

PERIYAR UNIVERSITY

ARIGNAR ANNA GOVERNMENT ARTS COLLEGE, ATTUR

DEPARTMENT OF MATHEMATICS

III-BSc Mathematics (2023-2024)

INCHARGE: Mr. K. CHINNAIYA, M.Sc., M.Ed., M.Phil.,

Team id: NM2023TMID22575	
Student Name	Student NM Id
RAJA P	5B1A08B731CE5A3A67F4C8229157921F
HAREESH S	CAAFF6146A695F89AA945553F27E593D
MANIBHARATHI S	5ED090644713E0995344F59255DD0406
RAGUL R	0074E72906A922D853A4708D8239D3E0

PROJECT TITLE	<i>Unlocking Insights into The Global Air Transportation Network with Tableau</i>
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1) Introduction:

- This Global Air Transportation Network dataset is a comprehensive collection of information on airports, airlines and their routes.
- It contains information such as

- ❖ Names
- ❖ Cities
- ❖ Countries
- ❖ IATA Codes
- ❖ ICAO Codes
- ❖ Longitudes
- ❖ Latitudes
- ❖ Altitudes

of airports across the world with detailed time zone and daylight-saving time data.

- Additionally, this includes information about airlines including their,

- ❖ Airline IDs
- ❖ Name
- ❖ Aliases
- ❖ IATA and ICAO codes
- ❖ Callsigns
- ❖ Country of origin
- ❖ Active / Inactive status

- Similarly, it also covers route details such as airline sources to destination airports along with essential details like codeshare stakeholder.
- If any stops required during this journey along with the type of aircraft being used for that particular journey.
- This dataset has been compiled through meticulous labor by researchers all over the world to give you a comprehensive detail into air transportation networks from around the globe.

2) Problem Definition and Design Thinking:

2.1) Brainstorming:

Brainstorm & Idea Prioritization

Use this template to generate ideas, brainstorm, and prioritize them. The template is divided into two main sections: **Brainstorm** and **Idea Prioritization**.

