

ARIGNAR ANNA GOVERNMENT ARTS COLLEGE, MUSIRI.

Affiliated to Bharathidasan University, Tiruchirappalli.

NAAN MUDHALVAN PROJECT – III BSC PHYSICS.

TOPIC FOR THE PROJECT:

**UNLOCKING INSIGHTS INTO THE GLOBAL
AIR TRANSPORTATION NETWORK.**

SUBMITTED BY: TEAM THREE (3)

◆ TEAM ID: NM2023TMID25463

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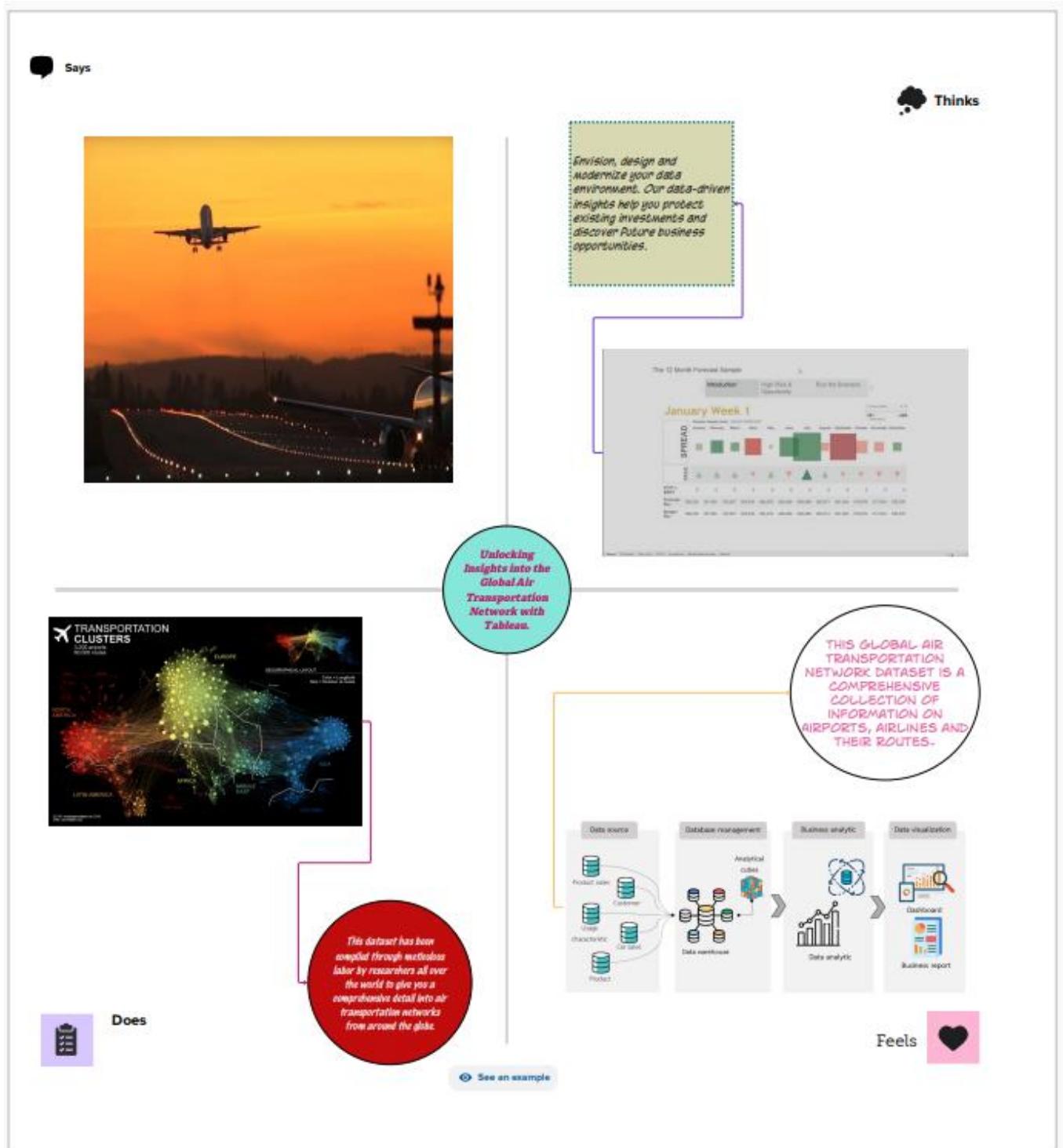
KALAIYARASAN S: D8DF3C45016EEA6B24D433F878DF2FA1

INTRODUCTION:

