Charting Air Travel Patterns: Decoding Air Tourism

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Introduction:

Objective: The dashboard visualises and analyses air tourism trends from 1970 to 2020. This includes exploring:

- Growth in tourist arrivals.
- Environmental impact through CO2 emissions.
- Safety factors like fatality rates and hijackings.
- Employment in the tourism industry and its relationship to GDP.

Key Questions:

- How have air tourism patterns evolved in the last 50 years?
- What is the environmental cost of increased air travel?
- Which regions/countries show the most growth in air tourism, and why?
- How has tourism contributed to GDP?
- Is employment in the tourism industry directly linked to GDP?

Data Collection:

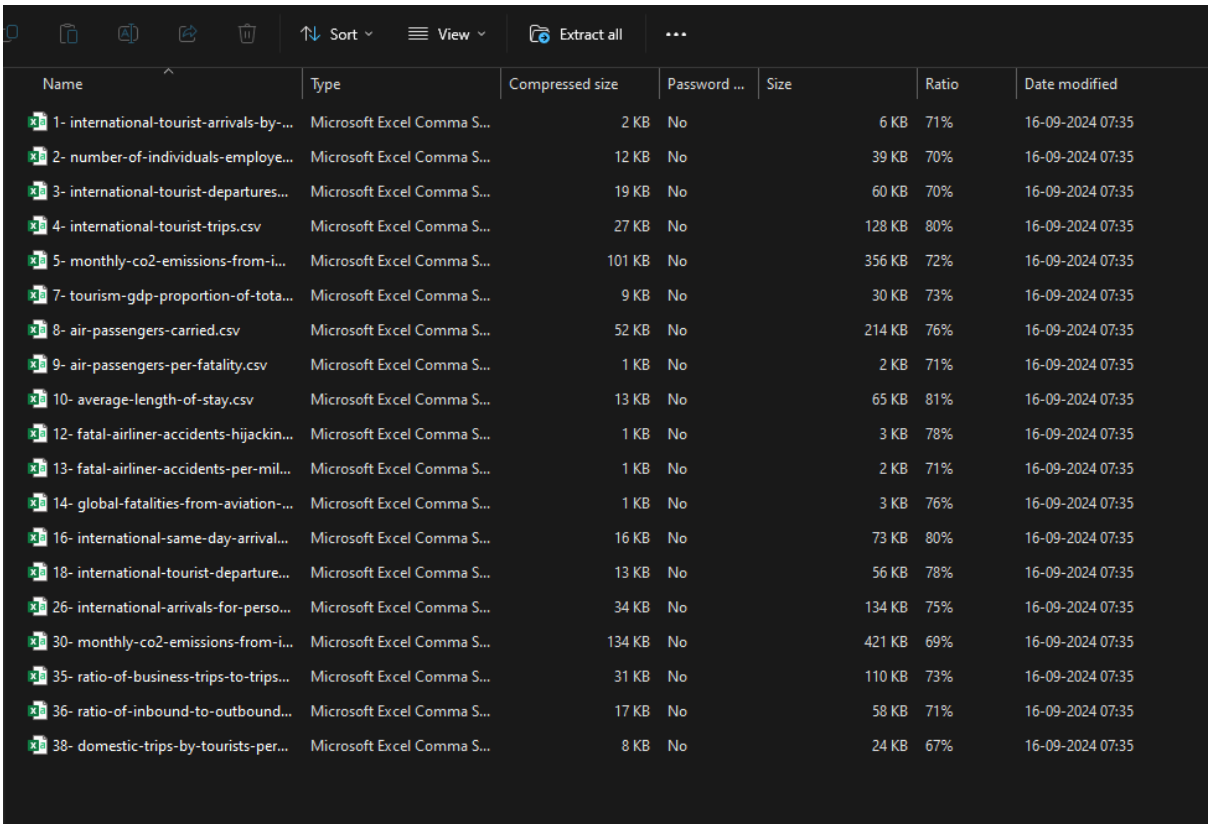
Source: The data was sourced from Kaggle (Tourism dataset).

