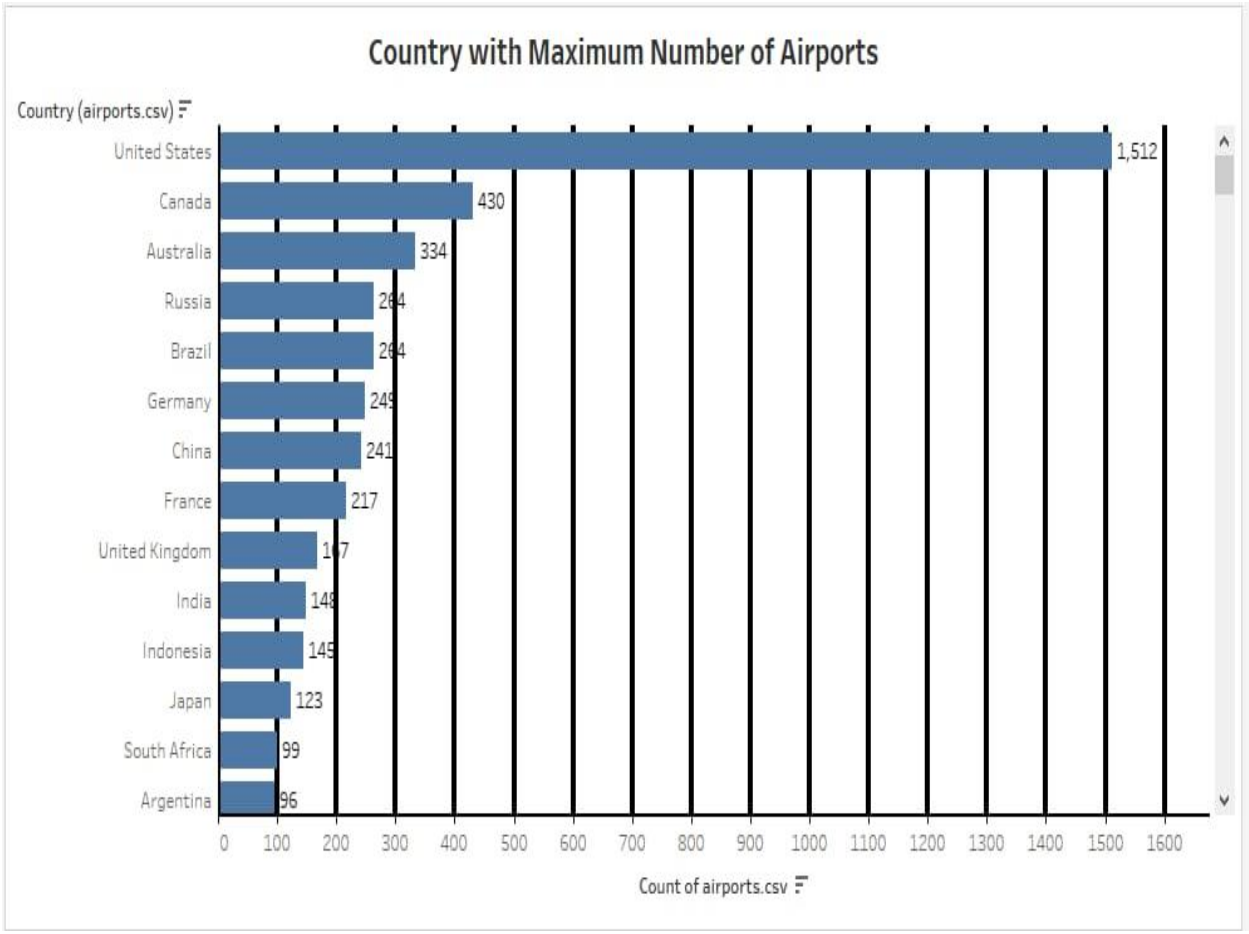
Airline ID (a..	Name	Icao	Callsign
218	Air India Limited	AIC	AIRINDIA
241	Air Sahara	RSH	SAHARA
569	Air India Express	AXB	EXPRESS INDIA
2575	Go Air	GOW	GOAIR
2850	IndiGo Airlines	IGO	IFLY
2853	Indian Airlines	IAC	INDAIR
3000	Jet Airways	JAI	JET AIRWAYS
3142	Kingfisher Airlines	KFR	KINGFISHER
3907	Paramount Airways	PMW	PARAWAY
4375	Spicejet	SEJ	SPICEJET
13105	Air India Regional	\N	ALLIED
13106	MDLR Airlines	\N	MDLR
13107	Jagson Airlines	JGN	JAGSON
16327	Indya Airline Group	IG1	Indya1
16362	OCEAN AIR CARGO	IXO	Null
16901	12 North	N12	12N
19451	Air Costa	\N	Null
20264	Air Vistara	VTI	Null
20286	Air Pegasus	PPL	Null
21270	Air Carnival	\N	Null

