

**TRACING THE GROWTH OF THE  
GLOBAL COMMUNITY: A POPULATION  
FORECASTING ANALYSIS**

**COMPLETED BY:**

**V .KALAI SELVI**  
**K .MONISHA**  
**R .REXALINE**  
**D .AKASH**

**Tracing the Growth of the Global  
Community: A Population Forecasting  
Analysis**

# INTRODUCTION

## 1.1 Overview

The world's population is more than three times larger than it was in the mid-twentieth century. The global human population reached 8.0 billion in mid-November 2022 from an estimated 2.5 billion people in 1950, adding 1 billion people since 2010 and 2 billion since 1998. The world's population is expected to increase by nearly 2 billion persons in the next 30 years, from the current 8 billion to 9.7 billion in 2050 and could peak at nearly 10.4 billion in the mid-2080s. This dramatic growth has been driven largely by increasing numbers of people surviving to reproductive age, the gradual increase in human lifespan, increasing urbanization, and accelerating migration. Major changes in fertility rate have accompanied this growth. These trends will have far-reaching implications for generations to come.

## Project Flow :

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

### • Define Problem / Problem Understanding

- Specify the business problem
- Business requirements
- Literature Survey
- Social or Business Impact.

### • Data Collection & Extraction from Database

- Collect the dataset,
- Storing Data in DB
- 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**

- Amount of Data Rendered to DB
  - Utilization of Data Filters o 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: Define Problem / Problem Understanding**

### **Activity 1: Specify the business problem**

### **Activity 2: Business requirements**

The business requirements for ‘Tracing the growth of global community’ includes

1. Accurate data on population growth and demographics for multiple countries and regions.
2. The ability to analyze and forecast population growth trends over a specific time period.
3. The ability to identify key factors influencing population growth and demographic changes.
4. The ability to present the data and analysis in a clear and visually appealing format, such as charts and graphs.
5. The ability to integrate the data and analysis with other relevant business information.
6. The ability to use the data and analysis to inform strategic decision-making for the company or organization

### **Activity 3:**

A literature survey is a method of researching existing literature and studies related to a specific topic. In the context of 'Tracing the growth of a global community' a literature survey would involve reviewing studies and articles that have been published on the topic of population and demographics, as well as studies specific population increase in cities. The literature survey would include sources such as academic journals, industry reports, and online articles. It would aim to identify key performance indicators (KPIs)

### **Activity 4: Social or Business Impact.**

#### **Social Impact:**

Improve the infrastructure and strategies through which the cities could manage the population.

#### **Business Model/Impact:**

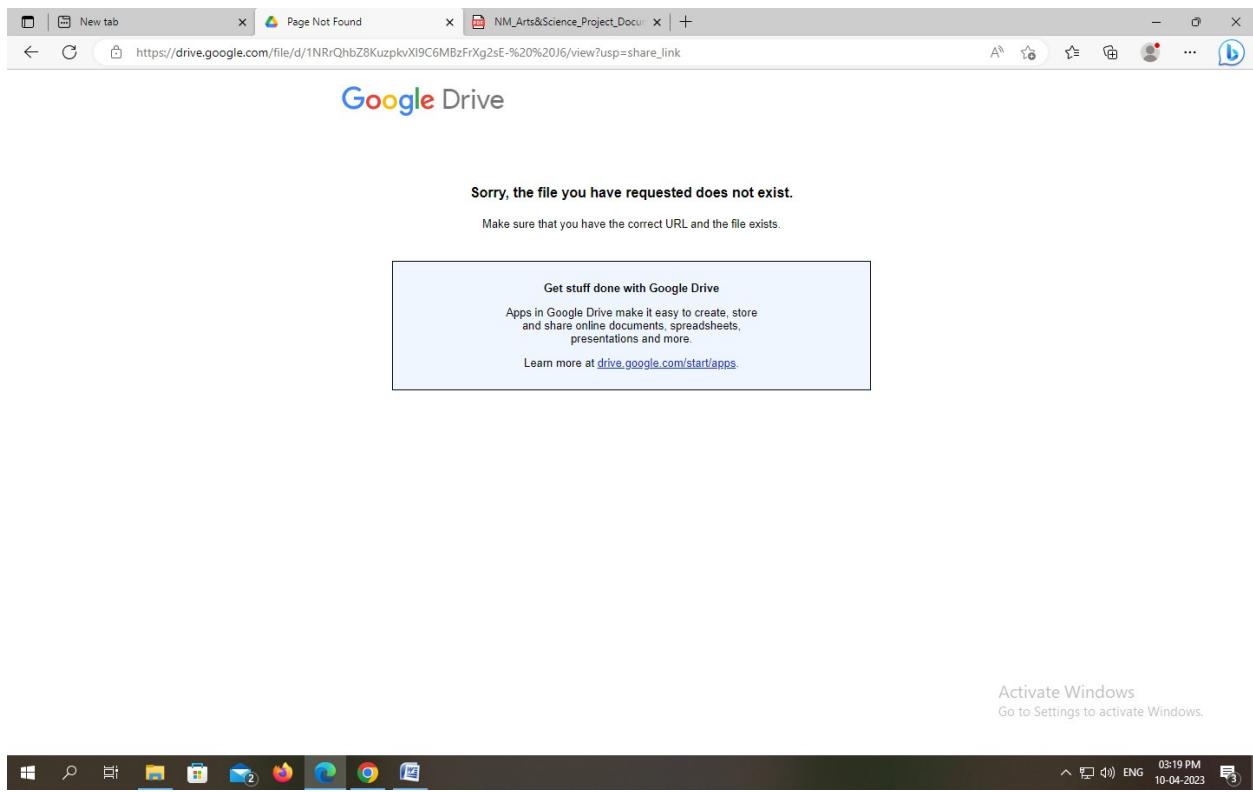
Improved strategic planning: By understanding population growth trends and demographics, a business can make more informed decisions about where to invest resources and expand operations.

## **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 Please use the link to download the dataset:**

[https://drive.google.com/file/d/1NRrQhbZ8KuzpkvXI9C6MBzFrXg2sE-J6/view?usp=share\\_link](https://drive.google.com/file/d/1NRrQhbZ8KuzpkvXI9C6MBzFrXg2sE-J6/view?usp=share_link)



### Activity 1.1: Understand the data

The data was compiled by UNSD(united nations statistics division).

