UNEARTHING THE ENVIRONMENTAL IMAPACT OF HUMAN ACTIVITY : A GOBAL CO2 EMISSION ANALYSIS

Project Based Experimental Learning program

Project Flow

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

- **Define Problem / Problem Understanding**
  - ✓ Specify the business problem
  - ✓ Business requirement
  - ✓ Literature Survey
  - ✓ Social or Business Impact.
- **Data Collection & Extraction from Database**
  - ✓ Collect the dataset,
  - ✓ Storing Data in DB o Perform SQL Operations
  - ✓ Connect DB 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 o Amount of Data Rendered to DB**
  - ✓ 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 o Project Documentation-Step by step project development procedure

Unearthing The Environmental Impact Of Human Activity: A Gobal CO2 Emission Analysis

Milestone 1: Define Problem / Problem Understanding :

Activity 1: Specify the business problem.

Global warming is one of the biggest challenges currently being faced by the human race, although correlation is not causation, a likely cause of global warming is due to increased atmospheric carbon dioxide from human activities. **CO2 Emission** refers to the Carbon Dioxide emitted throughout the world. For this analysis we will be focusing on CO2 Emissions and its effect on the world we live in as well as some key factors and stats that may play a role in the emission of CO2 globally. Fossil fuel use is the primary source of CO2. The data throws light onto how much fossil fuels are burnt, per year per nation, which amounts to an increase in CO2 every year. This will help researchers and environment experts to predict global warming. So countries should set a goal to decrease this amount yearly.

Activity 2: Business requirements.

The business requirements for analysing the Co2 Emission Globally over time, identifying affecting factors, creating interactive dashboards and reports, identifying areas for improvement, making data-driven decisions, comparing to countries average and creating forecasting models for future performance. The ultimate goal is to gain insights and reduce the emission through data visualization techniques.

Activity 3: Literature Survey.

A literature survey is a method of researching existing literature and studies related to a specific topic. In the context of analyzing the Global Co2 Emission, a literature survey would involve reviewing studies and

articles that have been published on the topic of Emission, as well as studies specific to Co2.The literature survey would include sources such as academic journals, industry reports, and online articles. It would aim to identify different internal and external factors that are responsible and commonly used to determine Co2 Emission, as well as any best practices or strategies that have been identified for reducing emission.The literature survey would also explore any existing research on Co2 Emission specifically, and would aim to identify any challenges or opportunities that the Countries can opt to reduce emission.

The survey articles :

- ## CO_2 emissions: A quantitative analysis among the BRICS nations:

Abstract ;

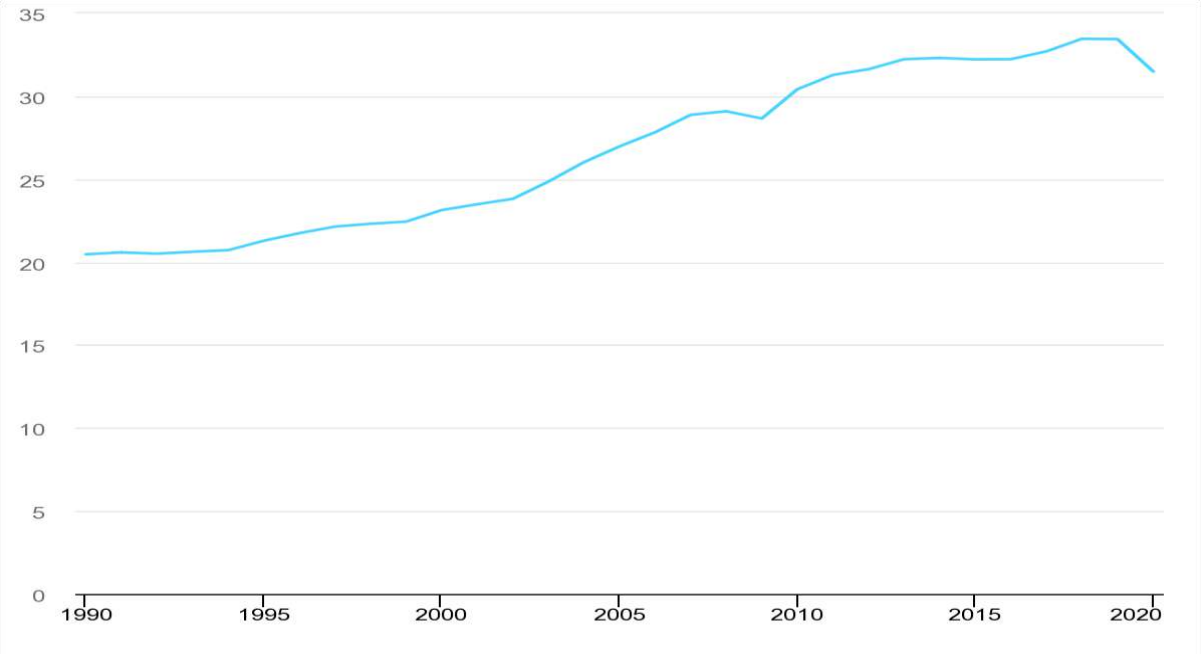
This study aims to examine the volume of carbon dioxide (CO_2) emissions by lag of the emissions and by the Gross Domestic Product (GDP) for the BRICS (Brazil, Russia, India, China, and South Africa) countries from 1980 to 2011. Due to the heterogeneity of CO_2 emission among the BRICS countries, we organized the countries into two groups. In Group 1 (Brazil and Russia), we identified that the main causes of the variation of CO_2 emission in time t are the emission of CO_2 in time t-1 and the annual GDP of the country. In Group 2 (China, India, and South Africa), the findings do not depend on the income level of individual countries, but only from the emission of CO_2 in the lag period. Therefore, the main contribution of this study is that the environmental consequences of growing economic activity may be very mixed and must be examined on a case-by-case basis.

- Global Energy Review: CO2 Emissions in 2020 By IEA :

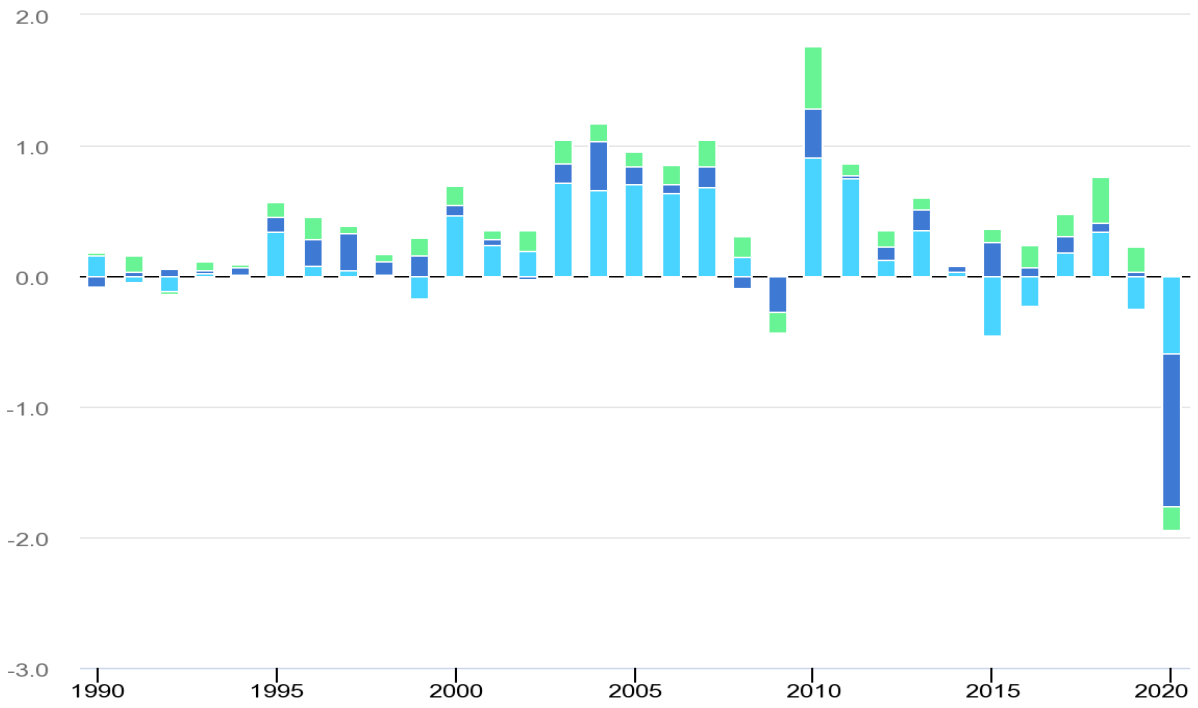
The Covid-19 pandemic and resulting economic crisis had an impact on almost every aspect of how energy is produced, supplied, and consumed around the world. The pandemic defined energy and emissions trends in 2020 – it drove down fossil fuel consumption for much of the year, whereas renewables and electric vehicles, two of the main building blocks of clean energy transitions, were largely immune.

As primary energy demand dropped nearly 4% in 2020, global energy-related CO2 emissions fell by 5.8% according to the latest statistical data, the largest annual percentage decline since World War II. In absolute terms, the decline in emissions of almost 2000 million tonnes of CO2 is without precedent in human history – broadly speaking, this is the equivalent of removing all of the European Union's emissions from the global total. Demand for fossil fuels was hardest hit in 2020 – especially oil, which plunged 8.6%, and coal, which dropped by 4%. Oil's annual decline was its largest ever, accounting for more than half of the drop in global emissions. Global emissions from oil use plummeted by well over 1100 Mt CO2, down from around 11400 Mt in 2019. The drop in road transport activity accounted for 50% of the decline in global oil demand, and the slump in the aviation sector for around 35%. Meanwhile, low-carbon fuels and technologies, in particular, solar PV and wind, reached their highest ever annual share of the global energy mix, increasing it by more than one percentage point to over 20%.

Global energy-related CO2 emissions, 1990-2020 :



Change in CO2 emissions by fuel, 1990-2020 :



- Global Energy Review: CO2 Emissions in 2021 By IEA :

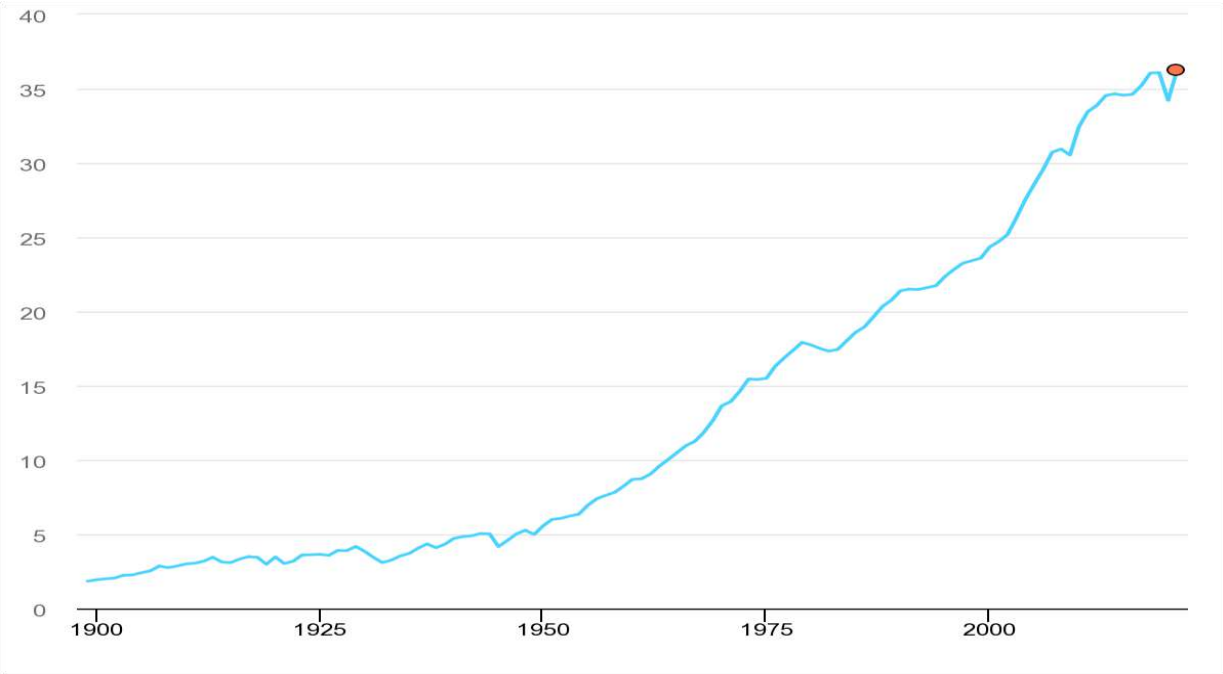
Energy-related CO2 emissions grew to 36.3 Gt in 2021, a record high

Global CO_2 emissions from energy combustion and industrial processes[1] rebounded in 2021 to reach their highest ever annual level. A 6% increase from 2020 pushed emissions to 36.3 gigatonnes (Gt), an estimate based on the IEA's detailed region-by-region and fuel-by-fuel analysis, drawing on the latest official national data and publicly available energy, economic and weather data.

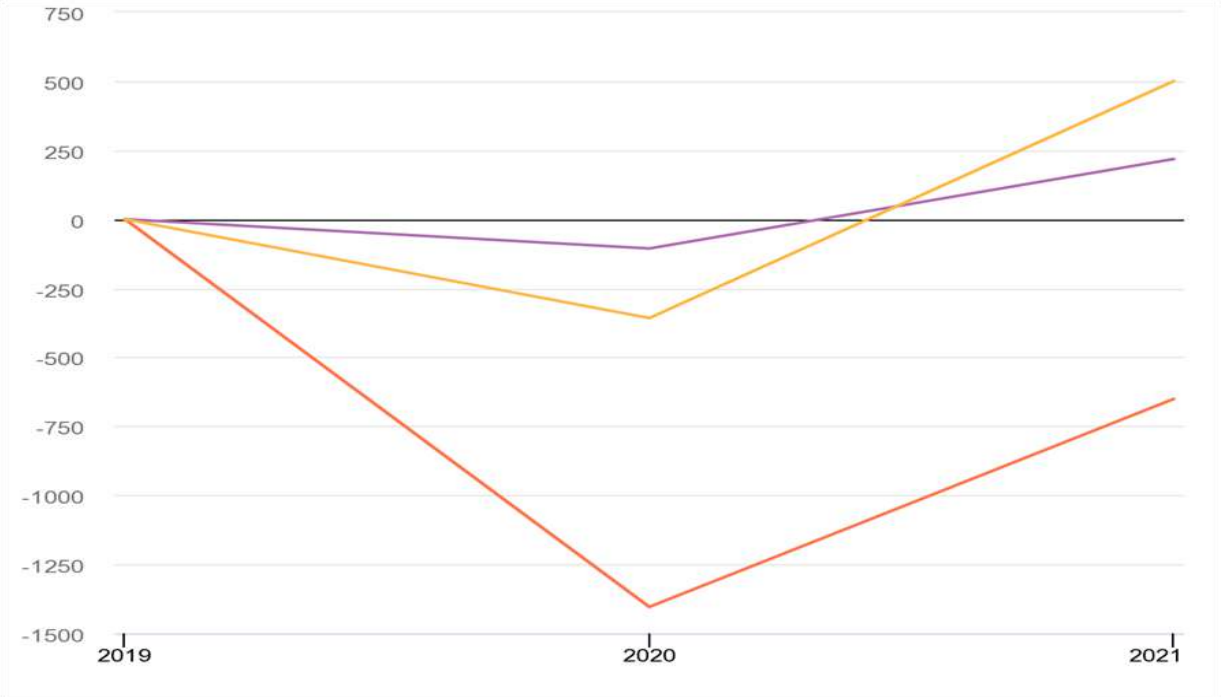
The Covid-19 pandemic had far-reaching impacts on energy demand in 2020, reducing global CO_2 emissions by 5.2%. However, the world has experienced an extremely rapid economic recovery since then, driven by unprecedented fiscal and monetary stimulus and a fast –

although uneven – roll-out of vaccines. The recovery of energy demand in 2021 was compounded by adverse weather and energy market conditions, which led to more coal being burnt despite renewable power generation registering its largest ever annual growth.
Emissions increased by almost 2.1 Gt from 2020 levels. This puts 2021 above 2010 as the largest ever year-on-year increase in energy-related CO_2 emissions in absolute terms. The rebound in 2021 more than reversed the pandemic-induced decline in emissions of 1.9 Gt experienced in 2020. CO_2 emissions in 2021 rose to around 180 megatonnes (Mt) above the pre-pandemic level of 2019.
The 6% increase in CO_2 emissions in 2021 was in line with the jump in global economic output of 5.9%. This marks the strongest coupling of CO_2 emissions with Gross domestic product (GDP) growth since 2010, when global emissions rebounded by 6.1% while economic output grew by 5.1% as the world emerged from the Global Financial Crisis.

CO2 emissions from energy combustion and industrial processes, 1900-2021:



Change in CO2 emissions by fossil fuel, relative to 2019 levels, 2019-2021:



- **CO2 Emissions in 2022 By IEA :**

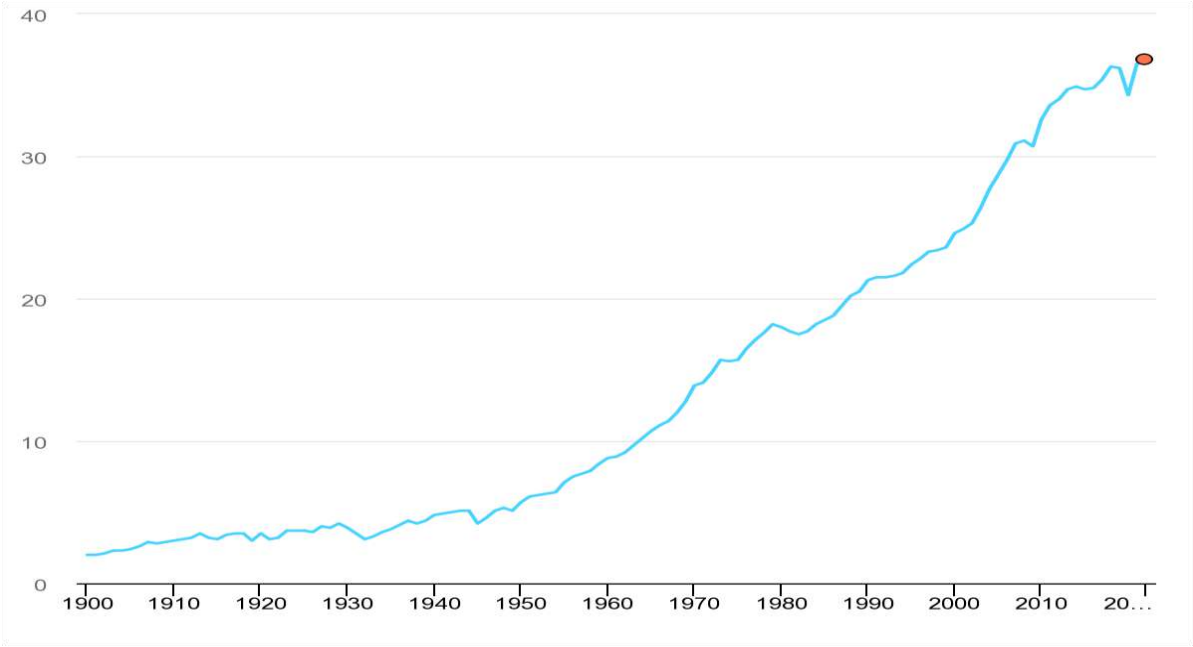
- **Global energy-related CO2 emissions grew by 0.9% or 321 Mt in 2022, reaching a new high of over 36.8 Gt.** Following two years of exceptional oscillations in energy use and emissions, caused in part by the Covid-19 pandemic, last year's growth was much slower than 2021's rebound of more than 6%. Emissions from energy combustion increased by 423 Mt, while emissions from industrial processes decreased by 102 Mt.
- In a year marked by energy price shocks, rising inflation, and disruptions to traditional fuel trade flows, **global growth in emissions was lower than feared**, despite gas-to-coal switching in many countries. Increased deployment of clean energy technologies such as renewables, electric vehicles, and heat pumps helped prevent an additional 550 Mt in CO_2 emissions.

Industrial production curtailment, particularly in China and Europe, also averted additional emissions.

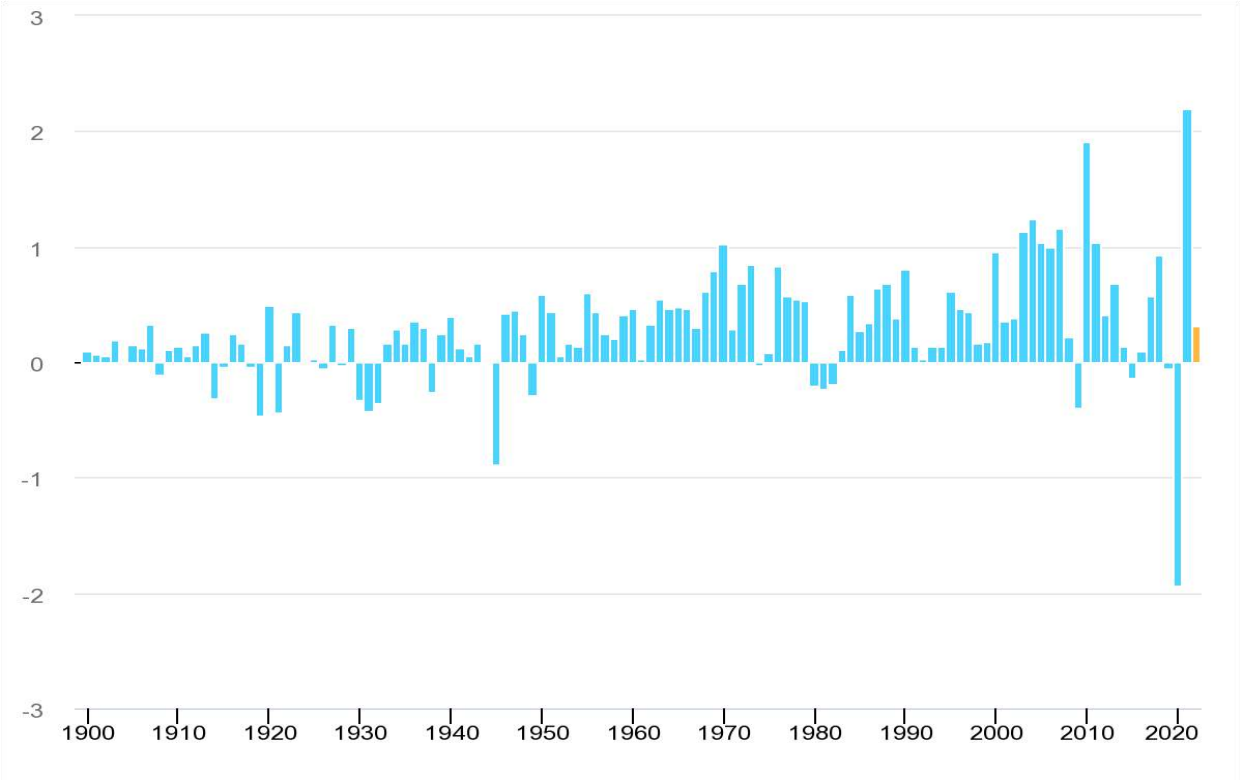
- **Specific challenges in 2022 contributed to the growth in emissions.** Of the 321 Mt CO_2 increase, 60 Mt CO_2 can be attributed to cooling and heating demand in extreme weather and another 55 Mt CO_2 to nuclear power plants being offline.
- **CO2 growth in 2022 was well below global GDP growth of 3.2%**, reverting to a decade-long trend of decoupling emissions and economic growth that was broken by 2021's sharp rebound in emissions. Improvements in the CO_2 intensity of energy use were slightly slower than the past decade's average.
- **Emissions from natural gas fell by 1.6% or 118 Mt**, following continued tightening of supply exacerbated by Russia's invasion of Ukraine. Reductions in emissions from gas were particularly pronounced in Europe (-13.5%). The Asia Pacific region also saw unprecedented reductions (-1.8%).
- **Increased emissions from coal more than offset reductions from natural gas**. Amid a wave of gas-to-coal switching during the global energy crisis, CO_2 emissions from coal grew by 1.6% or 243 Mt, far exceeding the last decade's average growth rate, and reaching a new all-time high of almost 15.5 Gt.
- **Emissions from oil grew even more than emissions from coal, rising by 2.5% or 268 Mt to 11.2 Gt.** Around half of the increase came from aviation, as air travel continued to rebound from pandemic lows, nearing 80% of 2019 levels. Tempering this increase, electric vehicles continued to gain momentum in 2022, with over 10 million cars sold, exceeding 14% of global car sales.
- **The biggest sectoral increase in emissions in 2022 came from electricity and heat generation,** whose emissions were up by 1.8% or 261 Mt. In particular, global emissions from coal-fired electricity and heat generation grew by 224 Mt or 2.1%, led by emerging economies in Asia.
- **A strong expansion of renewables limited the rebound in coal power emissions**. Renewables met 90% of last year's global growth in electricity generation. Solar PV and wind generation each increased by around 275 TWh, a new annual record.
- **Emissions from industry declined by 1.7% to 9.2 Gt last year**. While several regions saw manufacturing curtailments, the global decline was largely driven by a 161 Mt CO_2 decrease in China's industry emissions, reflecting a 10% decline in cement production and a 2% decline in steel making.

