<u>Tableau Insight:</u> Unearthing The Environmental Impact Of Human Activity: A Global

The purpose of the CO2 emissions project is to analyse and understand the historical evolution of carbon dioxide emissions globally. By examining data from 1947 to 2022, the project aims to uncover trends, identify key drivers, and assess the impact of various factors on global carbon output. Through comprehensive data analysis and visualization, the project seeks to provide insights into the patterns of CO2 emissions over time, highlighting the influence of industrialization, economic development, and policy interventions. Ultimately, the project serves to raise awareness about the urgent need to address climate change challenges and advocate for sustainable solutions to mitigate CO2 emissions and protect the environment.

REAL TIME SCENARIO :

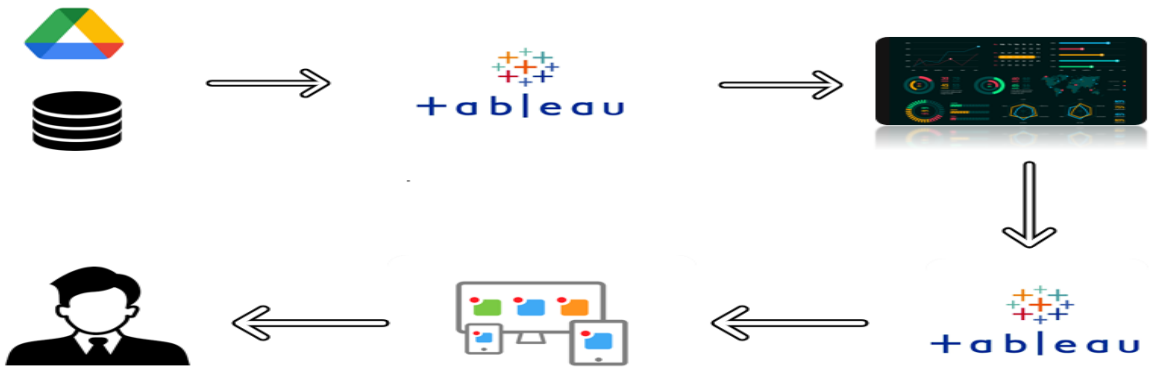
1. Emission Spikes:

In real-time, the project can detect sudden increases in CO2 emissions from specific regions or industries. For example, if there's a surge in emissions from a factory due to equipment malfunction, environmental agencies can be alerted to investigate and take corrective action promptly, ensuring compliance with emission regulations and protecting air quality.

2. Climate Policy Impact:

The project's real-time analysis can help policymakers assess the immediate impact of climate policies. For instance, if a new policy is implemented to promote renewable energy, real-time data can show whether there's a decrease in CO2 emissions from the energy sector. This feedback loop enables policymakers to adjust policies as needed to achieve desired emission reduction targets efficiently.

Technical Architecture:



Project Flow

To accomplish this, we have to complete all the activities listed below,

- Data Collection & Extraction from Database
  - Collect the dataset,
  - Connect data with Tableau
- Data Preparation
  - Prepare the Data for Visualization
- Data Visualizations
  - No of Unique Visualizations
- Dashboard
  - Responsive and Design of Dashboard
- Story
  - No of Scenes of Story
- Performance Testing
  - Amount of Data Loaded
  - Utilization of Data Filters
  - No of Calculation Fields
  - No of Visualizations/ Graphs
- Web Integration
  - Dashboard and Story embed with UI With Flask
- Project Demonstration & Documentation
  - Record explanation Video for project end to end solution
  - Project Documentation-Step by step project development procedure

Milestone 1: Data Collection & Extraction from Database

Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes and generate insights from the data.

Activity 1.1: Understand the data

Data contains all the meta information regarding the columns described in the CSV files.

Column Description of the Dataset:

1. Country: Indicates the name of the country for which CO2 emission data is recorded.

2. Year: Represents the year in which the CO2 emissions data was measured.

3. CO2 Denotes the total amount of carbon dioxide emissions (in metric tons) attributed to the country in the given year.

4.CO2 Growth (%): Shows the percentage change in CO2 emissions compared to the previous year, indicating the rate of growth or decline in emissions.

5. CO2 Per Capita: Indicates the average amount of CO2 emissions per person in the country, providing insight into individual carbon footprints.

6. Cumulative CO2: Represents the total accumulated CO2 emissions for the country up to the specified year, showing the historical trend of emissions over time.