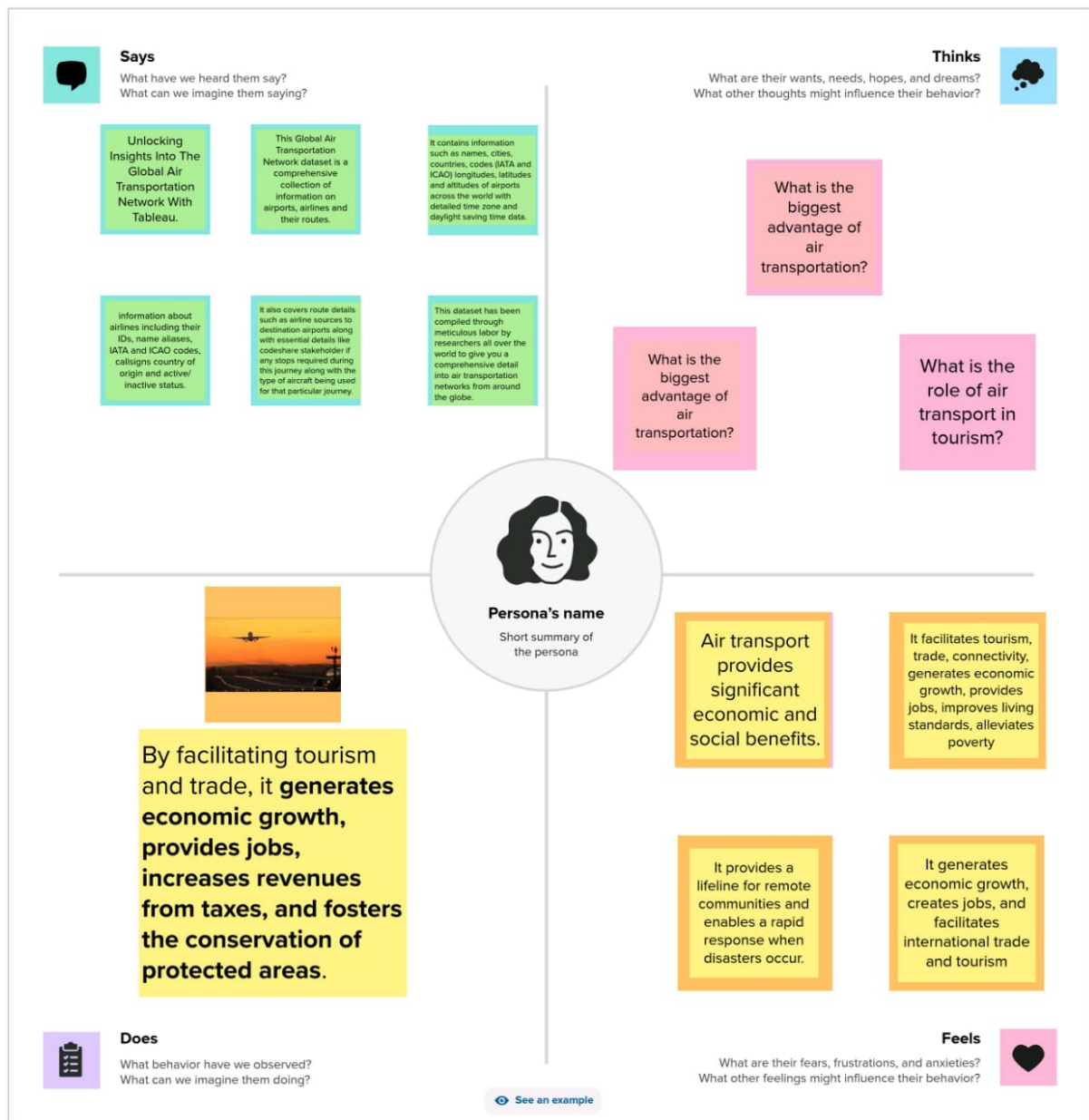
Brainstorm

- Define your problem statement:** Write a clear, concise statement of the problem you are trying to solve. This will help you focus your brainstorming efforts.
- Brainstorm:** Generate as many ideas as possible. Write down every idea, no matter how silly or impractical it seems. The goal is to generate a large number of ideas, so you can then filter them down to the best ones.
- Brainstorming Rules:**
 - Go for quantity.
 - Don't judge ideas.
 - Encourage wild ideas.
 - Build on the ideas of others.
 - One idea at a time.
 - Keep the focus on the problem.
 - Stay on topic.
 - Don't let the group get sidetracked.
 - Don't let the group get too large.
 - Don't let the group get too small.
 - Don't let the group get too quiet.
 - Don't let the group get too loud.
 - Don't let the group get too bored.
 - Don't let the group get too tired.
 - Don't let the group get too hungry.
 - Don't let the group get too thirsty.
 - Don't let the group get too hot.
 - Don't let the group get too cold.
 - Don't let the group get too sleepy.
 - Don't let the group get too awake.
 - Don't let the group get too happy.
 - Don't let the group get too sad.
 - Don't let the group get too angry.
 - Don't let the group get too nervous.
 - Don't let the group get too confident.
 - Don't let the group get too humble.
 - Don't let the group get too arrogant.
 - Don't let the group get too shy.
 - Don't let the group get too outgoing.
 - Don't let the group get too introverted.
 - Don't let the group get too extroverted.
 - Don't let the group get too reserved.
 - Don't let the group get too expressive.
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 - Don't let the group get too extroverted.
 - Don't let the group get too reserved.
 - Don't let the group get too expressive.

Idea Prioritization

Use this section to evaluate and prioritize the ideas you generated. You can use a variety of methods to do this, such as dot voting, where each person gets a set of dots to place next to the ideas they like best. You can also use a scoring system, where you assign a numerical value to each idea based on its perceived value or feasibility. The ideas with the highest scores or most dots are the ones you should focus on developing further.