3.1.5 Airports at highest altitude in world:

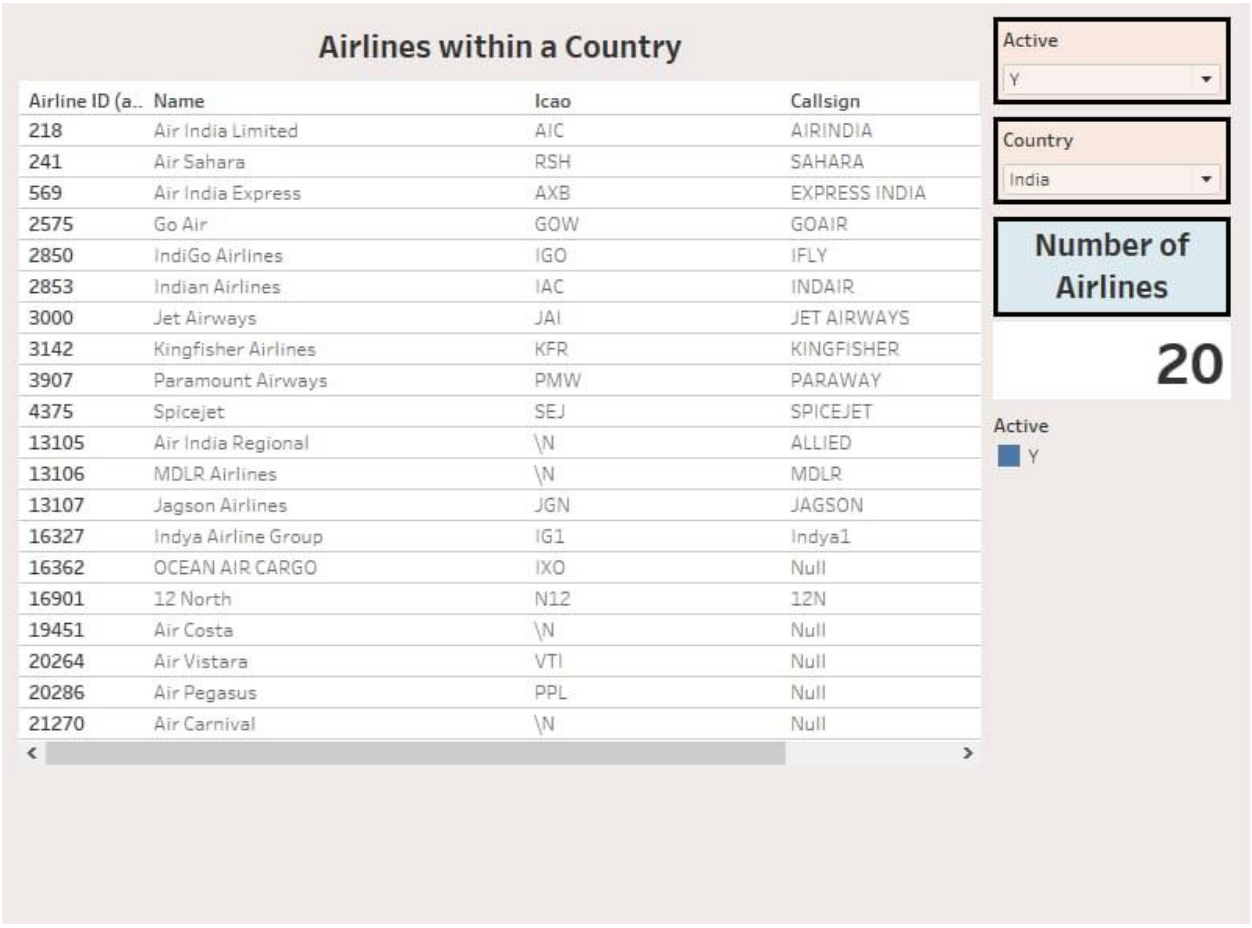
Airports at Highest Altitude in World

Name (airports.csv)	City	ICAO (airport..	
Daocheng Yading Airport	Daocheng	ZUDC	14,472
Qamdo Bangda Airport	Bangda	ZUBD	14,219
Kangding Airport	Kangding	ZUKD	14,042
