



UNLOCKING INSIGHTS INTO THE GLOBAL AIR TRANSPORTATION NETWORK

SUBMITTED BY

KAVIYA N	35621U25015
KOTTEESWAR G	35621U25016
VANITHA R	35618U25030
GANESH S	35621U25007

Under the Guidance of

Mr.SANGEETHA THULASI RAMAN.

M.Sc., M.Phil.,B.Ed.,SET

DEPARMENT OF MATHEMATCS

**GOVERNMENT ARTS AND SCIENCE COLLEGE (Attupakam) ,
ARAKKONAM-631051, RANIPET DISTRICT,
TAMIL NADU.**

INTRODUCTION :

Air transport network or air transportation network (ATN) is an example of transport networks and spatial networks. The nodes of the network are the airports and the links represent direct flight routes between two airports. Alternatively, cities can be considered as the nodes with links representing direct flight connection between them. Air transport networks can be defined worldwide as well as for one region or for one airline company; the scale of the network can be global or domestic. The worldwide air transportation network is represented by the database of International Air Transport Association (IATA). The worldwide air transportation network is a critical infrastructure with high impact on mobility, trade and economy.

Air Transportation Network



EMPATHY MAP

empathy map.pdf - Foxit PDF Reader

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Start empathy map.pdf x

Convert PDF to Word

The diagram is an Empathy Map for a character named 'Mia'. It is a square divided into four quadrants by a horizontal and vertical line, with a central circle containing a cartoon drawing of Mia's face. The quadrants are labeled as follows:

- Says** (top-left, green header):
 - What have we heard them say?
 - What can we imagine them saying?
- Thinks** (top-right, blue header):
 - What are their wants, needs, hopes, and dreams?
 - What other thoughts might influence their behavior?
- Does** (bottom-left, purple header):
 - What behavior have we observed?
 - What can we imagine them doing?
- Feels** (bottom-right, pink header):
 - What are their fears, frustrations, and emotions?
 - What other feelings might influence their behavior?

Sticky notes with text are placed within each quadrant. A link 'See an example' is at the bottom center.

1/1 11.09%

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BRAINSTORM

Brainstorm and Idea.pdf - Foxit PDF Reader

Search

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Hand Select SnapShot Clipboard Zoom Page Fit Reflow Rotate View Typewriter Highlight Link Bookmark File Attachment Image Annotation & Video Audio Fill & Sign AI Assistant

Start Brainstorm and Idea....

Brainstorm & Idea prioritization

Use this template in your own brainstorming sessions to your team can release their imagination and start shaping concrete ideas if you're not sitting on the border right.

Before you collaborate

1. Make all of your team members aware of the session. Don't wait until you're all sitting on the border right.

Define your problem statement

1. Make all of your team members aware of the session. Don't wait until you're all sitting on the border right.

Brainstorm

1. Make all of your team members aware of the session. Don't wait until you're all sitting on the border right.

Group ideas

1. Make all of your team members aware of the session. Don't wait until you're all sitting on the border right.

Prioritize

1. Make all of your team members aware of the session. Don't wait until you're all sitting on the border right.

After you collaborate

1. Make all of your team members aware of the session. Don't wait until you're all sitting on the border right.

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RESULTS

Tableau - Book1

File Data Server Window Help

airlines+ Connection: ☐ Live ☒ Extract | Edit Refresh Filters: 0 | Add
Extract contains all data. 16-Oct-23 9:11:06 PM

airlines.csv routes.csv airplanes.csv airports.csv

airlines.csv 9 fields 6162 rows 100 rows

Name: airlines.csv

Fields:

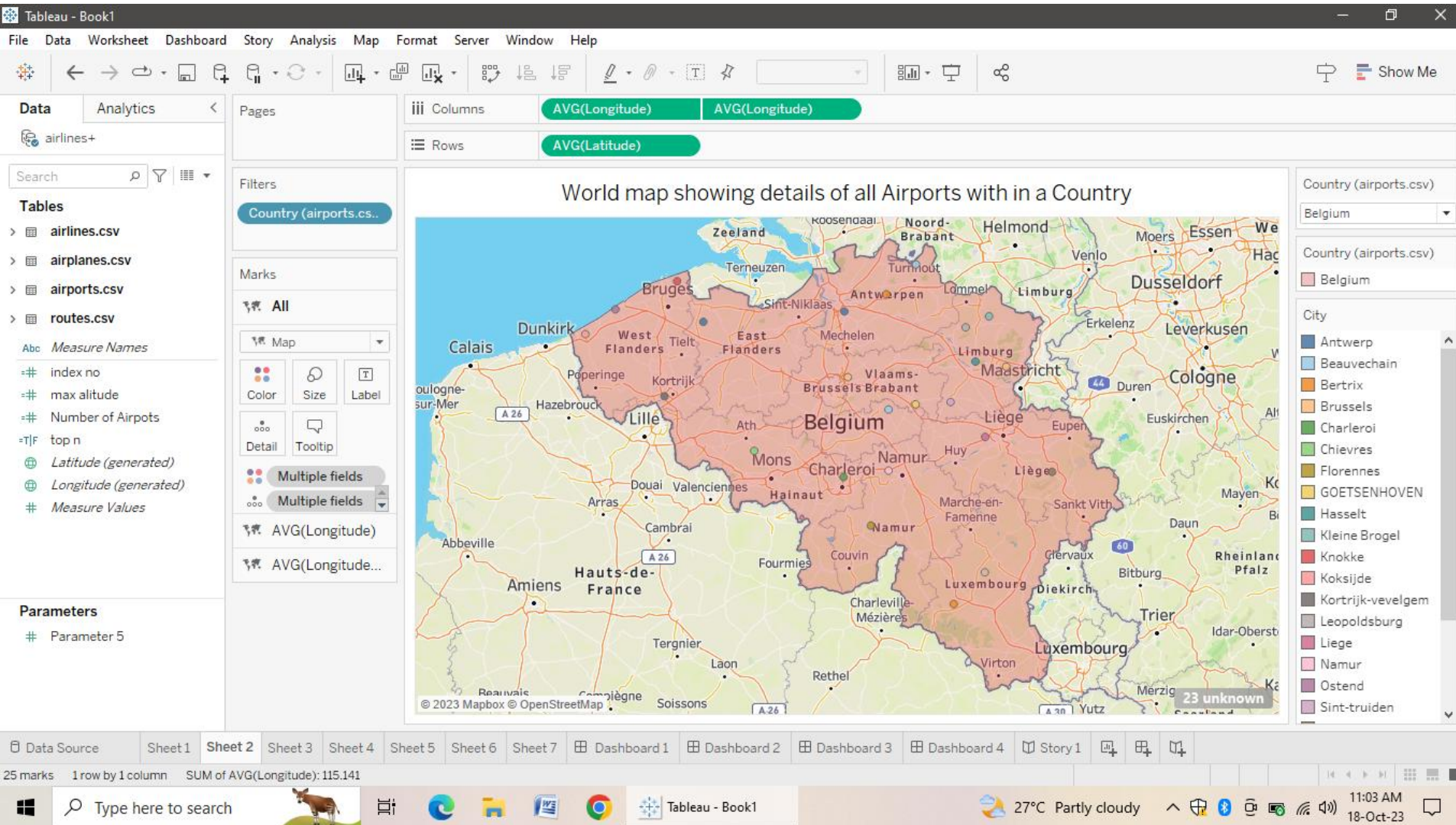
Type	Field Name	Physical Table	Remote Field Name
#	Index	airlines.csv	index

#	#	Abc	Abc	Abc	Abc	Abc
airlines.csv	airlines.csv	airlines.csv	airlines.csv	airlines.csv	airlines.csv	airlines.csv
Index	Airline ID	Name	Alias	Iata	Icao	Cal
0	-1	Unknown	\N	-	null	\N
1	1	Private flight	\N	-	null	
2	2	135 Airways	\N	null	GNL	GI
3	3	1Time Airline	\N	1T	RNX	NI
4	4	2 Son No 1 Elementary Flying...	\N	null	WYT	