7. Coal CO2, Cement CO2, Flaring CO2, Gas CO2, Oil CO2, Other Industry CO2: Breaks down CO2 emissions by source, indicating the contribution of each sector to total emissions.

8. Cement CO2 Per Capita, Coal CO2 Per Capita, Flaring CO2 Per Capita, Gas CO2 Per Capita, Oil CO2 Per Capita, Other CO2 Per Capita: Represents the average amount of CO2 emissions per person for each specific emission source, providing insights into the relative impact of different sectors on individual carbon footprints.

9. Trade CO2 Share: Indicates the percentage of CO2 emissions that are attributed to international trade activities, reflecting the country's role in global emissions through imports and exports.

10. Population: Denotes the population of the country in the specified year, providing context for interpreting per capita emissions and understanding trends in emissions relative to population changes.

Milestone 2: Data Preparation

Activity 1: Prepare the Data for Visualization

Preparing the data for visualization involves cleaning the data to remove irrelevant or missing data, transforming the data into a format that can be easily visualized, exploring the data to identify patterns and trends, filtering the data to focus on specific subsets of data, preparing the data for visualization software, and ensuring the data is accurate and complete. This process helps to make the data easily understandable and ready for creating visualizations to gain insights into the performance and efficiency.

Explanation video link 1: Data Loading

https://drive.google.com/file/d/1qNAkZc8YsaJU48FzwSycQIsZ3gSbcA8w/view?usp=drivesdk

Milestone 3: Data Visualization

Data visualization is the process of creating graphical representations of data in order to help people understand and explore the information. The goal of data visualization is to make complex data sets more accessible, intuitive, and easier to interpret. By using visual elements such as charts, graphs, and maps, data visualizations can help people quickly identify patterns, trends, and outliers in the data.

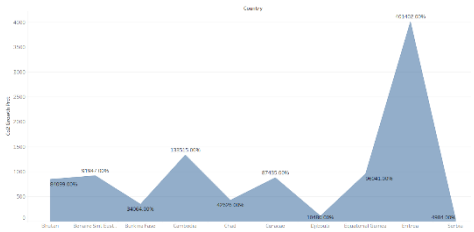
Activity 1: No of Unique Visualizations

The number of unique visualizations that can be created with a given dataset. Some common types of visualizations that can be used to analyse the performance and efficiency of Radisson Hotels include bar charts, line charts, heat maps, scatter plots, pie charts, Maps etc. These visualizations can be used to compare performance, track changes over time, show distribution, and relationships between variables, breakdown of revenue and customer demographics, workload, resource allocation and location of hotels.

Activity 1.1: Decades of Global CO2 Emission Trends: Analyse Growth Percentages from 1974 to 2020

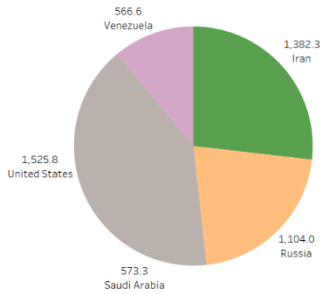
Explanation video link:

https://drive.google.com/file/d/1qNAkZc8YsaJU48FzwSycQIsZ3gSbcA8w/view?usp=drivesdk



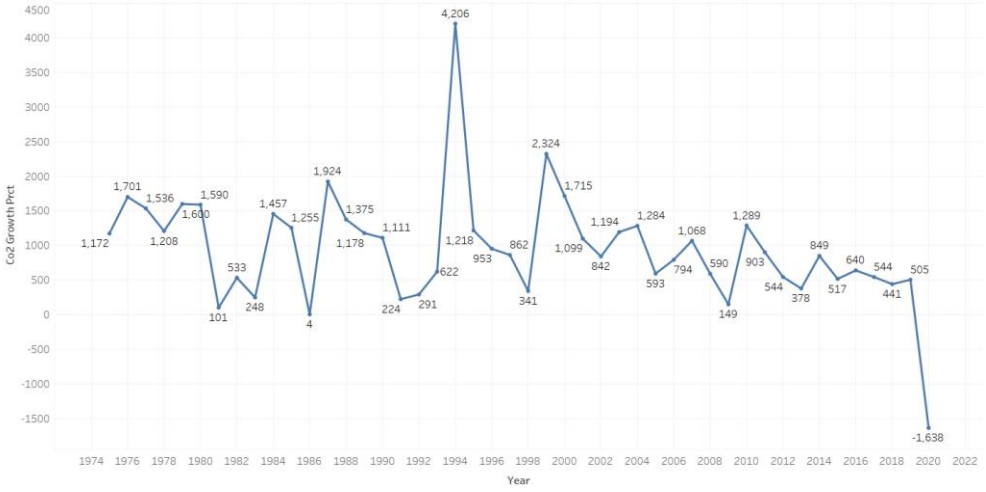
Activity 1.2: Top 5 Countries with Highest Flaring CO2 Emissions: Pie Chart Analysis