Ngari Gunsa Airport	Shiquanhe	ZUAL	14,022
El Alto International Airport	La Paz	SLLP	13,355
Capitan Nicolas Rojas Airport	Potosi	SLPO	12,913
Yushu Batang Airport	Yushu	ZYLS	12,816
Copacabana Airport	Copacabana	SLCC	12,591
Inca Manco Capac International Airport	Juliaca	SPJL	12,552
Golog Maqin Airport	Golog	ZLGL	12,426

3.1.6 Country with maximum number of airports



3.1.7 airlines within a country:



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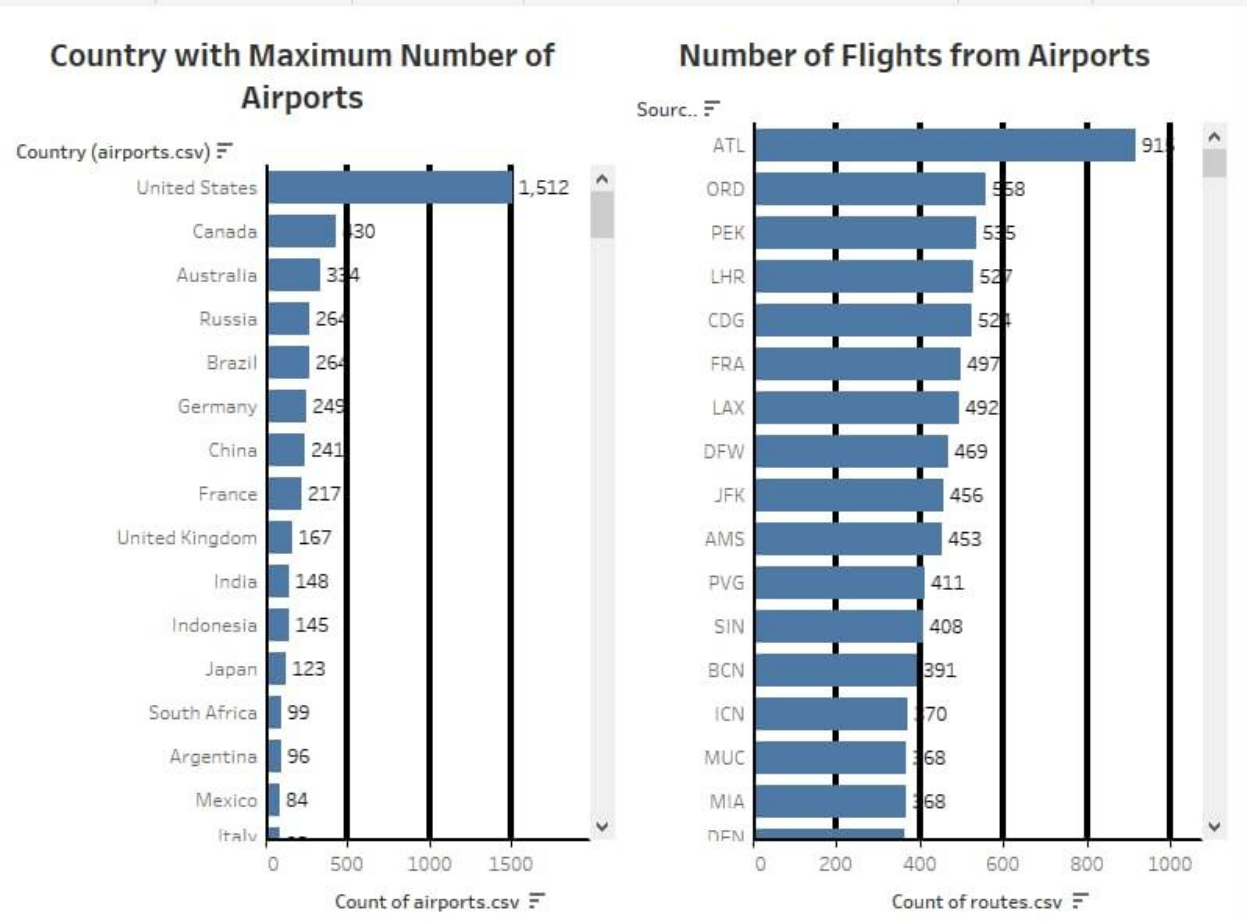
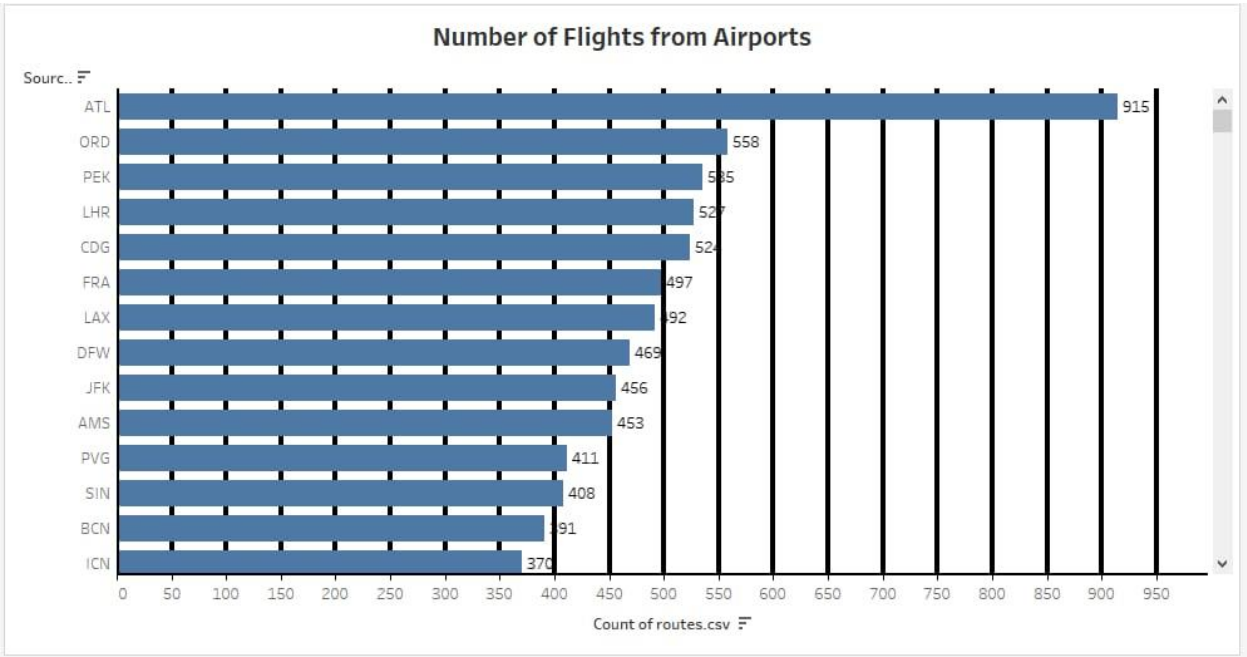
20286	Air Pegasus	PPL	Null
21270	Air Carnival	\N	Null