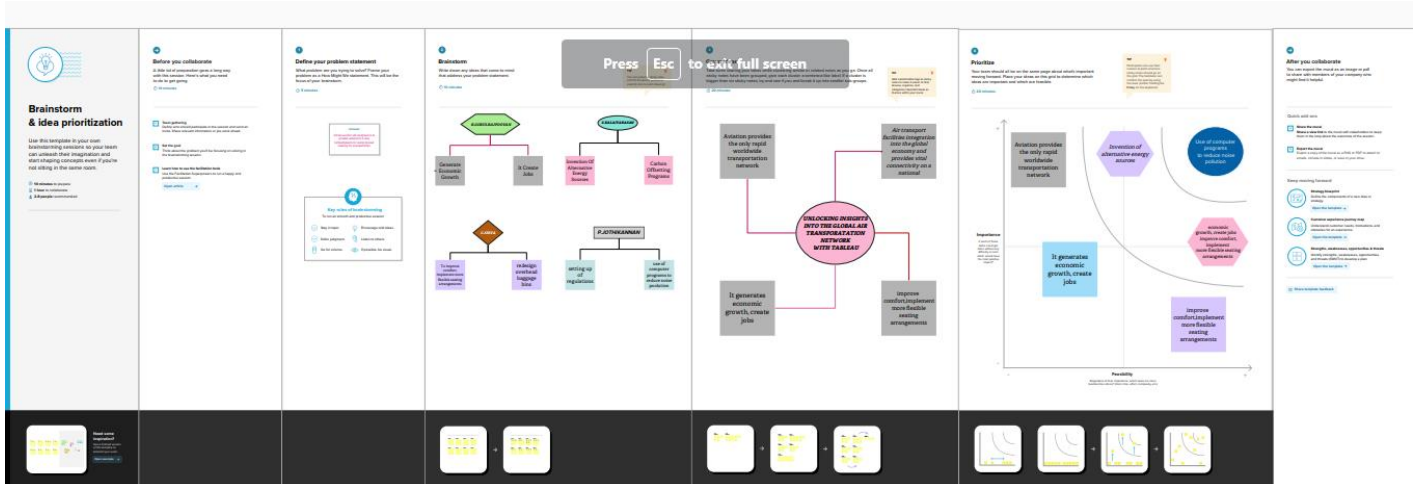
- ♥ Air transportation is the movement of passengers and goods by aircraft. It's an important part of the global economy, facilitating trade, tourism, and employment.
- ♥ The aviation industry is one of the fastest transportation sectors. It provides 87.7 million jobs worldwide.
- ♥ Global air transportation refers to the worldwide network of commercial and cargo aviation services that connect people and goods across the globe.
- ♥ It involves a complex system of airlines, airports, air traffic control, and supporting infrastructure to facilitate the movement of passengers and freight.
- ♥ The air transportation network is a complex network with the properties of small-world networks and scale-free networks.

❖ MILESTONE 1: Define Problem / Problem Understanding.

➤ Activity 1:



➤ Activity 2: Requirement.



REFERENCE:

- ✓ Wensven, J.G., AirTransportation: A Management Perspective, Ashgate, 2007.
- ✓ Belobaba, P., Odoni, A. and Barnhart, C., Global Airline Industry, Wiley, 2009.
- ✓ M. Bazargan, M., Airline operations and Scheduling Ashgate, 2004.
- ✓ Nolan, M. S., Fundamentals of Air Traffic Control, fourth edn., Thomson Learning, 2004.
- ✓ Wells, A. and Young, S., Airport Planning and Management, fifth edn., McGraw-Hill, 1986.

❖ MILESTONE 2: Data Collection & Extraction.

➤ Activity 1: Collect the Dataset.

Please use the link to download the dataset:

https://drive.google.com/drive/folders/1RJnbcGxvIVulM3fkZH1Wz3_IbLDP2RjY?u

⇒ Activity 1.1: Understand the data.

The screenshot displays a Windows File Explorer window titled 'Datasets'. The left sidebar shows the navigation pane with 'Local Disk (C:)' expanded, revealing a folder structure: 'GLOBAL AIR TRANSPORTATION NETWORK' > 'GLOBAL AIR TRANSPORTATION NETWORK' > 'Datasets'. The main pane shows four Excel files: 'airlines' (344 KB), 'airplanes' (8 KB), 'airports' (1,009 KB), and 'routes' (2,708 KB). The 'airlines' file is selected.