Explanation video link:
https://drive.google.com/file/d/1qNAkZc8YsaJU48FzwSycQIsZ3gSbcA8w/view?usp=drivesdk



Activity 1.3: These countries have experienced significant growth in CO2 emissions percentage-wise.

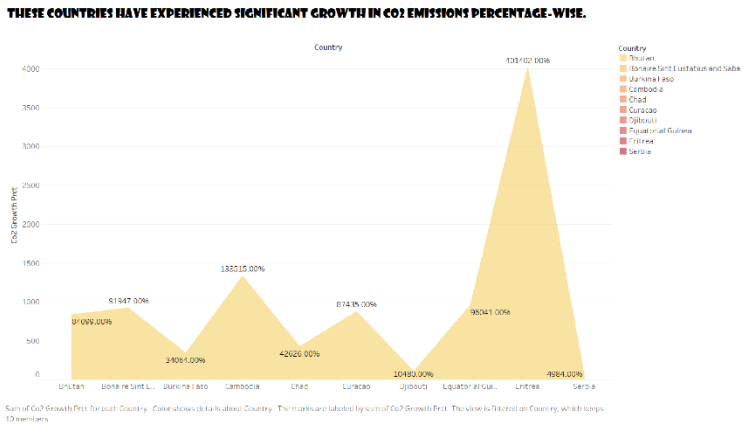
Explanation video link:
https://drive.google.com/file/d/1qNAkZc8YsaJU48FzwSycQIsZ3gSbcA8w/view?usp=drivesdk



Activity 1.4Evolution of Trade-Related CO2 Emissions: 1990-2020

Explanation video link:

https://drive.google.com/file/d/1qNAkZc8YsaJU48FzwSycQIsZ3gSbcA8w/view?usp=drivesdk



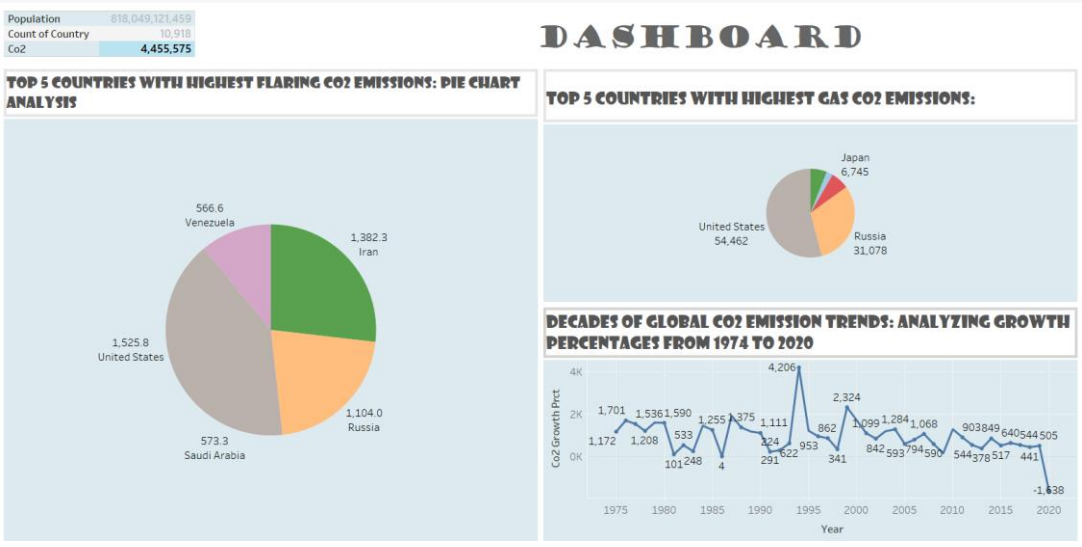
Milestone 4: Dashboard

A dashboard is a graphical user interface (GUI) that displays information and data in an organized, easy-to-read format. Dashboards are often used to provide real-time monitoring and analysis of data, and are typically designed for a specific purpose or use case. Dashboards can be used in a variety of settings, such as business, finance, manufacturing, healthcare, and many other industries. They can be used to track key performance indicators (KPIs), monitor performance metrics, and display data in the form of charts, graphs, and tables.