To understand more about the dataset, please go through this :

<https://datahub.io/core/population-city>

**Data Files**

Download files in this dataset

File	Description	Size	Last changed	Download
<a href="#">unsd-citypopulation-year-both</a>		2MB		<a href="#">csv (2MB)</a> , <a href="#">json (5MB)</a>
<a href="#">unsd-citypopulation-year-fm</a>		3MB		<a href="#">csv (3MB)</a> , <a href="#">json (8MB)</a>
<a href="#">population-city.zip</a>	Compressed versions of dataset. Includes normalized CSV and JSON files.	2MB		<a href="#">zip (2MB)</a>

**unsd-citypopulation-year-both** ⓘ

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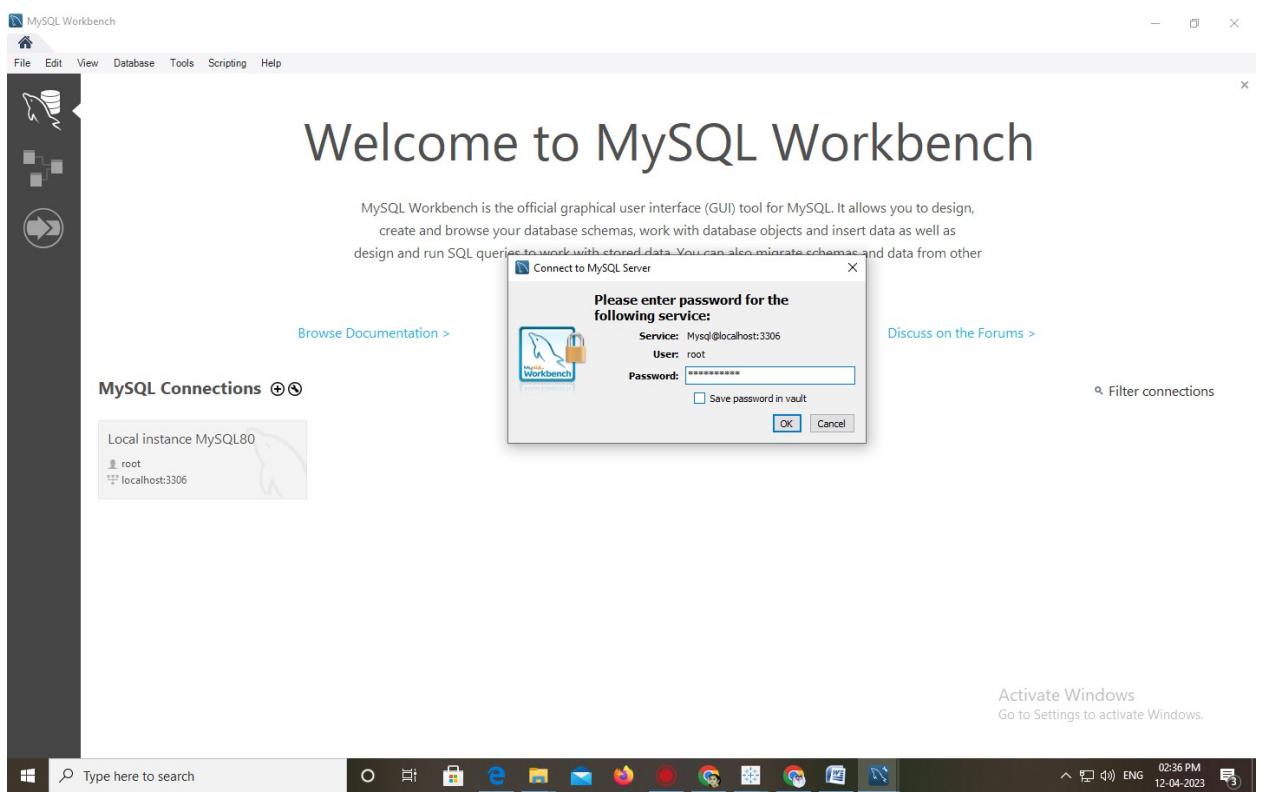
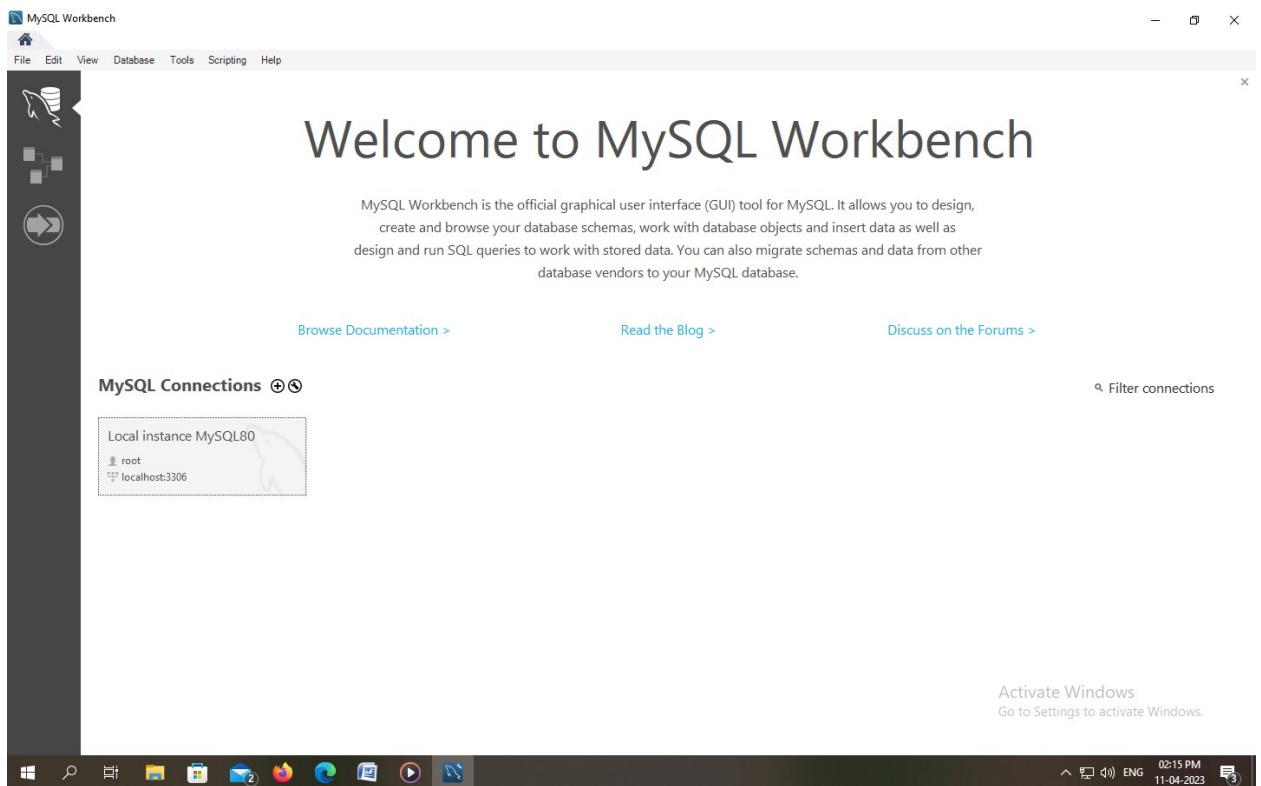
Share: <https://datahub.io/core/population-city> | Embed: <iframe src="https://datahub.io/core/population-city"></iframe>

Country or Area	Year	Area	Sex	City	City type	Record Type	Reliability	Source Year	Value	Value Footnotes
Åland Islands	2013	Total	Both Sexes	MARIEHAMN	City proper	Estimate - de jure	Final figure, complete	2014	11370	
Åland Islands	2012	Total	Both Sexes	MARIEHAMN	City proper	Estimate - de jure	Final figure, complete	2013	11304.5	
Åland Islands	2011	Total	Both Sexes	MARIEHAMN	City proper	Estimate - de jure	Final figure, complete	2012	11226.5	
Åland Islands	2010	Total	Both Sexes	MARIEHAMN	City proper	Estimate - de jure	Final figure, complete	2011	11156.5	
Åland Islands	2009	Total	Both Sexes	MARIEHAMN	City proper	Estimate - de jure	Final figure, complete	2009	11064	
Åland Islands	2008	Total	Both Sexes	MARIEHAMN	City proper	Estimate - de jure	Final figure, complete	2009	10954	
Åland Islands	2007	Total	Both Sexes	MARIEHAMN	City proper	Estimate - de jure	Final figure, complete	2007	10863	Activate Windows Go to Settings to activate Windows.