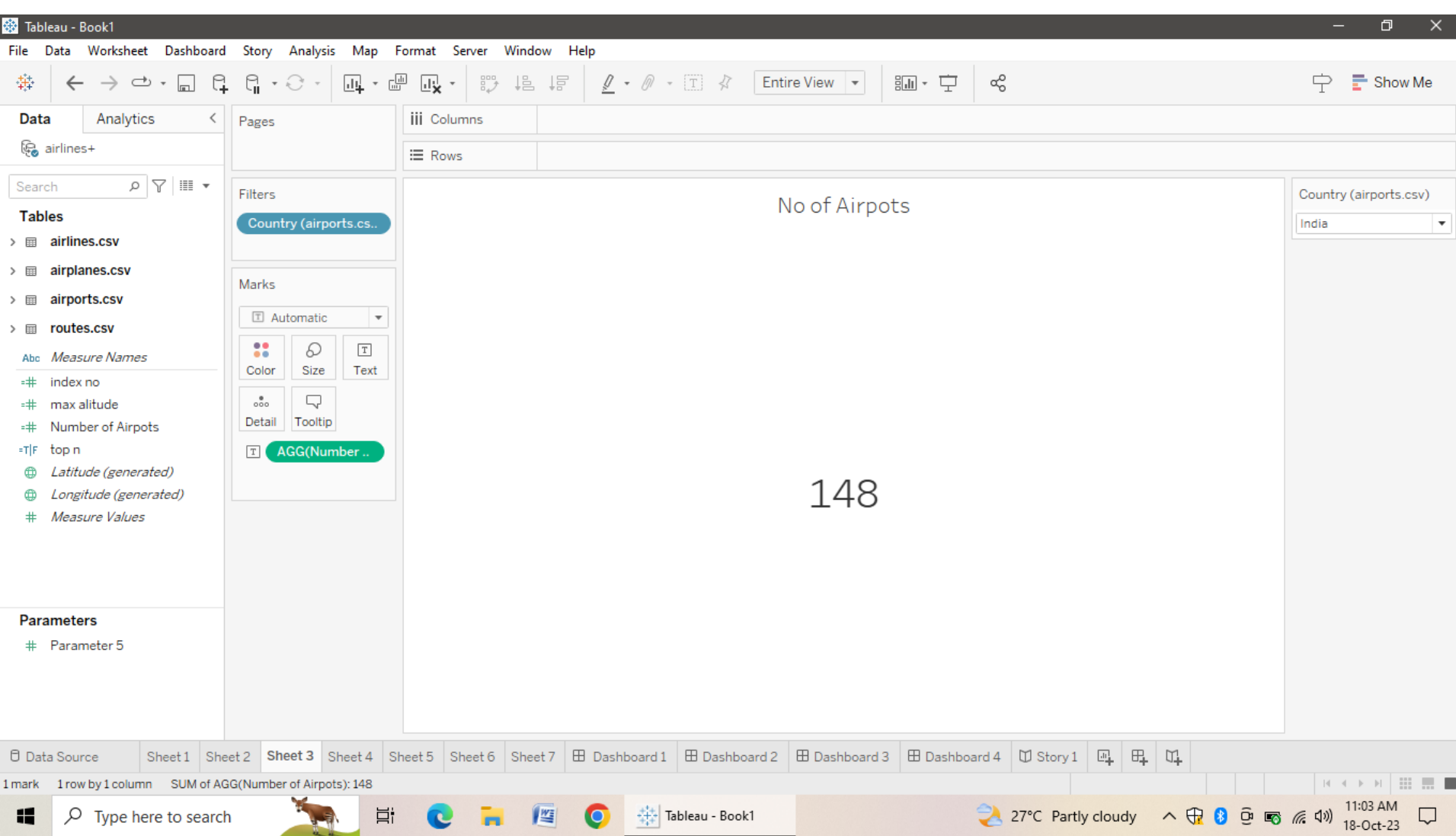
Data Source Sheet 1 Sheet 2 Sheet 3 Sheet 4 Sheet 5 Sheet 6 Sheet 7 Dashboard 1 Dashboard 2 Dashboard 3 Dashboard 4 Story 1

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WORLD MAP SHOWING DETILS OF ALL AIRPORTS WITHIN A COUNTRY



NUMBER OF AIRPORTS WITHIN A COUNTRY



AIRPORTS AT HIGHER ALTITUDE WITHIN A COUNTRY

Tableau - Book1

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

airlines+

Search

Tables

- airlines.csv
- airplanes.csv
- airports.csv
- routes.csv

Measure Names

- index no
- max altitude
- Number of Airports
- top n
- Latitude (generated)
- Longitude (generated)
- Measure Values

Parameters

- Parameter 5

Pages

Filters

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

Marks

Automatic

Color Size Text

Detail Tooltip

SUM(Altitude)

Columns

Rows

AGG(index no) Airport Name City ICAO Code

Airport at Higher Altitude within a Country

Rank of ind..	Airport Name	City	ICAO Code	
Null	Bamiyan Airport	Bamyan	OABN	8,367
	Bost Airport	Lashkar Gah	OABT	2,464
1	Bagram Air Base	Kabul	OAIX	4,895