2.2) Empathy Map:



3) Result:

3.1) Dashboard:

3.1.1) Dashboard 1:



3.1.2) Dashboard 2:

Airports at higher altitude within a country

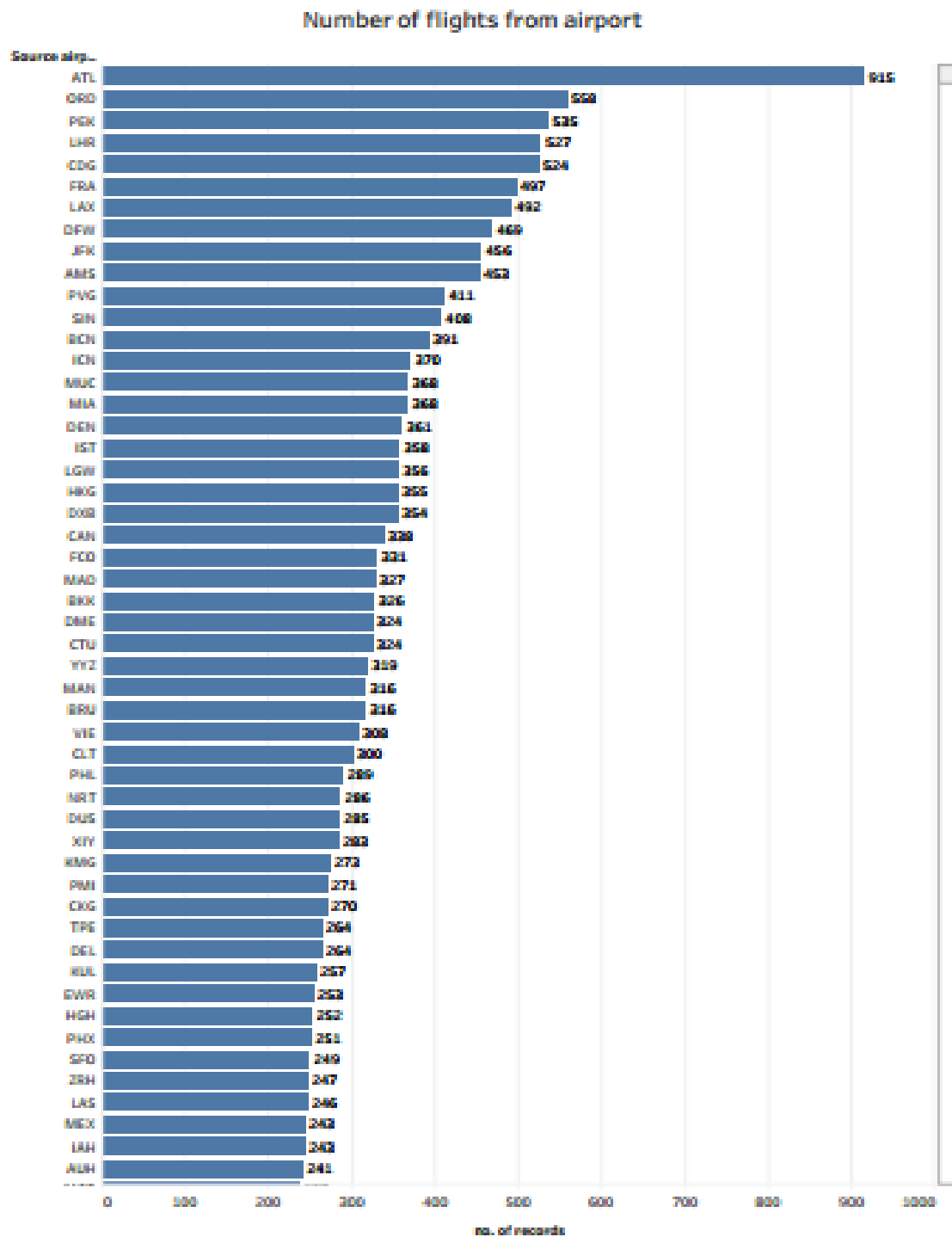
Country (airports.csv)
Afghanistan

index no.	Airport Name	City	ICAO (airp..	
1	Zaranj Airport	Zaranj	OAZJ	1,572
	Tarin Kowt Airport	Tarin Kowt	OATN	4,429
	Shindand Airport	Shindand	OASD	3,773