Now you can request additional data and/or customized columns! [Try It Now!](#)

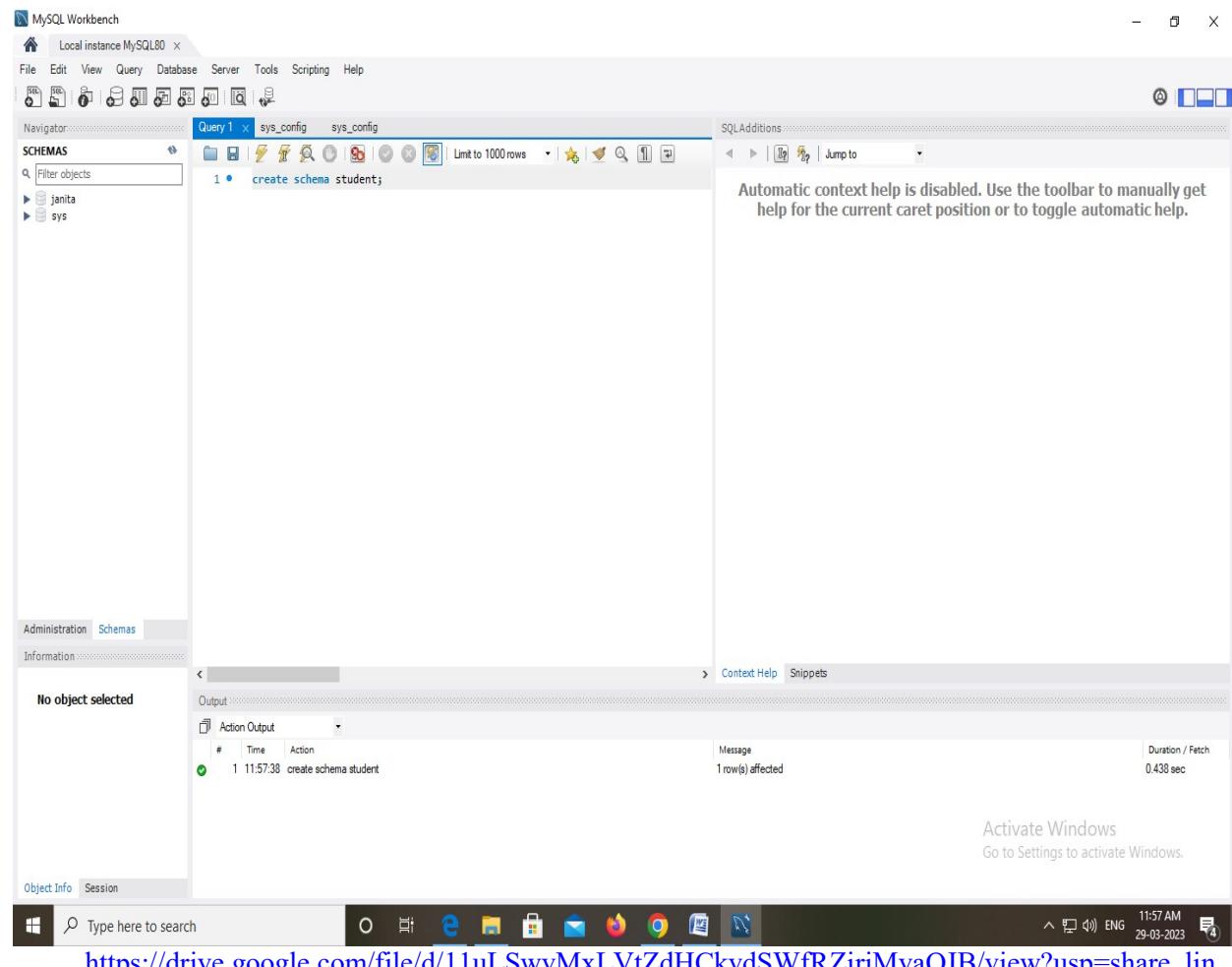
## Activity 2:

Storing Data in DB & Perform SQL Operations Explanation video link:  
<https://drive.google.com/file/d/1uUaPt7PE3t-jPk4txwyGsbVDkcXzDwOl/view?usp=sharing>



## Activity 3:

Connect DB with Tableau Explanation video link:



[https://drive.google.com/file/d/11uLSwvMxLVtZdHCkvdSWfRZjriMvaQJB/view?usp=share\\_link](https://drive.google.com/file/d/11uLSwvMxLVtZdHCkvdSWfRZjriMvaQJB/view?usp=share_link)

UN population data - Microsoft Excel

Country	Year	Area	Sex	City	City type	Record Ty	Reliability	Source Ye	Populatio	Value	Footnotes
Åland Isla	2013	Total	Male	MARIEHAI	City prop	Estimate - Final	figur	2014	5445		
Åland Isla	2013	Total	Female	MARIEHAI	City prop	Estimate - Final	figur	2014	5925		
Åland Isla	2012	Total	Male	MARIEHAI	City prop	Estimate - Final	figur	2013	5408		
Åland Isla	2012	Total	Female	MARIEHAI	City prop	Estimate - Final	figur	2013	5896.5		
Åland Isla	2011	Total	Male	MARIEHAI	City prop	Estimate - Final	figur	2012	5363.5		
Åland Isla	2011	Total	Female	MARIEHAI	City prop	Estimate - Final	figur	2012	5863		
Åland Isla	2010	Total	Male	MARIEHAI	City prop	Estimate - Final	figur	2011	5327		
Åland Isla	2010	Total	Female	MARIEHAI	City prop	Estimate - Final	figur	2011	5829.5		
Åland Isla	2009	Total	Male	MARIEHAI	City prop	Estimate - Final	figur	2009	5264		
Åland Isla	2009	Total	Female	MARIEHAI	City prop	Estimate - Final	figur	2009	5800		
Åland Isla	2008	Total	Male	MARIEHAI	City prop	Estimate - Final	figur	2009	5189		
Åland Isla	2008	Total	Female	MARIEHAI	City prop	Estimate - Final	figur	2009	5765		
Åland Isla	2007	Total	Male	MARIEHAI	City prop	Estimate - Final	figur	2007	5151		
Åland Isla	2007	Total	Female	MARIEHAI	City prop	Estimate - Final	figur	2007	5712		
Åland Isla	2000	Total	Male	MARIEHAI	City prop	Census - c	Final	figur	2009	4943	
Åland Isla	2000	Total	Female	MARIEHAI	City prop	Census - c	Final	figur	2009	5545	
Albania	2011	Total	Male	Durrâs	City prop	Census - c	Final	figur	2013	56511	
Albania	2011	Total	Male	TIRANA	City prop	Census - c	Final	figur	2013	203239	
Albania	2011	Total	Female	Durrâs	City prop	Census - c	Final	figur	2013	56738	
Albania	2011	Total	Female	TIRANA	City prop	Census - c	Final	figur	2013	215256	
Albania	2003	Total	Male	TIRANA	City prop	Estimate - Final	figur	2004	194006		
Albania	2003	Total	Female	TIRANA	City prop	Estimate - Final	figur	2004	198857		
American	2000	Total	Male	PAGO PAC	City prop	Census - c	Final	figur	2005	2086	1
American	2000	Total	Female	PAGO PAC	City prop	Census - c	Final	figur	2005	2192	1
Andorra	2011	Total	Male	ANDORRA	Urban agg	Estimate - Final	figur	2011	11056		
Andorra	2011	Total	Female	ANDORRA	Urban agg	Estimate - Final	figur	2011	11149		
Andorra	2010	Total	Male	ANDORRA	Urban agg	Estimate - Final	figur	2010	11750		
Andorra	2010	Total	Female	ANDORRA	Urban agg	Estimate - Final	figur	2010	11755		
Andorra	2009	Total	Male	ANDORRA	Urban agg	Estimate - Final	figur	2009	12539		
Andorra	2009	Total	Female	ANDORRA	Urban agg	Estimate - Final	figur	2009	12240		
Andorra	2008	Total	Male	ANDORRA	Urban agg	Estimate - Final	figur	2008	12437		