Data Structure: The dataset consisted of multiple CSV files, each representing different factors related to air tourism, including a common Entity column representing the country and/or continent.

Data Preparation:

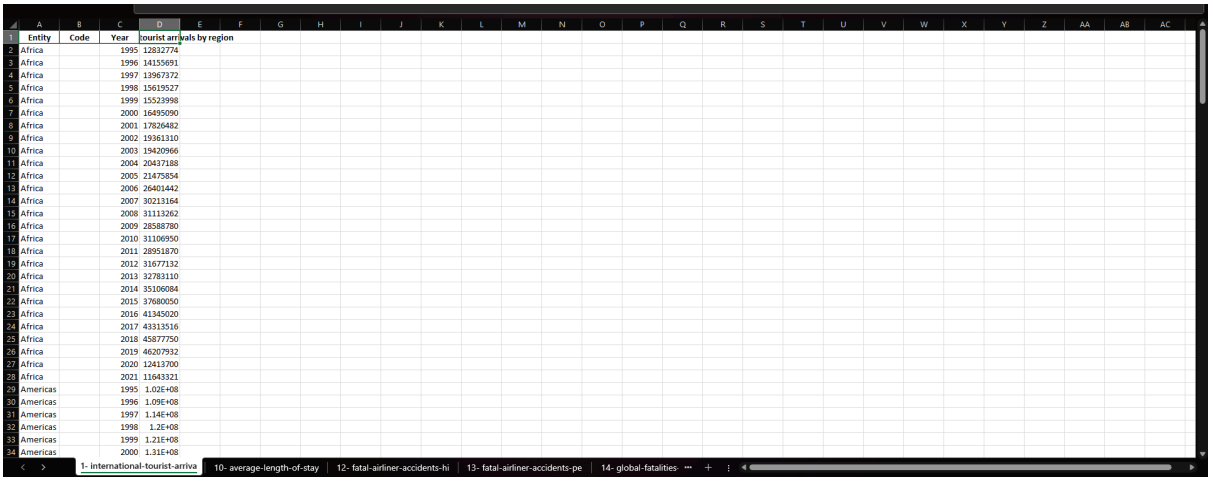
None of the 36 original files were immediately relevant, so we carefully selected the files needed and compiled them into one Excel workbook. A Python script was used to merge CSVs into worksheets within the workbook for ease of use in Power BI.

Selected Data Files :