Activity :1- Responsive and Design of Dashboard

Explanation video link:

https://drive.google.com/file/d/1qNAkZc8YsaJU48FzwSycQIsZ3gSbcA8w/view?usp=drivesdk



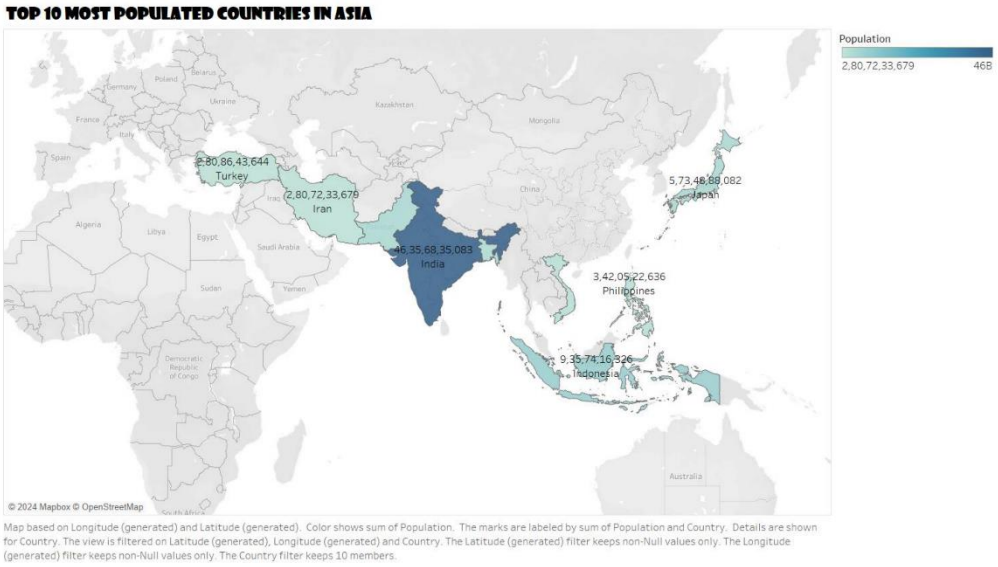
Milestone 5: Story

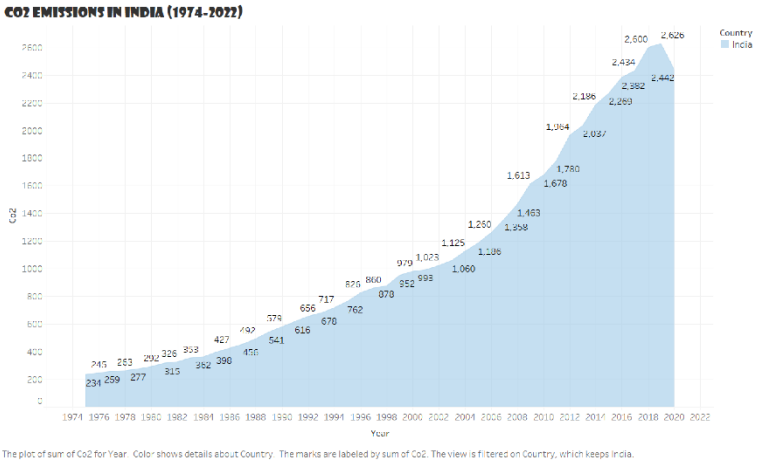
A data story is a way of presenting data and analysis in a narrative format, with the goal of making the information more engaging and easier to understand. A data story typically includes a clear introduction that sets the stage and explains the context for the data, a body that presents the data and analysis in a logical and systematic way, and a conclusion that summarizes the key findings and highlights their implications. Data stories can be told using a variety of mediums, such as reports, presentations, interactive visualizations, and videos.