Country (airports.csv)

Afghanistan

Data Source Sheet 1 Sheet 2 Sheet 3 Sheet 4 Sheet 5 Sheet 6 Sheet 7 Dashboard 1 Dashboard 2 Dashboard 3 Dashboard 4 Story 1

3 marks 3 rows by 1 column SUM(Altitude): 15,726

Type here to search

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AIRPOTS AT HIGHER ALTITUDE IN WORLD

Tableau - Book1

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Fit Width

Show Me

Data Analytics

airlines+

Search

Tables

- airlines.csv
- airplanes.csv
- airports.csv
- routes.csv

Measure Names

- index no
- max altitude
- Number of Airports
- top n
- Latitude (generated)
- Longitude (generated)
- Measure Values

Parameters

- Parameter 5

Pages

Columns

Rows

Airport Name City ICAO Code

Filters

ICAO Code

Marks

Automatic

Color Size Text

Detail Tooltip

Altitude

Airports at Highest Altitude in World

Airport Name	City	ICAO Code	
Daocheng Yading Airport	Daocheng	ZUDC	14472
Qamdo Bangda Airport	Bangda	ZUBD	14219
Kangding Airport	Kangding	ZUKD	14042
Ngari Gunsa Airport	Shiquanhe	ZUAL	14022
El Alto International Airport	La Paz	SLLP	13355
Capitan Nicolas Rojas Airport	Potosi	SLPO	12913

Data Source Sheet 1 Sheet 2 Sheet 3 Sheet 4 Sheet 5 Sheet 6 Sheet 7 Dashboard 1 Dashboard 2 Dashboard 3 Dashboard 4 Story 1

6 marks 6 rows by 1 column

Type here to search

Tableau - Book1

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AIRLINES WITHIN A COUNTRY

Tableau - Book1

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

airlines+

Search

Tables

- airlines.csv
- airplanes.csv
- airports.csv
- routes.csv

Measure Names

- index no
- max altitude
- Number of Airports
- top n
- Latitude (generated)
- Longitude (generated)
- Measure Values