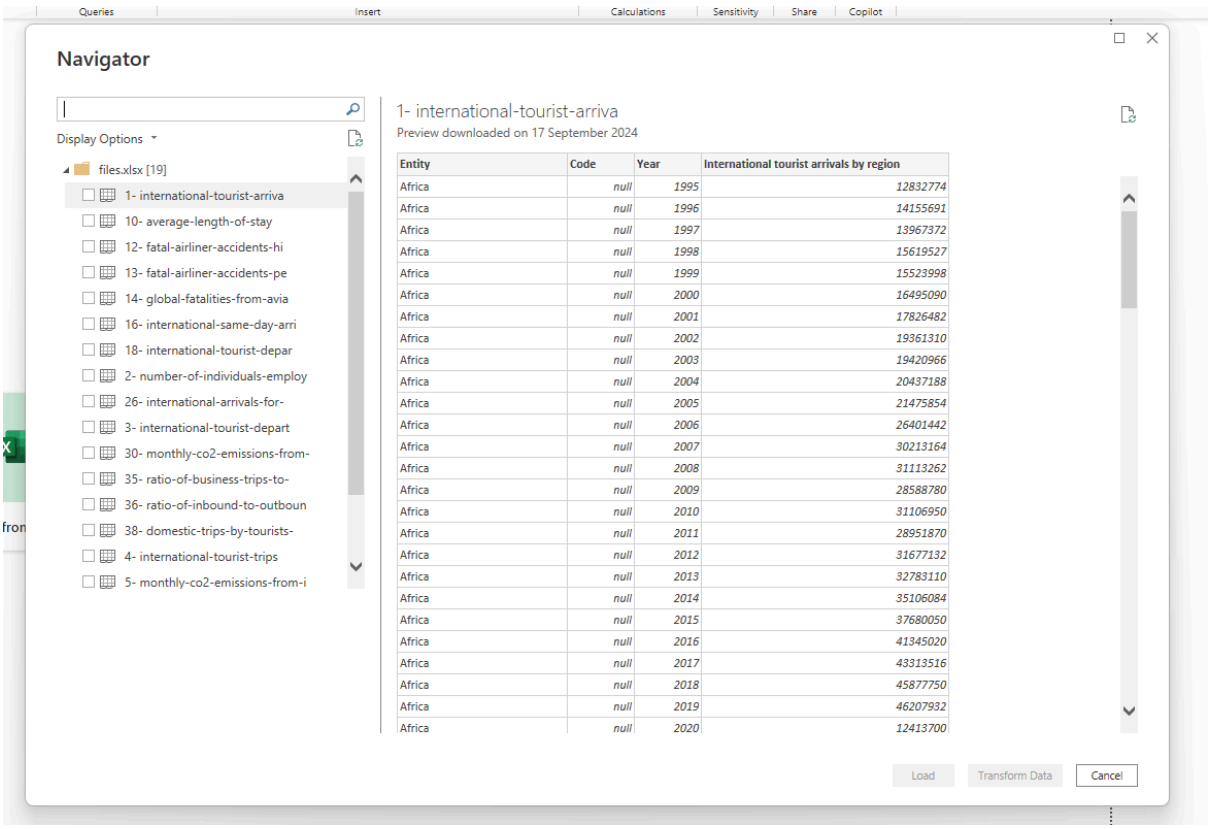
Name	Type	Compressed size	Password ...	Size	Ratio	Date modified
1- international-tourist-arrivals-by-...	Microsoft Excel Comma S...	2 KB	No	6 KB	71%	16-09-2024 07:35
2- number-of-individuals-employe...	Microsoft Excel Comma S...	12 KB	No	39 KB	70%	16-09-2024 07:35
3- international-tourist-departures...	Microsoft Excel Comma S...	19 KB	No	60 KB	70%	16-09-2024 07:35
4- international-tourist-trips.csv	Microsoft Excel Comma S...	27 KB	No	128 KB	80%	16-09-2024 07:35
5- monthly-co2-emissions-from-i...	Microsoft Excel Comma S...	101 KB	No	356 KB	72%	16-09-2024 07:35
7- tourism-gdp-proportion-of-tota...	Microsoft Excel Comma S...	9 KB	No	30 KB	73%	16-09-2024 07:35
8- air-passengers-carried.csv	Microsoft Excel Comma S...	52 KB	No	214 KB	76%	16-09-2024 07:35
9- air-passengers-per-fatality.csv	Microsoft Excel Comma S...	1 KB	No	2 KB	71%	16-09-2024 07:35
10- average-length-of-stay.csv	Microsoft Excel Comma S...	13 KB	No	65 KB	81%	16-09-2024 07:35
12- fatal-airliner-accidents-hijackin...	Microsoft Excel Comma S...	1 KB	No	3 KB	78%	16-09-2024 07:35
13- fatal-airliner-accidents-per-mil...	Microsoft Excel Comma S...	1 KB	No	2 KB	71%	16-09-2024 07:35
14- global-fatalities-from-aviation-...	Microsoft Excel Comma S...	1 KB	No	3 KB	76%	16-09-2024 07:35
16- international-same-day-arrival...	Microsoft Excel Comma S...	16 KB	No	73 KB	80%	16-09-2024 07:35
18- international-tourist-departure...	Microsoft Excel Comma S...	13 KB	No	56 KB	78%	16-09-2024 07:35
26- international-arrivals-for-perso...	Microsoft Excel Comma S...	34 KB	No	134 KB	75%	16-09-2024 07:35
30- monthly-co2-emissions-from-i...	Microsoft Excel Comma S...	134 KB	No	421 KB	69%	16-09-2024 07:35
35- ratio-of-business-trips-to-trips...	Microsoft Excel Comma S...	31 KB	No	110 KB	73%	16-09-2024 07:35
36- ratio-of-inbound-to-outbound...	Microsoft Excel Comma S...	17 KB	No	58 KB	71%	16-09-2024 07:35
38- domestic-trips-by-tourists-per...	Microsoft Excel Comma S...	8 KB	No	24 KB	67%	16-09-2024 07:35