- **China's emissions were relatively flat in 2022, declining by 23 Mt or 0.2%.** Growing emissions from combustion were offset by declines from industrial processes. Weaker economic growth, declining construction activity, and strict Covid-19 measures led to reductions in industrial and transport emissions. Power sector emissions growth slowed compared with the average of the past decade but still reached 2.6%.
- **The European Union saw a 2.5% or 70 Mt reduction in CO2 emissions** despite oil and gas market disruptions, hydro shortfalls due to drought, and numerous nuclear plants going offline. Buildings sector emissions fell markedly, helped by a mild winter. Although power sector emissions increased by 3.4%, coal use was not as high as anticipated. For the first time, electricity generation from wind and solar PV combined exceeded that of gas or nuclear.
- **US emissions grew by 0.8% or 36 Mt. The buildings sector saw the highest emissions growth, driven by extreme temperatures.** The main emissions reductions came from electricity and heat generation, thanks to unprecedented increases in solar PV and wind, as well as coal-to-gas switching. While many other countries reduced their natural gas use, the United States saw an increase of 89 Mt in CO_2 emissions from gas, as it was called upon to meet peak electricity demand during summer heat waves.
- **Emissions from Asia's emerging market and developing economies, excluding China, grew more than those from any other region in 2022,** increasing by 4.2% or 206 Mt CO_2. Over half of the region's increase in emissions came from coal-fired power generation.

Global CO2 emissions from energy combustion andindustrial processes, 1900-2022 :



Annual change in global CO2 emissions from energy combustion and industrial processes, 1900-2022 :



Activity 4: Social or Business Impact.

Social impact :

Carbon dioxide emissions are the primary driver of global climate change. It's widely recognised that to avoid the worst impacts of climate change, the world needs to urgently reduce emissions. As the impacts of climate change mount, millions of vulnerable people face disproportionate challenges in terms of extreme events, health effects, food, water, and livelihood security, migration and forced displacement, loss of cultural identity, and other related risks.

Business Model/Impact :

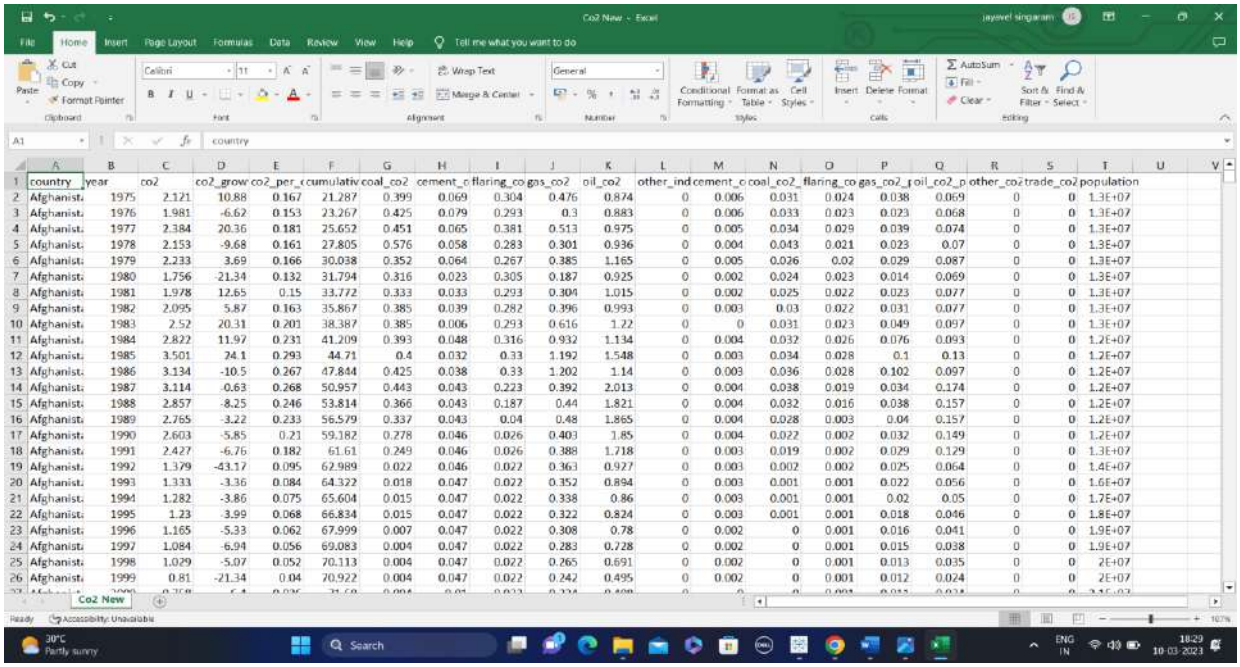
By conducting an analysis the countries can identify areas for improvement and take steps to reduce factors that are responsible for Co2 Emission for environmental sustainability by improving the efficiency and transitioning to low carbon alternatives.**Higher carbon footprint is indicative of greater energy costs**. Expenditure on energy bills could be channeled to other areas of the business that require more attention.

Milestone 2: 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: Collect the dataset:

The data is collected from the given datasheet in the project manual.



country	year	co2	co2_grow	co2_per_c	cumulativ	coal_co2	cement_c	flaring_co	gas_co2	oil_co2	other_ind	cement_c	coal_co2_	flaring_co	gas_co2_p	oil_co2_p	other_co2	trade_co2	population
Afghanist	1975	2.121	10.88	0.167	21.287	0.399	0.069	0.304	0.476	0.874	0	0.006	0.031	0.024	0.038	0.069	0	0	1.3E+07
Afghanist	1976	1.981	-6.62	0.153	23.267	0.425	0.079	0.293	0.3	0.883	0	0.006	0.033	0.023	0.023	0.068	0	0	1.3E+07
Afghanist	1977	2.384	20.36	0.181	25.652	0.451	0.065	0.381	0.513	0.975	0	0.005	0.034	0.029	0.039	0.074	0	0	1.3E+07
Afghanist	1978	2.153	-9.68	0.161	27.805	0.576	0.058	0.283	0.301	0.936	0	0.004	0.043	0.021	0.023	0.07	0	0	1.3E+07
Afghanist	1979	2.233	3.69	0.166	30.038	0.352	0.064	0.267	0.385	1.165	0	0.005	0.026	0.02	0.029	0.087	0	0	1.3E+07
Afghanist	1980	1.756	-21.34	0.132	31.794	0.316	0.023	0.305	0.187	0.925	0	0.002	0.024	0.023	0.014	0.069	0	0	1.3E+07
Afghanist	1981	1.978	12.65	0.15	33.772	0.333	0.033	0.293	0.304	1.015	0	0.002	0.025	0.022	0.023	0.077	0	0	1.3E+07
Afghanist	1982	2.095	5.87	0.163	35.867	0.385	0.039	0.282	0.396	0.993	0	0.003	0.03	0.022	0.031	0.077	0	0	1.3E+07
Afghanist	1983	2.52	20.31	0.201	38.387	0.385	0.006	0.293	0.616	1.22	0	0	0.031	0.023	0.049	0.097	0	0	1.3E+07
Afghanist	1984	2.822	11.97	0.231	41.209	0.393	0.048	0.316	0.932	1.134	0	0.004	0.032	0.026	0.076	0.093	0	0	1.2E+07
Afghanist	1985	3.501	24.1	0.293	44.71	0.4	0.032	0.33	1.192	1.548	0	0.003	0.034	0.028	0.1	0.13	0	0	1.2E+07
Afghanist	1986	3.134	-10.5	0.267	47.844	0.425	0.038	0.33	1.202	1.14	0	0.003	0.036	0.028	0.102	0.097	0	0	1.2E+07
Afghanist	1987	3.114	-0.63	0.268	50.957	0.443	0.043	0.223	0.392	2.013	0	0.004	0.038	0.019	0.034	0.174	0	0	1.2E+07
Afghanist	1988	2.857	-8.25	0.246	53.814	0.366	0.043	0.187	0.44	1.821	0	0.004	0.032	0.016	0.038	0.157	0	0	1.2E+07
Afghanist	1989	2.765	-3.22	0.233	56.579	0.337	0.043	0.04	0.48	1.865	0	0.004	0.028	0.003	0.04	0.157	0	0	1.2E+07
Afghanist	1990	2.603	-5.85	0.21	59.182	0.278	0.046	0.026	0.403	1.85	0	0.004	0.022	0.002	0.032	0.149	0	0	1.2E+07
Afghanist	1991	2.427	-6.76	0.182	61.61	0.249	0.046	0.026	0.388	1.718	0	0.003	0.019	0.002	0.029	0.129	0	0	1.3E+07
Afghanist	1992	1.379	-43.17	0.095	62.989	0.022	0.046	0.027	0.363	0.927	0	0.003	0.002	0.002	0.025	0.064	0	0	1.4E+07
Afghanist	1993	1.333	-3.36	0.084	64.322	0.018	0.047	0.022	0.352	0.894	0	0.003	0.001	0.001	0.022	0.056	0	0	1.6E+07
Afghanist	1994	1.282	-3.86	0.075	65.604	0.015	0.047	0.022	0.338	0.86	0	0.003	0.001	0.001	0.02	0.05	0	0	1.7E+07
Afghanist	1995	1.23	-3.99	0.068	66.834	0.015	0.047	0.022	0.322	0.824	0	0.003	0.001	0.001	0.018	0.046	0	0	1.8E+07
Afghanist	1996	1.165	-5.33	0.062	67.999	0.007	0.047	0.022	0.308	0.78	0	0.002	0	0.001	0.016	0.041	0	0	1.9E+07
Afghanist	1997	1.084	-6.94	0.056	69.083	0.004	0.047	0.022	0.283	0.728	0	0.002	0	0.001	0.015	0.038	0	0	1.9E+07
Afghanist	1998	1.029	-5.07	0.052	70.113	0.004	0.047	0.022	0.265	0.691	0	0.002	0	0.001	0.013	0.035	0	0	2E+07
Afghanist	1999	0.81	-21.34	0.04	70.922	0.004	0.047	0.022	0.242	0.495	0	0.002	0	0.001	0.012	0.024	0	0	2E+07

Activity 1.1: Understand the data:

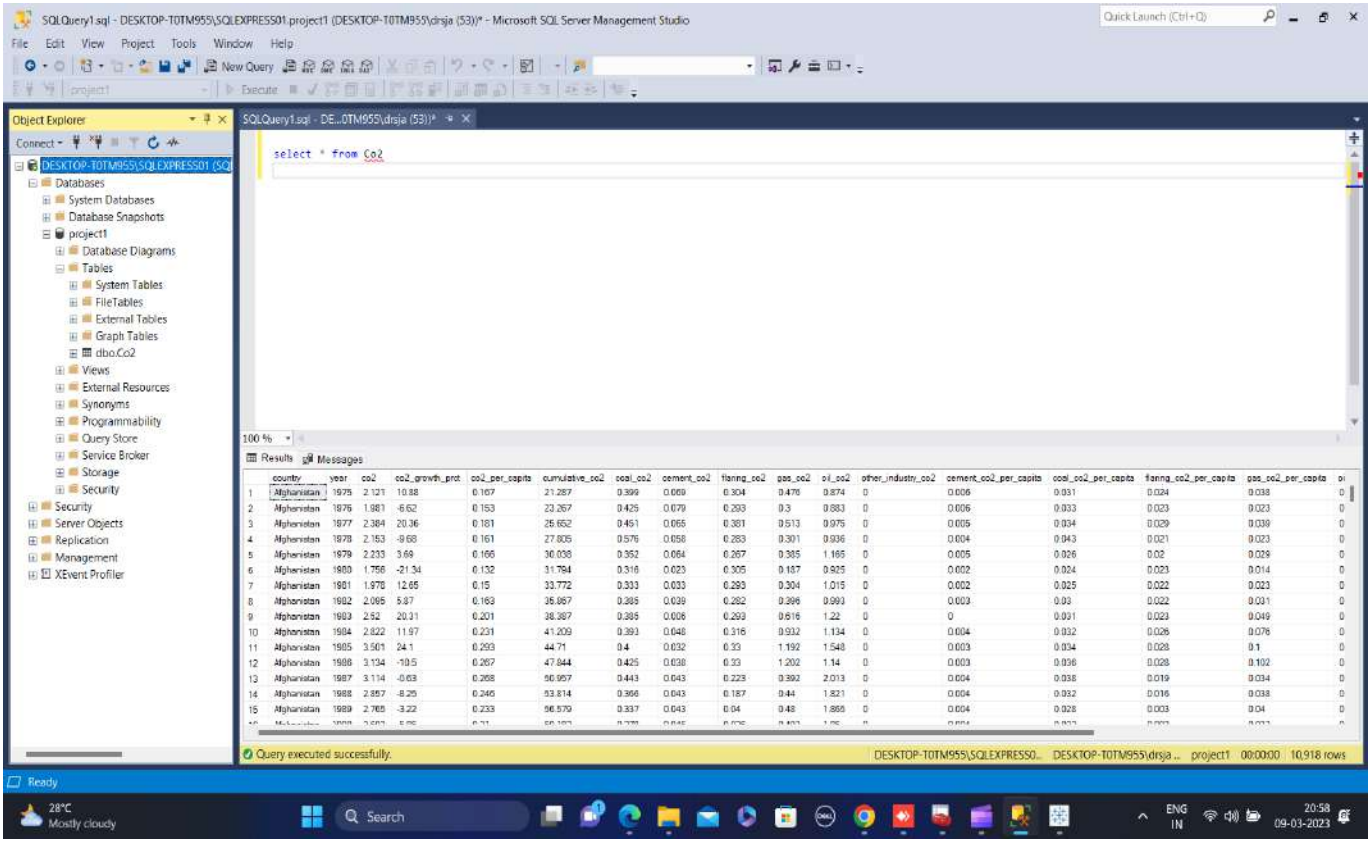
Dataset consists CO2 emissions in metric ton per capita of every country around the world. The data is collected from 1975 to 2020. In this dataset Countries and regions are included. Data is initially pre-processed using excel.

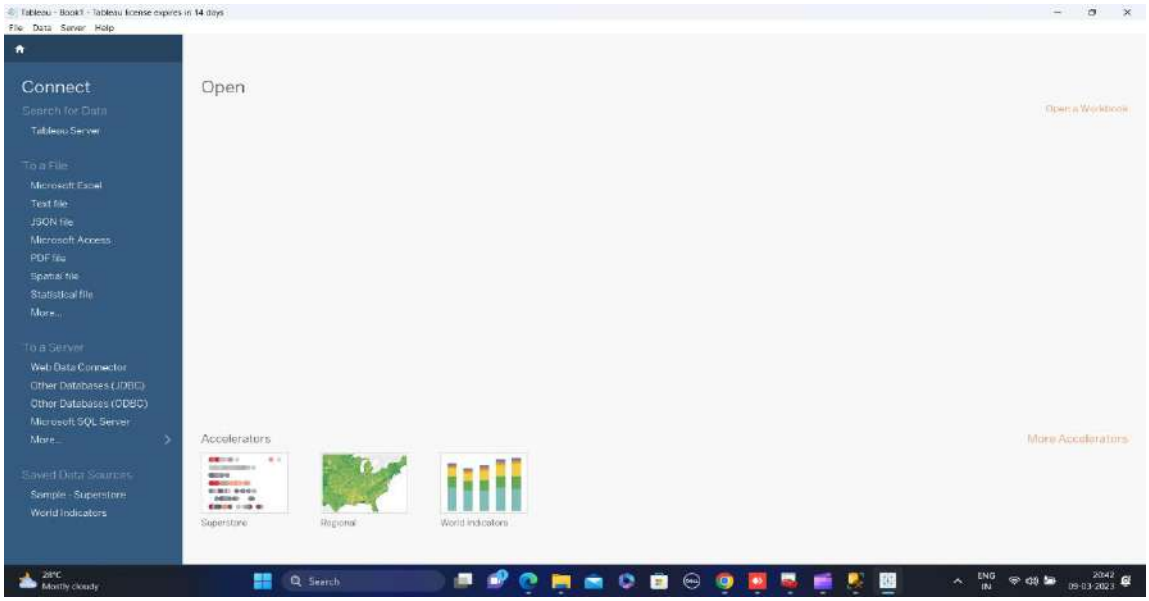
The dataset contains ,

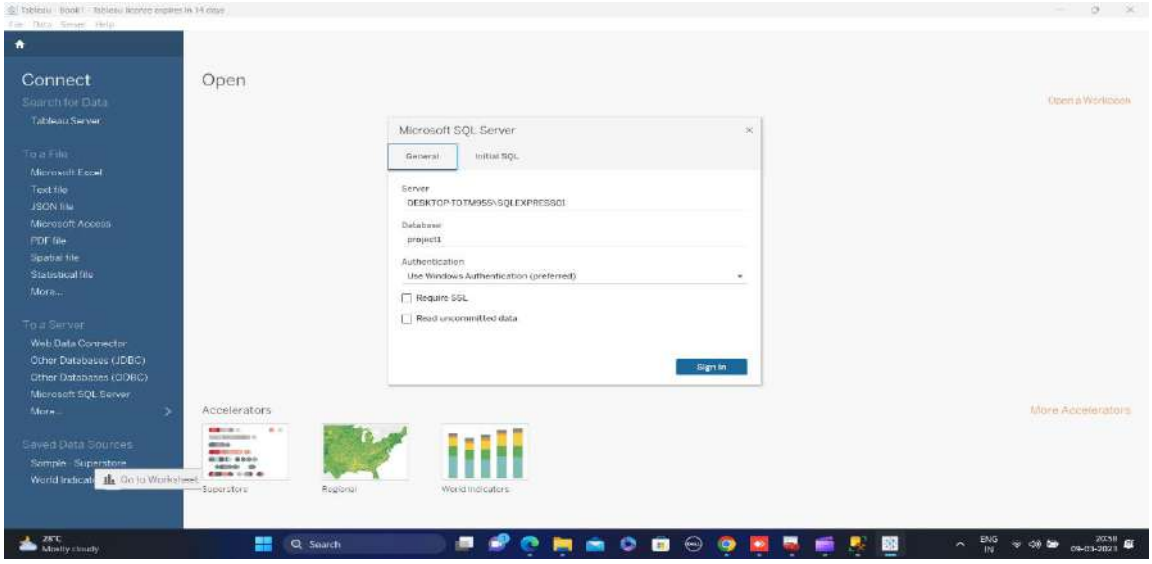
- Country- Country for which Co2 is Recorded
- Year- Year the data was recorded
- Co2 Emission (In Million Metric Tons)
- Co2 Growth per Capita
- Co2 Per Capita
- Cumulative Co2
- Several Fossil Fuels rate of Emission

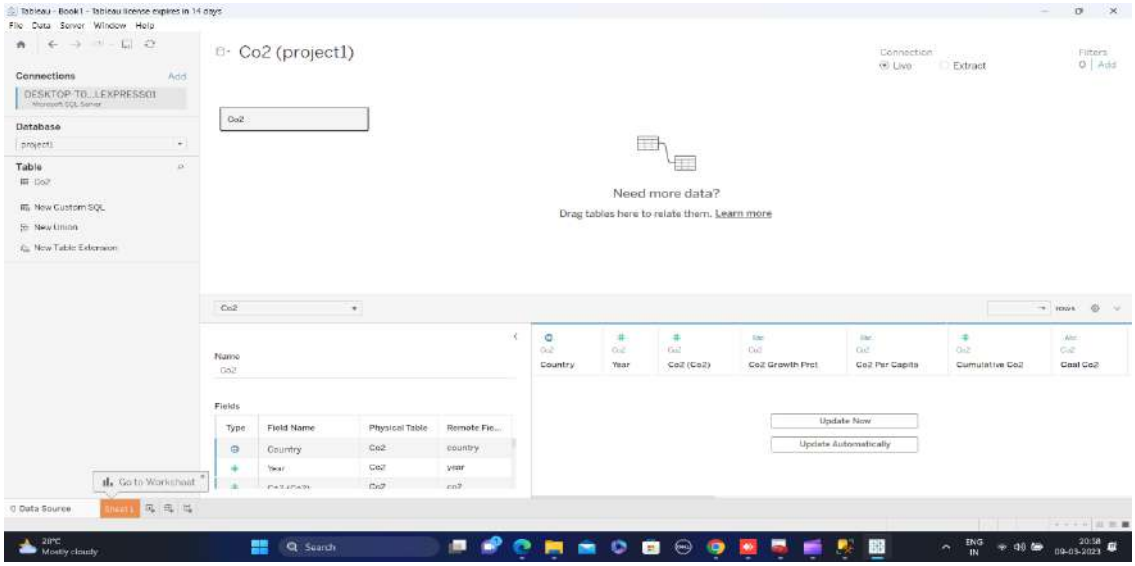
Activity 2: Storing Data in DB & Connect DB with Tableau :

The database is stored and connected in Tableau.




Connect
Search for Data
Tableau Server
To a File
Microsoft Excel
Text file
JSON file
Microsoft Access
PDF file
Spatial file
Statistical file
More...
To a Server
Web Data Connector
Other Databases (JDBC)
Other Databases (ODBC)
Microsoft SQL Server
More...
Saved Data Sources
Sample - Superstore
World Indicators
Open
Open a Workbook
Accelerators
More Accelerators
Superstore
Regional
World Indicators


Connect
Search for Data
Tableau Server
To a File
Microsoft Excel
Text file
JSON file
Microsoft Access
PDF file
Spatial file
Statistical file
More...
To a Server
Web Data Connector
Other Databases (JDBC)
Other Databases (ODBC)
Microsoft SQL Server
More...
Saved Data Sources
Sample - Superstore
Open
Open a Workbook
Microsoft SQL Server
General
Initial SQL
Server
DESKTOP-TOTM955\SQLEXPRESS01
Database
project1
Authentication
Use Windows Authentication (preferred)
Require SSL
Read uncommitted data
Sign In
Accelerators
More Accelerators
Superstore
Regional
World Indicators


File Data Server Window Help
Connections
Add
Database
Table
New Custom SQL
New Union
New Table Extension
Co2 (project1)
Connection
Live
Extract
Filters
Add
Need more data?
Drag tables here to relate them. Learn more
Name
Fields
Type
Field Name
Physical Table
Remote Fie...
Country
Year
Co2 (Co2)
Co2 Growth Prct
Co2 Per Capita
Cumulative Co2
Coal Co2
Update Now
Update Automatically
Go to Worksheet
Data Source

Milestone 3: Data Preparation :

Activity: 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. Since the Data is initially pre-processed we can skip this step. Basically this process helps to make the data easily understandable and ready for creating visualizations to gain insights into the performance and efficiency.