Parameters

- Parameter 5

Columns

Rows

Airline ID Name Icao Callsign

Airlines with in a country

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

Country

Denmark

Active

Y

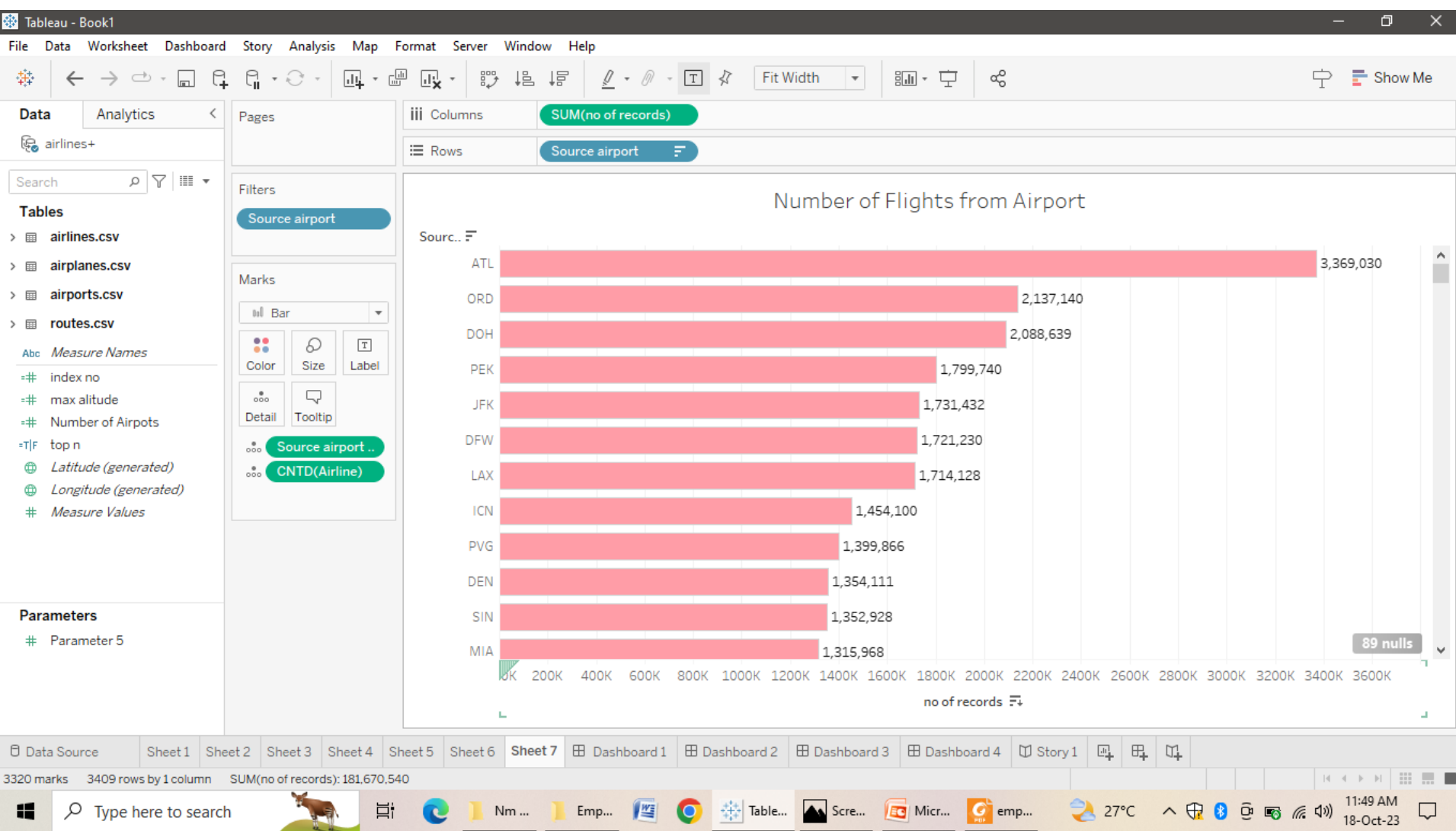
Active

Y

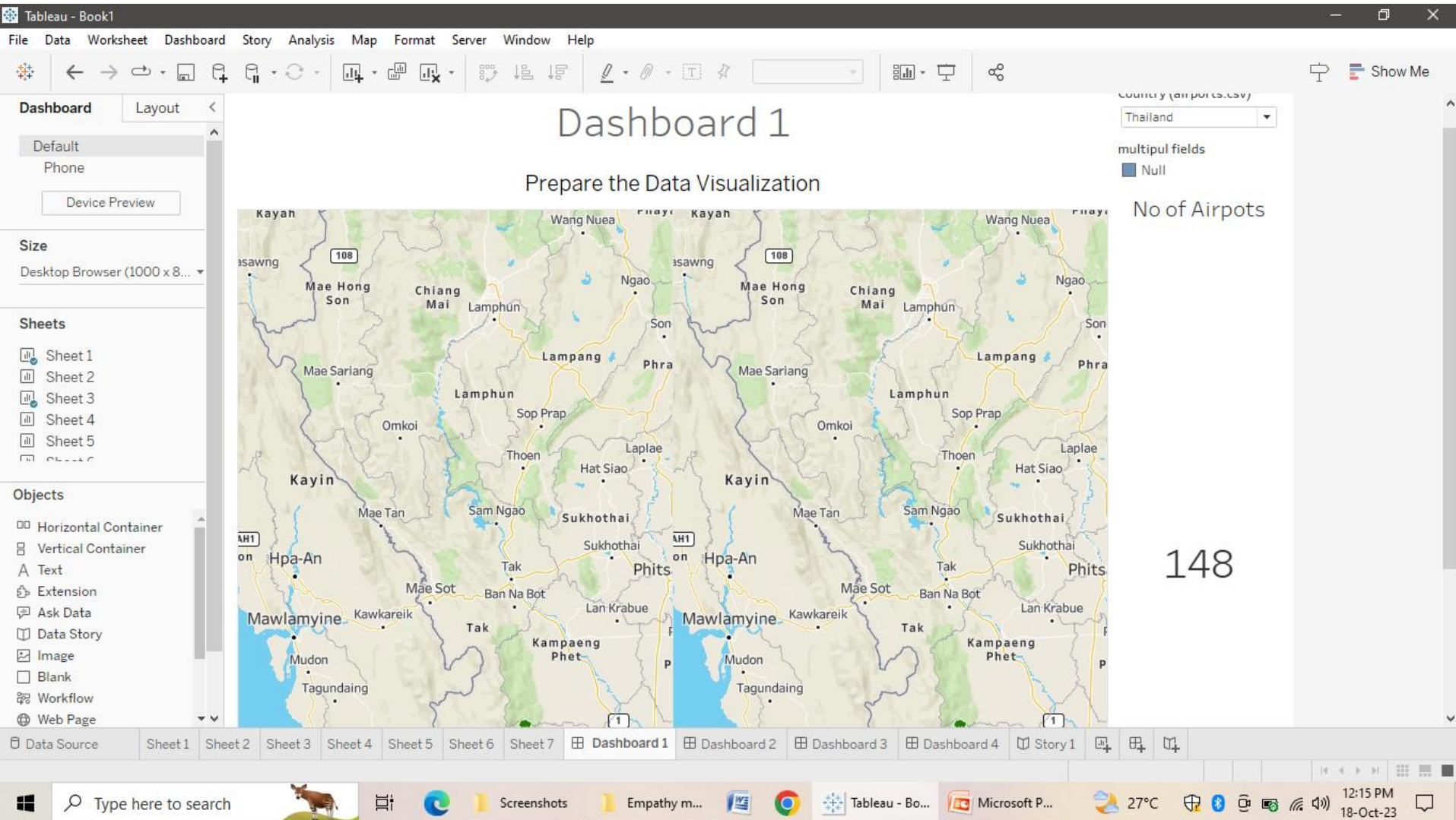
7 marks 7 rows by 1 column

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NUMBER OF FLIGHTS FORM AIRPORT



DASHBOARD 1



DASHBOARD 2

Tableau - Book1

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Dashboard 2 Afghanistan

Airport at Higher Altitude within a Country