Below the File Explorer, a screenshot of the Microsoft Excel spreadsheet for 'airlines' is shown. The spreadsheet has columns for index, Airline ID, Name, Alias, IATA, ICAO, and Callsign. The data lists various airlines, including '1 Private flight', '2 135 Airways', '3 1Time Airline', '4 2 Sqn No 1 Elementary Flying Training School', '5 213 Flight Unit', '6 223 Flight Unit State Airline', '7 224th Flight Unit', '8 247 Jet Ltd', '9 3D Aviation', '10 40-Mile Air', '11 4D Air', '12 611897 Alberta Limited', '13 Ansett Australia', '14 Abacus International', '15 Abelag Aviation', '16 Army Air Corps', '17 Aero Aviation Centre Ltd.', '18 Aero Servicios Ejecutivos Internacionales', '19 Aero Biniza', '20 Aero Albatros', and '21 Aigle Azur'.

➤ Activity 2: Connecting to Tableau.

The screenshot shows the Tableau interface with a data source named 'airlines+'. The connection diagram shows 'airlines.csv' connected to 'routes.csv', which then branches to 'airplanes.csv' and 'airports.csv'. The 'airlines.csv' data source is selected, showing 9 fields and 6162 rows. The data table below shows the following columns and rows:

Index	Airline ID	Name	Alias	Iata	Icao	Callsign	Country	Active
0	-1	Unknown	\N	-	null	\N	\N	Y
1	1	Private flight	\N	-	null	null	null	Y
2	2	135 Airways	\N	null	GNL	GENERAL	United States	N
3	3	1Time Airline	\N	IT	RNX	NEXTIME	South Africa	Y
4	4	2 Sqn No 1 Elementary Flying...	\N	null	WYT	null	United Kingdom	N

❖ MILESTONE 3: Data Preparation.

This process helps to make the data easily understandable and ready for creating visualization gain insights into performance and efficiency.

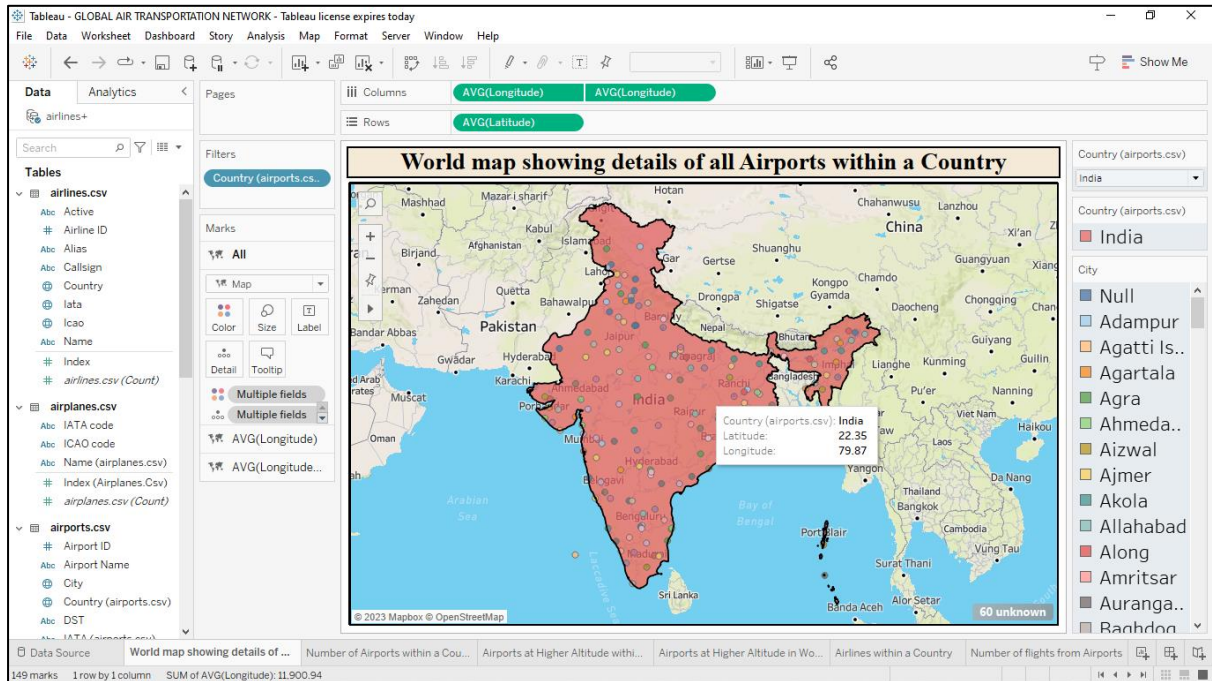
❖ MILESTONE 4: Data Visualization.

Data visualization is the process of creating graphical representations of data in order to help people understand and explore the information.