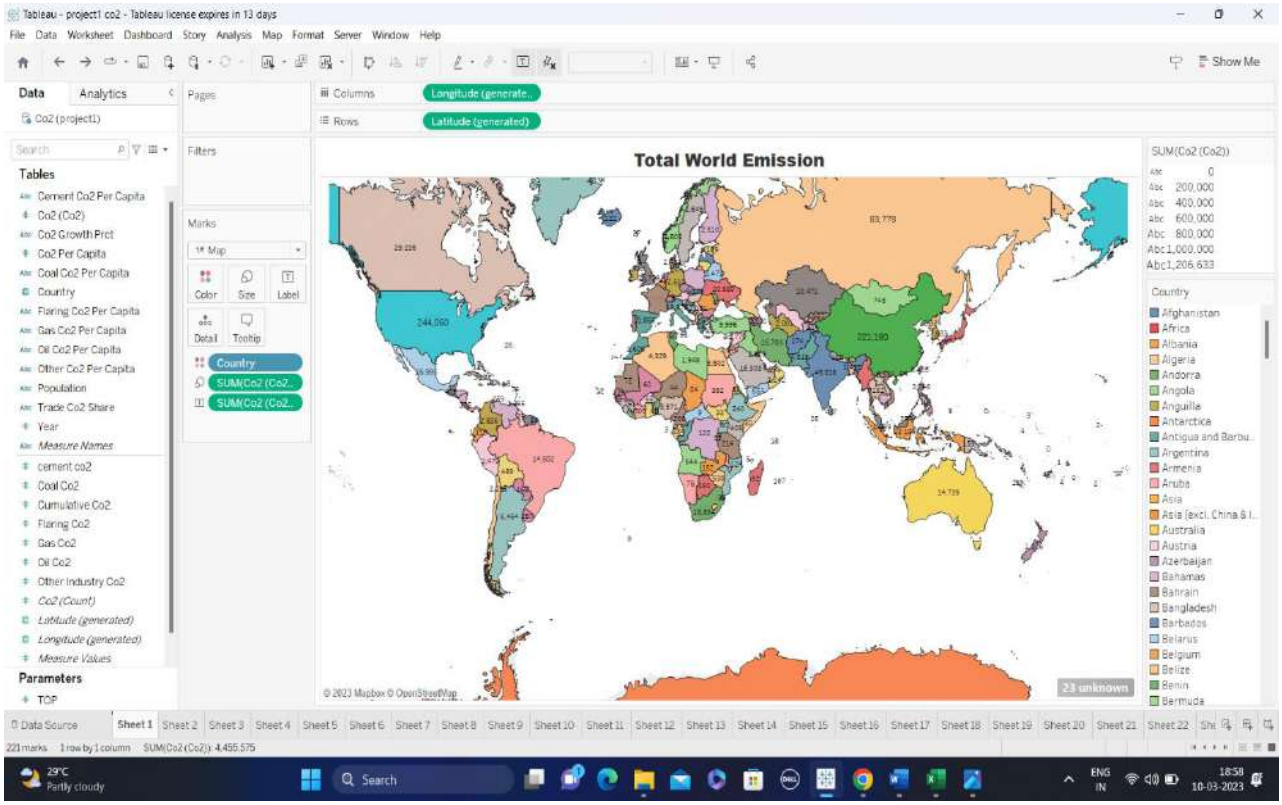
Milestone 4: Data Visualization :

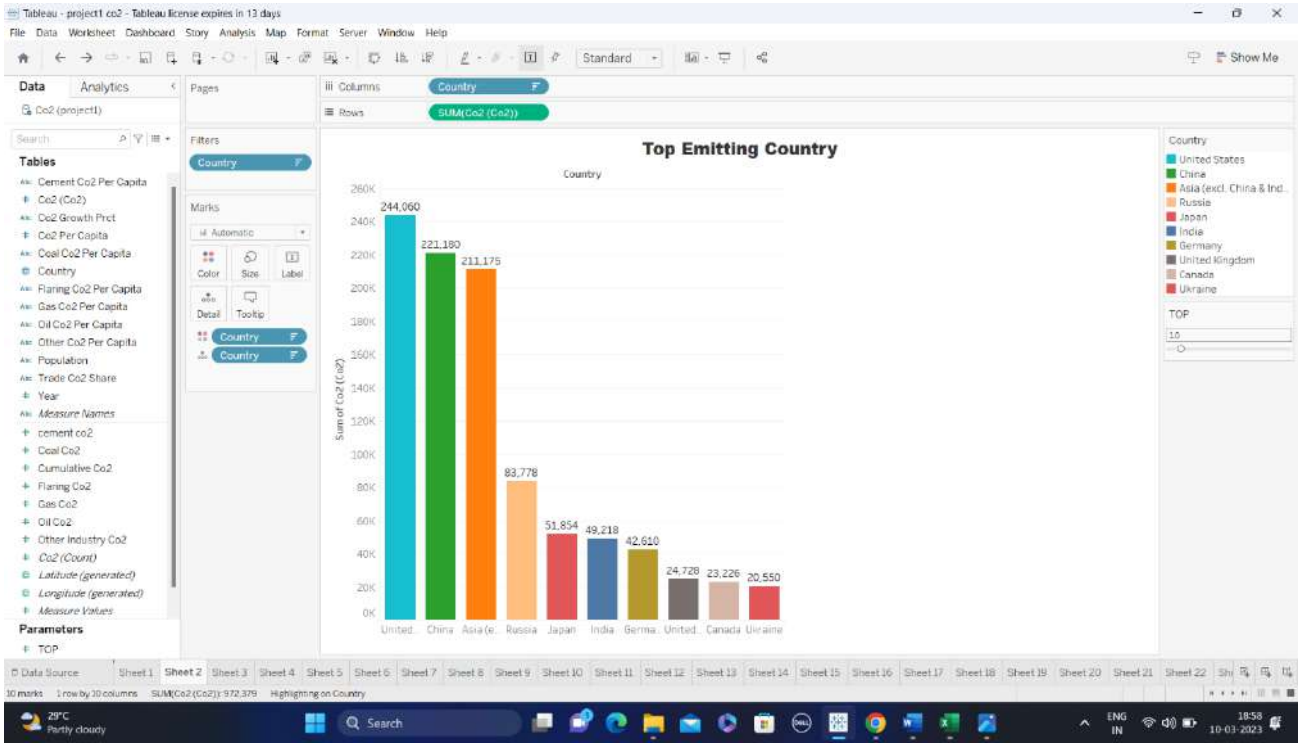
Data visualization is the process of creating graphical representations of data in order to help people understand and explore the information. The goal of data visualization is to make complex data sets more accessible, intuitive, and easier to interpret. By using visual elements such as charts, graphs, and maps, data visualizations can help people quickly identify patterns, trends, and outliers in the data. Activity 1: No of Unique Visualizations

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 analyze the Co2 Emission include bar charts, line charts, Tree Map, scatter plots, pie charts, Maps etc. These visualizations can be used to compare performance, track changes over time, show Emission, and relationships between variables, breakdown of factors and emission by countries and continenrts.

Activity 1.1 :To Understand- Total World Emission, Co2 Emission over Time, Total Emission by Continents :





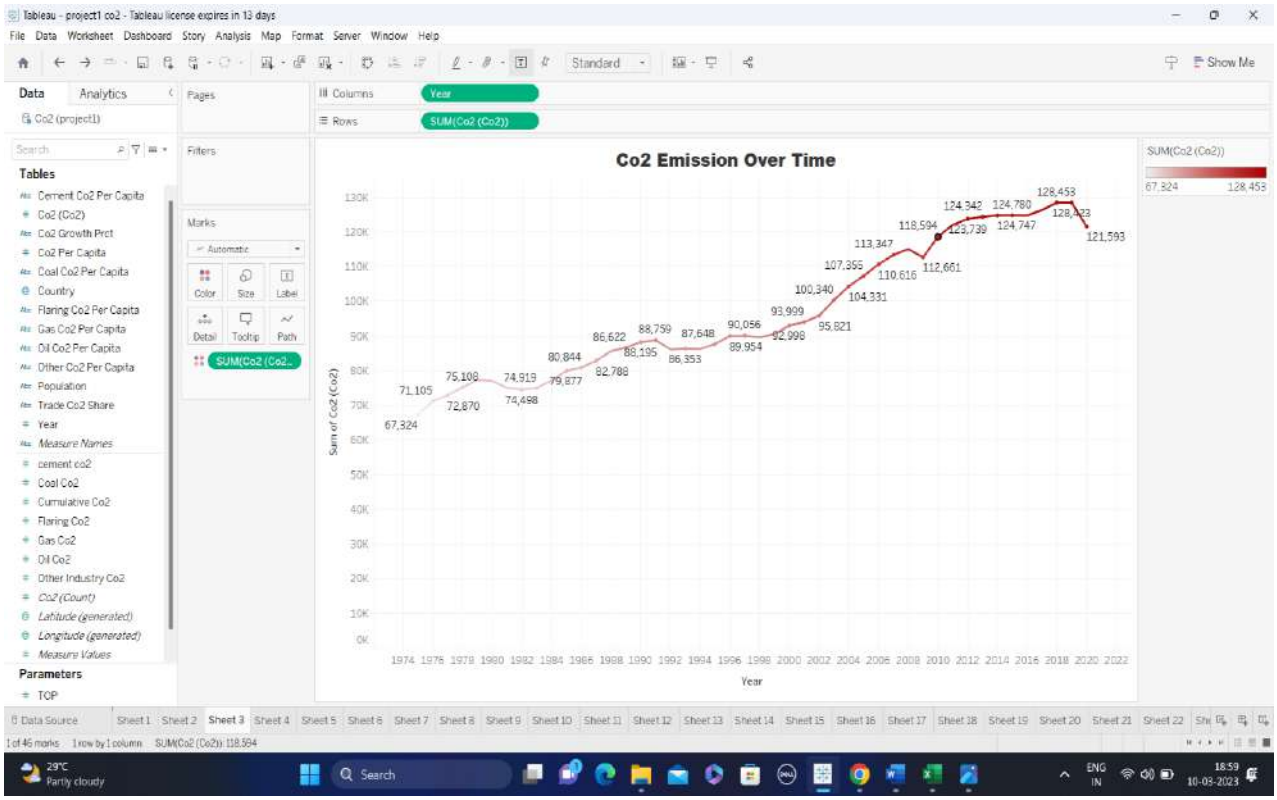


Tableau - project1 co2 - Tableau license expires in 13 days
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Data Analytics
Co2 (project1)
Tables
Cement Co2 Per Capita
Co2 (Co2)
Co2 Growth Prct
Co2 Per Capita
Coal Co2 Per Capita
Country
Flaring Co2 Per Capita
Gas Co2 Per Capita
Oil Co2 Per Capita
Other Co2 Per Capita
Population
Trade Co2 Share
Year
Measure Names
cement co2
Coal Co2
Cumulative Co2
Flaring Co2
Gas Co2
Oil Co2
Other Industry Co2
Co2 (Count)
Latitude (generated)
Longitude (generated)
Measure Values
Parameters
TOP
Pages
Filters
Marks
Automatic
Color
Size
Label
Detail
Tooltip
Path
SUM(Co2 (Co2..
Columns
Year
Rows
SUM(Co2 (Co2))
Co2 Emission Over Time
Sum of Co2 (Co2)
Year
SUM(Co2 (Co2))
67,324
128,453
Data Source
Sheet 1
Sheet 2
Sheet 3
Sheet 4
Sheet 5
Sheet 6
Sheet 7
Sheet 8
Sheet 9
Sheet 10
Sheet 11
Sheet 12
Sheet 13
Sheet 14
Sheet 15
Sheet 16
Sheet 17
Sheet 18
Sheet 19
Sheet 20
Sheet 21
Sheet 22
1 of 46 marks
1 row by 1 column
SUM(Co2 (Co2)): 118,594
29°C
Partly cloudy
Search
ENG
IN
18:59
10-03-2023

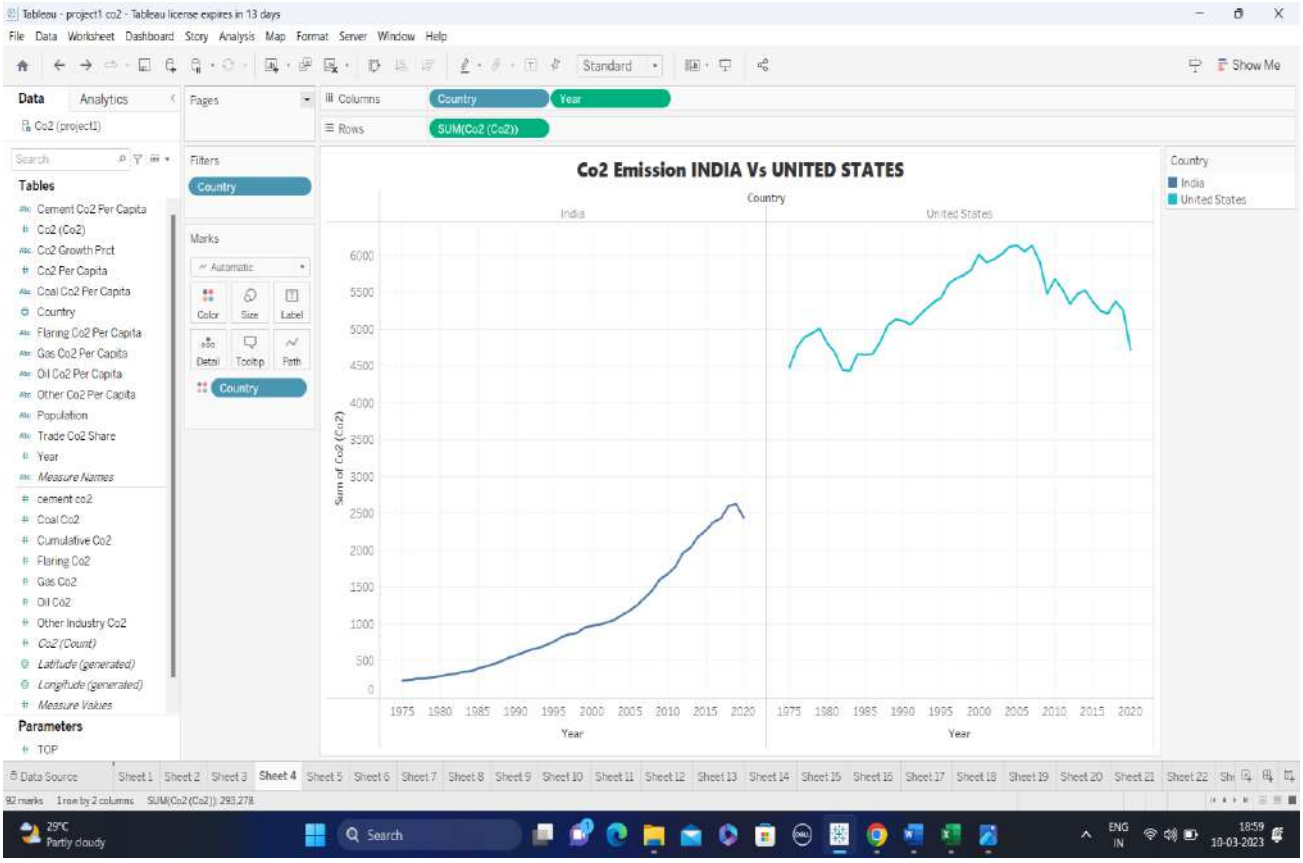
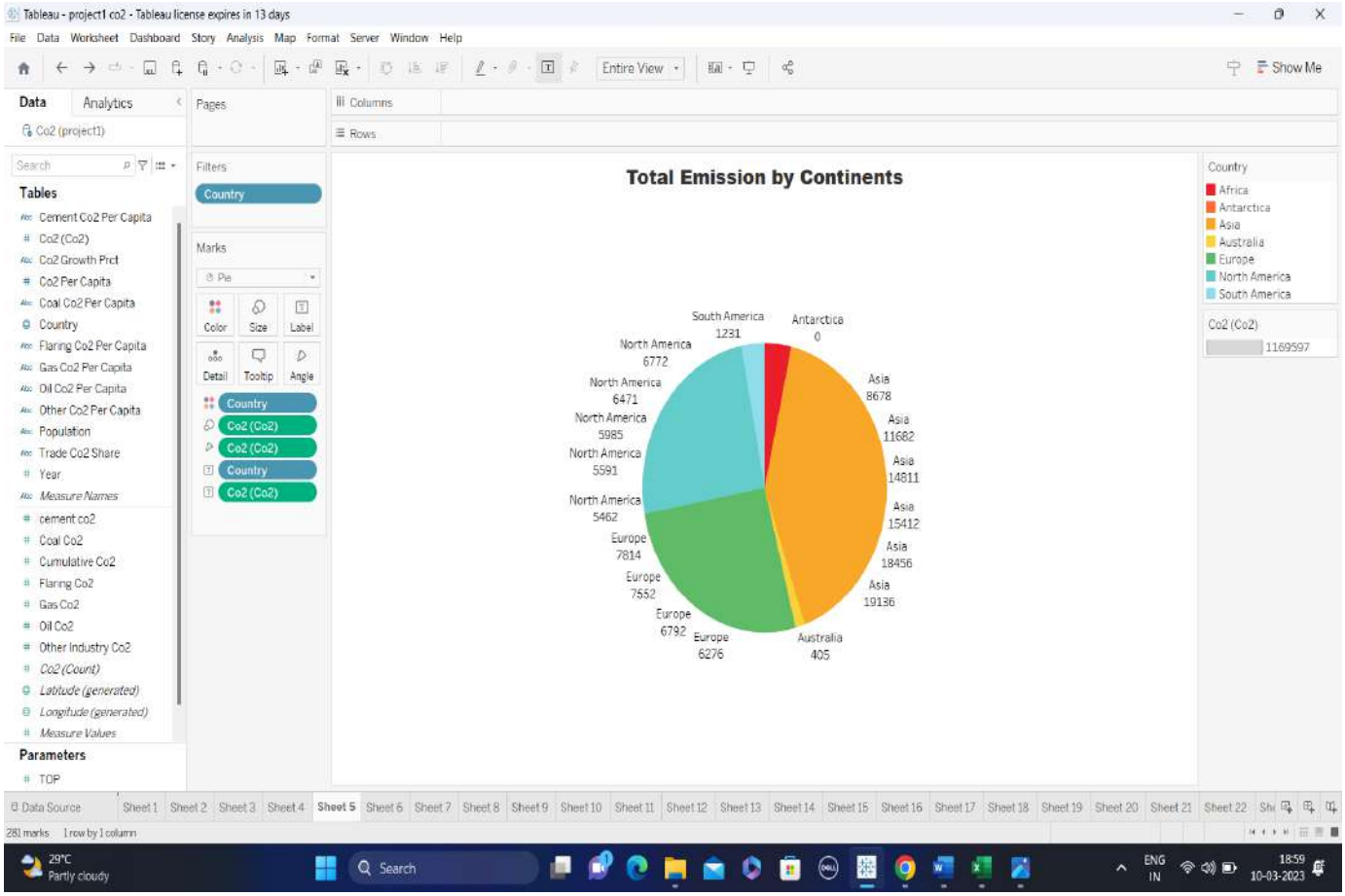


Tableau - project1 co2 - Tableau license expires in 13 days
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Data Analytics
Co2 (project1)
Tables
Cement Co2 Per Capita
Co2 (Co2)
Co2 Growth Prct
Co2 Per Capita
Coal Co2 Per Capita
Country
Flaring Co2 Per Capita
Gas Co2 Per Capita
Oil Co2 Per Capita
Other Co2 Per Capita
Population
Trade Co2 Share
Year
Measure Names
cement co2
Coal Co2
Cumulative Co2
Flaring Co2
Gas Co2
Oil Co2
Other Industry Co2
Co2 (Count)
Latitude (generated)
Longitude (generated)
Measure Values
Parameters
TOP
Pages
Filters
Country
Marks
Automatic
Color
Size
Label
Detail
Tooltip
Path
Country
Columns
Country
Year
Rows
SUM(Co2 (Co2))
Co2 Emission INDIA Vs UNITED STATES
Country
India
United States
Sum of Co2 (Co2)
Year
Country
India
United States
Data Source
Sheet 1
Sheet 2
Sheet 3
Sheet 4
Sheet 5
Sheet 6
Sheet 7
Sheet 8
Sheet 9
Sheet 10
Sheet 11
Sheet 12
Sheet 13
Sheet 14
Sheet 15
Sheet 16
Sheet 17
Sheet 18
Sheet 19
Sheet 20
Sheet 21
Sheet 22
92 marks
1 row by 2 columns
SUM(Co2 (Co2)): 293,278
29°C
Partly cloudy
Search
ENG
IN
18:59
10-03-2023



Activity 1.2 : To Understand- Co2 Emission per Capita, Co2 Emission by International Factors, Emission Rate Over Years :

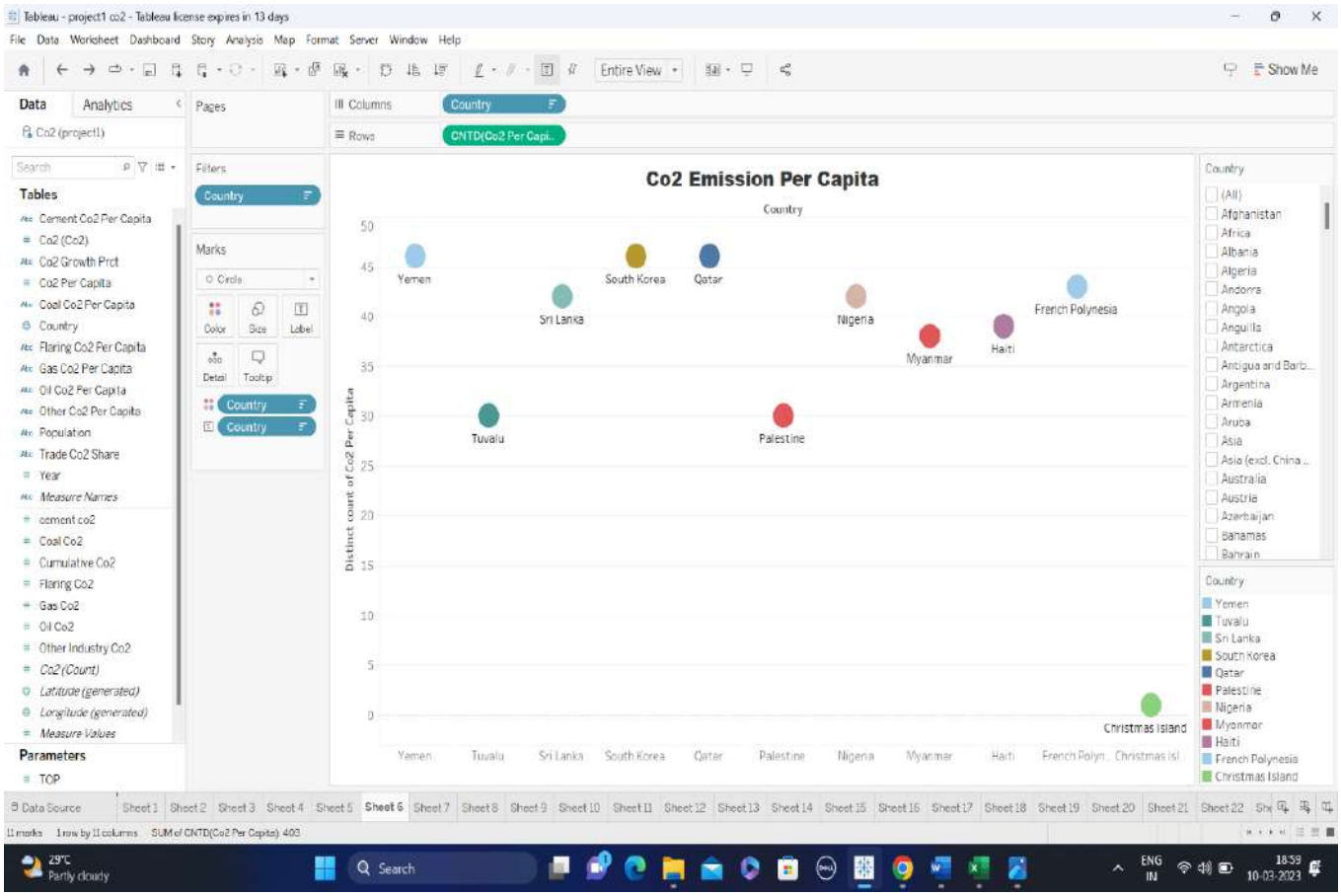


Tableau - project1 co2 - Tableau license expires in 13 days
Co2 Emission Per Capita
Country
Distinct count of Co2 Per Capita
Yemen
Tuvalu
Sri Lanka
South Korea
Qatar
Palestine
Nigeria
Myanmar
Haiti
French Polynesia
Christmas Island