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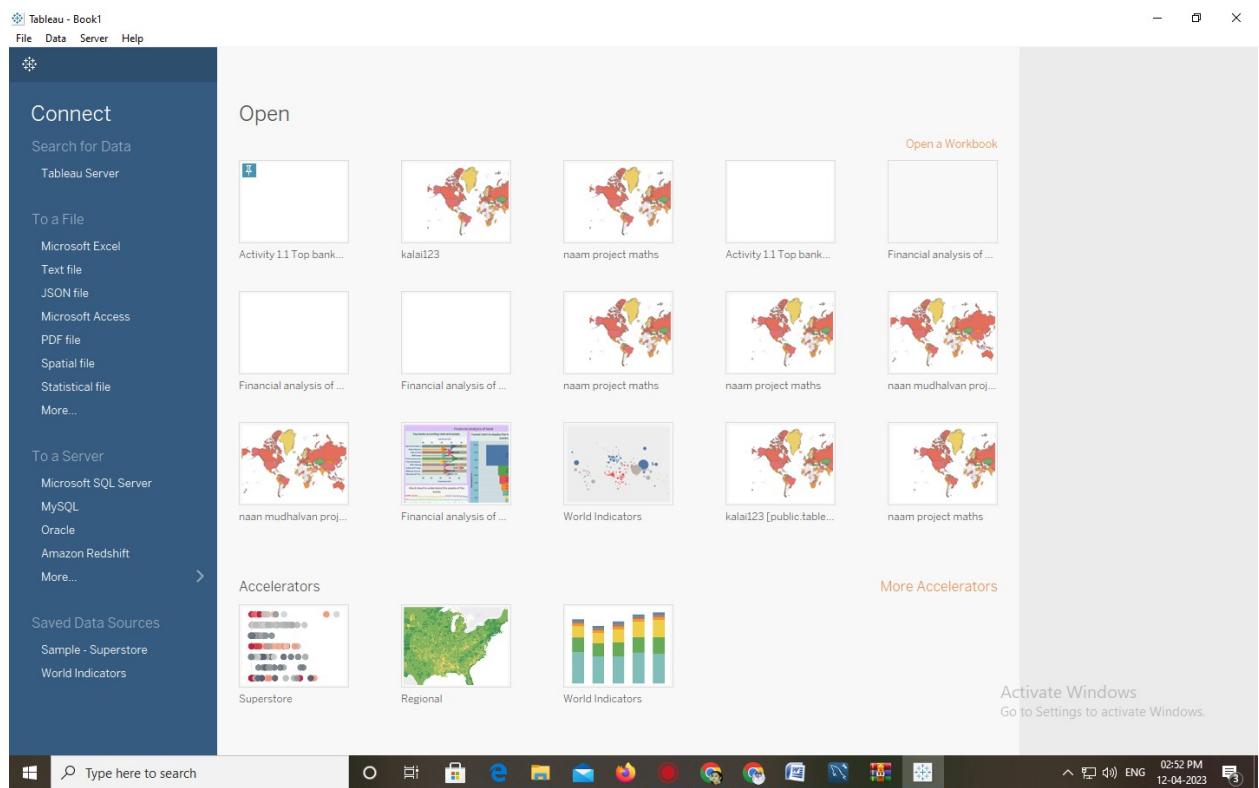
The screenshot shows the Tableau Data Source interface. On the left, the 'Connections' pane lists 'UN population data' (Text file). The main area displays 'UN population data.csv' with 28441 rows. A preview table shows columns: Country or Area, Year, Area, Sex, City, and City type. The bottom status bar shows 'Janita P' and the date '12-04-2023'.

Country or Area	Year	Area	Sex	City	City type
Land Islands	2013	Total	Male	MARIEHAMN	City p
Land Islands	2013	Total	Female	MARIEHAMN	City p
Land Islands	2012	Total	Male	MARIEHAMN	City p
Land Islands	2012	Total	Female	MARIEHAMN	City p
Land Islands	2011	Total	Male	MARIEHAMN	City p
Land Islands	2011	Total	Female	MARIEHAMN	City p
Land Islands	2010	Total	Male	MARIEHAMN	City p