Activity 1: No of Scenes of Story

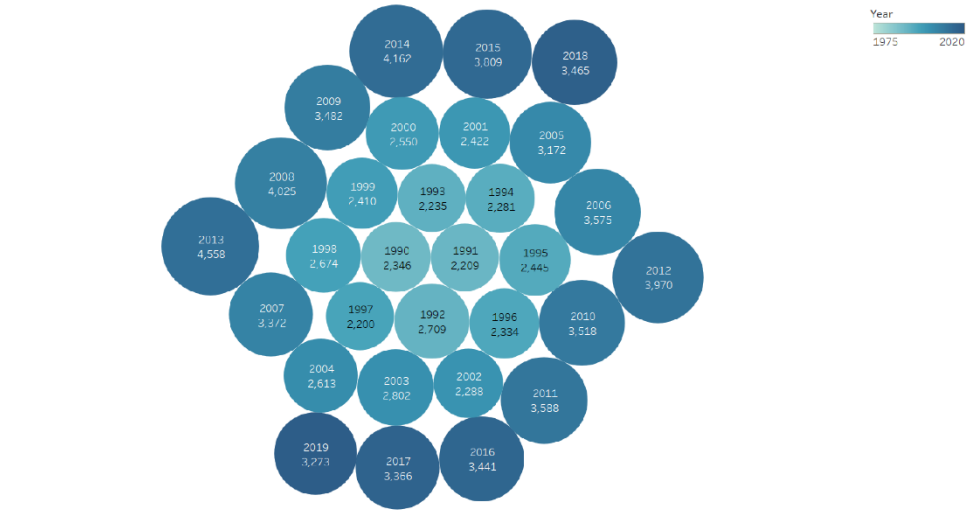
Explanation video link:

https://drive.google.com/file/d/1qNAkZc8YsaJU48FzwSycQIsZ3gSbcA8w/view?usp=drivesdk





TRADE CO2 SHARES (1974-2022)

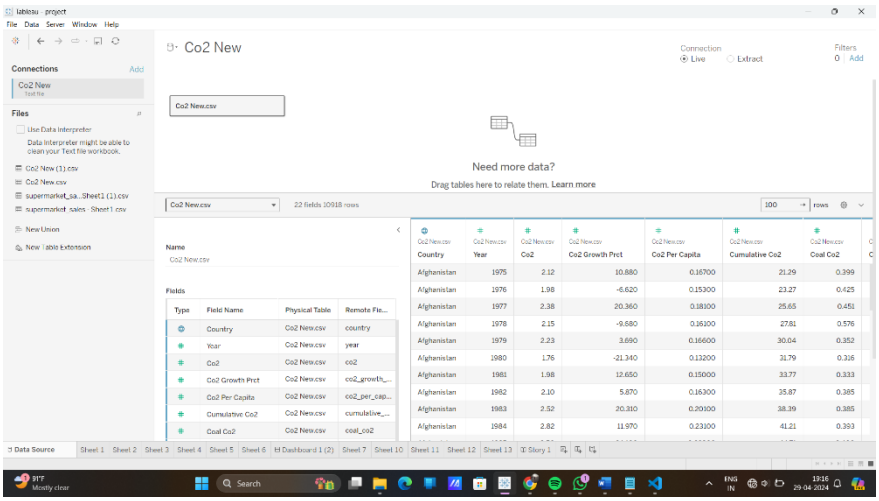


Year and sum of Trade Co2 Share. Color shows details about Year. Size shows sum of Trade Co2 Share. The marks are labeled by Year and sum of Trade Co2 Share.

Milestone 6: Performance Testing

Activity 1: Amount of Data Loaded

"Amount of Data Loaded" refers to the quantity or volume of data that has been imported, retrieved, or loaded into a system, software application, database, or any other data storage or processing environment. It's a measure of how much data has been successfully processed and made available for analysis, manipulation, or use within the system.