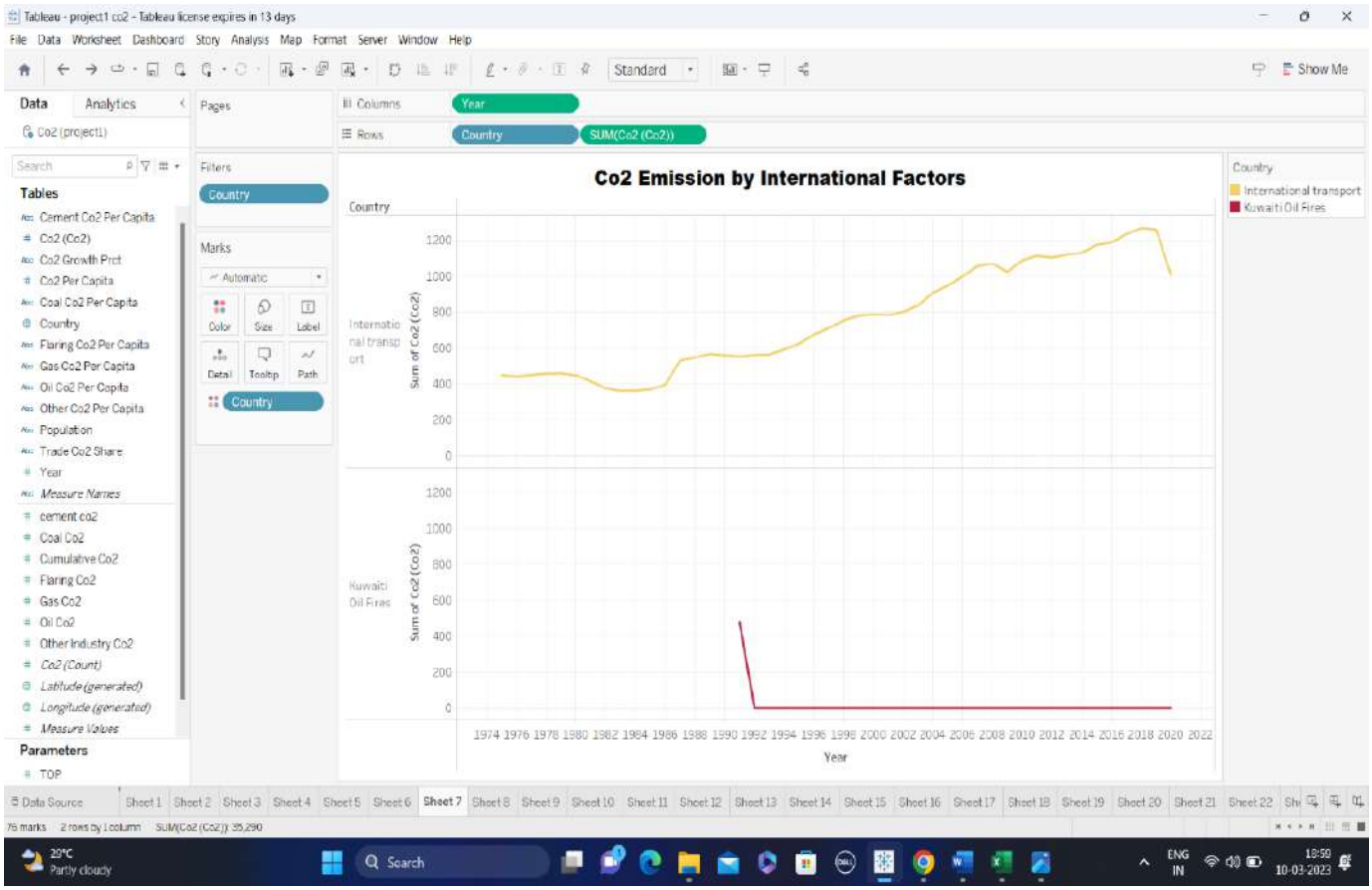
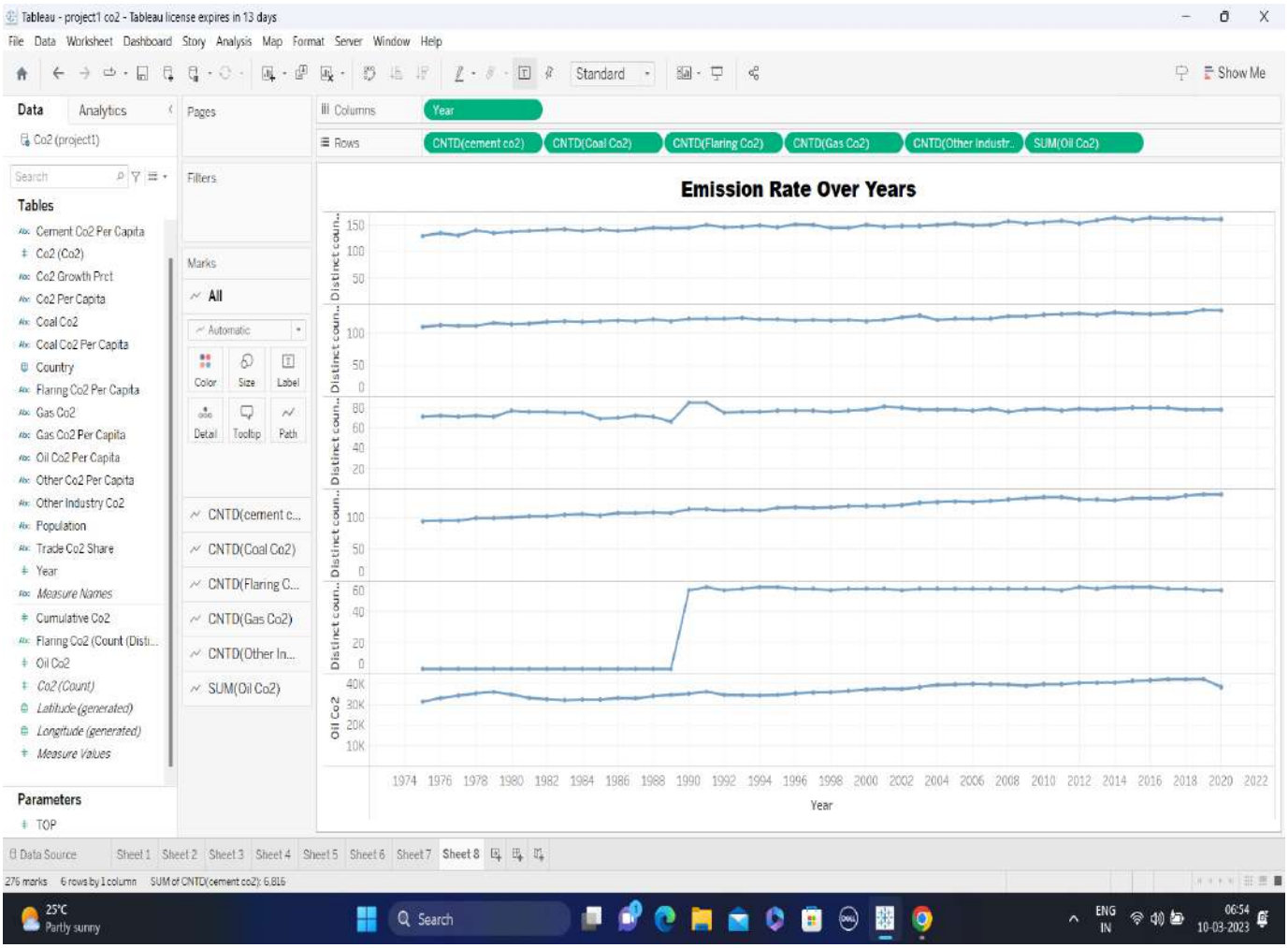


Tableau - project1 co2 - Tableau license expires in 13 days
Co2 Emission by International Factors
Country
International transport
Kuwaiti Oil Fires
Sum of Co2 (Co2)
Year



Activity 1.3 : To Understand- Co2 contribution by different fossil fuels, Co2 Emission over past 10 Years, Change in Co2 Emission and Co2 Emission in 2020 :

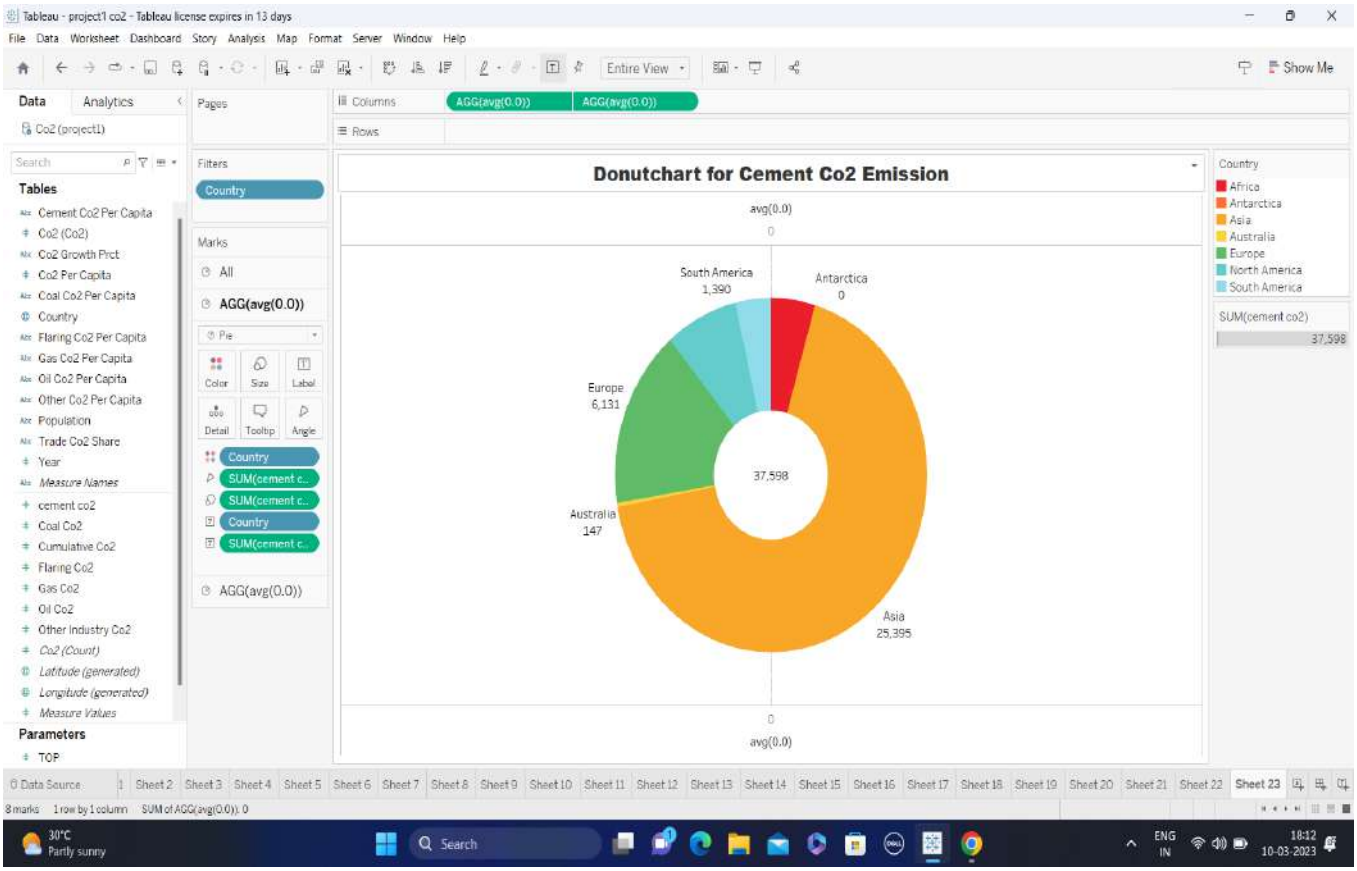


Tableau - project1 co2 - Tableau license expires in 13 days
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Donutchart for Cement Co2 Emission
avg(0.0)
South America
1,390
Antarctica
0
Europe
6,131
Australia
147
Asia
25,395
37,598
Country
Africa
Antarctica
Asia
Australia
Europe
North America
South America
SUM(cement co2)
37,598
Tables
Cement Co2 Per Capita
Co2 (Co2)
Co2 Growth Prct
Co2 Per Capita
Coal Co2 Per Capita
Country
Flaring Co2 Per Capita
Gas Co2 Per Capita
Oil Co2 Per Capita
Other Co2 Per Capita
Population
Trade Co2 Share
Year
Measure Names
cement co2
Coal Co2
Cumulative Co2
Flaring Co2
Gas Co2
Oil Co2
Other Industry Co2
Co2 (Count)
Latitude (generated)
Longitude (generated)
Measure Values
Parameters
TOP

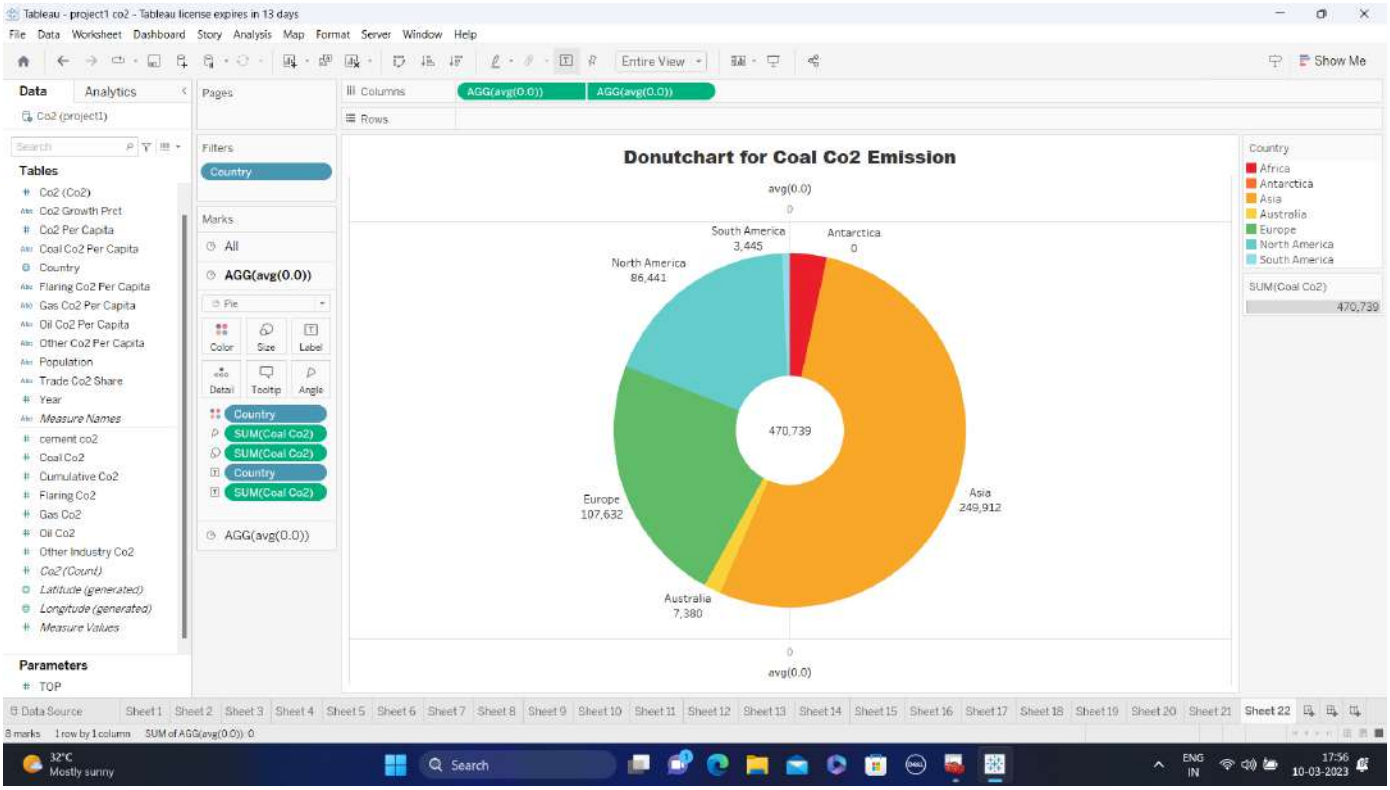


Tableau - project1 co2 - Tableau license expires in 13 days
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Donutchart for Coal Co2 Emission
avg(0.0)
South America
3,445
Antarctica
0
North America
86,441
Europe
107,632
Australia
7,380
Asia
249,912
470,739
Country
Africa
Antarctica
Asia
Australia
Europe
North America
South America
SUM(Coal Co2)
470,739
Tables
Co2 (Co2)
Co2 Growth Prct
Co2 Per Capita
Coal Co2 Per Capita
Country
Flaring Co2 Per Capita
Gas Co2 Per Capita
Oil Co2 Per Capita
Other Co2 Per Capita
Population
Trade Co2 Share
Year
Measure Names
cement co2
Coal Co2
Cumulative Co2
Flaring Co2
Gas Co2
Oil Co2
Other Industry Co2
Co2 (Count)
Latitude (generated)
Longitude (generated)
Measure Values
Parameters
TOP

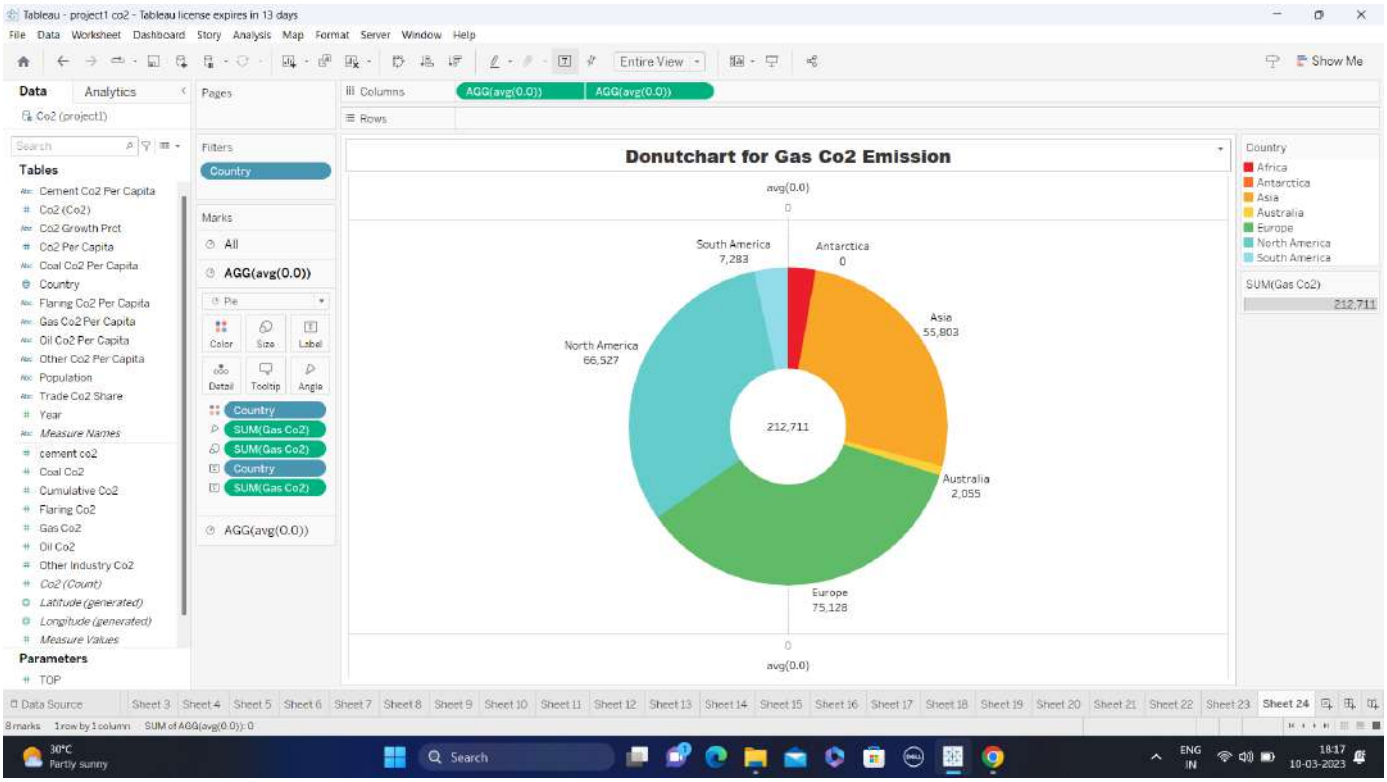


Tableau - project1 co2 - Tableau license expires in 13 days
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Entire View
Show Me
Data
Analytics
Co2 (project1)
Tables
Cement Co2 Per Capita
Co2 (Co2)
Co2 Growth Prct
Co2 Per Capita
Coal Co2 Per Capita
Country
Flaring Co2 Per Capita
Gas Co2 Per Capita
Oil Co2 Per Capita
Other Co2 Per Capita
Population
Trade Co2 Share
Year
Measure Names
cement co2
Coal Co2
Cumulative Co2
Flaring Co2
Gas Co2
Oil Co2
Other Industry Co2
Co2 (Count)
Latitude (generated)
Longitude (generated)
Measure Values
Parameters
TOP
Pages
Filters
Country
Marks
All
AGG(avg(0.0))
Pie
Color
Size
Label
Detail
Tooltip
Angle
Country
SUM(Gas Co2)
SUM(Gas Co2)
Country
SUM(Gas Co2)
AGG(avg(0.0))
Columns
AGG(avg(0.0))
AGG(avg(0.0))
Rows
Donutchart for Gas Co2 Emission
avg(0.0)
0
South America
7,283
Antarctica
0
Asia
55,803
North America
66,527
212,711
Australia
2,055
Europe
75,128
0
avg(0.0)
Country
Africa
Antarctica
Asia
Australia
Europe
North America
South America
SUM(Gas Co2)
212,711
Data Source
Sheet 3
Sheet 4
Sheet 5
Sheet 6
Sheet 7
Sheet 8
Sheet 9
Sheet 10
Sheet 11
Sheet 12
Sheet 13
Sheet 14
Sheet 15
Sheet 16
Sheet 17
Sheet 18
Sheet 19
Sheet 20
Sheet 21
Sheet 22
Sheet 23
Sheet 24
8 marks
1 row by 1 column
SUM of AGG(avg(0.0)): 0
30°C
Partly sunny
Search
ENG
IN
18:17
10-03-2023