## Milestone 3: 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 our analysis.



#### 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.

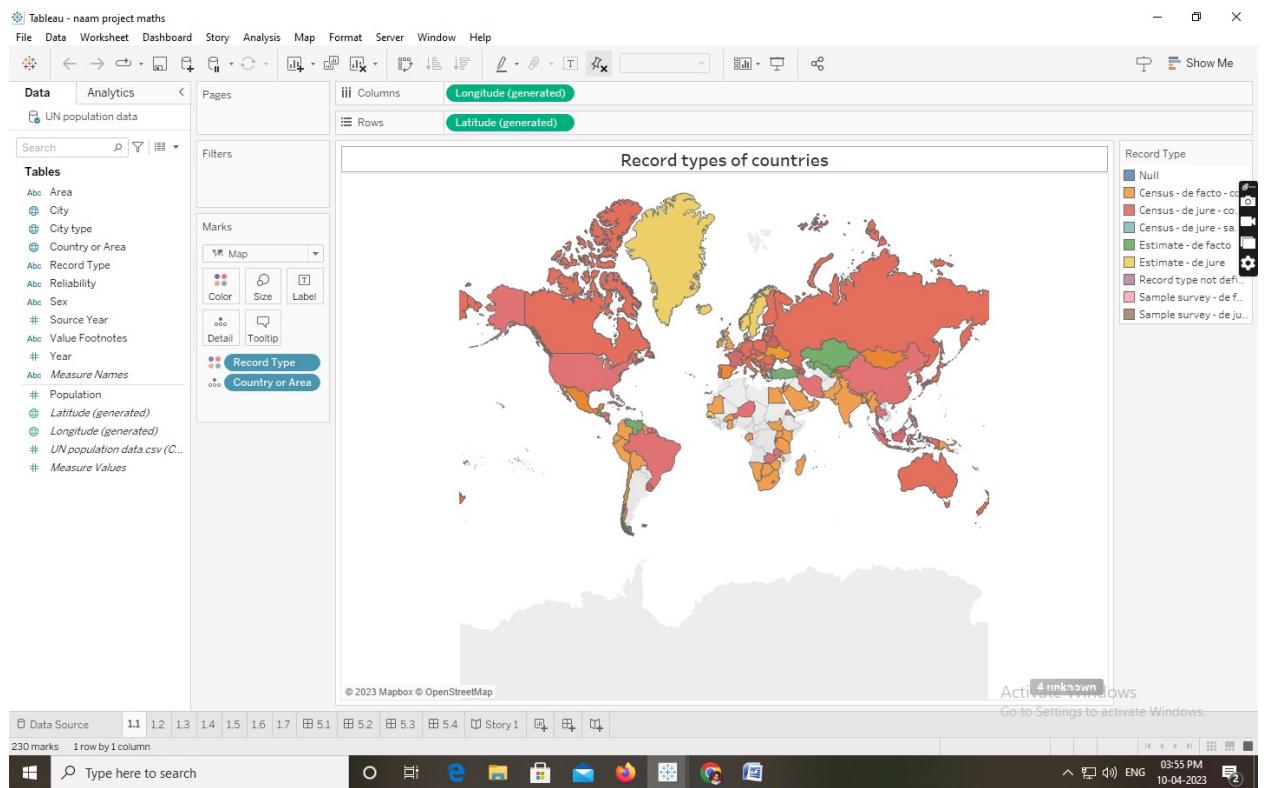
#### Activity 1 No of Unique Visualizations

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 population growth in the cities, 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

#### Activity 1.1: Population records by type of countries

**Explanation video link:**

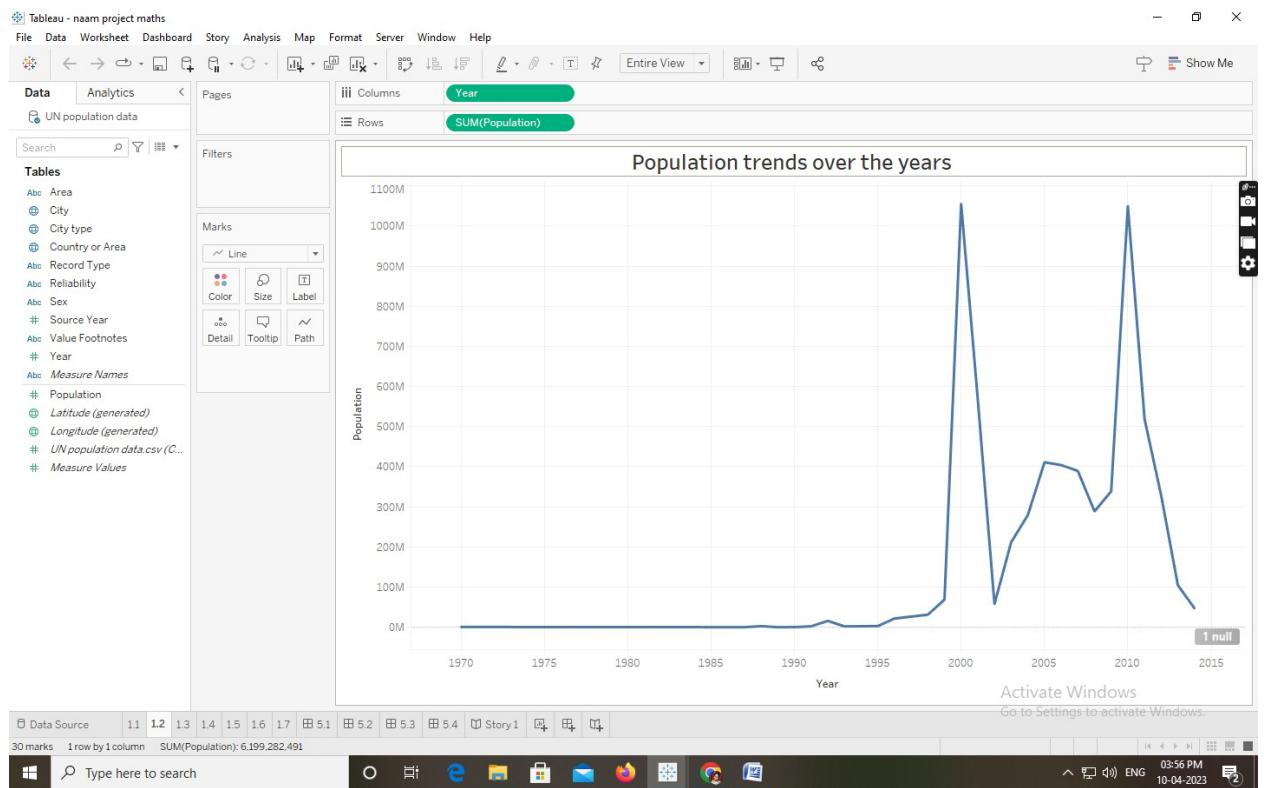
[https://drive.google.com/file/d/18eZJD4Xkr0Cd1OPCg4fXV2j9m5AJTlyx/view?usp=share\\_link](https://drive.google.com/file/d/18eZJD4Xkr0Cd1OPCg4fXV2j9m5AJTlyx/view?usp=share_link)