Airports at higher altitude in the world

Airport Name	City	ICAO (airpo..	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
Capitan Nicolas Rojas Airport	Potosi	SLPQ	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

3.1.3) Dashboard 3:



3.2) Story:

3.2.1) Story:

Global Air Transportation Network

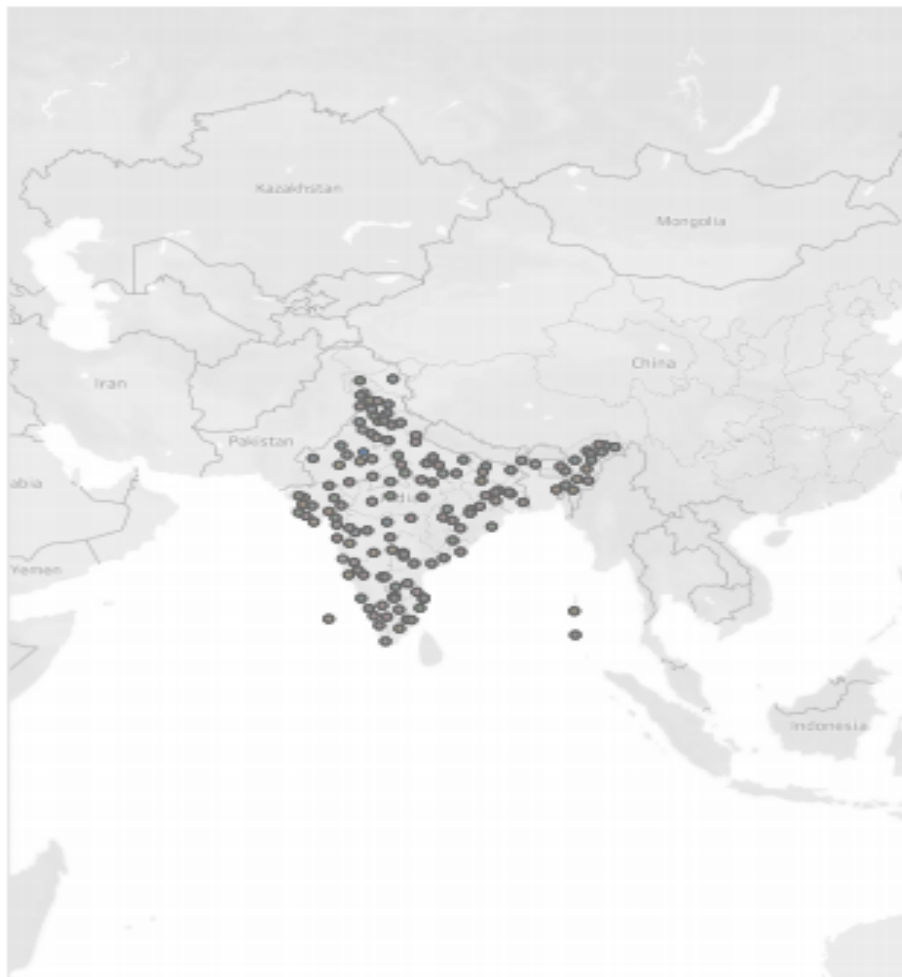
World Map Showing
Countries with details of
Airports.

Table showing Airports
which are at Highest
Altitude in the world and
within the Country.

Table showing List of all
Airlines within the country

Bar Graphs showing
Countries with Max No. of
Airports & No. of Flights
from Airports.

World map showing details of all airports within the country



Country (airports.csv)
India

Number of
Airports
within the
country

148

Country (airports.csv)
India

3.2.2) Story:

Global Air Transportation Network

World Map Showing Countries with details of Airports.

Table showing Airports which are at Highest Altitude in the world and within the Country.

Table showing List of all Airlines within the country

Bar Graphs showing Countries with Max No. of Airports & No. of Flights from Airports.