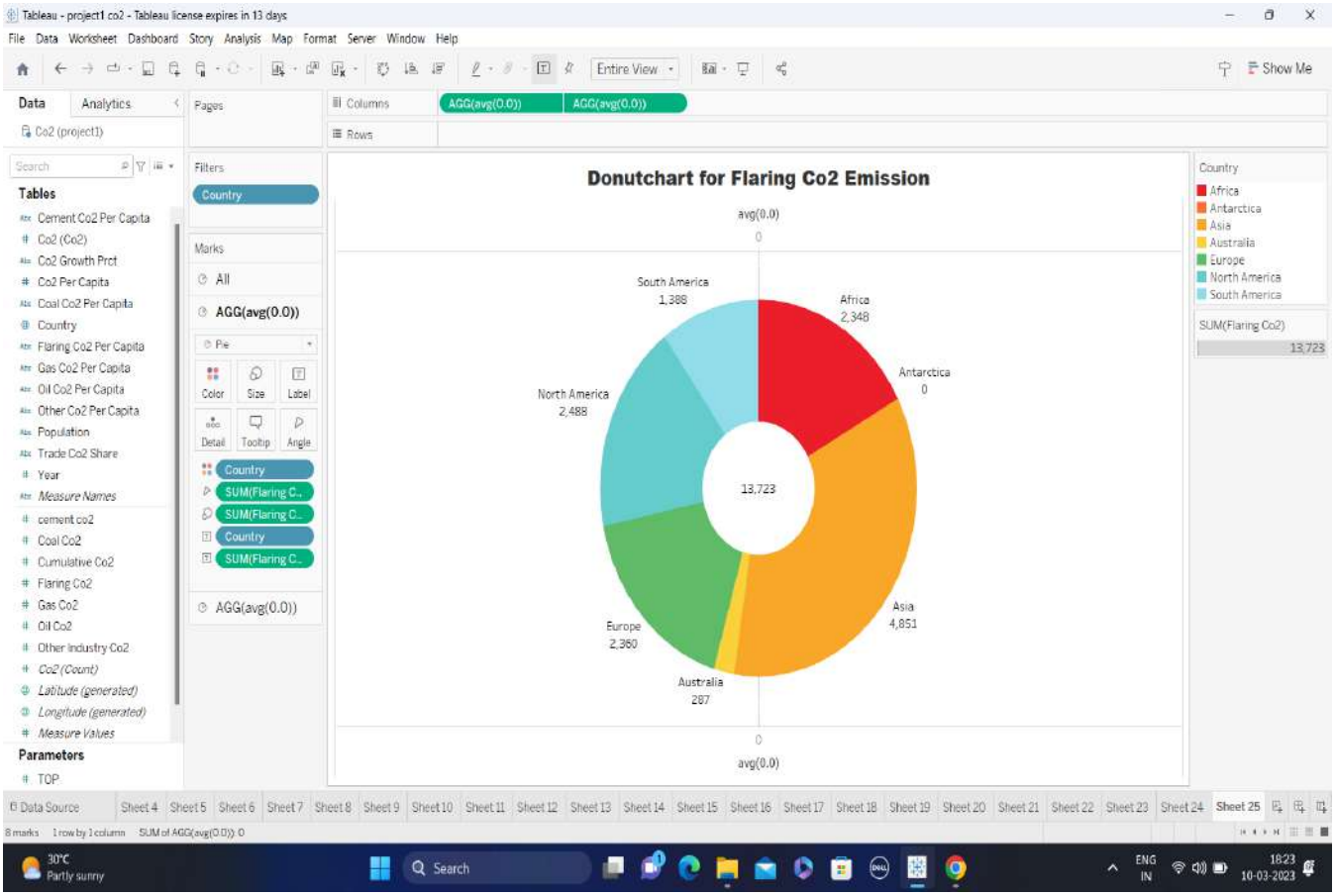


Tableau - project1 co2 - Tableau license expires in 13 days
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Entire View
Show Me
Data
Analytics
Co2 (project1)
Tables
Cement Co2 Per Capita
Co2 (Co2)
Co2 Growth Prct
Co2 Per Capita
Coal Co2 Per Capita
Country
Flaring Co2 Per Capita
Gas Co2 Per Capita
Oil Co2 Per Capita
Other Co2 Per Capita
Population
Trade Co2 Share
Year
Measure Names
cement co2
Coal Co2
Cumulative Co2
Flaring Co2
Gas Co2
Oil Co2
Other Industry Co2
Co2 (Count)
Latitude (generated)
Longitude (generated)
Measure Values
Parameters
TOP
Pages
Filters
Country
Marks
All
AGG(avg(0.0))
Pie
Color
Size
Label
Detail
Tooltip
Angle
Country
SUM(Flaring C...
SUM(Flaring C...
Country
SUM(Flaring C...
AGG(avg(0.0))
Columns
AGG(avg(0.0))
AGG(avg(0.0))
Rows
Donutchart for Flaring Co2 Emission
avg(0.0)
0
South America
1,388
Africa
2,348
Antarctica
0
North America
2,488
13,723
Asia
4,851
Europe
2,360
Australia
287
0
avg(0.0)
Country
Africa
Antarctica
Asia
Australia
Europe
North America
South America
SUM(Flaring Co2)
13,723
Data Source
Sheet 4
Sheet 5
Sheet 6
Sheet 7
Sheet 8
Sheet 9
Sheet 10
Sheet 11
Sheet 12
Sheet 13
Sheet 14
Sheet 15
Sheet 16
Sheet 17
Sheet 18
Sheet 19
Sheet 20
Sheet 21
Sheet 22
Sheet 23
Sheet 24
Sheet 25
8 marks
1 row by 1 column
SUM of AGG(avg(0.0)): 0
30°C
Partly sunny
Search
ENG
IN
18:23
10-03-2023

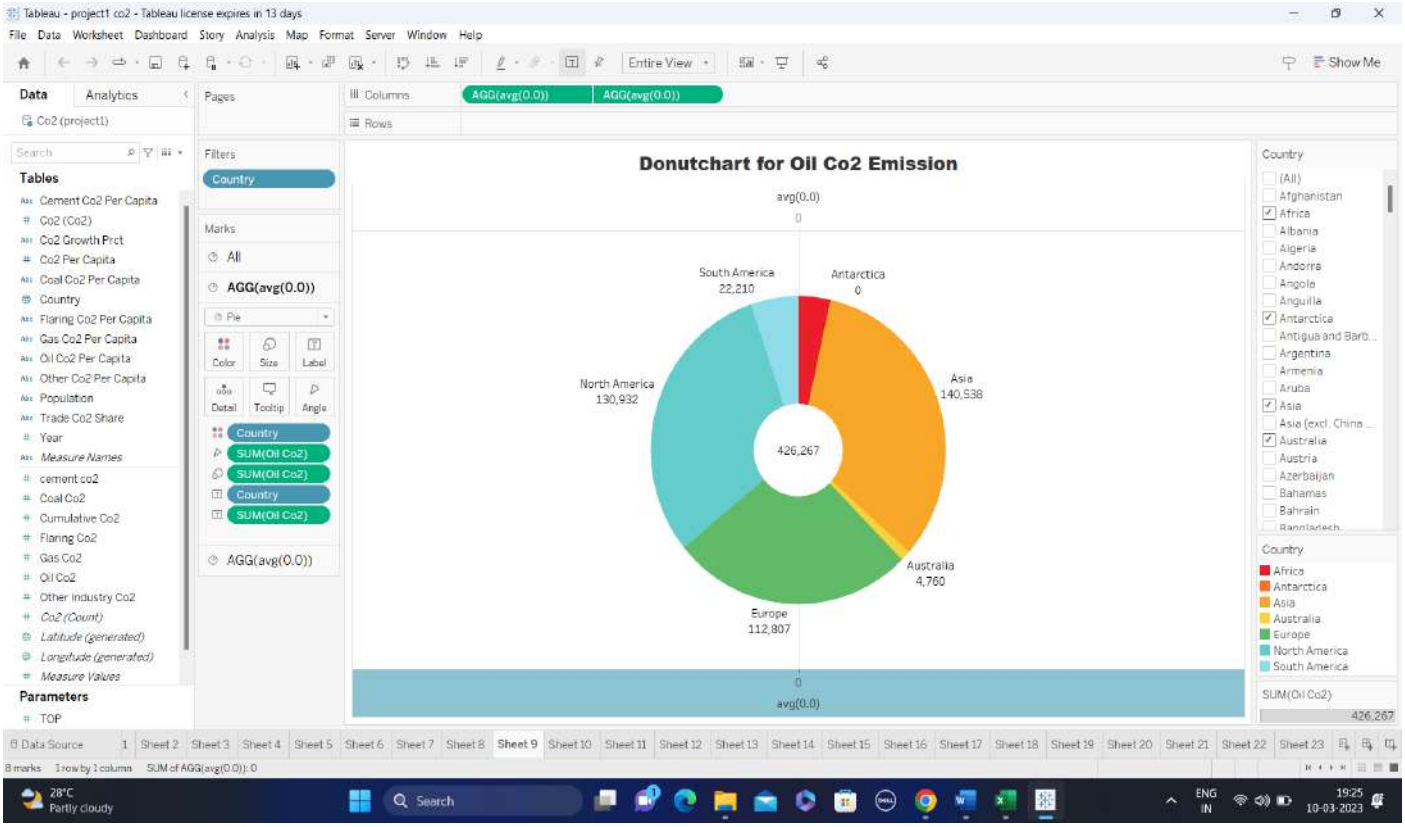


Tableau - project1 co2 - Tableau license expires in 13 days
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Donutchart for Oil Co2 Emission
avg(0.0)
South America
22,210
Antarctica
0
Asia
140,538
North America
130,932
426,267
Australia
4,760
Europe
112,807
avg(0.0)
Country
Africa
Antarctica
Asia
Australia
Europe
North America
South America
SUM(Oil Co2)
426,267

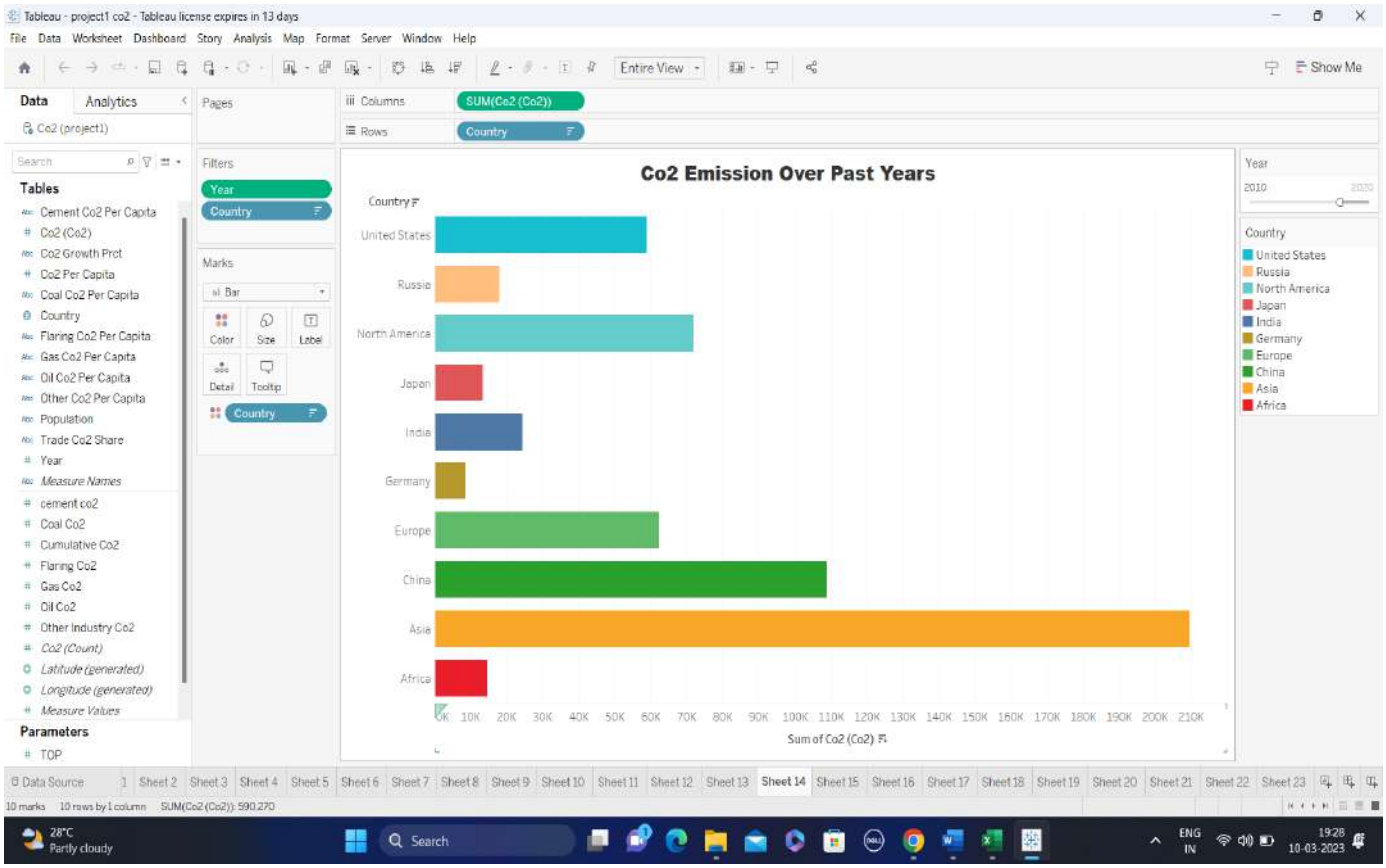


Tableau - project1 co2 - Tableau license expires in 13 days
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Co2 Emission Over Past Years
Country
United States
Russia
North America
Japan
India
Germany
Europe
China
Asia
Africa
0K 10K 20K 30K 40K 50K 60K 70K 80K 90K 100K 110K 120K 130K 140K 150K 160K 170K 180K 190K 200K 210K
Sum of Co2 (Co2)
Year
2010
2020
Country
United States
Russia
North America
Japan
India
Germany
Europe
China
Asia
Africa

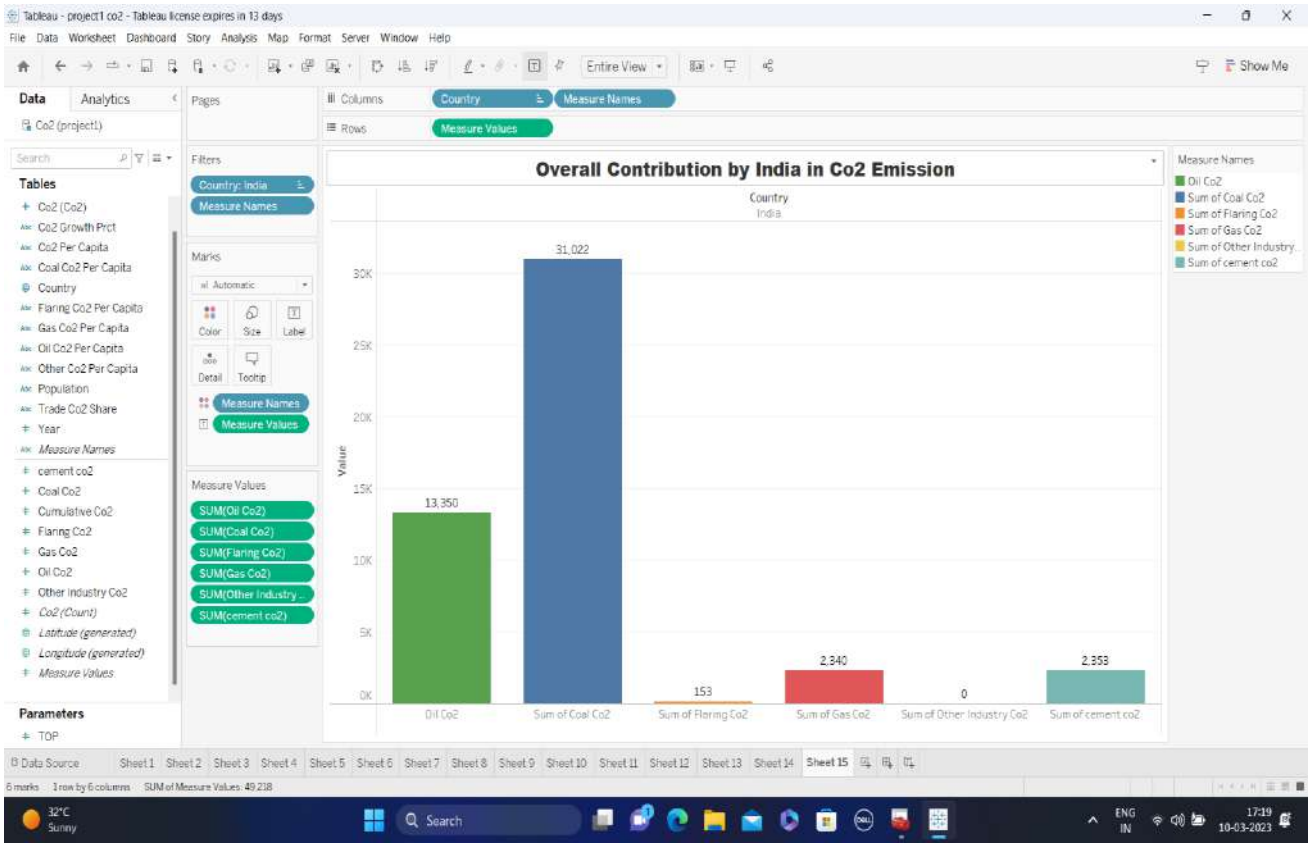


Tableau - project1 co2 - Tableau license expires in 13 days
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Data Analytics
Pages
Columns Country Measure Names
Rows Measure Values
Filters
Country: India
Measure Names
Marks
Measure Values
SUM(Oil Co2)
SUM(Coal Co2)
SUM(Flaring Co2)
SUM(Gas Co2)
SUM(Other Industry ...
SUM(cement co2)
Overall Contribution by India in Co2 Emission
Country
India
Value
13,350
31,022
153
2,340
0
2,353
Oil Co2
Sum of Coal Co2
Sum of Flaring Co2
Sum of Gas Co2
Sum of Other Industry Co2
Sum of cement co2
Measure Names
Oil Co2
Sum of Coal Co2
Sum of Flaring Co2
Sum of Gas Co2
Sum of Other Industry
Sum of cement co2
Parameters
TOP
Sheet 15
6 marks 1 row by 6 columns SUM of Measure Values: 49,238

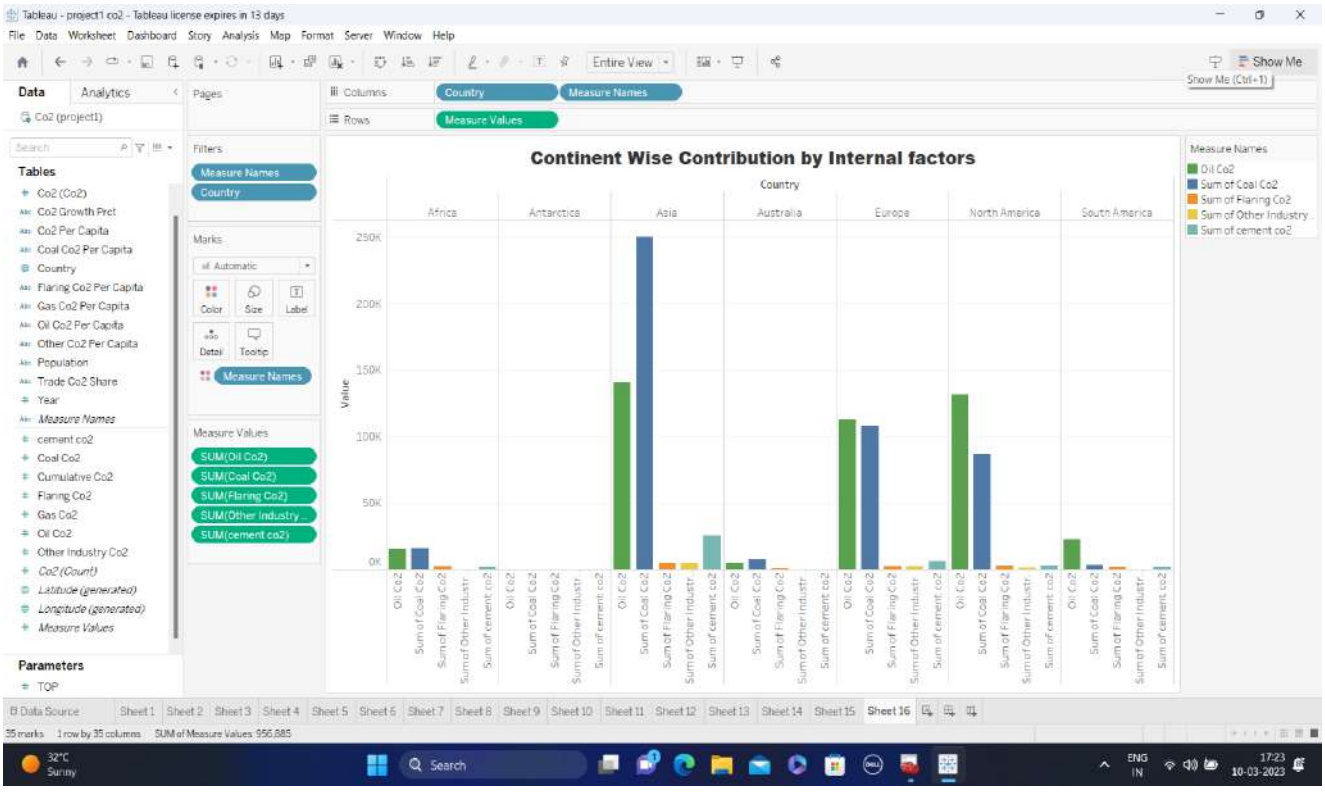


Tableau - project1 co2 - Tableau license expires in 13 days
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Show Me
Show Me (Ctrl+1)
Data Analytics
Pages
Columns Country Measure Names
Rows Measure Values
Filters
Measure Names
Country
Marks
Measure Values
SUM(Oil Co2)
SUM(Coal Co2)
SUM(Flaring Co2)
SUM(Other Industry ...
SUM(cement co2)
Continent Wise Contribution by Internal factors
Country
Africa
Antarctica
Asia
Australia
Europe
North America
South America
Value
Measure Names
Oil Co2
Sum of Coal Co2
Sum of Flaring Co2
Sum of Other Industry
Sum of cement co2
Parameters
TOP
Sheet 16
35 marks 1 row by 35 columns SUM of Measure Values: 956,885

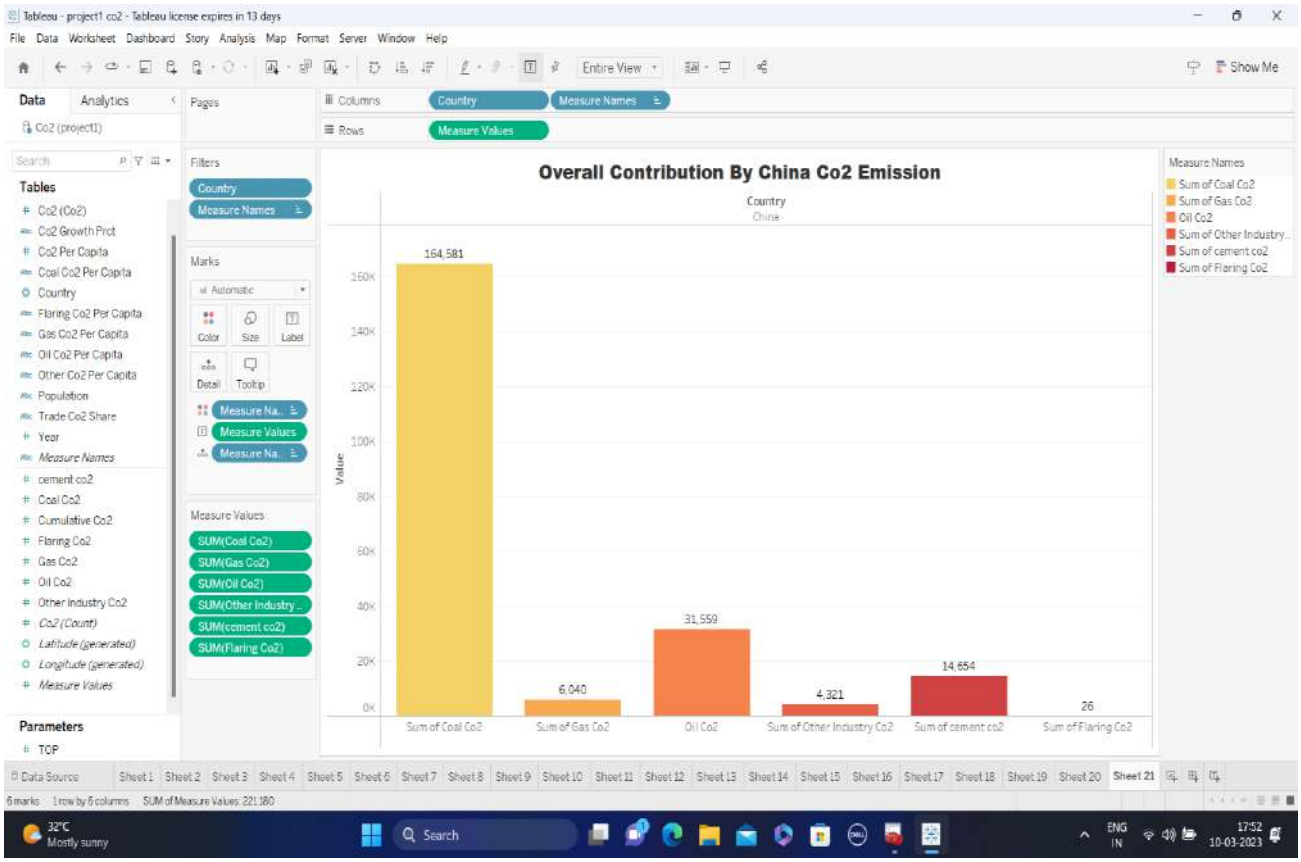


Tableau - project1 co2 - Tableau license expires in 13 days
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Columns Country Measure Names
Rows Measure Values
Overall Contribution By China Co2 Emission
Country
China
164,581
31,559
6,040
4,321
14,654
26
Value
Sum of Coal Co2
Sum of Gas Co2
Oil Co2
Sum of Other Industry Co2
Sum of cement co2
Sum of Flaring Co2
Measure Names
Sum of Coal Co2
Sum of Gas Co2
Oil Co2
Sum of Other Industry..
Sum of cement co2
Sum of Flaring Co2
Filters
Country
Measure Names
Marks
Measure Values
SUM(Coal Co2)
SUM(Gas Co2)
SUM(Oil Co2)
SUM(Other Industry..
SUM(cement co2)
SUM(Flaring Co2)
Parameters
TOP