## Activity 1.2: Population trends over the years

**Explanation video link:**

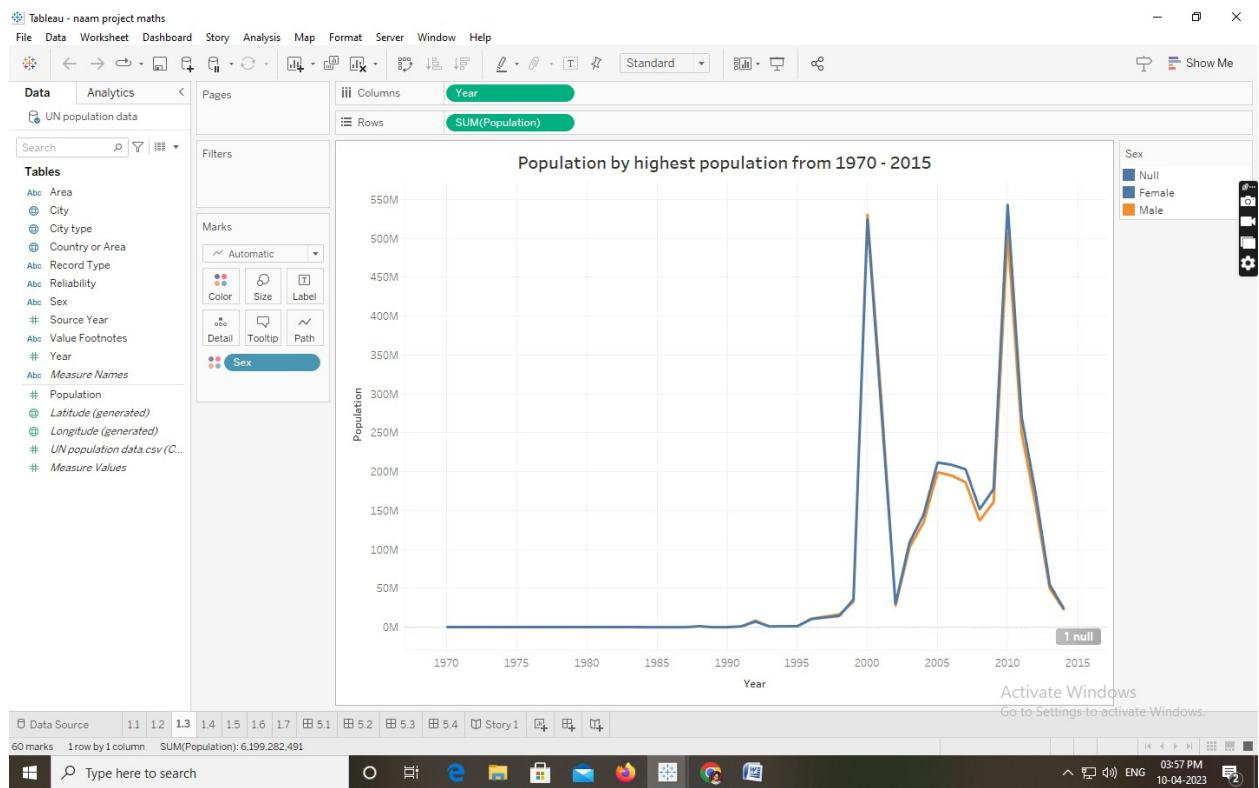
[https://drive.google.com/file/d/1qNvsp6tLQTG1KaZU7XeM6oya8vehHEvU/view?usp=share\\_link](https://drive.google.com/file/d/1qNvsp6tLQTG1KaZU7XeM6oya8vehHEvU/view?usp=share_link)



### Activity 1.3: Population trends over the years by sex

**Explanation video link:**

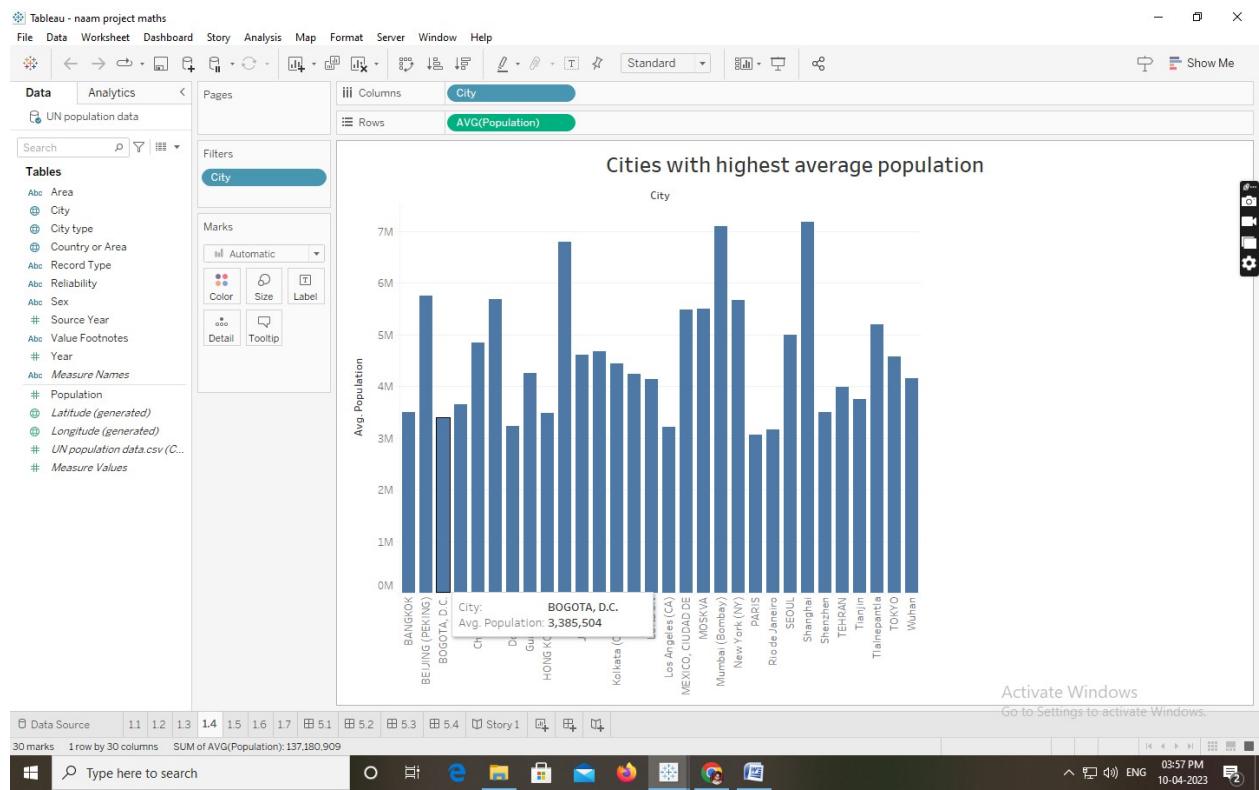
[https://drive.google.com/file/d/1hw1uL02MBM5Us8umvV725\\_K4Z7XHN0fr/view?usp=share\\_link](https://drive.google.com/file/d/1hw1uL02MBM5Us8umvV725_K4Z7XHN0fr/view?usp=share_link)