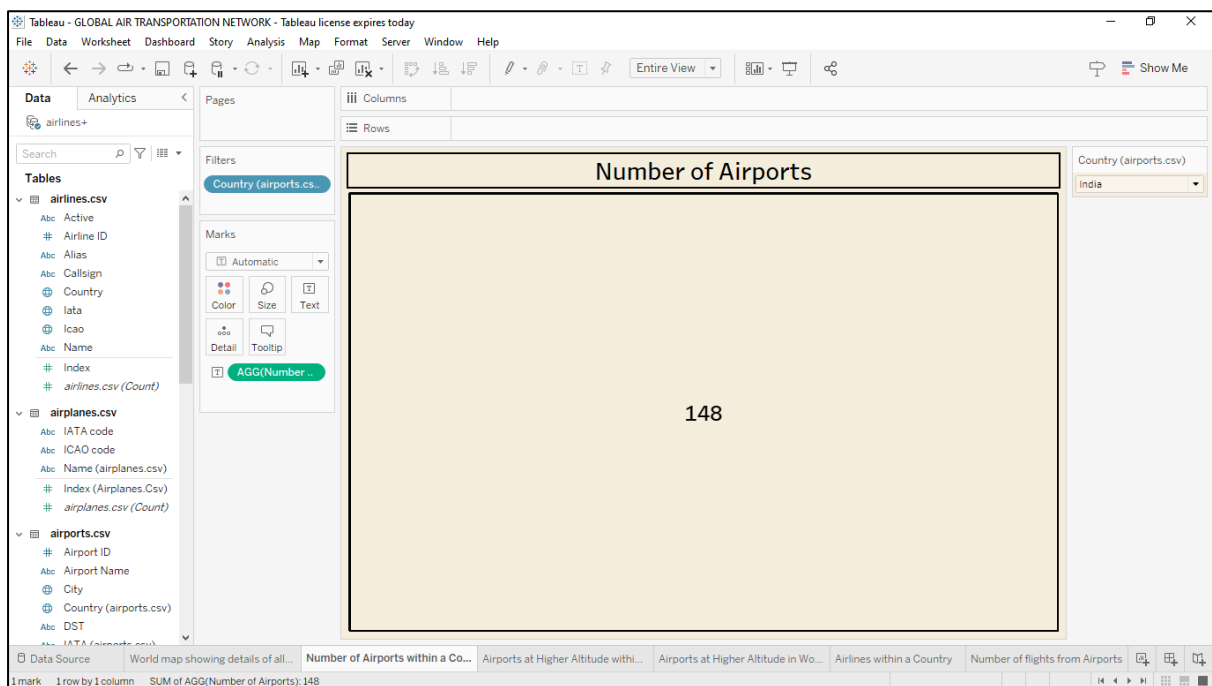
➤ Activity 1: No. of Unique Visualization.

The number of unique visualizations that can be created with a given dataset. These visualizations can be used to compare performance, track changes over time, and show distribution, and relationships between variables.

⇒ Activity 1.1: World Map Showing details of all Airports within a Country.



⇒ Activity 1.2: Number of Airports within a Country.



⇒ Activity 1.3: Airports at Higher Altitude within a Country.

Tableau - GLOBAL AIR TRANSPORTATION NETWORK - Tableau license expires today

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Entire View

Columns: Index no., Airport Name, City, ICAO Code

Rows: SUM(Altitude)

Filters: Country (airports.csv) top n: True

Country (airports.csv): India

Index no.	Airport Name	City	ICAO Code	SUM(Altitude)
1	Ziro Airport	Zero	VEZO	5,403
	Yelahanka Air Force Station	Bangalore	VOYK	3,045
	Vishakhapatnam Airport	Vishakhapatn..	VEVZ	15

3 marks 3 rows by 1 column SUM(Altitude): 8,463

⇒ Activity 1.4: Airports at Higher Altitude in the World.