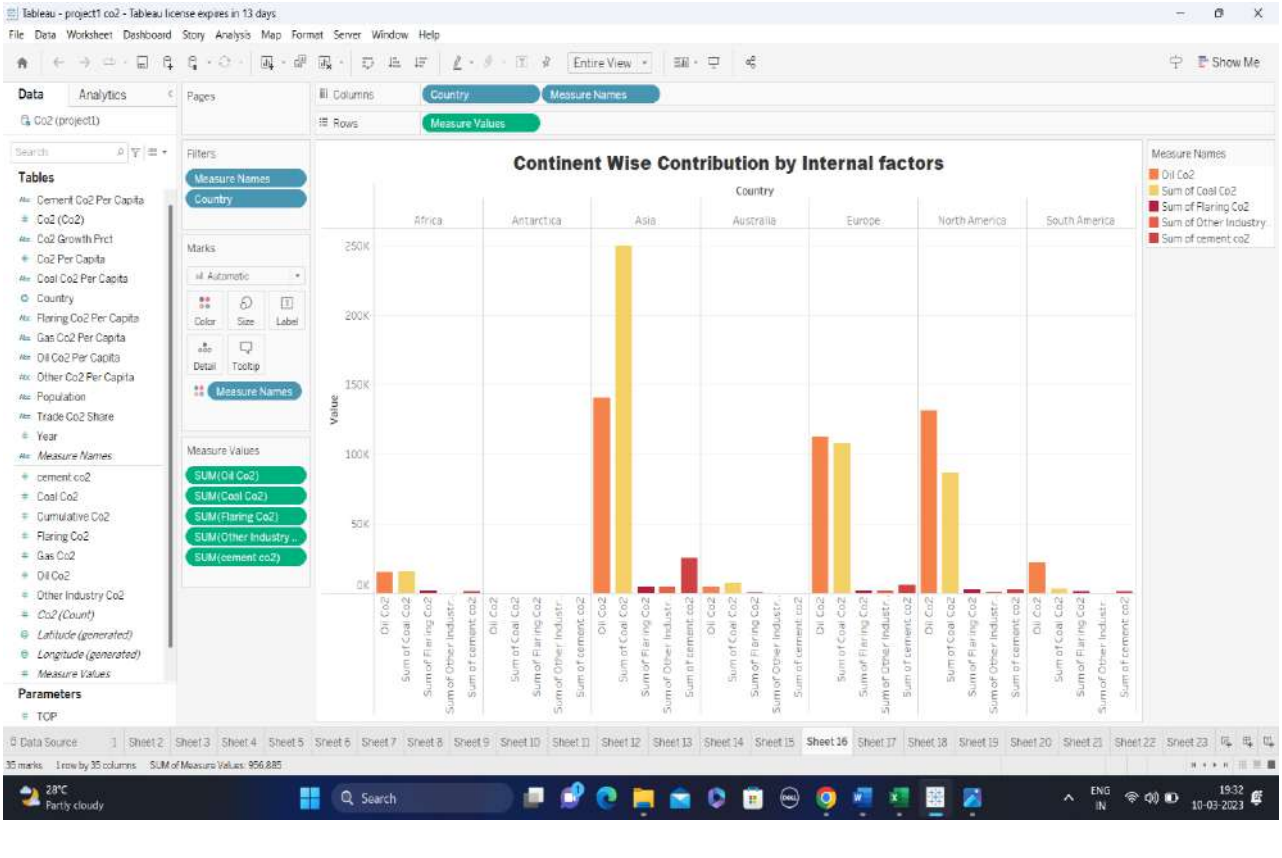


Tableau - project1 co2 - Tableau license expires in 13 days
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Columns Country Measure Names
Rows Measure Values
Continent Wise Contribution by Internal factors
Country
Africa
Antarctica
Asia
Australia
Europe
North America
South America
Value
Measure Names
Oil Co2
Sum of Coal Co2
Sum of Flaring Co2
Sum of Other Industry
Sum of cement co2
Filters
Measure Names
Country
Marks
Measure Values
SUM(Oil Co2)
SUM(Coal Co2)
SUM(Flaring Co2)
SUM(Other Industry..
SUM(cement co2)
Parameters
TOP

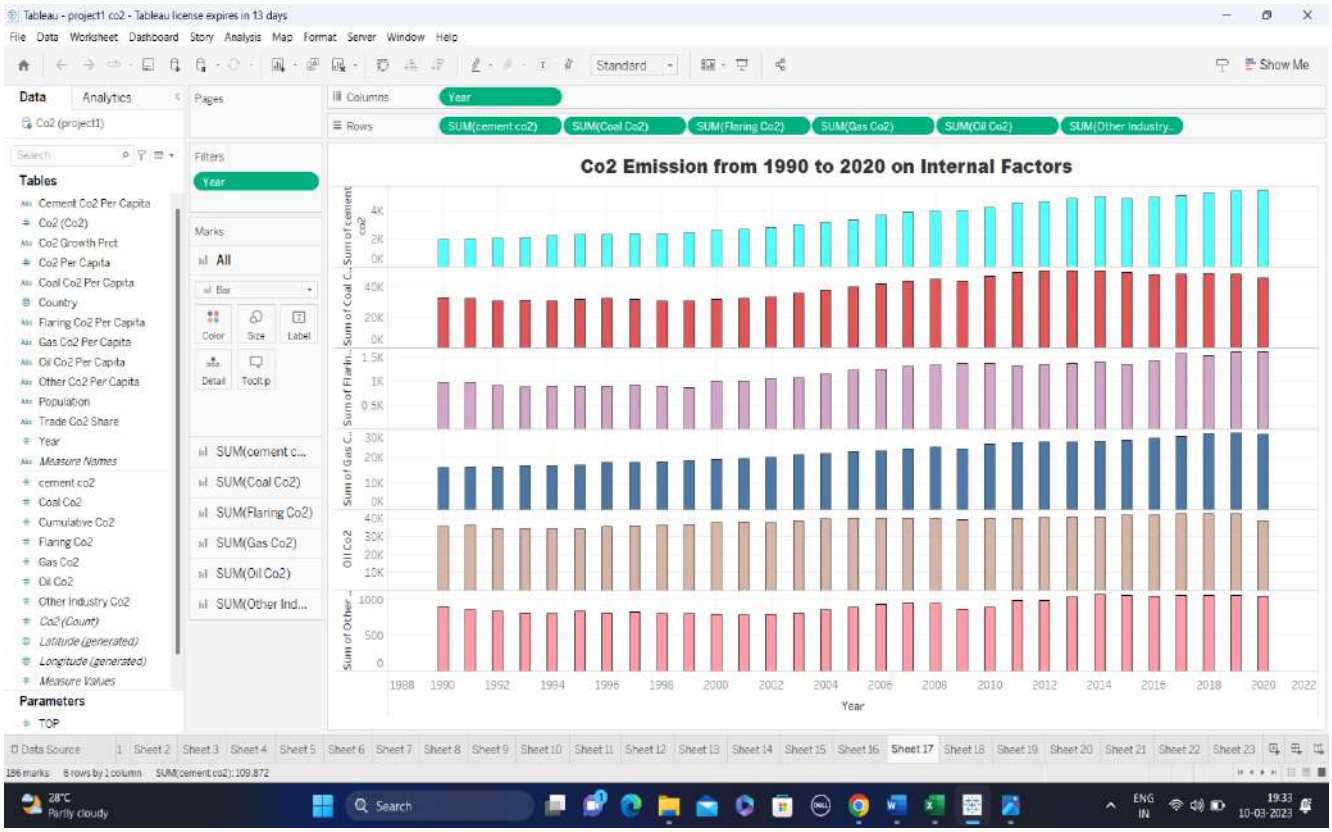


Tableau - project1 co2 - Tableau license expires in 13 days
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Data Analytics
Co2 (project1)
Tables
Cement Co2 Per Capita
Co2 (Co2)
Co2 Growth Prct
Co2 Per Capita
Coal Co2 Per Capita
Country
Flaring Co2 Per Capita
Gas Co2 Per Capita
Oil Co2 Per Capita
Other Co2 Per Capita
Population
Trade Co2 Share
Year
Measure Names
cement co2
Coal Co2
Cumulative Co2
Flaring Co2
Gas Co2
Oil Co2
Other Industry Co2
Co2 (Count)
Latitude (generated)
Longitude (generated)
Measure Values
Parameters
TOP
Pages
Filters
Year
Marks
All
Bar
Color
Size
Label
Detail
Tooltip
SUM(cement c...
SUM(Coal Co2)
SUM(Flaring Co2)
SUM(Gas Co2)
SUM(Oil Co2)
SUM(Other Ind...
Columns
Year
Rows
SUM(cement co2)
SUM(Coal Co2)
SUM(Flaring Co2)
SUM(Gas Co2)
SUM(Oil Co2)
SUM(Other Industry...
Co2 Emission from 1990 to 2020 on Internal Factors
Sum of cement co2
Sum of Coal C...
Sum of Flarin...
Sum of Gas C...
Oil Co2
Sum of Other ...
Year
Data Source
Sheet 17
186 marks 6 rows by 1 column SUM(cement co2): 109,872
28°C Partly cloudy
Search
ENG IN
19:33 10-03-2023

f

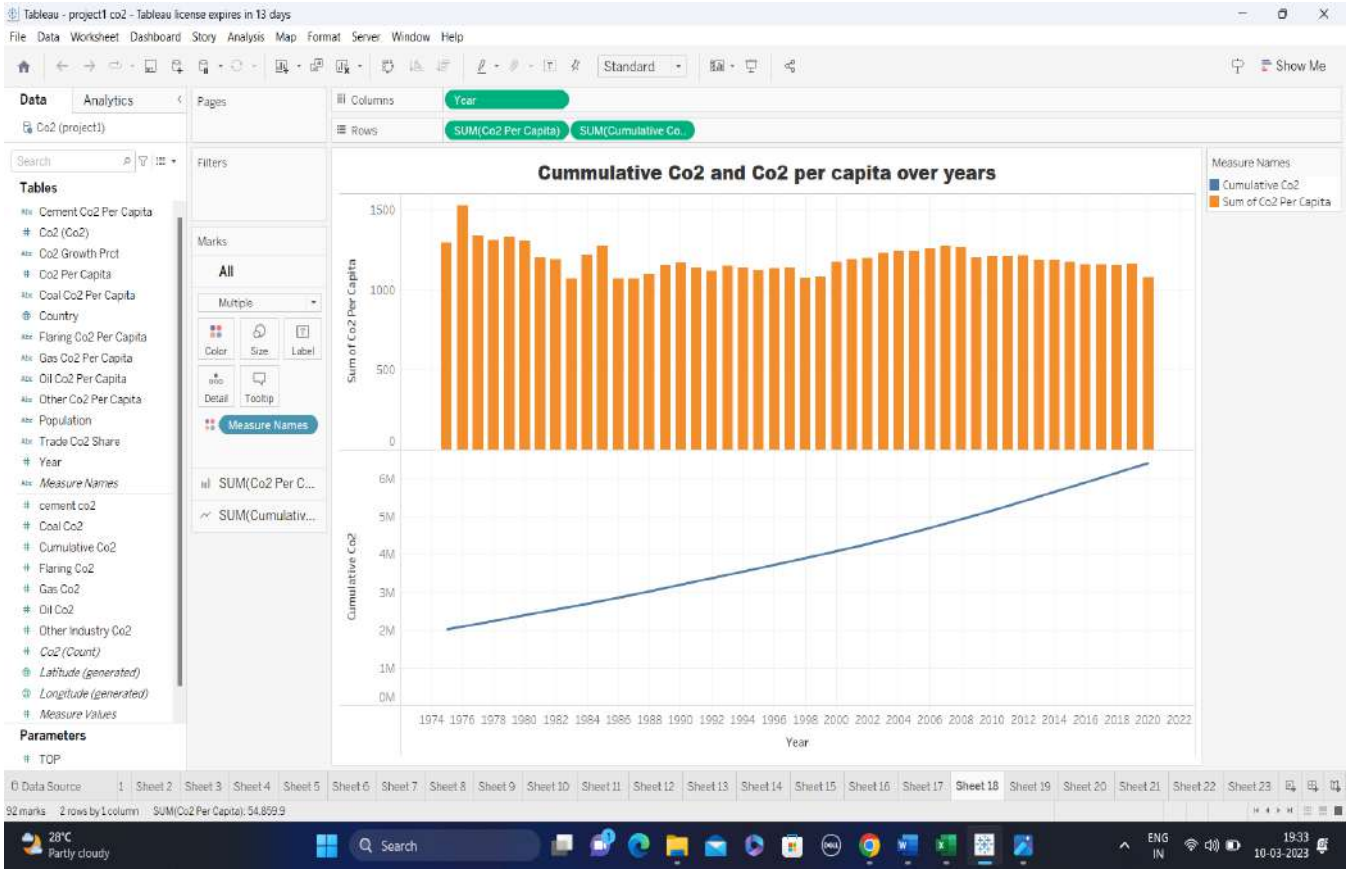


Tableau - project1 co2 - Tableau license expires in 13 days
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Data Analytics
Co2 (project1)
Tables
Cement Co2 Per Capita
Co2 (Co2)
Co2 Growth Prct
Co2 Per Capita
Coal Co2 Per Capita
Country
Flaring Co2 Per Capita
Gas Co2 Per Capita
Oil Co2 Per Capita
Other Co2 Per Capita
Population
Trade Co2 Share
Year
Measure Names
cement co2
Coal Co2
Cumulative Co2
Flaring Co2
Gas Co2
Oil Co2
Other Industry Co2
Co2 (Count)
Latitude (generated)
Longitude (generated)
Measure Values
Parameters
TOP
Pages
Filters
Marks
All
Multiple
Color
Size
Label
Detail
Tooltip
Measure Names
SUM(Co2 Per C...
SUM(Cumulativ...
Columns
Year
Rows
SUM(Co2 Per Capita)
SUM(Cumulative Co...
Cummulative Co2 and Co2 per capita over years
Measure Names
Cumulative Co2
Sum of Co2 Per Capita
Sum of Co2 Per Capita
Cumulative Co2
Year
Data Source
Sheet 18
92 marks 2 rows by 1 column SUM(Co2 Per Capita): 54,859.9
28°C Partly cloudy
Search
ENG IN
19:33 10-03-2023

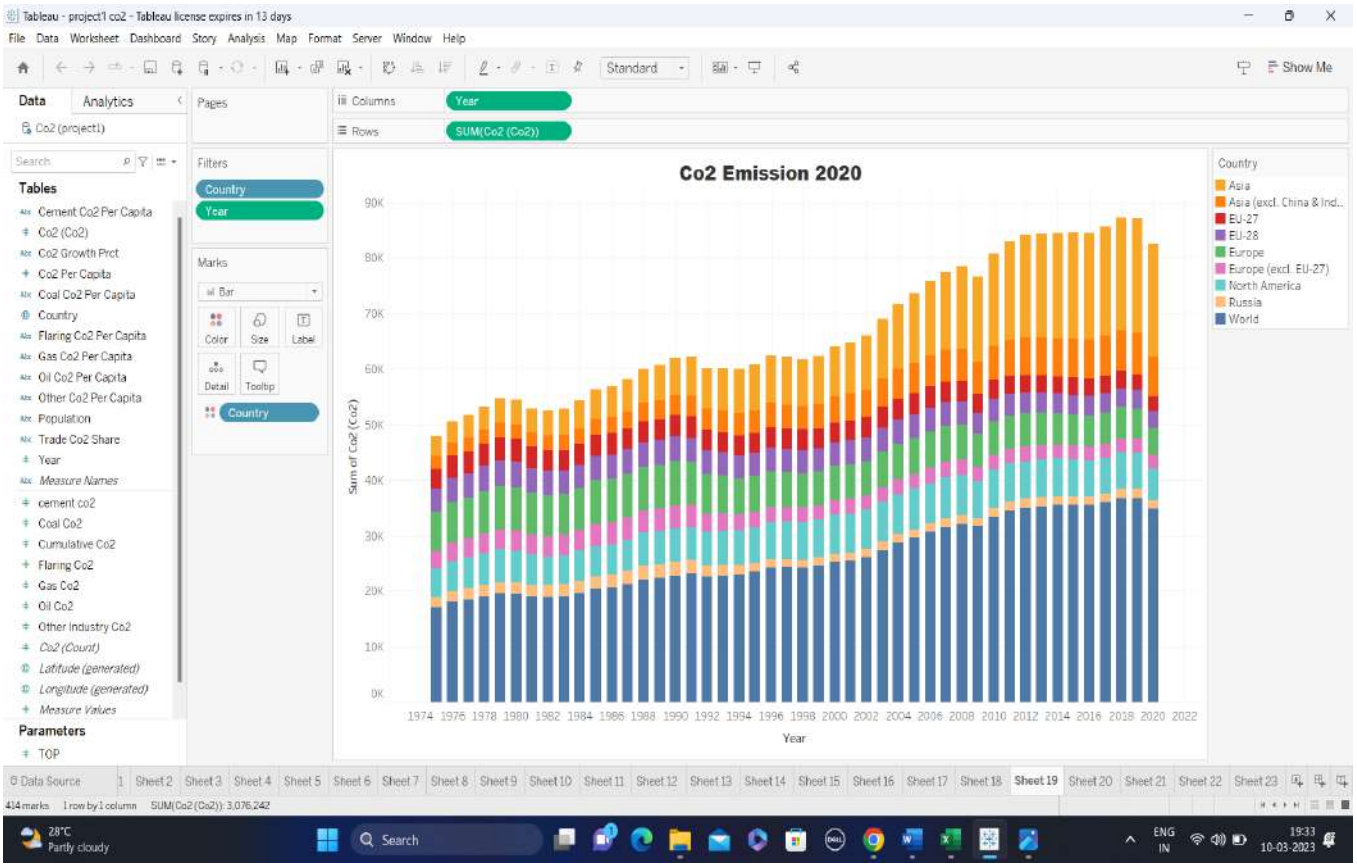


Tableau - project1 co2 - Tableau license expires in 13 days
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Data Analytics
Co2 (project1)
Tables
Cement Co2 Per Capita
Co2 (Co2)
Co2 Growth Prct
Co2 Per Capita
Coal Co2 Per Capita
Country
Flaring Co2 Per Capita
Gas Co2 Per Capita
Oil Co2 Per Capita
Other Co2 Per Capita
Population
Trade Co2 Share
Year
Measure Names
cement co2
Coal Co2
Cumulative Co2
Flaring Co2
Gas Co2
Oil Co2
Other Industry Co2
Co2 (Count)
Latitude (generated)
Longitude (generated)
Measure Values
Parameters
TOP
Pages
Filters
Country
Year
Marks
Bar
Color
Size
Label
Detail
Tooltip
Country
Columns
Year
Rows
SUM(Co2 (Co2))
Co2 Emission 2020
Sum of Co2 (Co2)
Year
Country
Asia
Asia (excl. China & Ind..
EU-27
EU-28
Europe
Europe (excl. EU-27)
North America
Russia
World
Data Source
Sheet 19
414 marks
1 row by 1 column
SUM(Co2 (Co2)): 3,076,242
28°C
Partly cloudy
Search
ENG
IN
19:33
10-03-2023

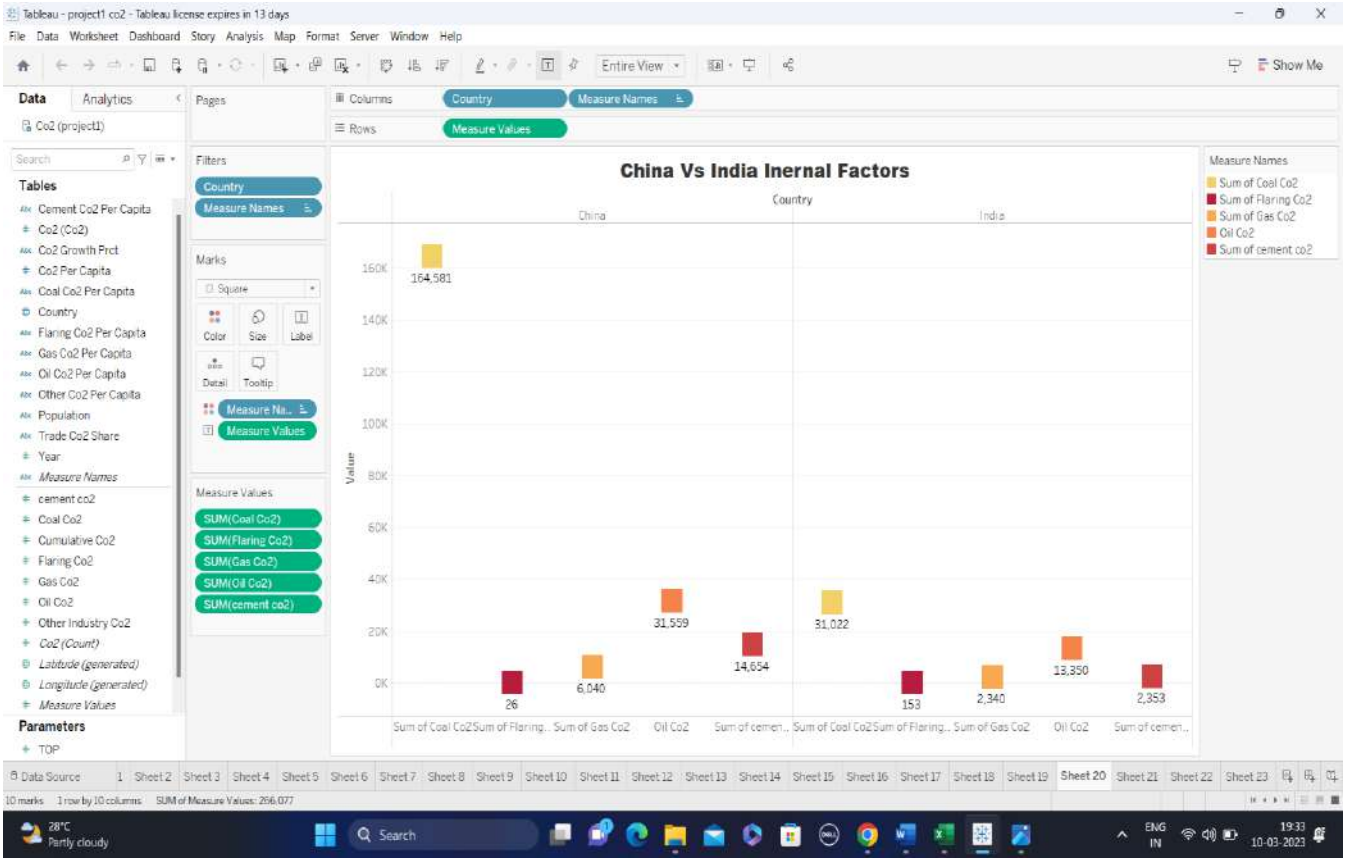
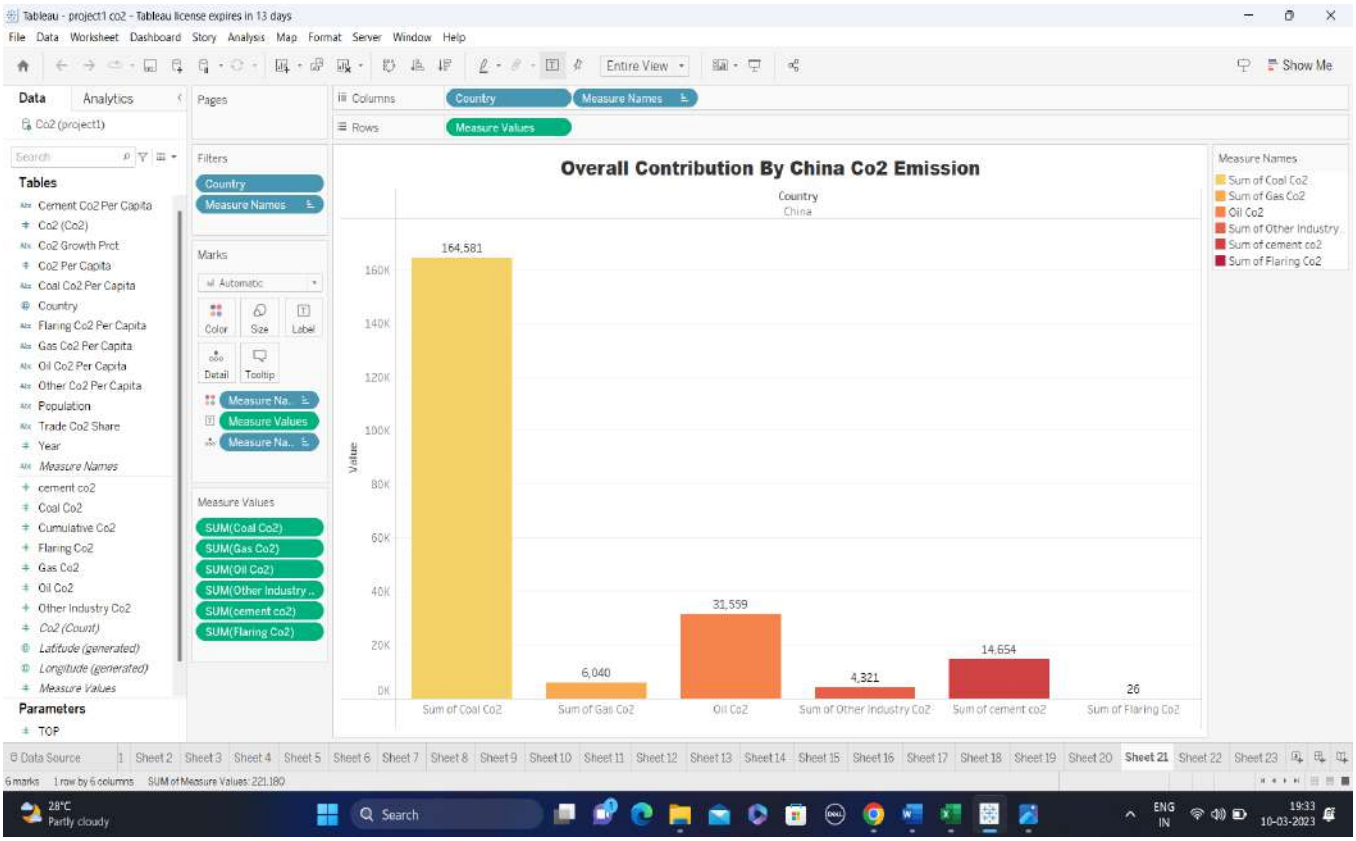