Merged Excel File :



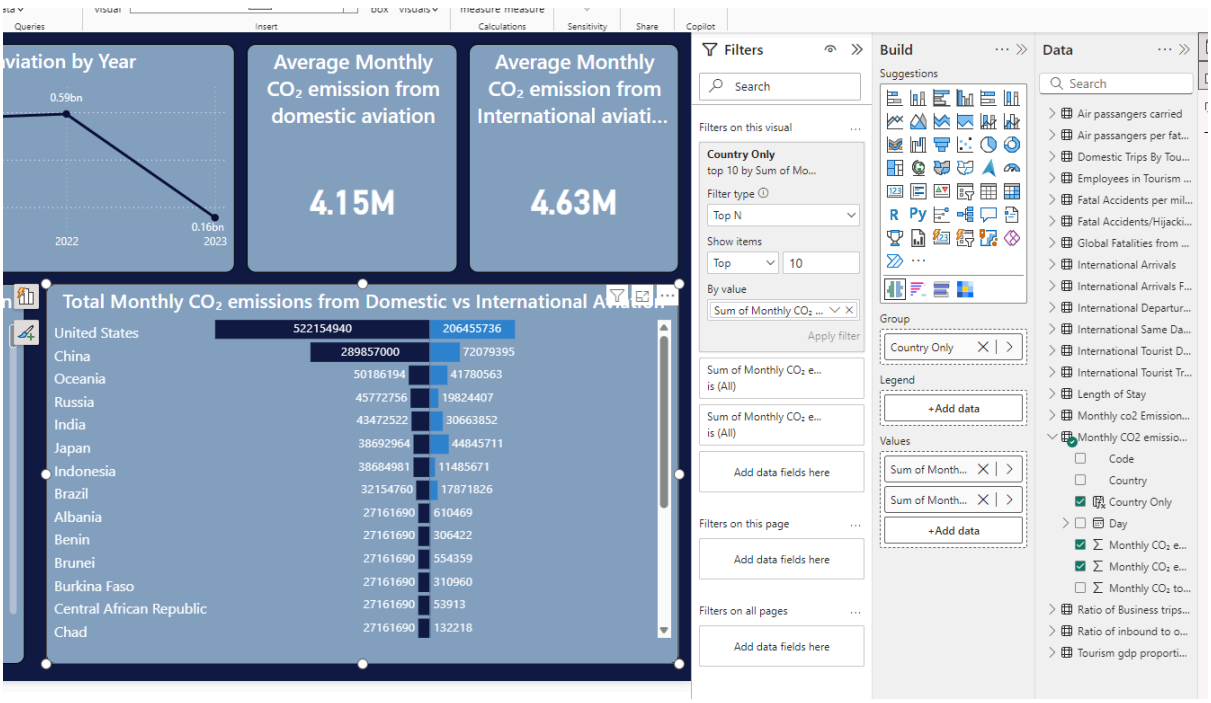
Entity	Code	Year	tourist arrivals by region
Africa		1995	12832774
Africa		1996	14155691
Africa		1997	13967372
Africa		1998	15619527
Africa		1999	15523998
Africa		2000	16495090
Africa		2001	17826482
Africa		2002	19361310
Africa		2003	19420966
Africa		2004	20437188
Africa		2005	21475854
Africa		2006	26401442
Africa		2007	30213164
Africa		2008	31113262
Africa		2009	28588780
Africa		2010	31106950
Africa		2011	28951870
Africa		2012	31677132
Africa		2013	32783110
Africa		2014	35106084
Africa		2015	37680050
Africa		2016	41345020
Africa		2017	43313516
Africa		2018	45877750
Africa		2019	46207932
Africa		2020	12413700
Africa		2021	11643321
Americas		1995	1.02E+08
Americas		1996	1.09E+08
Americas		1997	1.14E+08
Americas		1998	1.2E+08
Americas		1999	1.21E+08
Americas		2000	1.31E+08