Tableau - GLOBAL AIR TRANSPORTATION NETWORK - Tableau license expires today

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Entire View

Columns: Airport Name, City, ICAO Code

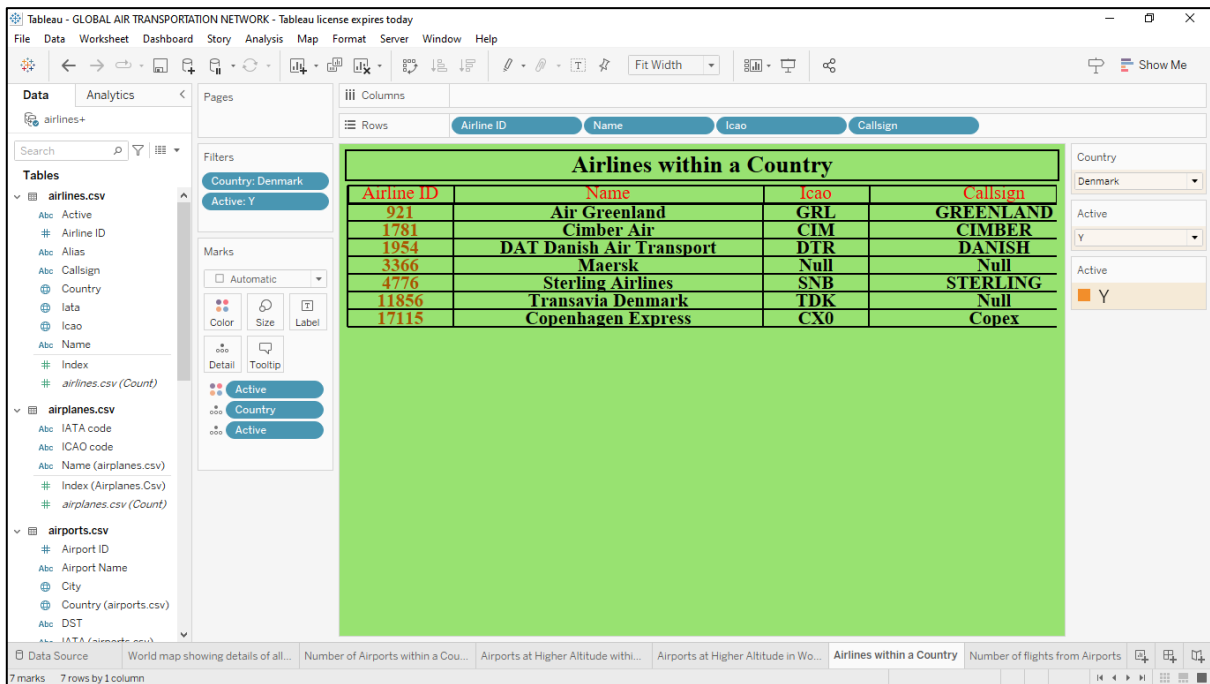
Rows: SUM(Altitude)

Filters: ICAO Code

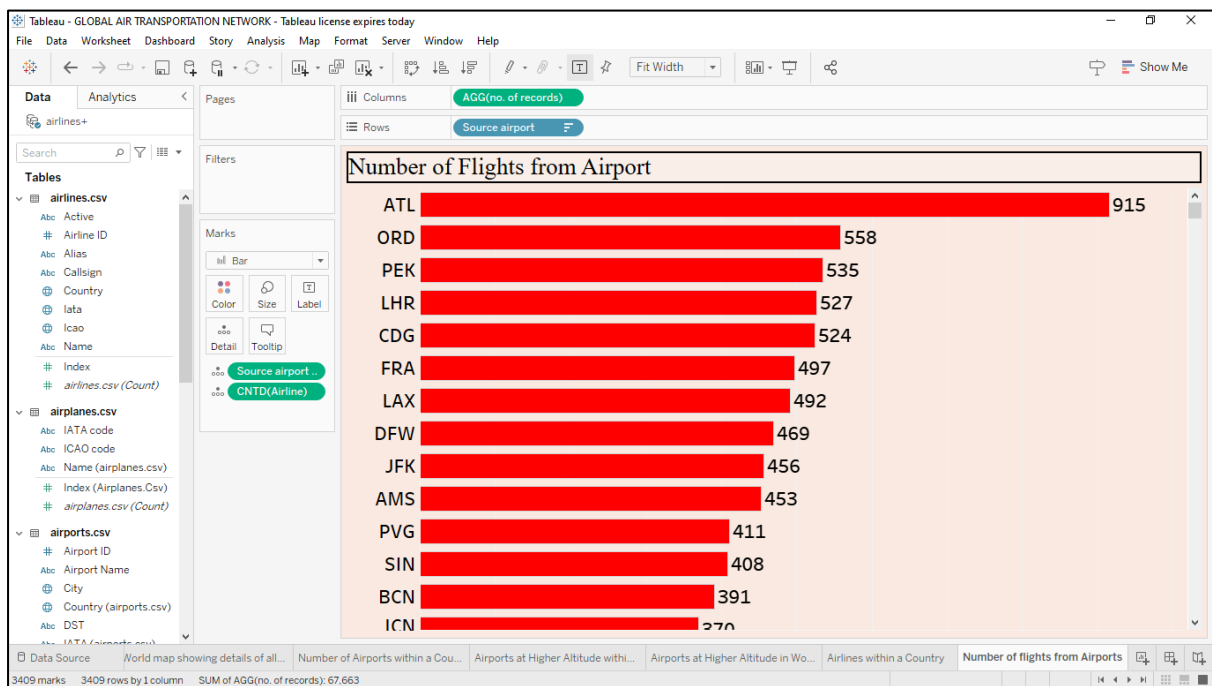
Airport Name	City	ICAO Code	SUM(Altitude)
Daocheng Yading Airport	Daocheng	ZUDC	14,472
Qamdo Bangda Airport	Bangda	ZUBD	14,219
Kangding Airport	Kangding	ZUKD	14,042
Ngari Gunsa Airport	Shiquanhe	ZUAL	14,022
El Alto International Airport	La Paz	SLLP	13,355