Tableau - project1 co2 - Tableau license expires in 13 days
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Data Analytics
Co2 (project1)
Tables
Cement Co2 Per Capita
Co2 (Co2)
Co2 Growth Prct
Co2 Per Capita
Coal Co2 Per Capita
Country
Flaring Co2 Per Capita
Gas Co2 Per Capita
Oil Co2 Per Capita
Other Co2 Per Capita
Population
Trade Co2 Share
Year
Measure Names
cement co2
Coal Co2
Cumulative Co2
Flaring Co2
Gas Co2
Oil Co2
Other Industry Co2
Co2 (Count)
Latitude (generated)
Longitude (generated)
Measure Values
Parameters
TOP
Pages
Filters
Country
Measure Names
Marks
Square
Color
Size
Label
Detail
Tooltip
Measure Na..
Measure Values
Measure Values
SUM(Coal Co2)
SUM(Flaring Co2)
SUM(Gas Co2)
SUM(Oil Co2)
SUM(cement co2)
Columns
Country
Measure Names
Rows
Measure Values
China Vs India Inernal Factors
Country
China
India
Value
164,581
26
6,040
31,559
14,654
31,022
153
2,340
13,350
2,353
Sum of Coal Co2
Sum of Flaring..
Sum of Gas Co2
Oil Co2
Sum of cemen..
Measure Names
Sum of Coal Co2
Sum of Flaring Co2
Sum of Gas Co2
Oil Co2
Sum of cement co2
Data Source
Sheet 20
10 marks
1 row by 10 columns
SUM of Measure Values: 296,077
28°C
Partly cloudy
Search
ENG
IN
19:33
10-03-2023

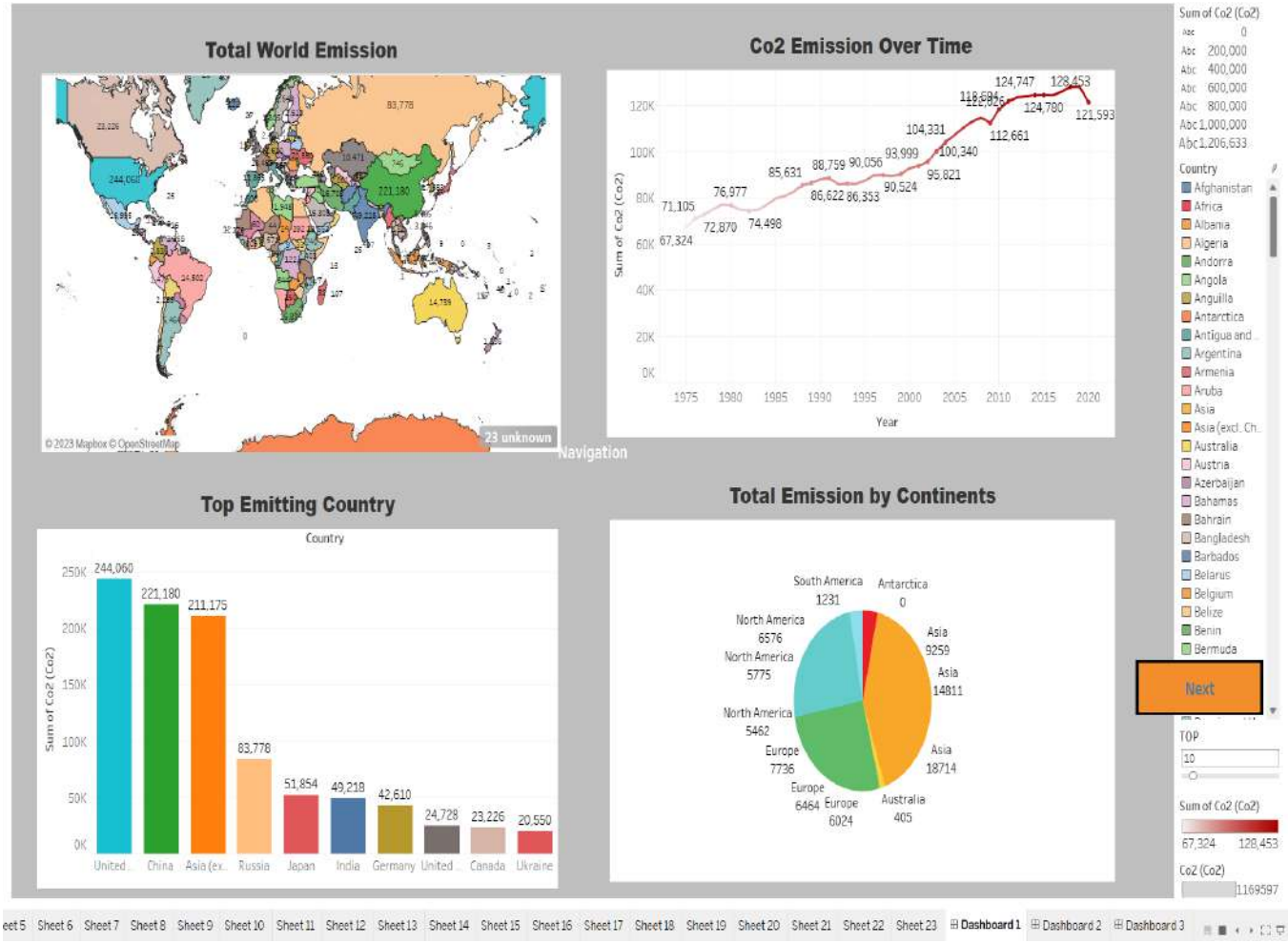


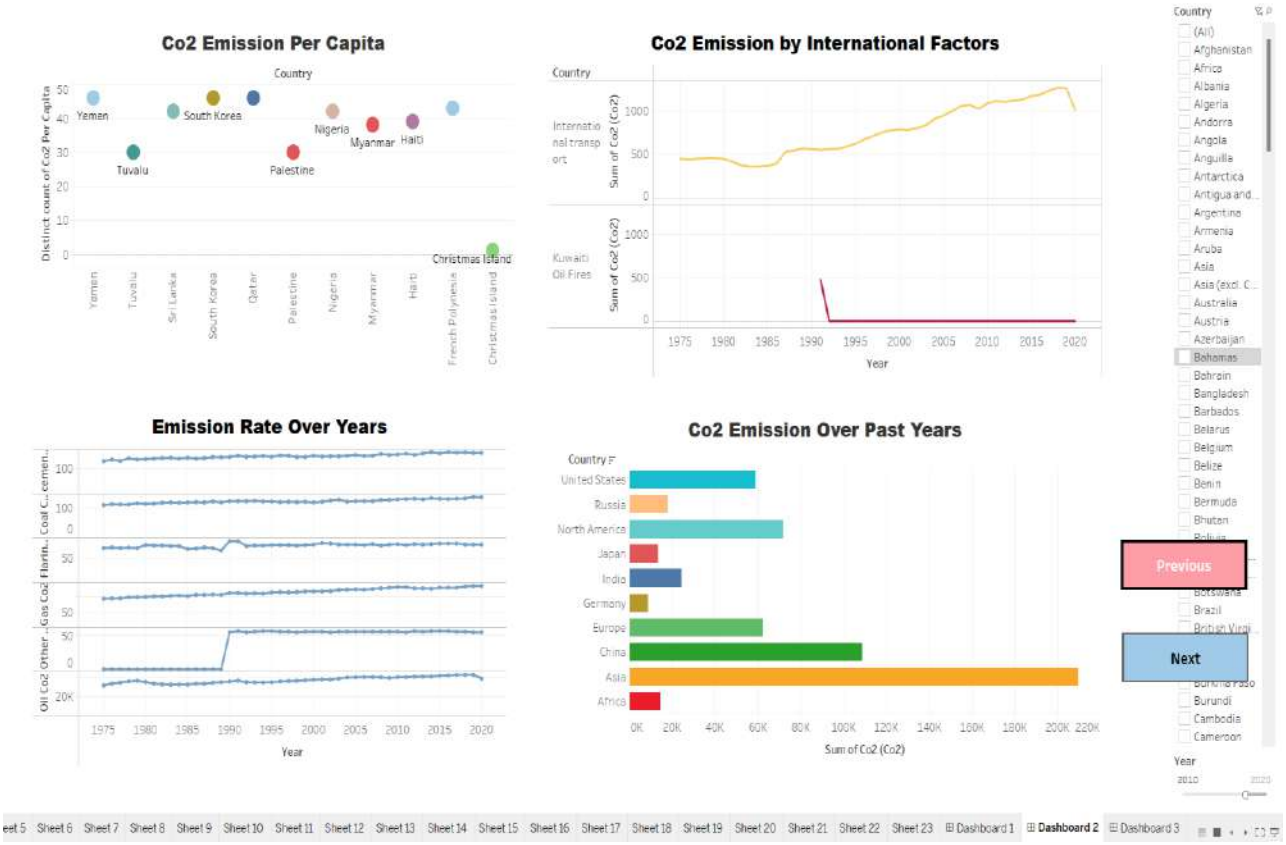
Milestone 5: Dashboard :

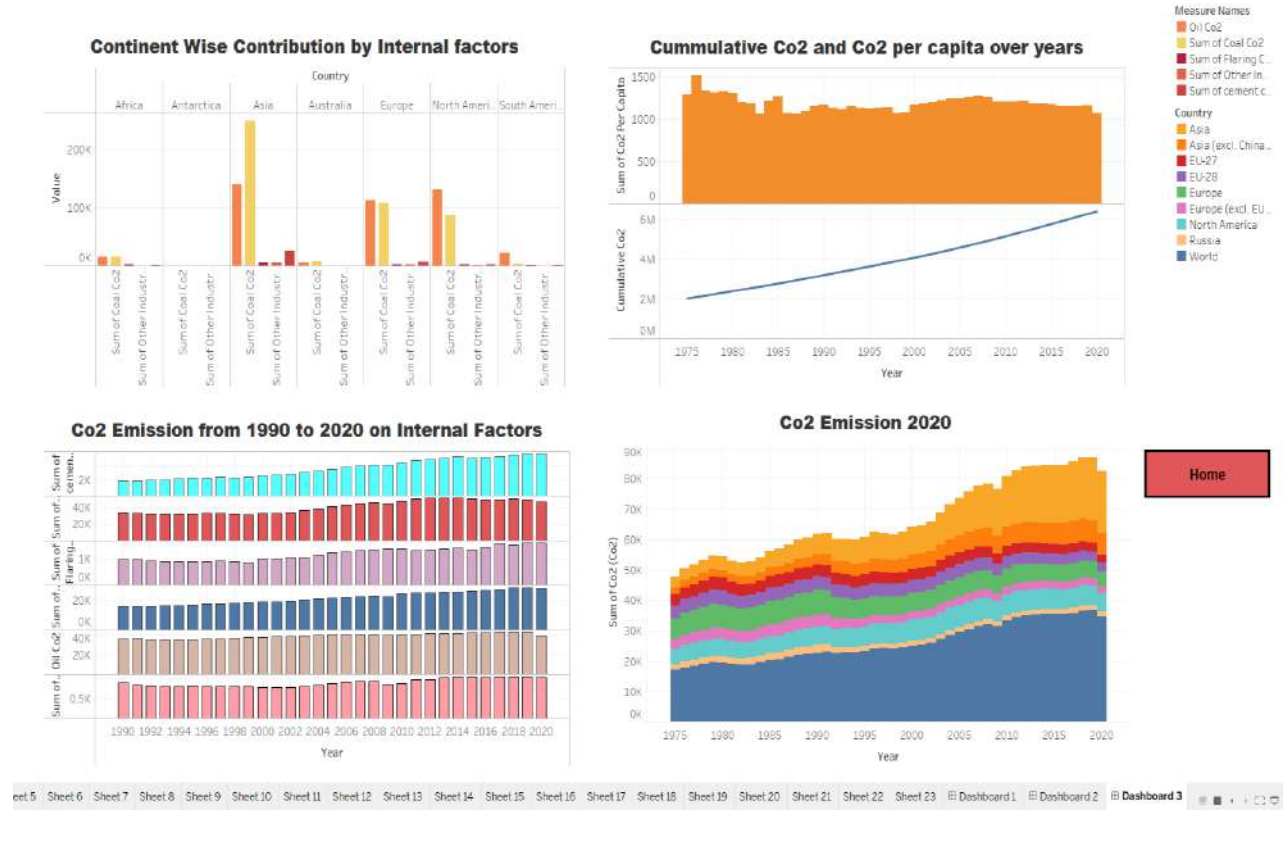
A dashboard is a graphical user interface (GUI) that displays information and data in an organized, easy-to-read format. Dashboards are often used to provide real-time monitoring and analysis of data, and are typically designed for a specific purpose or use case. Dashboards can be used in a variety of 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

The responsiveness and design of a dashboard for analyzing the globally Co2 Emission. It is crucial to ensure that the information is easily understandable and actionable. Key considerations for designing a responsive and effective dashboard include user-centred design, clear and concise information, interactivity, data-driven approach, accessibility, customization. Once you have created views on different sheets in Tableau, you can pull them into a dashboard.




Co2 Emission Per Capita
Co2 Emission by International Factors
Emission Rate Over Years
Co2 Emission Over Past Years
Previous
Next
Sheet 5 Sheet 6 Sheet 7 Sheet 8 Sheet 9 Sheet 10 Sheet 11 Sheet 12 Sheet 13 Sheet 14 Sheet 15 Sheet 16 Sheet 17 Sheet 18 Sheet 19 Sheet 20 Sheet 21 Sheet 22 Sheet 23 Dashboard 1 Dashboard 2 Dashboard 3

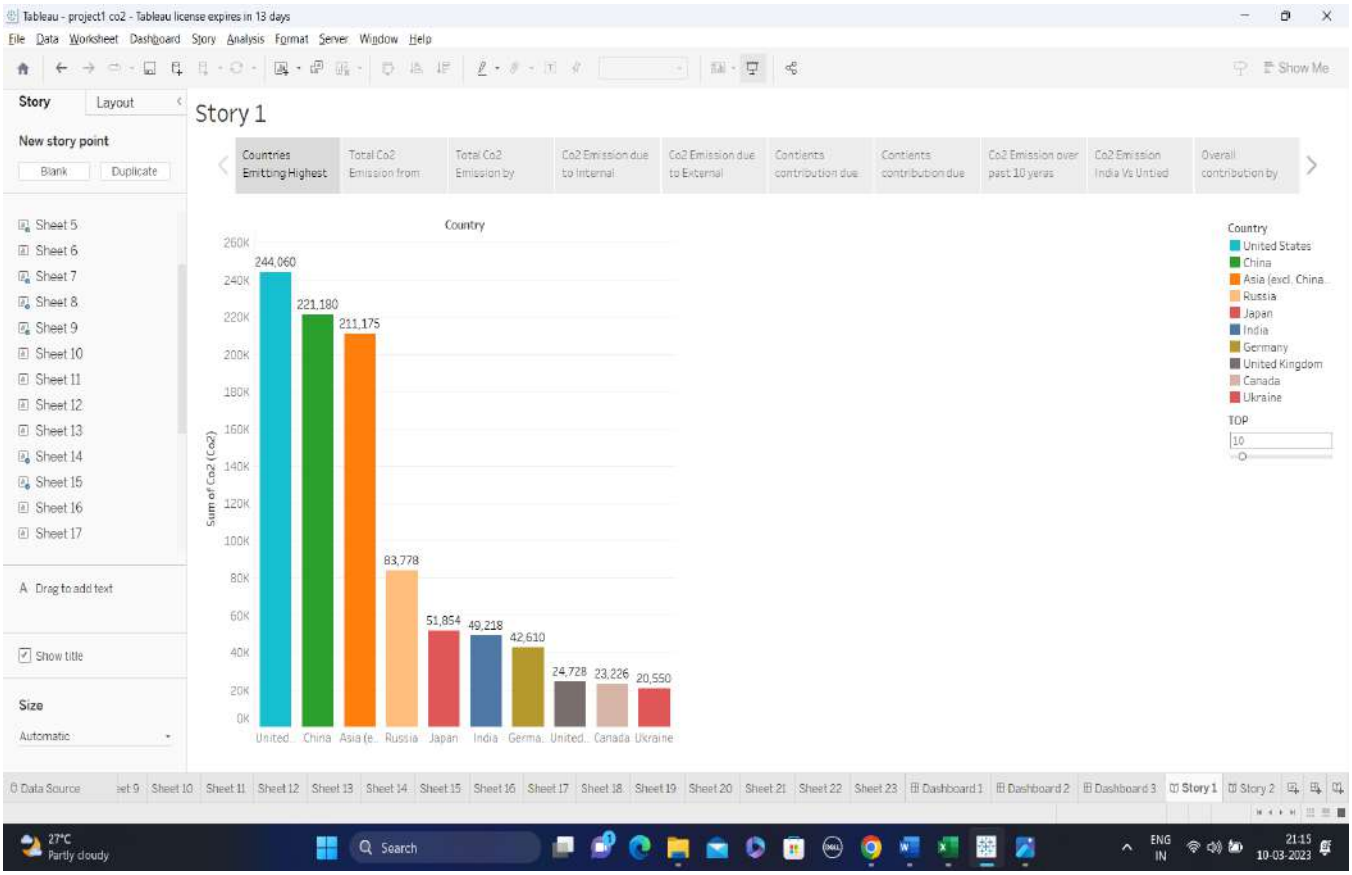

Continent Wise Contribution by Internal factors
Cummulative Co2 and Co2 per capita over years
Co2 Emission from 1990 to 2020 on Internal Factors
Co2 Emission 2020
Home
Sheet 5 Sheet 6 Sheet 7 Sheet 8 Sheet 9 Sheet 10 Sheet 11 Sheet 12 Sheet 13 Sheet 14 Sheet 15 Sheet 16 Sheet 17 Sheet 18 Sheet 19 Sheet 20 Sheet 21 Sheet 22 Sheet 23 Dashboard 1 Dashboard 2 Dashboard 3

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. 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 :

The number of scenes in a storyboard for a data visualization analysis of the Co2 Emission will depend on the complexity of the analysis and the specific insights that are trying to be conveyed. A storyboard is a visual representation of the data analysis process and it breaks down the analysis into a series of steps or scenes.