## Activity 1.4: Cities with highest average populations

**Explanation video link:**

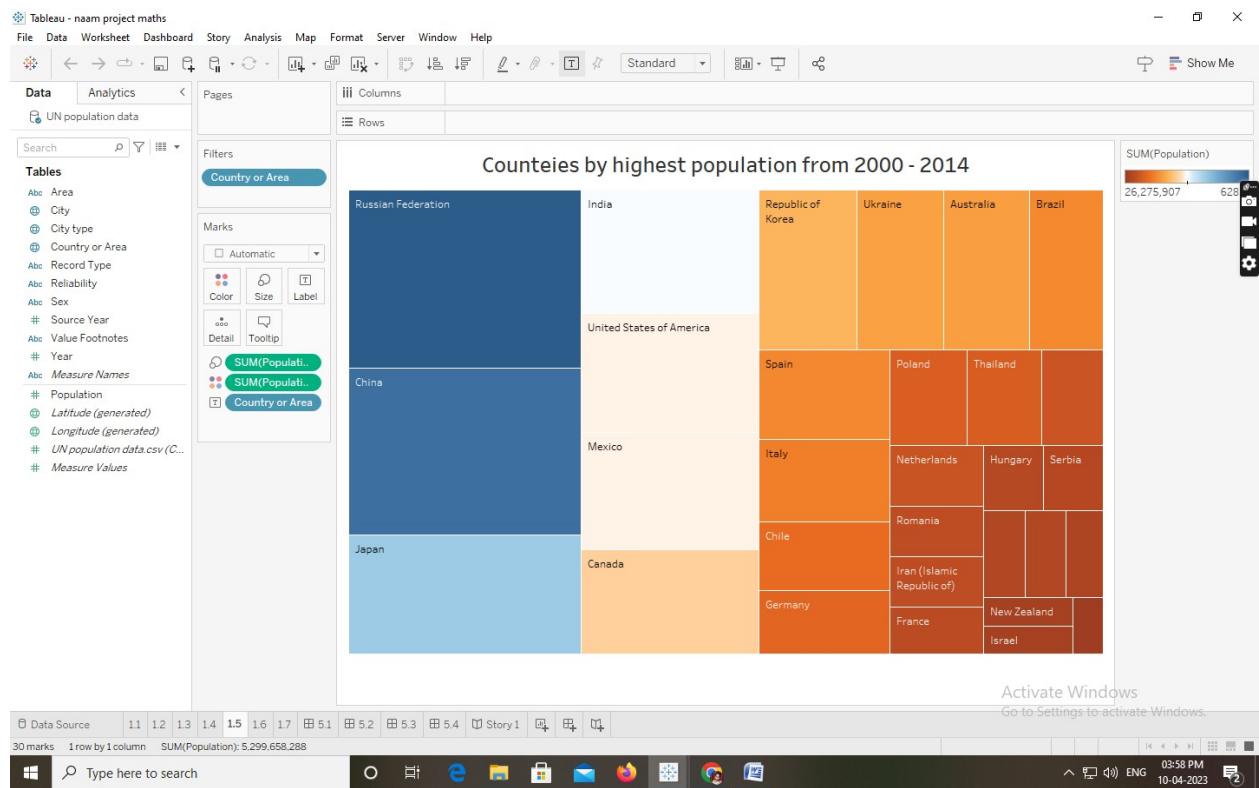
[https://drive.google.com/file/d/1ALi9nhNqDwONdMoglkiTKzU3xUY2CIH4/view?usp=share\\_link](https://drive.google.com/file/d/1ALi9nhNqDwONdMoglkiTKzU3xUY2CIH4/view?usp=share_link)



## Activity 1.5: Countries with highest average population from 200-2014

Explanation video link:

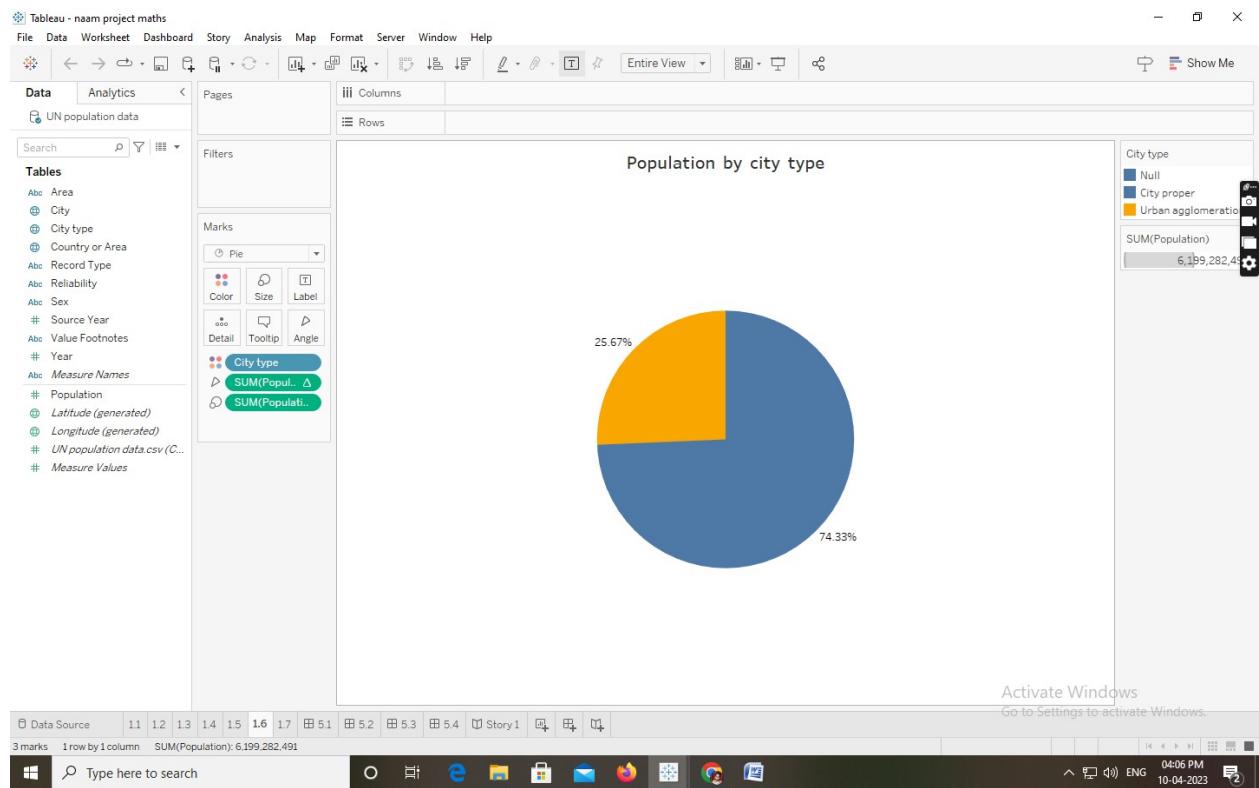
[https://drive.google.com/file/d/1txARO5s9SKAh-5LnevRdrhkwgUISgXsk/view?usp=share\\_link](https://drive.google.com/file/d/1txARO5s9SKAh-5LnevRdrhkwgUISgXsk/view?usp=share_link)