Airports at higher altitude within a country

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Golog Maqin Airport	Golog	ZLGL	12,426

3.2.3) Story:



Global Air Transportation Network

World Map Showing Countries with details of Airports.

Table showing Airports which are at Highest Altitude in the world and within the Country.

Table showing list of all Airlines within the country.

Bar Graphs showing Countries with Max No. of Airports, LNo. of Flights from Airports.

Airline ID	Name	Icon	CallSign	Country	
0001	Air Alpha Greenland	ANA	ALPHA		Denmark
0001	Atlantic Helicopters	HAC	HELIROTOR		Iceland
0001	Air Greenland	GRG	GREENLAND		Greenland
0000	Air Alpha	AAA	ALPHA		Denmark
0000	Red Air Helicopters	RAH	RED HELICOPTER		Denmark
0000	Billund Air Center	BAC	BILLUND		Denmark
0000	CDC Denmark	CDR	CDC DENMARK		Denmark
0000	Cerberus Air	CAB	CERBERUS		Denmark
0000	Company Flight	CFY	COMPANY FLIGHT		Denmark
0000	Copenhagen Airport	CAT	COPENHAGEN		Denmark
0000	DAT Danish Air Transport	DAT	DANISH		Denmark
0000	Helicopter	HCP	HELICOPTER		Denmark
0000	Danish Air Force	DAP	DANISH AIR FORCE		Denmark
0000	Danish Army	DAB	DANISH ARMY		Denmark
0000	Danish Navy	DAN	DANISH NAVY		Denmark
0000	Transport Scandinavia	VSP	SCANDINAVIA		Denmark
0000	Parasporter	PAR	PARASPORT		Denmark
0000	FlareFlight	FAT	FLARE		Denmark
0000	Helicopter Helicopter Service	HHP	HELICOPTER		Denmark
0000	Home DC	HCB	HOME DC		Denmark
0000	Airline	ATC	AIRLINE		Denmark
0000	Harling Air Charter	HAC	HARLING		Denmark
0000	Morad	MAD	MORAD		Denmark
0000	MyTravel Airways	VMS	MYTRAVEL		Denmark
0000	North Flying	NFA	NORTH FLYING		Denmark
0000	Star Air	ASR	STARTEAM		Denmark
0000	Star Air of Scandinavia	ASR	STARTEAM		Denmark
0000	Starling Air Lines	SLA	STARLING		Denmark
0000	Star Air	ASR	STARTEAM		Denmark
0000	Starfly	SLF	STARFLY		Denmark
0000	Transavia Denmark	TDA	TRANSVIA		Denmark
0000	Copenhagen Express	CED	COPENHAGEN		Denmark

3.2.4) Story:

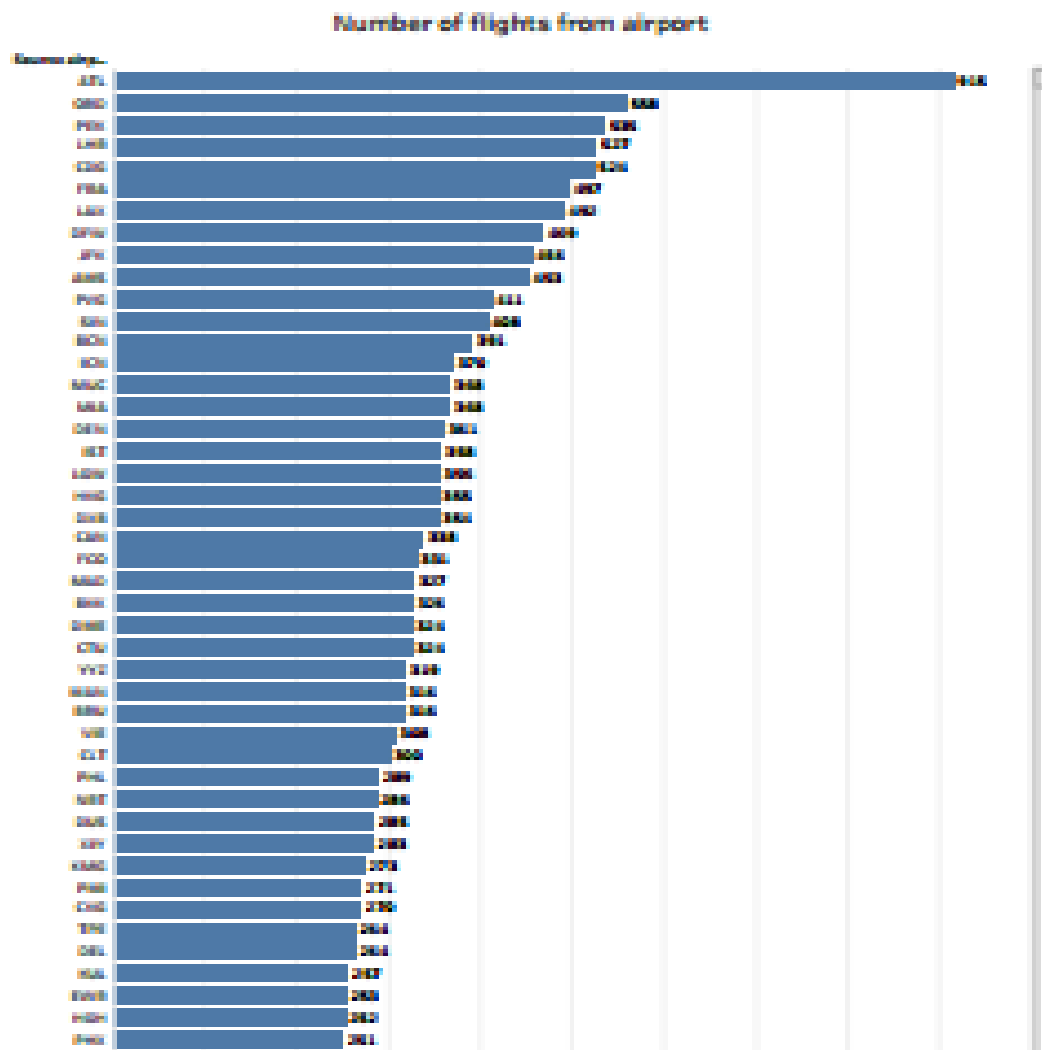
Global Air Transportation Network

Wiederholungsübungen
Consonant clusters write them with and without diacritics...

Twitter, Facebook, MySpace,
and others are all important
channels in the world and
within the country.

[Download the book](#)
[Download the book](#)

Blue-Gray Gnatcatcher
Common, with **Red** and
Black in N. of Florida.
Rare in N. of Florida.



4) Advantages and Disadvantages:

4.1) Advantages of Air Transport:

Fast speed: Air transport is capable of moving bulky cargo and hundreds of people very fast in any part of the world. Obviously, it is much faster than any mode of transportation like road transportation, rail transportation or water transportation. It is well used in nation emergencies due to its speed. In India, railways are majorly used by people for moving to any part of the country due to its economic service but nowadays people are moving towards airways for its fastest speed and people want to reach their destination as soon as possible.

Rapid service: Air transport is easy, dependable and definitely the fastest way to transport passengers and goods. It offers rapid and convenient service at a low cost. Air transport is the best way for the transport of ramble goods due to its fastest service.

Low infrastructure: Air transport travels totally on a natural path so it just requires very less investment for its maintenance. Apart from constructing airports from where air traffic is also controlled, there is no other infrastructure needed like making rail paths or several stations like in railways or in any other mode of transportation.

No physical barriers: As land routes have so many obstacles or barriers like divided regions need special permission every time which is not applicable while travelling by air. There are no obstructions like mountains, rivers or any other element which can affect its speed. It works on a direct route and hence it is faster than other modes of transport.

Defence service: Every country is very much reliant on Airforce service. Nowadays wars are not only fought on land borders but the air force offers a much easy and fast way to reach the enemy and vanish their evil intentions without much loss. During natural calamities like earthquakes, floods etc. it plays a very vital role in saving the lives of people and providing them special service in bad times.