5 marks 5 rows by 1 column SUM(Altitude): 70,110

⇒ Activity 1.5: Airlines within a Country.



⇒ Activity 1.6: Number of Flights from Airports.



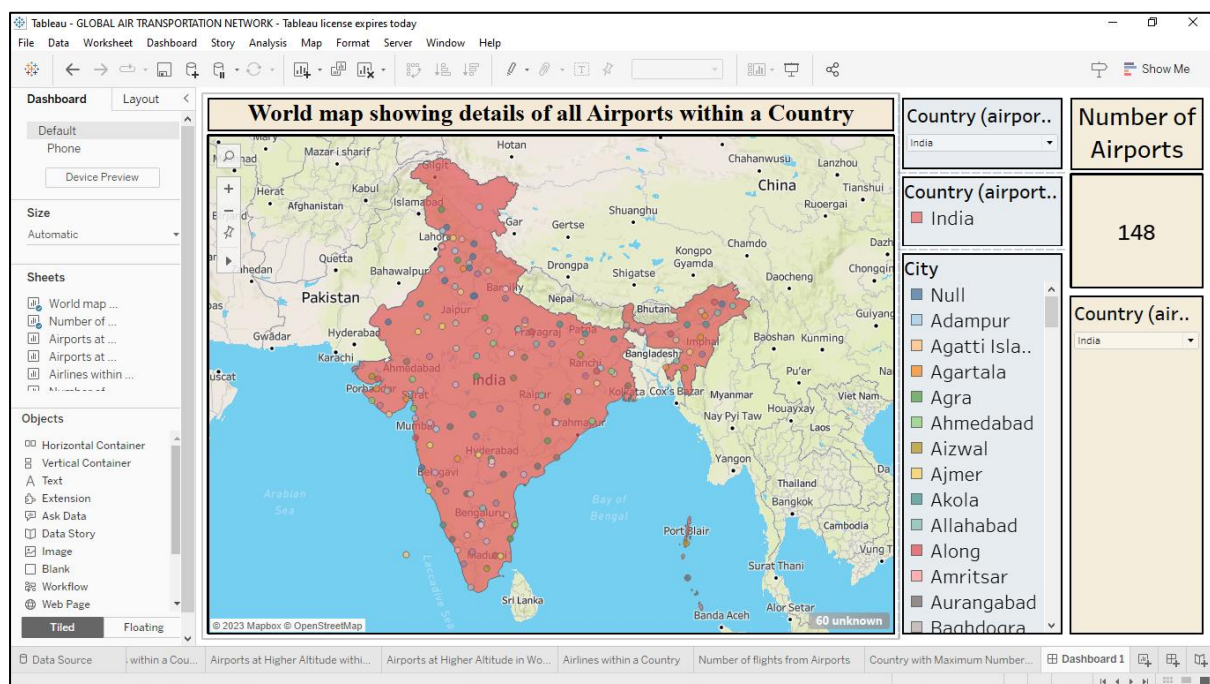
❖ MILESTONE 5: Dashboard.

A dashboard is a graphical user interface (GUI) that displays information and data in an organized, easy-to-read format.

➤ Activity 1: Responsive & Design of Dashboard.

The goal is to create a dashboard that is user-friendly, interactive, and data-driven, providing actionable insights.

⇒ DASHBOARD 1:



⇒ DASHBOARD 2:

Tableau - GLOBAL AIR TRANSPORTATION NETWORK - Tableau license expires today

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Dashboard Layout

Default Phone Device Preview

Size Automatic

Sheets

World map ...
Number of ...
Airports at ...
Airports at ...
Airlines within ...