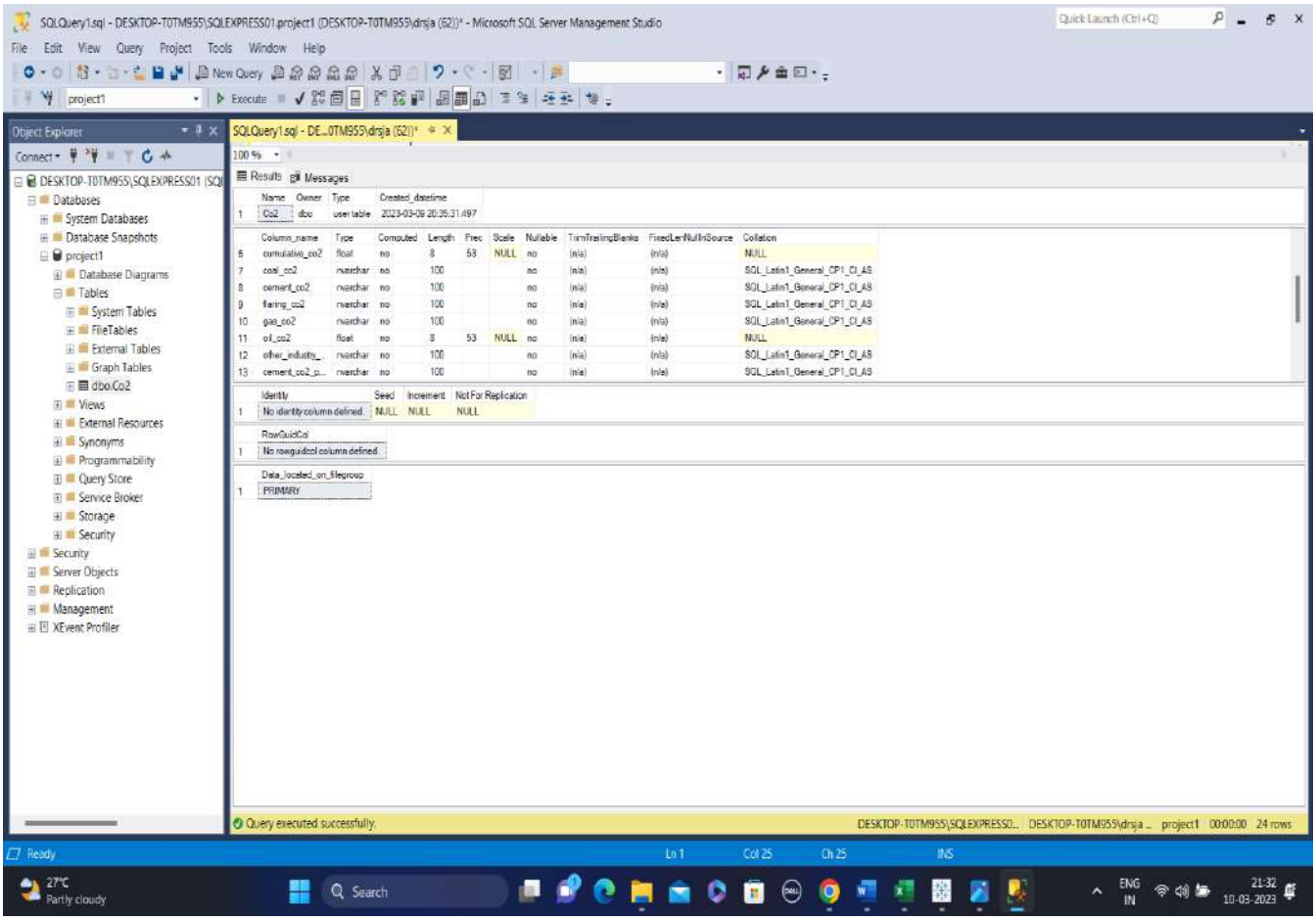


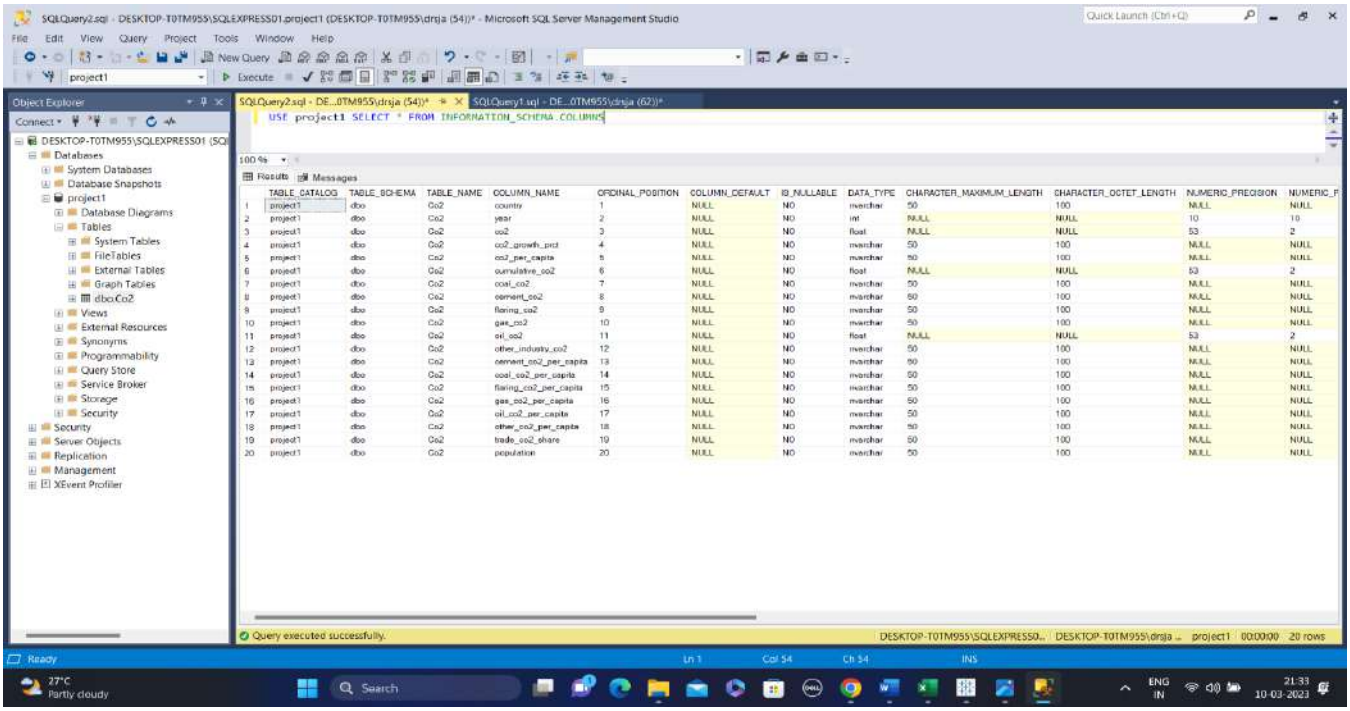
Milestone 7: Performance Testing:

Activity 1: Amount of Data Rendered to DB:

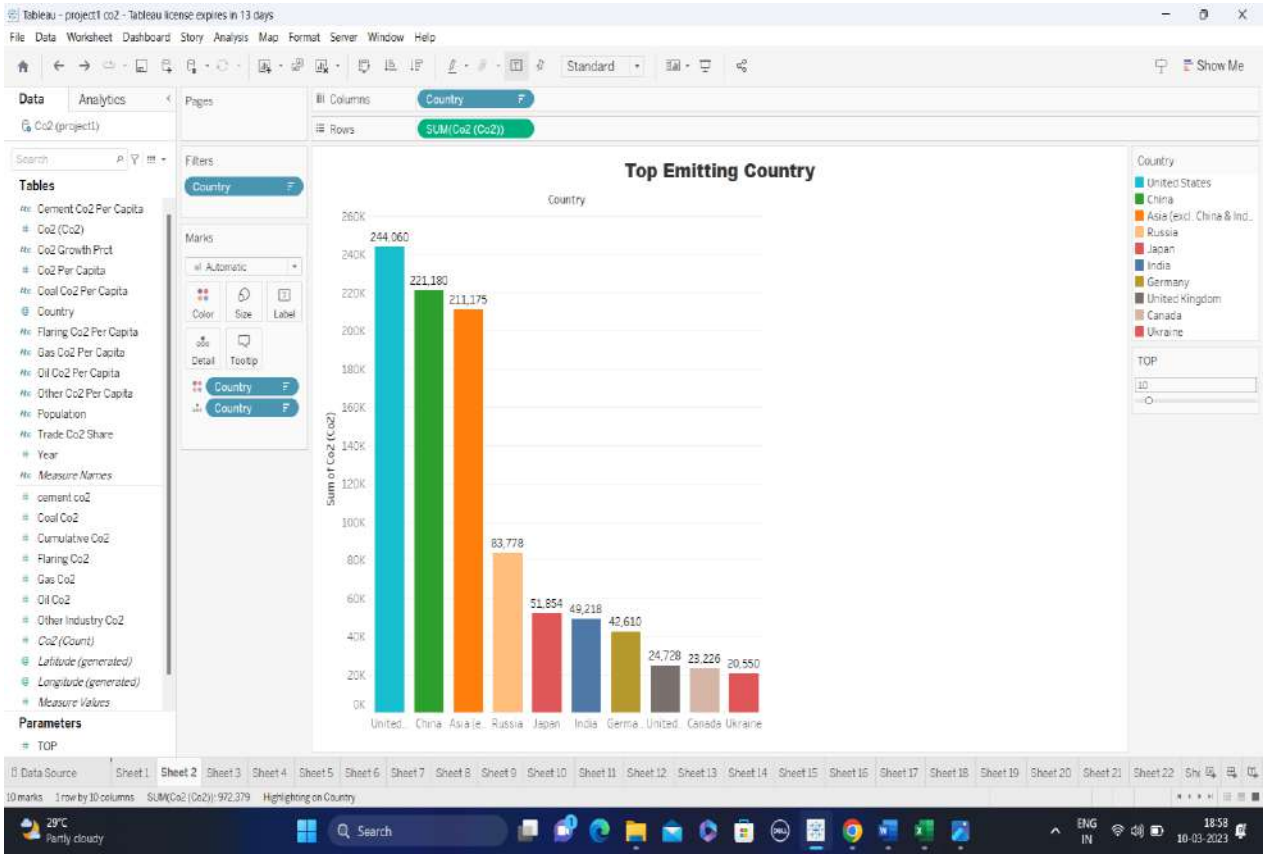
● The amount of data that is rendered to a database depends on the size of the dataset and the capacity of the database to store and retrieve data.

● Open the SQL Server Management Studio, go to the database then click to expand the tables, select the table and Right click and select Properties





Activity 2: Utilization of Data Filters:



Activity 3: No of Visualizations/ Graphs :

1. Top World Emission.

2. Top Emitting Countries.

3. Co2 Emission over Time.

4. Co2 Emission India vs USA.

5. Total Emission by Continents.

6. Co2 Emission per Capita.

7. Co2 Emission by International Factors.

8. Emission Rate over Years.

9. Donut Charts - Coal Co2, Cement Co2, Gas Co2, Oil Co2, Flaring Co2.

10. Co2 Emission over past 10 years.

11. Continent Contribution in Co2 Emission .

12. Cumulative Co2 and Co2 per Capita.

13. Co2 Emission in 2020.

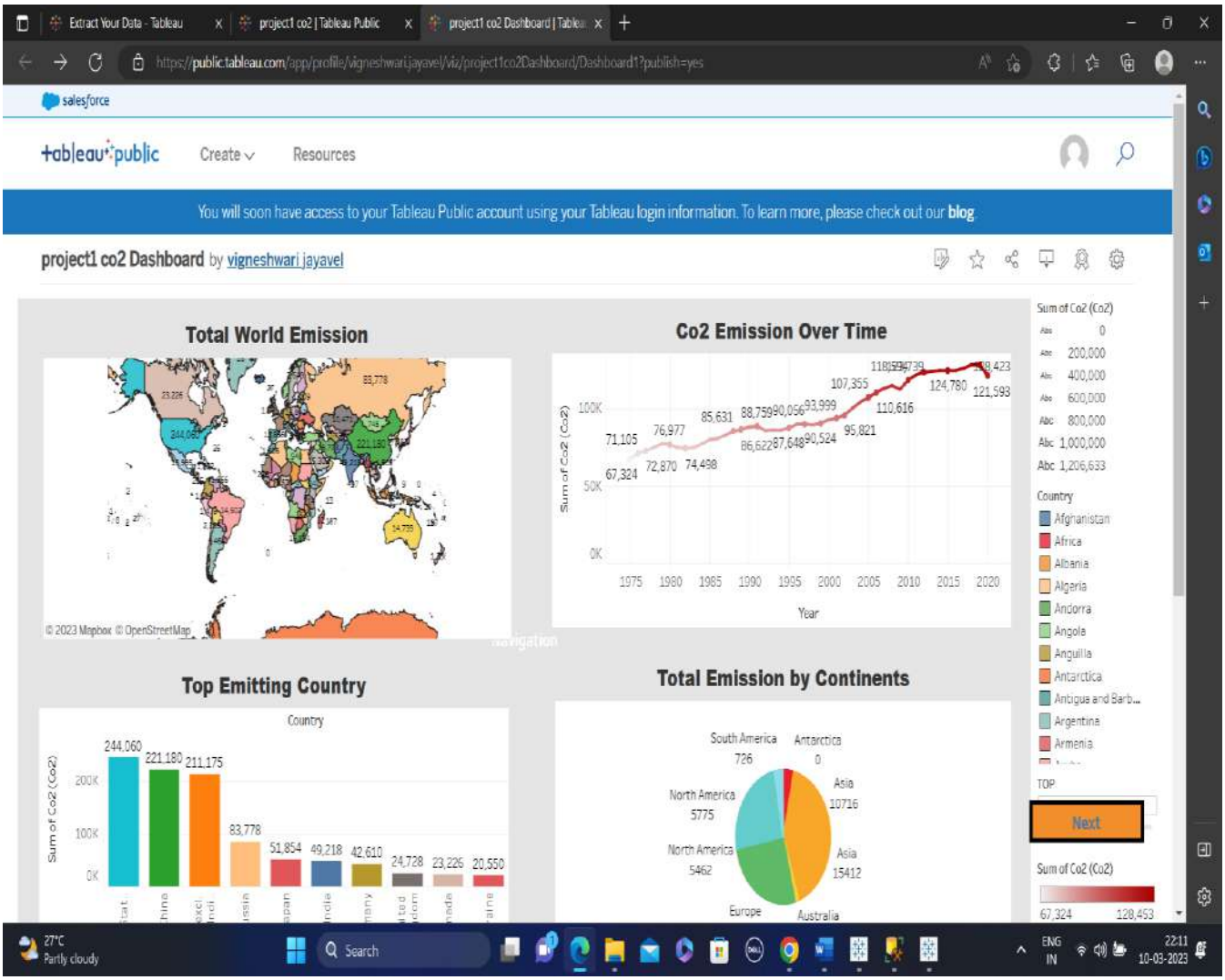
14. China vs India Co2 emission due to internal factors.

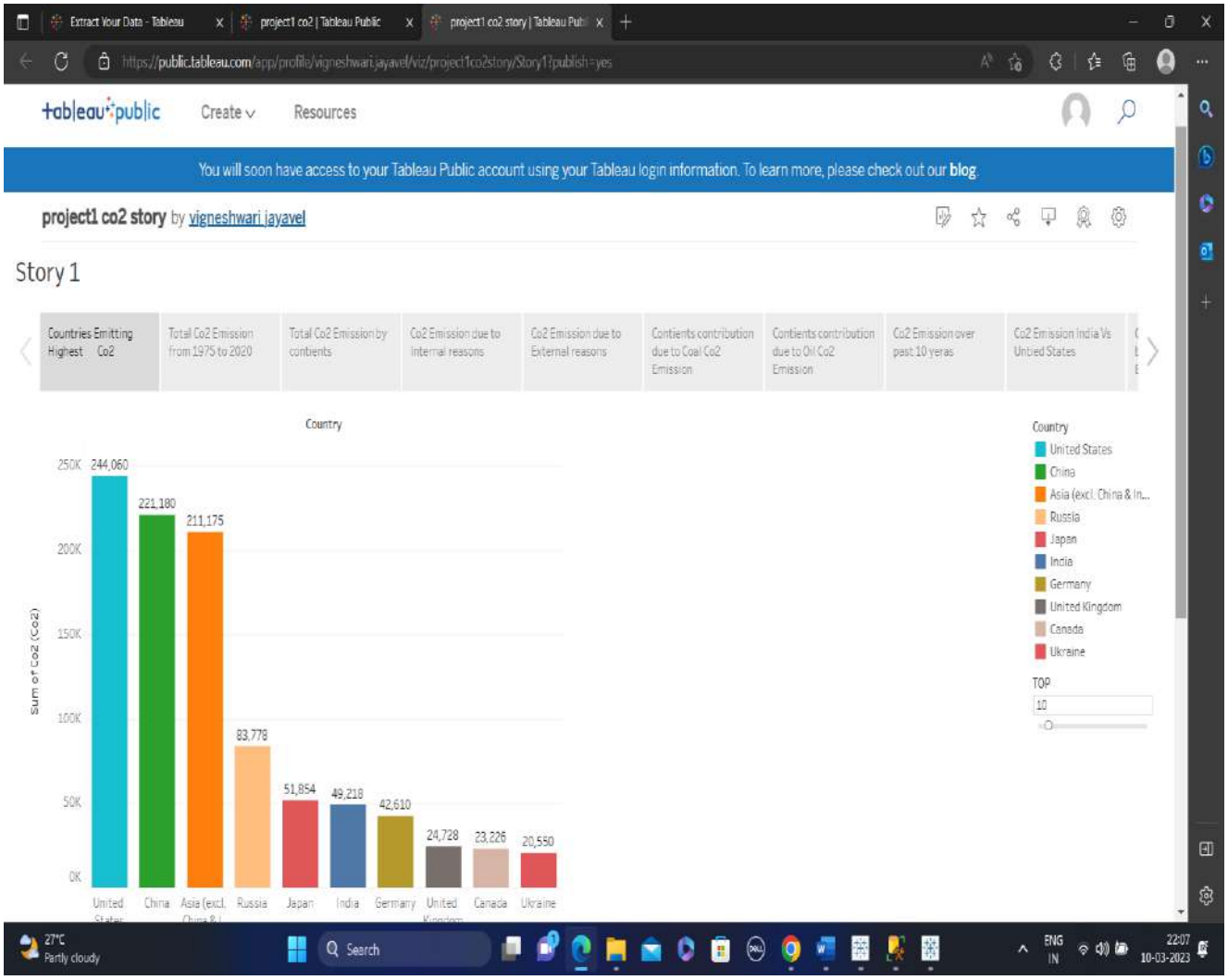
15. Overall Contribution by China in Co2 Emission.

Milestone 8: Web integration :

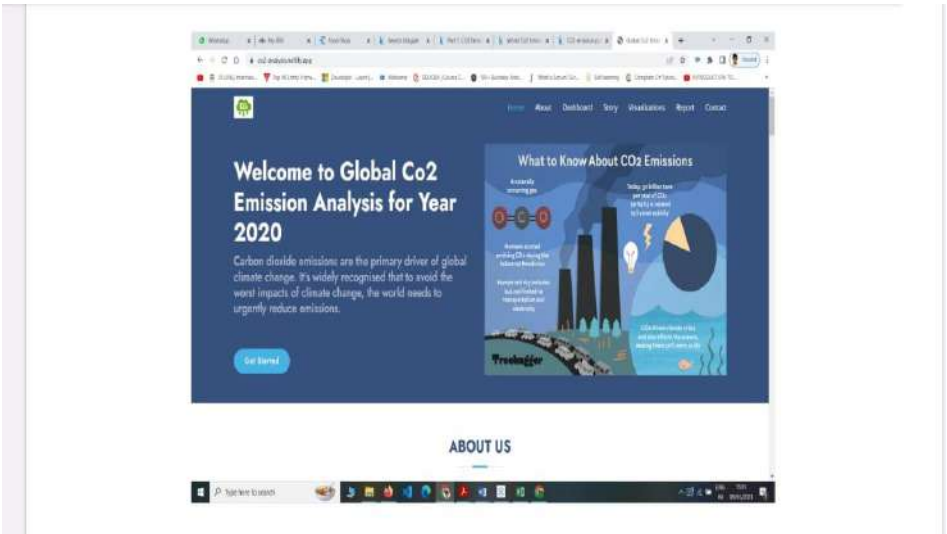
Publishing helps us to track and monitor key performance metrics, to communicate results and progress. help a publisher stay informed, make better decisions, and communicate their performance to others.

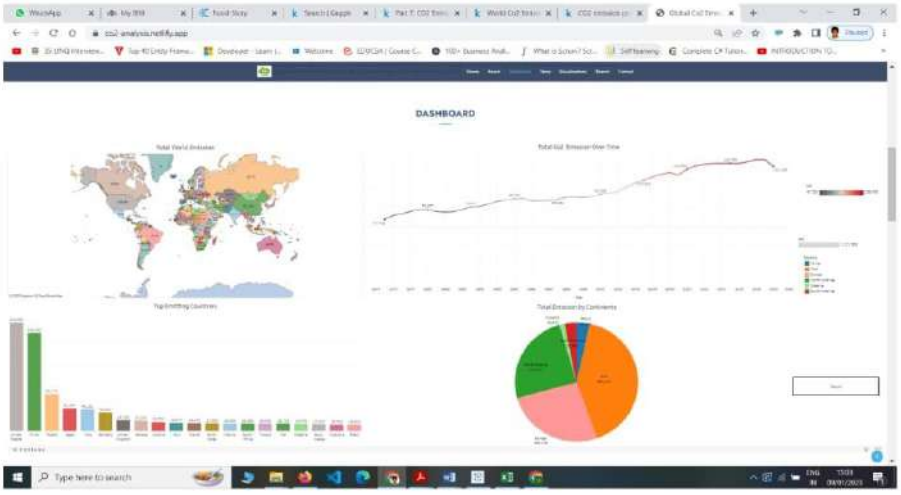
Publishing dashboard and reports to tableau public

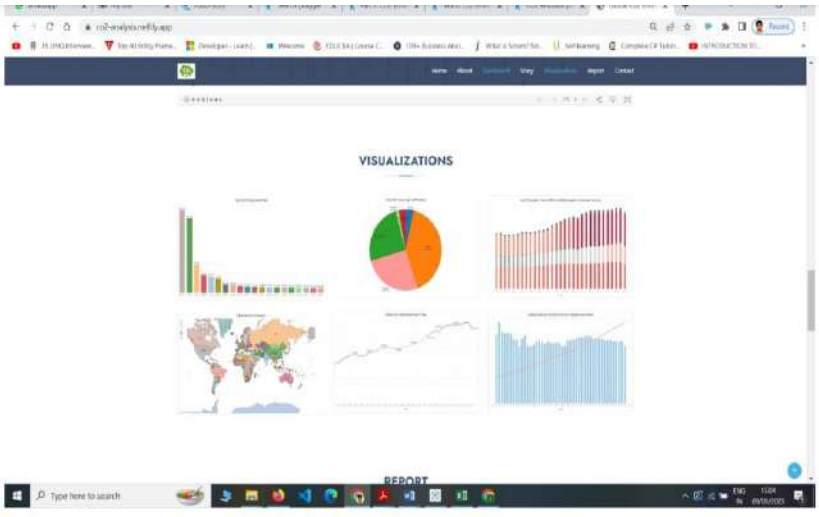


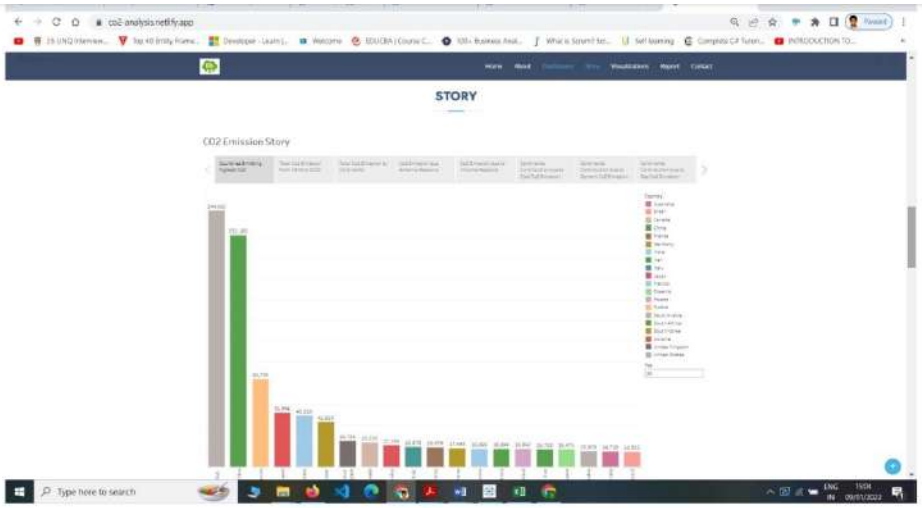


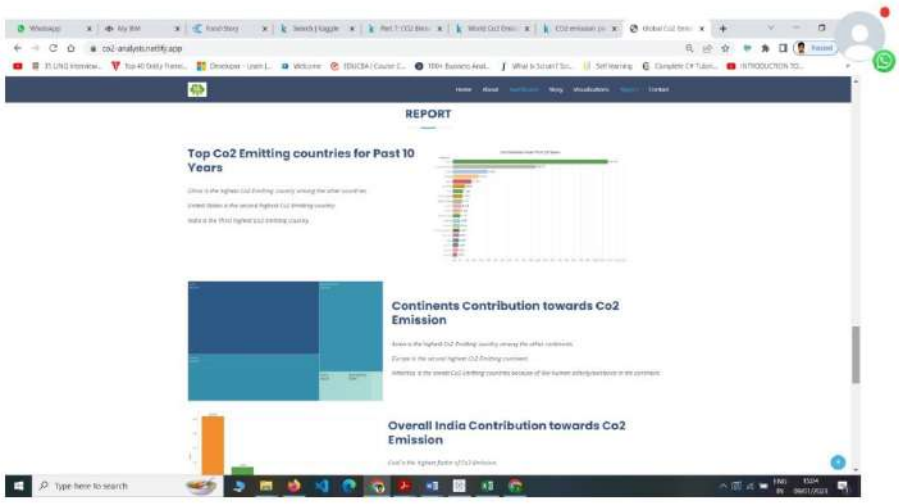
Activity 1: Dashboard and Story embed with UI :




DASHBOARD


VISUALIZATIONS
REPORT





Milestone 9: Project Demonstration & Documentation

Below mentioned deliverables to be submitted along with other deliverables

Activity 1 :- Record explanation Video for project end to end solution

Activity 2 :- Project Documentation-Step by step project development procedur