Rank of ind..	Airport Name	City	ICAO Code	
Null	Bamiyan Airport	Bamiyan	OABN	8,367
	Bost Airport	Lashkar Gah	OABT	2,464
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Airports at Highest Altitude in World

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Qamdo Bangda Airport	Bangda	ZUBD	14219
Kangding Airport	Kangding	ZUKD	14042
Ngari Gunsa Airport	Shiquanhe	ZUAL	14022

Dashboard 2

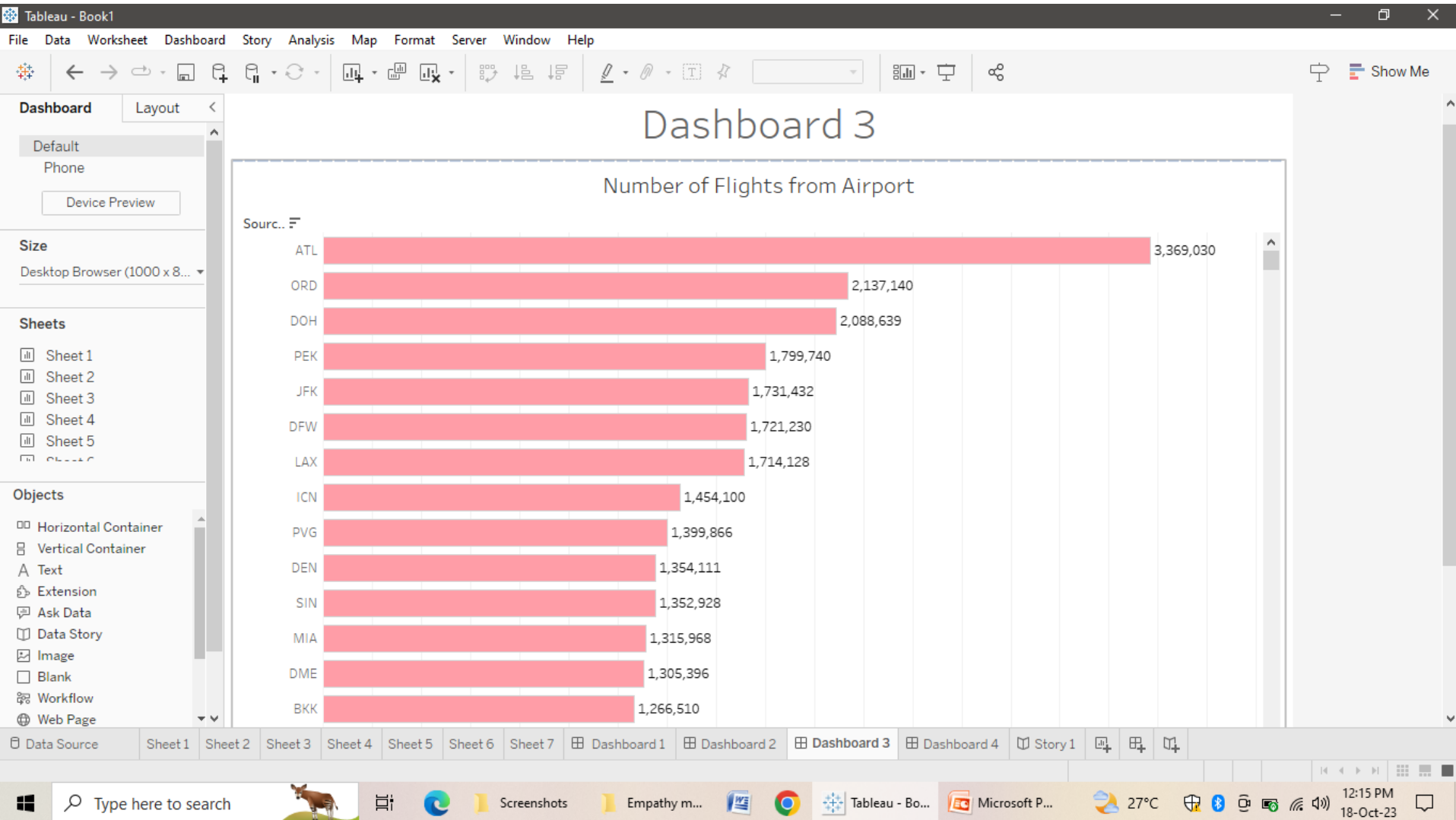
Sheet 1 Sheet 2 Sheet 3 Sheet 4 Sheet 5 Sheet 6 Sheet 7 Dashboard 1 Dashboard 2 Dashboard 3 Dashboard 4 Story 1