Objects

Horizontal Container
Vertical Container
Text
Extension
Ask Data
Data Story
Image
Blank
Workflow
Web Page

Tiled Floating

Airlines within a Country

Airline ID	Name	Icao	Callsign	
921	Air Greenland	GRL	GREENLAND	
1781	Cimber Air	CIM	CIMBER	
1954	DAT Danish Air Transport	DTR	DANISH	
3366	Maersk	Null	Null	
4776	Sterling Airlines	SNB	STERLING	
11856	Transavia Denmark	TDK	Null	
17115	Copenhagen Express	CX0	Copex	

Country Denmark

Active Y

Active Y

Data Source Airports at Higher Altitude within a Country Airports at Higher Altitude in Wo... Airlines within a Country Number of flights from Airports Country with Maximum Number... Dashboard 1 Dashboard 2

⇒ DASHBOARD 3:

Tableau - GLOBAL AIR TRANSPORTATION NETWORK - Tableau license expires today

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Dashboard Layout

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World map ...
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Airports at Higher Altitude within a Country

Index no.	Airport Name	City	ICAO Code	
1	Ziro Airport	Zero	VEZO	5,403
	Yelahanka Air Force Station	Bangalore	VOYK	3,045
	Vishakhapatnam Airport	Vishakhapatn...	VEVZ	15

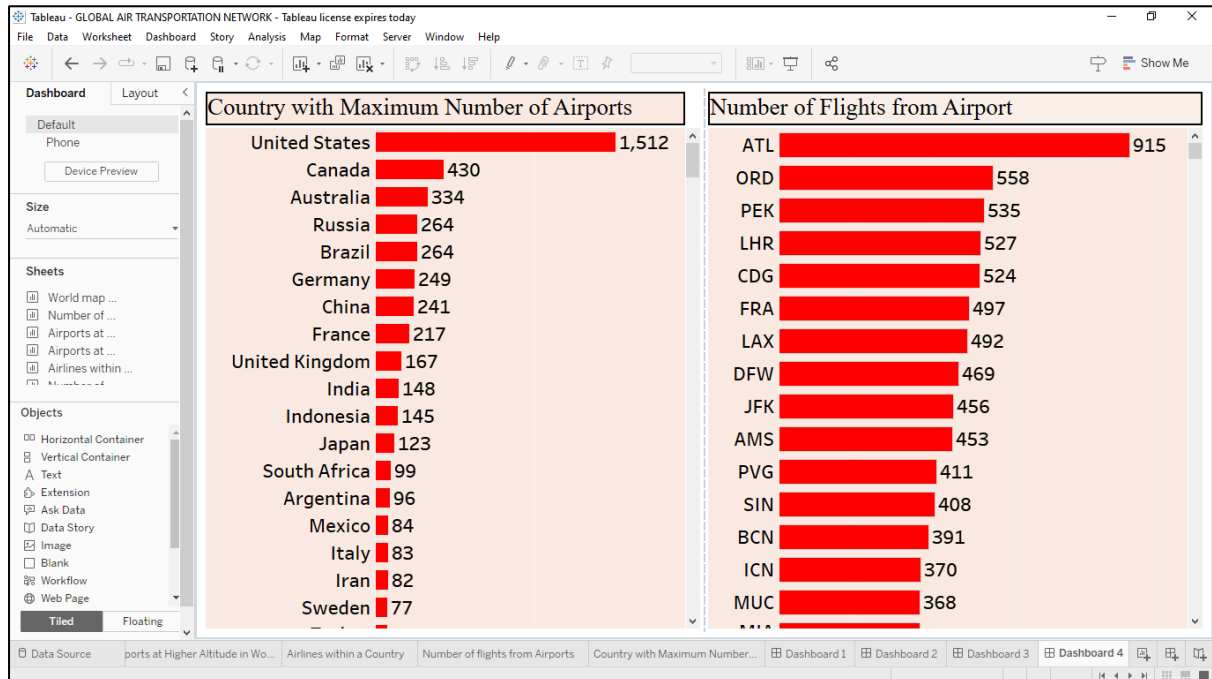
Country (air..) India

Airports at Highest Altitude in World

Airport Name	City	ICAO Code	
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