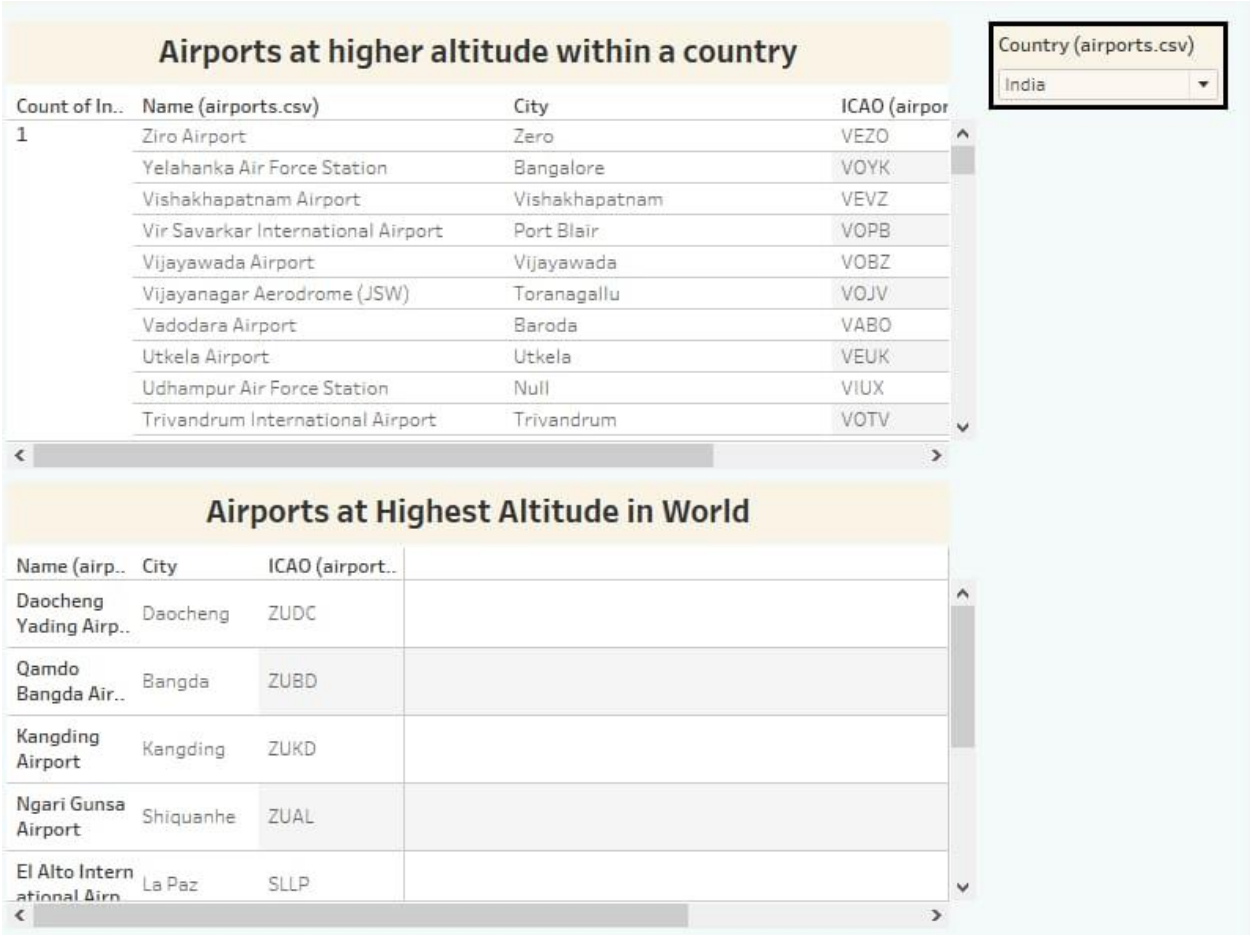
3.2 country with maximum number of airports &Number of flights from airport:



3.2.1Numder of flights airports:



3.3.Airports at higher altitude within a country:



Airports at higher altitude within a country

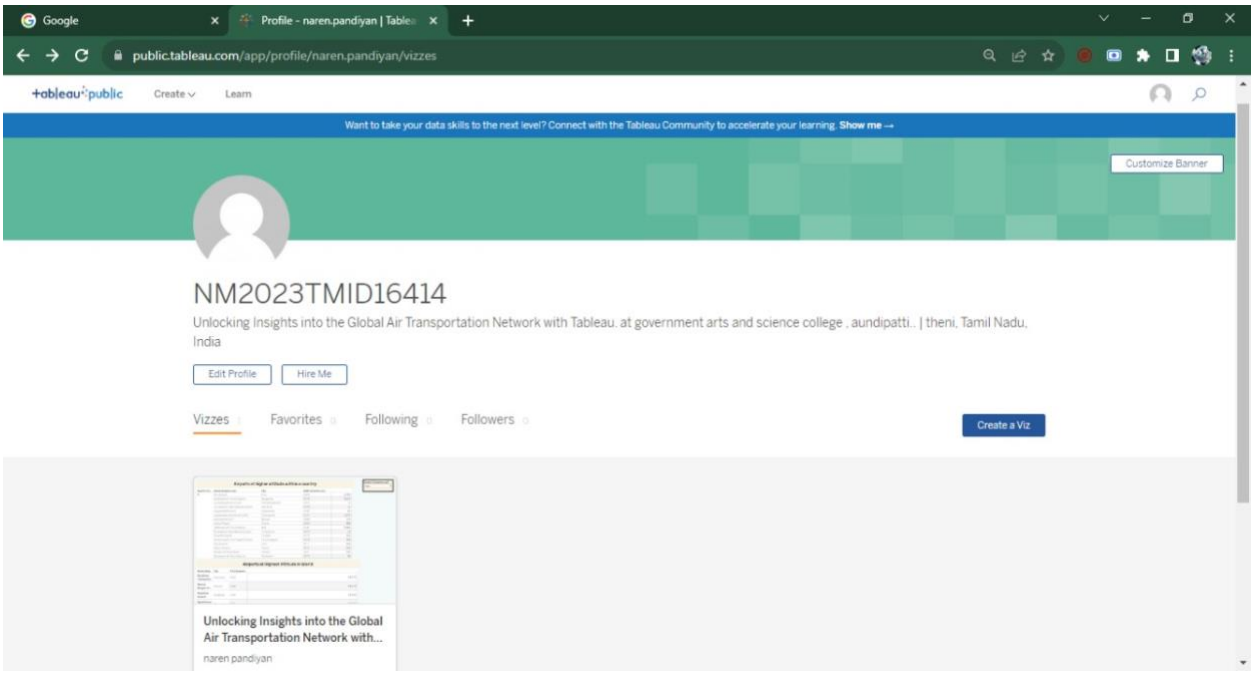
Country (airports.csv): India

Count of In..	Name (airports.csv)	City	ICAO (airpor
1	Ziro Airport	Zero	VEZO
	Yelahanka Air Force Station	Bangalore	VOYK
	Vishakhapatnam Airport	Vishakhapatnam	VEVZ
	Vir Savarkar International Airport	Port Blair	VOPB
	Vijayawada Airport	Vijayawada	VOBZ
	Vijayanagar Aerodrome (JSW)	Toranagallu	VOJV
	Vadodara Airport	Baroda	VABO
	Utkela Airport	Utkela	VEUK
	Udhampur Air Force Station	Null	VIUX
	Trivandrum International Airport	Trivandrum	VOTV

Airports at Highest Altitude in World

Name (airp..	City	ICAO (airport..	
Daocheng Yading Airp..	Daocheng	ZUDC	
Qamdo Bangda Air..	Bangda	ZUBD	
Kangding Airport	Kangding	ZUKD	
Ngari Gunsa Airport	Shiquanhe	ZUAL	
El Alto International Airp	La Paz	SLLP	

3.4 Tableau account:



4 Advantages and disadvantages:

4.1 Advantages

1.Data Visualization: Tableau is known for its powerful data visualization capabilities, making it easier to understand complex data related to the global air transportation network.

2.nteractive Dashboards: Tableau allows for the creation of interactive dashboards that can provide real-time updates and drill-down capabilities, enhancing the user experience.

3.Data Integration: It can integrate data from various sources, including databases, spreadsheets, and cloud-based services, providing a comprehensive view of the network.

4.User-Friendly: Tableau is user-friendly and does not require advanced technical skills to create and interact with visualizations.

5.Collaboration: It supports collaborative work, enabling multiple team members to collaborate on data analysis and share insights.

6.Scalability: Tableau can handle large datasets, making it suitable for analyzing the extensive data associated with global air transportation.

7.Predictive Analytics: Advanced analytics and predictive modeling can be incorporated into Tableau, allowing for forecasting and trend analysis.

Accessibility: Dashboards can be accessed from various devices, ensuring accessibility for stakeholders.

4.2Disadvantages:

1.Cost: Tableau licenses and ongoing maintenance costs can be expensive, especially for smaller organizations.

2.Learning Curve: While user-friendly, mastering Tableau's full capabilities may require some training and experience.

3.Data Preparation: Data preparation can be time-consuming, as data must be cleaned and structured correctly before visualization.

4.Performance: Large and complex dashboards may experience performance issues, leading to slower loading times.

5.Limited Customization: While Tableau offers customization options, highly specialized requirements may be challenging to implement.

6.Licensing Restrictions: Licensing models and restrictions can limit the number of users who can access and interact with the dashboards.

7.Security Concerns: Managing data security and permissions can be complex, especially when dealing with sensitive information.

8.Compatibility: Compatibility issues may arise when integrating Tableau with certain data sources or other software systems.

5. Applications:

1. Operations Management: Airlines and airports can use Tableau to monitor real-time flight schedules, track delays, optimize crew scheduling, and improve overall operational efficiency.