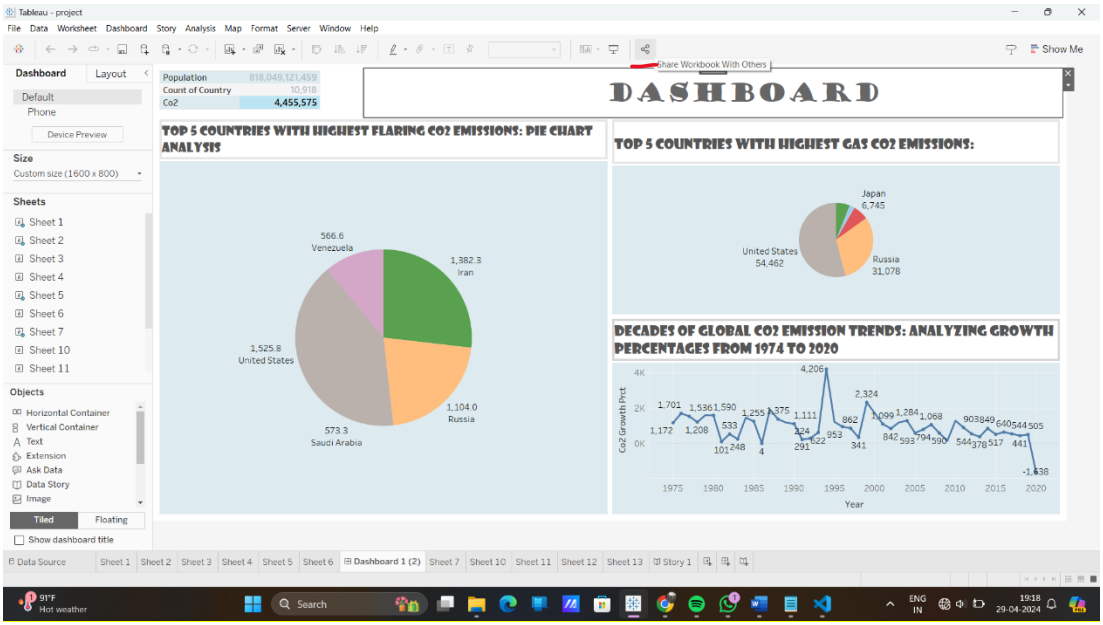


Milestone 7: Web integration

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.

Publishing dashboard and reports to tableau public

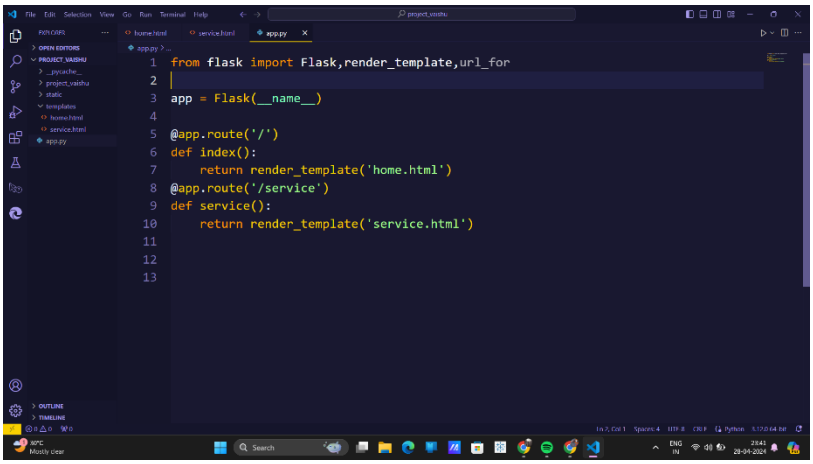
Step 1: Go to Dashboard/story, click on share button on the top ribbon



Activity 1: Dashboard and Story embed with UI With Flask

Explanation video link:

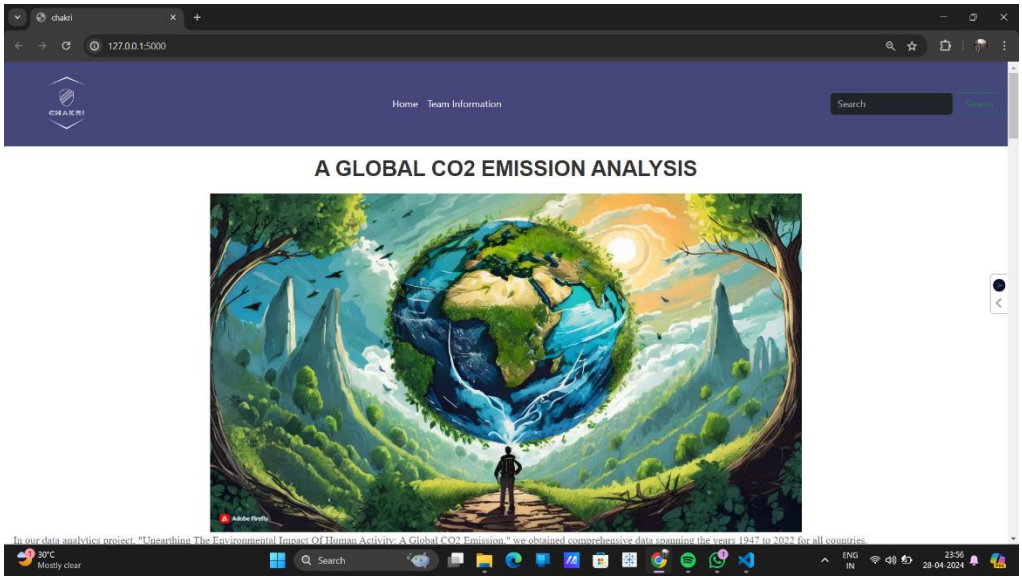
https://drive.google.com/file/d/1qNAkZc8YsaJU48FzwSycQIsZ3gSbcA8w/view?usp=drivesdk