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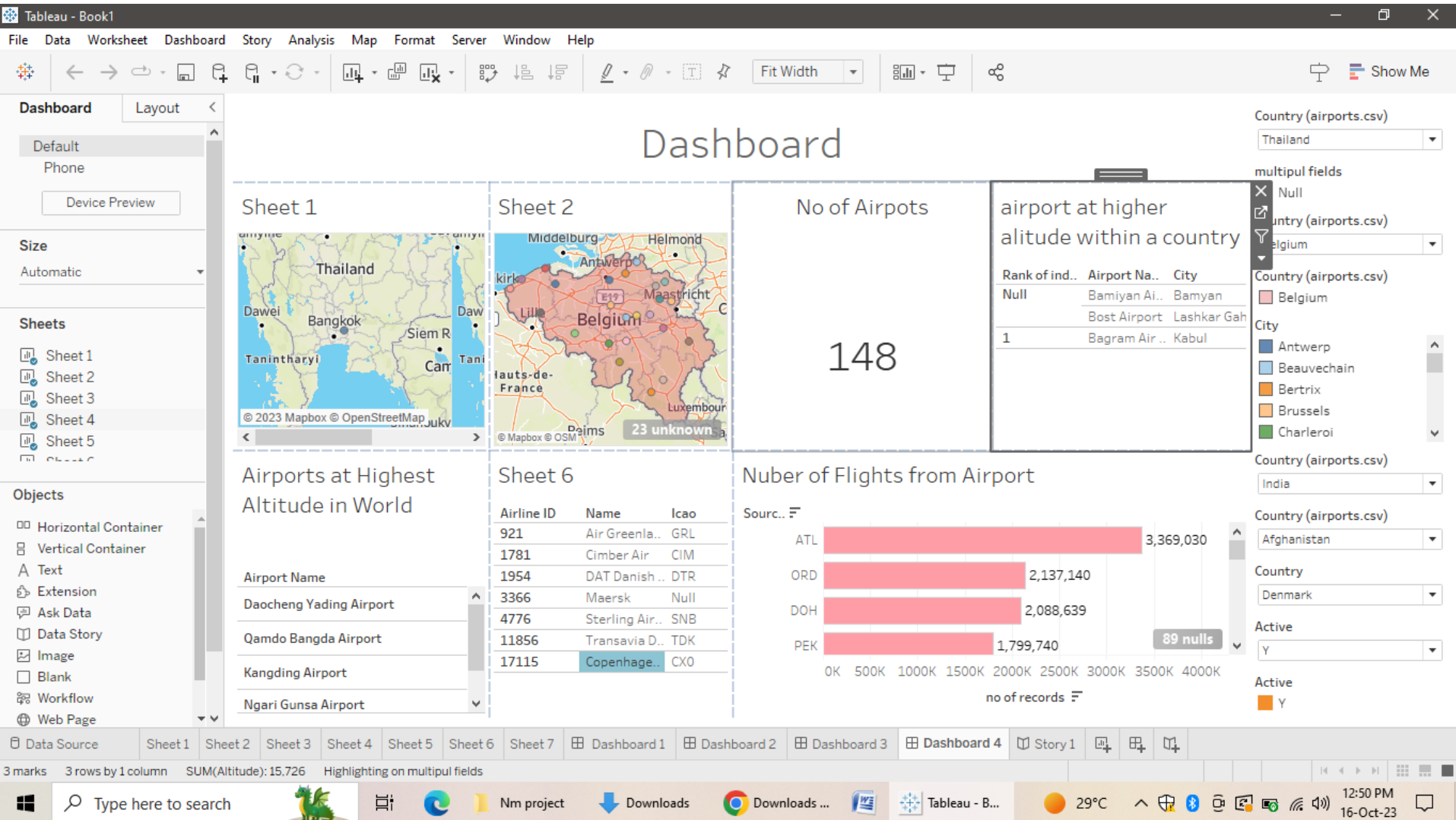
Screenshots Empathy m... Tableau - Bo... Microsoft P...