2. Revenue Management: Airlines can analyze passenger booking patterns, pricing strategies, and demand forecasts to maximize revenue and optimize seat inventory.

3. Customer Experience: Understanding passenger preferences and feedback can help airlines enhance the passenger experience by tailoring services and improving customer satisfaction.

4. Safety and Compliance: Safety data analysis and compliance reporting can be streamlined using Tableau, ensuring adherence to aviation regulations and standards.

5. Maintenance and Fleet Management: Airlines and maintenance providers can use data visualization to monitor aircraft health, predict maintenance needs, and optimize fleet management.

6. Supply Chain and Logistics: Air cargo companies can analyze supply chain data to improve cargo routing, reduce costs, and enhance logistics efficiency.

7. Market Analysis: Market researchers and analysts can use Tableau to analyze trends, competitive landscapes, and market dynamics within the aviation sector.

8. Environmental Impact: Evaluate the environmental impact of aviation operations, track emissions, and identify opportunities for sustainability improvements.

9. Security and Risk Management: Enhance security measures by analyzing data related to security incidents, passenger screening, and risk assessment.

10. Government and Regulatory Reporting: Aviation authorities can use Tableau to streamline reporting processes, ensuring compliance with aviation regulations and safety standards.

11. Airport Management: Airport authorities can optimize passenger flow, monitor terminal operations, and improve infrastructure planning based on data insights.

12. Emergency Response and Crisis Management: Tableau can be used to support emergency response teams in managing crises such as natural disasters or security incidents.

13. Training and Simulation: Aviation training centers can use data visualization for pilot and crew training, creating realistic scenarios for simulation and training purposes.

14. Financial Analysis: Financial departments of airlines and related businesses can use Tableau to track expenses, revenue, and financial performance metrics.

15. Predictive Analytics: Apply predictive modeling to forecast demand, maintenance needs, or potential disruptions, allowing for proactive decision-making.

6.Conclusion:

Through the utilization of Tableau's robust data visualization and analytics capabilities, we've successfully dissected the intricate web of data surrounding the global air transportation network. This approach has furnished us with an array of advantages, including improved data comprehension, empowered decision-making, and a holistic comprehension of the aviation domain.

Our analysis has uncovered a plethora of valuable insights across various facets of the aviation sector. From optimizing flight operations and revenue management to enhancing customer experiences and ensuring safety compliance, Tableau has enabled stakeholders to unearth actionable intelligence. These revelations have been instrumental in fostering smarter choices, streamlining processes, and bolstering operational efficiency throughout the industry.

7.Future scope:

1. 1.Data Integration: Incorporate more diverse and real-time data sources, such as weather, passenger demographics, and aircraft performance, to provide a comprehensive view of the air transportation network.

2. 2.Advanced Analytics: Implement machine learning and predictive analytics models to forecast trends, congestion, and flight delays. This can help airlines and airports make proactive decisions.

3. 3.Enhanced Visualization: Develop more interactive and intuitive dashboards in Tableau to allow users to drill down into specific regions, airports, or flight routes for deeper insights.

4. 4.Real-Time Monitoring: Enable real-time data streaming and monitoring to keep track of flights, passenger loads, and other critical metrics as they happen.

5. 5.Geospatial Analysis: Integrate geospatial data to visualize flight paths, optimize routes, and identify areas with high demand or potential expansion opportunities.

6. 6.Cost Optimization: Create cost modeling and optimization tools to help airlines reduce fuel consumption, maintenance costs, and overall operational expenses.

7. 7.Environmental Impact Analysis: Assess and visualize the environmental impact of air travel, including emissions and noise pollution, to encourage more sustainable practices.

8. Experience Insights: Analyze customer feedback and social media sentiment to improve the passenger experience and address pain points.

9. 9.Security and Safety: Develop tools for analyzing security and safety data to enhance airport and airline security protocols.

10. 10.Collaboration: Foster collaboration between airlines, airports, and relevant authorities by sharing data and insights to improve the overall efficiency and safety of the air transportation network.

11. 11.Mobile Accessibility: Ensure that the Tableau dashboards are mobile-friendly, allowing stakeholders to access critical information on the go.

12. 12.Data Privacy: Address data privacy and security concerns, especially when dealing with passenger and operational data.

13. 13.User Training: Provide training and support to users to maximize the utilization of Tableau and the insights it can provide.