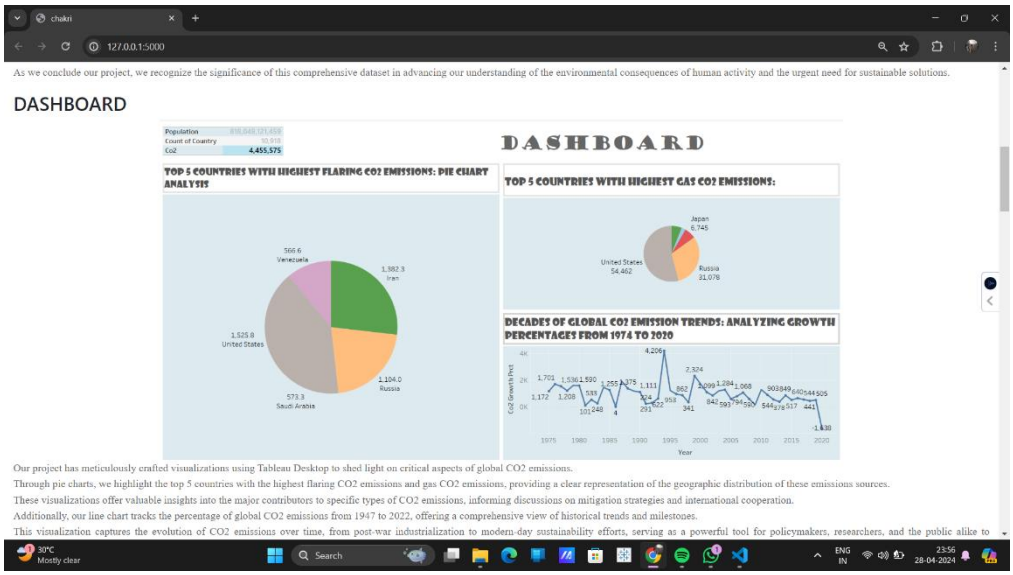


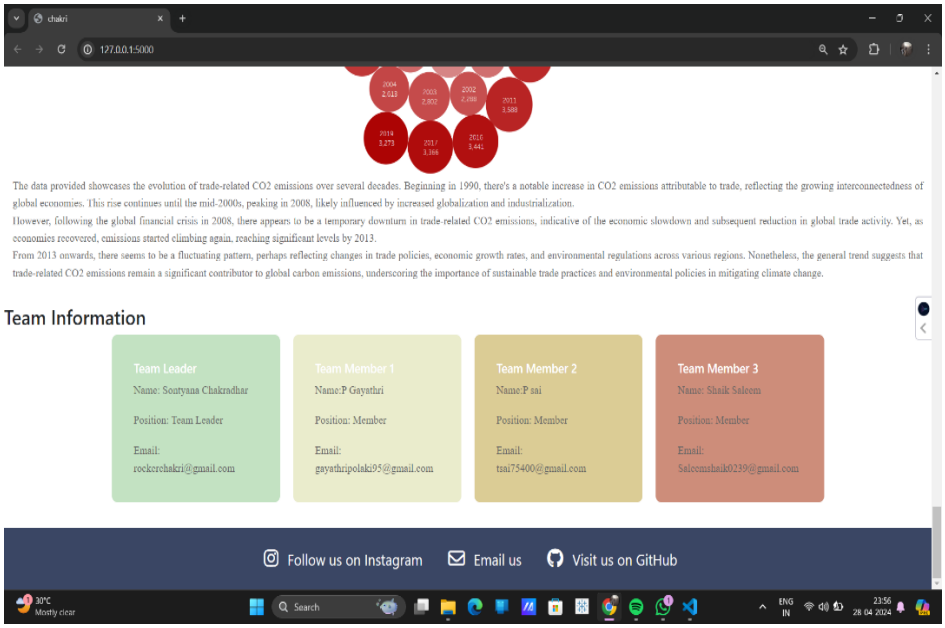
```
from flask import Flask,render_template,url_for

app = Flask(__name__)

@app.route('/')
def index():
    return render_template('home.html')
@app.route('/service')
def service():
    return render_template('service.html')
```