Security: Air transport provides quick and comfortable service with a very secure environment for people to travel around in any part of the world where other modes cannot reach. Travelling with very delicate or high-value goods over long distances is convenient through air transport.

4.2) Disadvantages of Air Transport:

Costly Service: As compared to land transport, rail transport and water transport this is relatively more costly for its services. Passengers cannot travel frequently if they are not financially good. Although Air service offers not only costly business class seats it provides economical class also which is cheaper than business class but still, it is costlier than other modes of transport. It applies the same to cargo. Though it provides faster service than other modes which is great for trading air service goods are costly and need special permission.

Limited capacity: Air transport provides fast means of transportation but it has the drawback of the limited capacity of goods which is better in other modes. It is not good for bulky cargo and has limitations on the number of passengers travelling. Also, some kind of goods such as batteries, gases, fired solid and liquids etc.

Undependable and risky: Air transport travels in a natural path so it is totally dependent on the weather which makes it sometimes uncertain to travel in bad weather conditions such as fog, rain and snow etc. which causes cancellation of flights or diversion of its routes and makes it risky to travel.

Accident-prone: Compared to other modes air travel is always at high risk of accidents. There are more accidents on count while travelling by air transport. The reason can be bad weather, signal issues or machine parts failure which causes loss of people, crew or goods.

Requires Skill: There are trained people required to fly an aircraft and because of it air travel becomes a little costly due to limited crew.

Unfit for cheap and bulky goods: Since airways are costly due to numerous conditions, it becomes expensive to move cheap goods and also aircraft are small in size as compared to other modes so it's difficult to load bulky cargo.

5) Applications:

- Air transport boosts productivity across the global economy: improved transport links expand the market in which companies operate.
- As a result, companies are better able to exploit economies of scale thereby reducing costs, and to specialise in areas of comparative advantage.
- By opening up markets, air services expose companies to stiffer competition, encouraging them to become more efficient.
- Air transport improves the efficiency of the supply chain, for example, many industries use air transport to shorten delivery times as part of their just-in-time delivery systems, enabling them to deliver products to clients quickly and reliably and to reduce costs.
- Air transport is an enabler of investment both into and out of countries and regions: viable air transport links are one of the key considerations that influence where international companies choose to invest.
- Air transport can act as a spur to innovation by encouraging effective networking and collaboration between companies located in different parts of the globe.
- A good transport infrastructure can also encourage greater spending on research and development by companies – for example, increasing the size of potential markets allows the fixed costs of innovation to be spread over larger sales.
- Air transport provides consumer welfare benefits to individuals in terms of the increased availability of travel connections, and for local airport communities.
- These must be taken into account when considering environmental impacts on, for example, air quality, noise and congestion in the vicinity of airports.
- There is a clear distinction between these ‘catalytic’ impacts and the direct, indirect and induced economic impacts of air transport.
- In simple terms, the economic value of the direct, indirect and induced effects is related to the total revenues of the air transport industry, whereas the catalytic impacts are “spin-off” effects on other industries.
- Air transport facilitates world trade: air transport helps countries participate in the global market by increasing access to main markets and allowing globalisation of production.

6) 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 has played a part in fostering these developments, but airlines, and to a greater degree, air transport infrastructure has had to respond to changing demands for its services.
- 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.
- Perhaps, however, more importantly, in the longer term, globalization stimulates technology and labor transfers and allows the dynamism that accompanies entrepreneurial activities to stimulate the development of new technologies and processes that enhance global welfare.
- To allow the flows of ideas, goods, and persons that facilitates both static and dynamic efficiency on a global scale, air transport has played a role in the past.
- It seems inevitable that it this role will continue in the future.

7) HTML CODE:

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= document.createElement('script');          scriptElement.src =
'https://public.tableau.com/javascripts/api/viz_v1.js';
vizElement.parentNode.insertBefore(scriptElement, vizElement);          </script>
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