Transformations: We modified data types as necessary, removed empty or irrelevant columns, and addressed missing values on a file-by-file basis. Fortunately, the dataset was relatively clean, requiring minimal further preparation.



Relationships: The auto-detect relationship feature in Power BI Desktop worked well, so we didn't need to manually define additional relationships in our data model.

Visualisation: We visualised the final clean data using easy to understand and insightful visuals available in PowerBI along with a few add-ins which help gather more insights and information from the data.



Dashboard Design and Features:

Dashboard: The main dashboard serves as an overview, with page navigation and key insights gathered throughout the case study.

Pages:

- Home
- Air Passengers Carried
- International Arrivals
- Domestic Trips
- Length of Stay
- Business vs Professional
- Employment
- India
- Fatal Accidents/ Hijackings
- CO2 Emissions

Key Insights:

- Top international arrivals include **France, Spain, the U.S., China, and Italy** due to their rich culture, iconic landmarks, and diverse attractions. France draws visitors with art and cuisine, **Spain** offers beaches and festivals, the **U.S**. attracts with cities and nature, China combines ancient history with modernity, and **Italy's** charm lies in its ruins and Renaissance art.
- Countries like **Finland, Australia, and Czechia** see strong domestic tourism due to vast landscapes and developed infrastructure. Domestic travel is key to their economies.
- Longer stays in **Hawaii and Cuba** result from remote locations, scenic beauty, tropical climates, and resort packages catering to extended vacations.
- Business travel is less frequent than personal travel, with **Europe** benefiting from efficient transport and compact geography. The **Schengen Area** further simplifies cross-border travel.
- **Macao, Monaco, and the U.S. Virgin Islands** rely heavily on tourism for jobs due to their natural attractions and government focus.
- **India's** tourism grew from 1995 to 2019 but dropped sharply in 2020-2021 due to the **COVID-19 pandemic**.
- A spike in hijackings around 2000 was caused by **global political instability, terrorism, and weak airport security pre-9/11**.
- **Aviation safety** has improved, leading to fewer fatal accidents due to **advancements in technology, training, and regulations**.
- Tourism contributes significantly towards a country's economy proved by its **proportion to the total GDP** of a country.

Conclusion:

- Power BI played a pivotal role in this case study by providing dynamic visualisations and enabling the seamless integration of clean, structured data. This powerful tool allowed

for a clearer, more accessible interpretation of the historical trends in air tourism from 1970 to 2020. Through its interactive dashboards and data relationships, Power BI simplified the analysis of complex data points, making it easier to understand key factors like air travel growth, environmental impacts, safety improvements, and economic contributions.

- The case study revealed how global tourism evolved over five decades, highlighting its substantial economic role while drawing attention to the environmental costs, such as CO2 emissions. As air tourism continues to grow, future trends must focus on balancing this expansion with sustainable practices to mitigate environmental impacts, ensuring a responsible path forward for the industry. Power BI's ability to visualise and analyse these trends provides a critical foundation for managing and guiding sustainable tourism growth.