chakri
127.0.0.1:5000
CHAKRI
Home
Team Information
Search
A GLOBAL CO2 EMISSION ANALYSIS
Adobe Firefly
In our data analytics project, "Unearthing The Environmental Impact Of Human Activity: A Global CO2 Emission," we obtained comprehensive data spanning the years 1947 to 2022 for all countries.
30°C
Mostly clear
Search
ENG
IN
23:56
28-04-2024


chakri
127.0.0.1:5000
As we conclude our project, we recognize the significance of this comprehensive dataset in advancing our understanding of the environmental consequences of human activity and the urgent need for sustainable solutions.
DASHBOARD
Population
Count of Country
Co2
4,455,575
DASHBOARD
TOP 5 COUNTRIES WITH HIGHEST FLARING CO2 EMISSIONS: PIE CHART ANALYSIS
566.6
Venezuela
1,382.3
Iran
1,525.8
United States
1,104.0
Russia
573.3
Saudi Arabia
TOP 5 COUNTRIES WITH HIGHEST GAS CO2 EMISSIONS:
Japan
6,745
United States
54,462
Russia
31,078
DECADES OF GLOBAL CO2 EMISSION TRENDS: ANALYZING GROWTH PERCENTAGES FROM 1974 TO 2020
CO2 Growth % PoP
Year
Our project has meticulously crafted visualizations using Tableau Desktop to shed light on critical aspects of global CO2 emissions.
Through pie charts, we highlight the top 5 countries with the highest flaring CO2 emissions and gas CO2 emissions, providing a clear representation of the geographic distribution of these emissions sources.
These visualizations offer valuable insights into the major contributors to specific types of CO2 emissions, informing discussions on mitigation strategies and international cooperation.
Additionally, our line chart tracks the percentage of global CO2 emissions from 1947 to 2022, offering a comprehensive view of historical trends and milestones.
This visualization captures the evolution of CO2 emissions over time, from post-war industrialization to modern-day sustainability efforts, serving as a powerful tool for policymakers, researchers, and the public alike to
30°C
Mostly clear
Search
ENG
IN
23:56
28-04-2024


chakri
127.0.0.1:5000
2004
2.610
2003
2.802
2002
2.598
2011
3.588
2019
3.273
2017
3.366
2010
3.441
The data provided showcases the evolution of trade-related CO2 emissions over several decades. Beginning in 1990, there's a notable increase in CO2 emissions attributable to trade, reflecting the growing interconnectedness of global economies. This rise continues until the mid-2000s, peaking in 2008, likely influenced by increased globalization and industrialization.
However, following the global financial crisis in 2008, there appears to be a temporary downturn in trade-related CO2 emissions, indicative of the economic slowdown and subsequent reduction in global trade activity. Yet, as economies recovered, emissions started climbing again, reaching significant levels by 2013.
From 2013 onwards, there seems to be a fluctuating pattern, perhaps reflecting changes in trade policies, economic growth rates, and environmental regulations across various regions. Nonetheless, the general trend suggests that trade-related CO2 emissions remain a significant contributor to global carbon emissions, underscoring the importance of sustainable trade practices and environmental policies in mitigating climate change.
Team Information
Team Leader
Name: Soutyana Chakradhar
Position: Team Leader
Email:
rockerchakri@gmail.com
Team Member 1
Name:P Gayathri
Position: Member
Email:
gayathripolaki95@gmail.com
Team Member 2
Name:P sai
Position: Member
Email:
tsai75400@gmail.com
Team Member 3
Name: Shaik Saleem
Position: Member
Email:
Saleemshaik0239@gmail.com
Follow us on Instagram
Email us
Visit us on GitHub
30°C
Mostly clear
Search
ENG
IN
23:56
28-04-2024