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DASHBOARD 3



DASHBOARD 4



STORY

Tableau - Book1

File Data Worksheet Dashboard Story Analysis Format Server Window Help

Story Layout

New story point

Blank Duplicate

Sheet 1
Sheet 2
Sheet 3
Sheet 4
Sheet 5
Sheet 6
Sheet 7
Dashboard 1
Dashboard 2
Dashboard 3
Dashboard 4

A Drag to add text

Show title

Size
Story (1016 x 964)

Story 1

Prepare the Data Visualization

World map showing details of all Airports with in a Country

Number of Airports with in the country

Airports at Higher altitude with in a country

Airports at Higher altitude in the world

Airlines with in a country

Nu air

Country (airports.csv)
Thailand

multiple fields
Null

Chiang Mai
Lampang
Phitsanulok
Bangkok
Dawei
Nakhon Ratchasima
Samraong
Poipet
Siem
Khon Kaen
Udon Thani
Vientiane
Phonhong
Anouvong
Pakxay
Sayaboury

Thailand

1
340
304

Data Source Sheet 1 Sheet 2 Sheet 3 Sheet 4 Sheet 5 Sheet 6 Sheet 7 Dashboard 1 Dashboard 2 Dashboard 3 Dashboard 4 Story 1

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Advantages of Air Transportation

- ❖ Undoubtedly, one of the most advantageous features offered by air transport is its speedy delivery times.
- ❖ There is no faster transport service than air transport. In addition, the frequency of flights makes delivery times very frequent and fast.
- ❖ Air transport is the only means of transportation that does not support physical limits.
- ❖ One of the great advantages of air transport for both passengers and goods is its great reliability.
- ❖ No other means of transport in the logistics sector can cover such long distances as air transport. This is a great advantage for international trade, being able to cover long distances, impossible for road or sea transport.

DISADVANTAGES

- ❖ Noise Pollution: Transportation traffic significantly contributes to noise pollution.
- ❖ Air Pollution: Transportation is a major contributor to air pollution.
- ❖ More Risks: Air transport is prone to accidents. A small mistake can be very dangerous for passengers. Hijacking of planes is easily possible.
- ❖ Congestion: Traffic congestion is a common problem in cities and densely populated areas.
- ❖ High Speed : It is the fast speed means of transport. Passengers and goods can be transported easily from one place to the other.
- ❖ High Costs: ADVERTISEMENTS: Air transport is a costly service. Its operational costs are too high.

Application of Air Transport Networks

- Modeling air transport networks aims airline companies to organize their routes in a cost-efficient way and therefore maximize their profits.
- Air transport network models are also the tool to investigate system robustness.
- They help to determine weaknesses of the system in case of various kinds of disruptions.
- An alternative application is modeling human disease networks.
- Air transport network is used by millions of people every day, therefore it plays key role in the spread of some infections, such as influenza or SARS.

CONCLUSION

This report demonstrates the significant value created by the air transport network itself. This value is generated through the higher frequency and quality of service and through the ability to serve a greater number of destinations than would be possible otherwise. The value of this network will increase even further over the next ten years. Air transport supports and facilitates economic growth but this will only occur if there is sufficient investment in infrastructure capacity to enable the airline industry to provide the connections to worldwide markets that businesses need and prosper from.