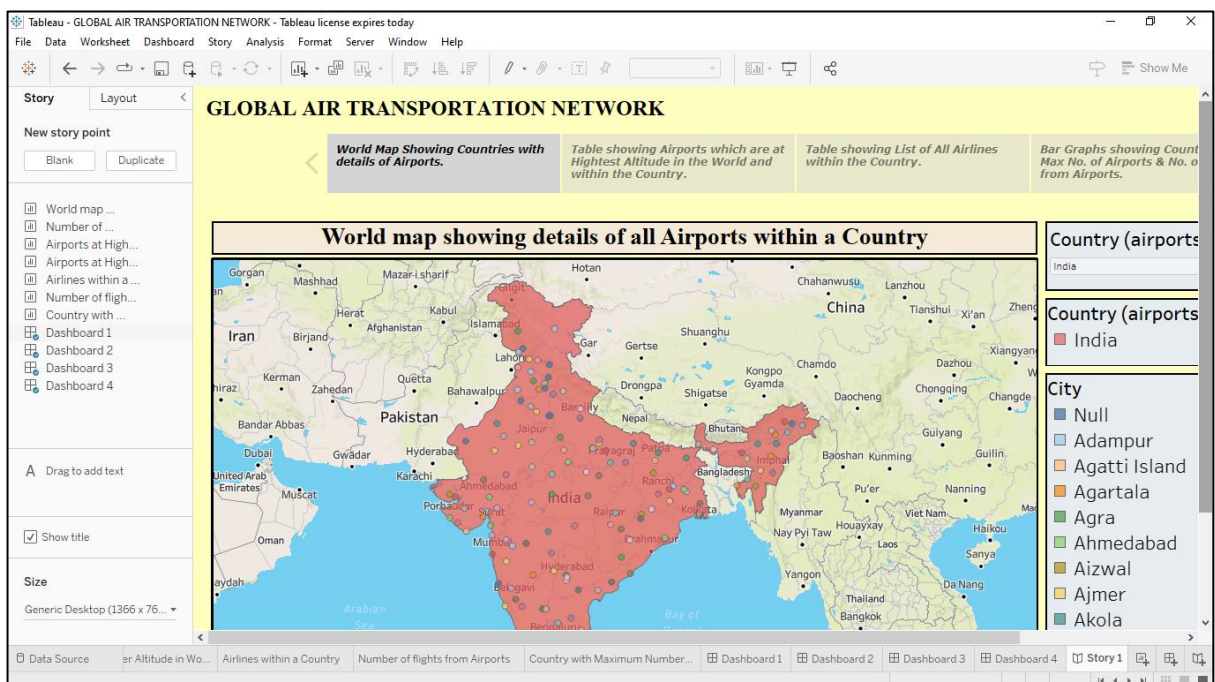
Data Source Airports at Higher Altitude within a Country Airports at Higher Altitude in Wo... Airlines within a Country Number of flights from Airports Country with Maximum Number... Dashboard 1 Dashboard 2 Dashboard 3

⇒ DASHBOARD 4:



❖ MILESTONE 6: Story.

A data story is a way of presenting data and analysis in a narrative format, with the goal of making the information more engaging and easier to understand.



❖ **MILESTONE 7: Publishing.**

Publishing helps us to track and monitor key performance metrics, to communicate results and progress. help a publisher stay informed, make better decisions, and communicate their performance to others.

➤ **DASHBOARD 1:**

https://public.tableau.com/views/GLOBALAIRTRANSPORTATIONNETWORK/Dashboard1?:language=en-US&publish=yes&:display_count=n&:origin=viz_share_link

➤ **DASHBOARD 2:**

https://public.tableau.com/views/GLOBALAIRTRANSPORTATIONNETWORK-DASHBOARD2/Dashboard2?:language=en-US&publish=yes&:display_count=n&:origin=viz_share_link

➤ **DASHBOARD 3:**

https://public.tableau.com/views/GLOBALAIRTRANSPORTATIONNETWORK-DASHBOARD3/Dashboard3?:language=en-US&publish=yes&:display_count=n&:origin=viz_share_link

➤ **DASHBOARD 4:**

https://public.tableau.com/views/GLOBALAIRTRANSPORTATIONNETWORK-DASHBOARD4/Dashboard4?:language=en-US&publish=yes&:display_count=n&:origin=viz_share_link

➤ **STORY:**

https://public.tableau.com/views/GLOBALAIRTRANSPORTATIONNETWORK/Story1?:language=en-US&publish=yes&:display_count=n&:origin=viz_share_link

❖ CONCLUSION:

- 🔍 The 21st century has seen the continued internationalization and globalization of the world's economy. There is also evidence of deeper globalization of cultures and politics.
- 🔍 Air transport is a facilitator and, as such, the demands for its services are derived from the requirements for high-quality, speedy, and reliable international transport.
- 🔍 Globalization, almost by definition, means demands for greater mobility and access, but these demands are for different types of passengers and cargoes, to different places, and over different distances than was the previous norm.
- 🔍 International air transport is less than a century old, but is now a major contributor to globalization and is continually reshaping itself to meet the demands of the economic and social integration that globalization engenders.
- 🔍 Economically, in static terms, globalization occurs to facilitate the greater division of labor and allows countries to exploit their comparative advantage more completely.