## Activity 1.6: Population by city type

**Explanation video link:**

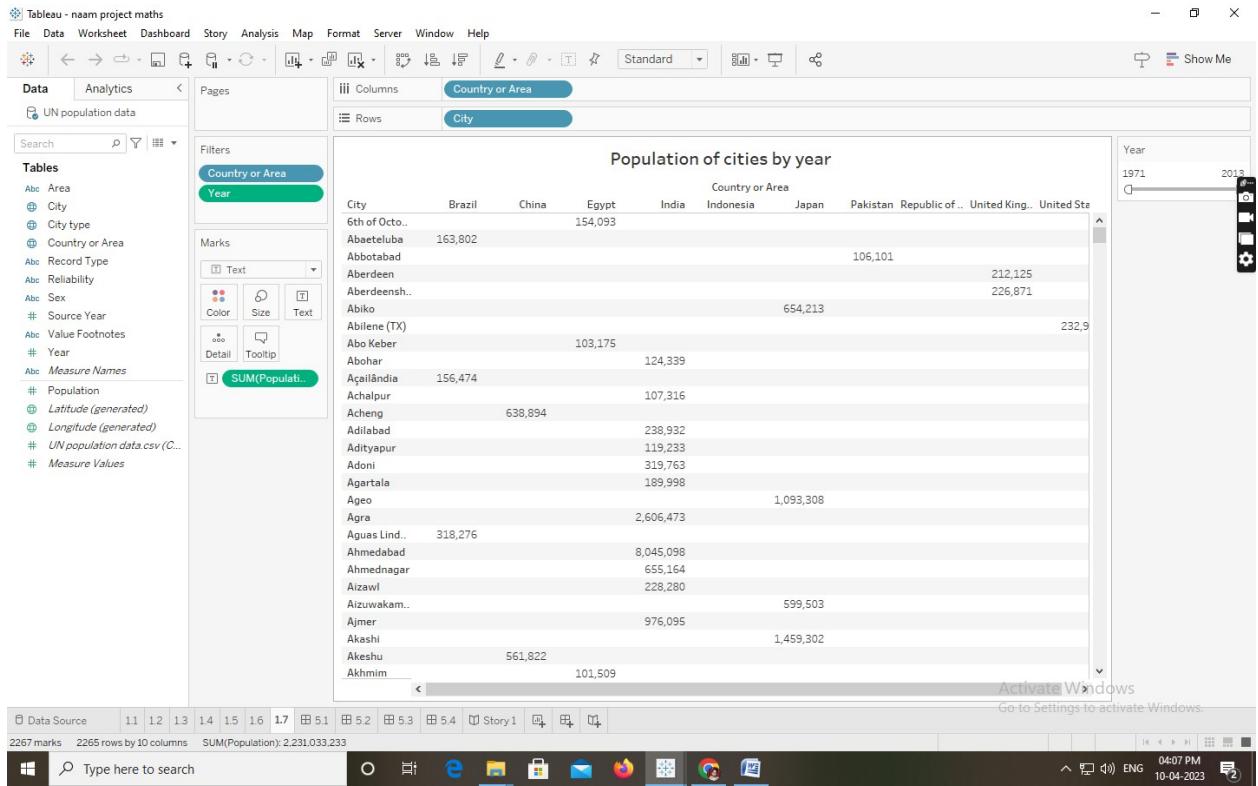
[https://drive.google.com/file/d/1kp44ar5-7g7HqtQ5GIRdyRFW7VqwKr\\_V/view?usp=share\\_link](https://drive.google.com/file/d/1kp44ar5-7g7HqtQ5GIRdyRFW7VqwKr_V/view?usp=share_link)



## Activity 1.7: Population of cities by year

**Explanation video link:**

[https://drive.google.com/file/d/1d5HRSXJmnf5DEtl1Vh7l71MNHN4InLKr/view?usp=share\\_link](https://drive.google.com/file/d/1d5HRSXJmnf5DEtl1Vh7l71MNHN4InLKr/view?usp=share_link)



## 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 population growth in the cities is crucial to ensure that the information is easily understandable and actionable. Key considerations for designing a responsive and effective dashboard include user-centered design, clear and concise information, interactivity, data-driven approach, accessibility, customization, and security. The goal is to create a dashboard that is user-friendly, interactive, and data-driven,

providing actionable insights on the population demographics of different cities across the world. Once you have created views on different sheets in Tableau, you can pull them into a dashboard.

Explanation video link:

[https://drive.google.com/file/d/1NfA20JXwSveCVwxUEBQd9b7Gc5sUuziT/view?usp=share\\_link](https://drive.google.com/file/d/1NfA20JXwSveCVwxUEBQd9b7Gc5sUuziT/view?usp=share_link)

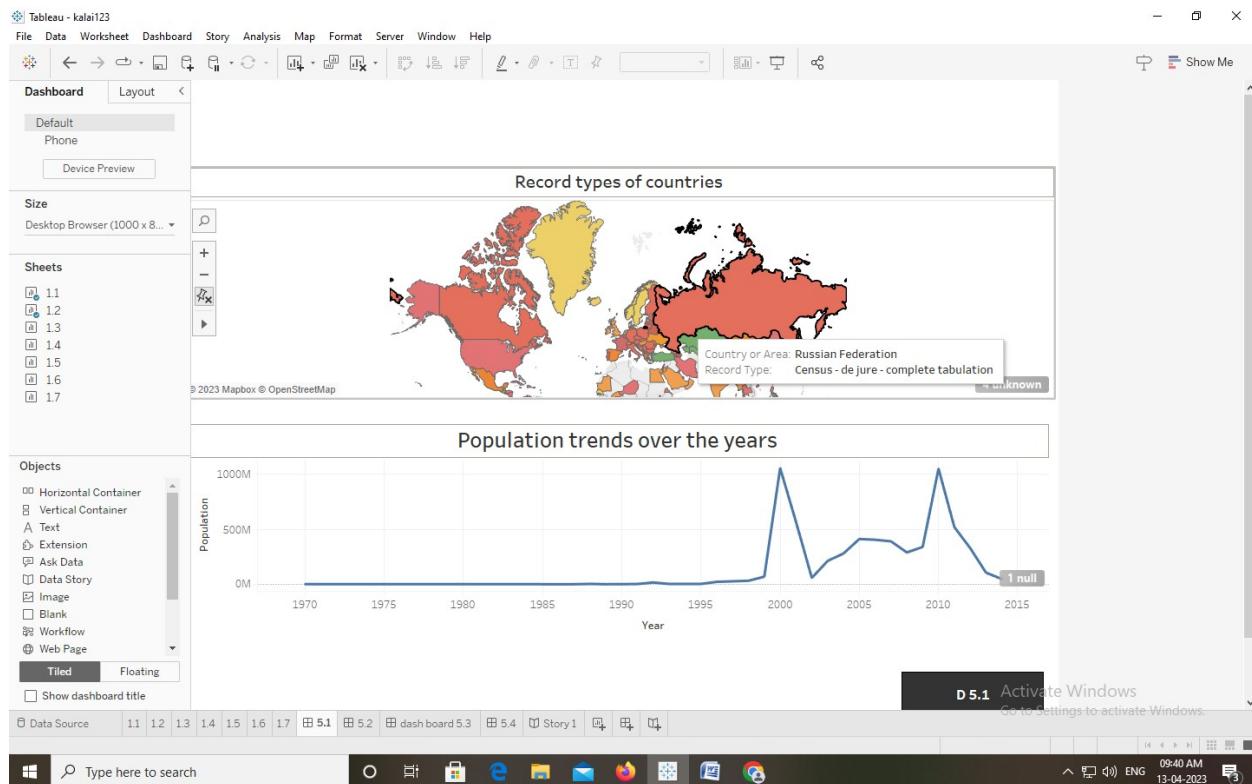


Tableau - naam project maths

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Dashboard Layout < Show Me

Default Phone Device Preview

Size Desktop Browser (1000 x 800)

Sheets

- 11
- 12
- 13
- 14
- 15
- 16
- 17

Objects

- Horizontal Container
- Vertical Container
- A Text
- Extension
- Ask Data
- Data Story
- Image
- Blank
- Workflow
- Web Page

Tiled Floating Show dashboard title

Record types of countries

© 2023 Mapbox © OpenStreetMap 4 unknown

Population trends over the years

Population

Year

Population by highest population from 1970 - 2015

Population

Year

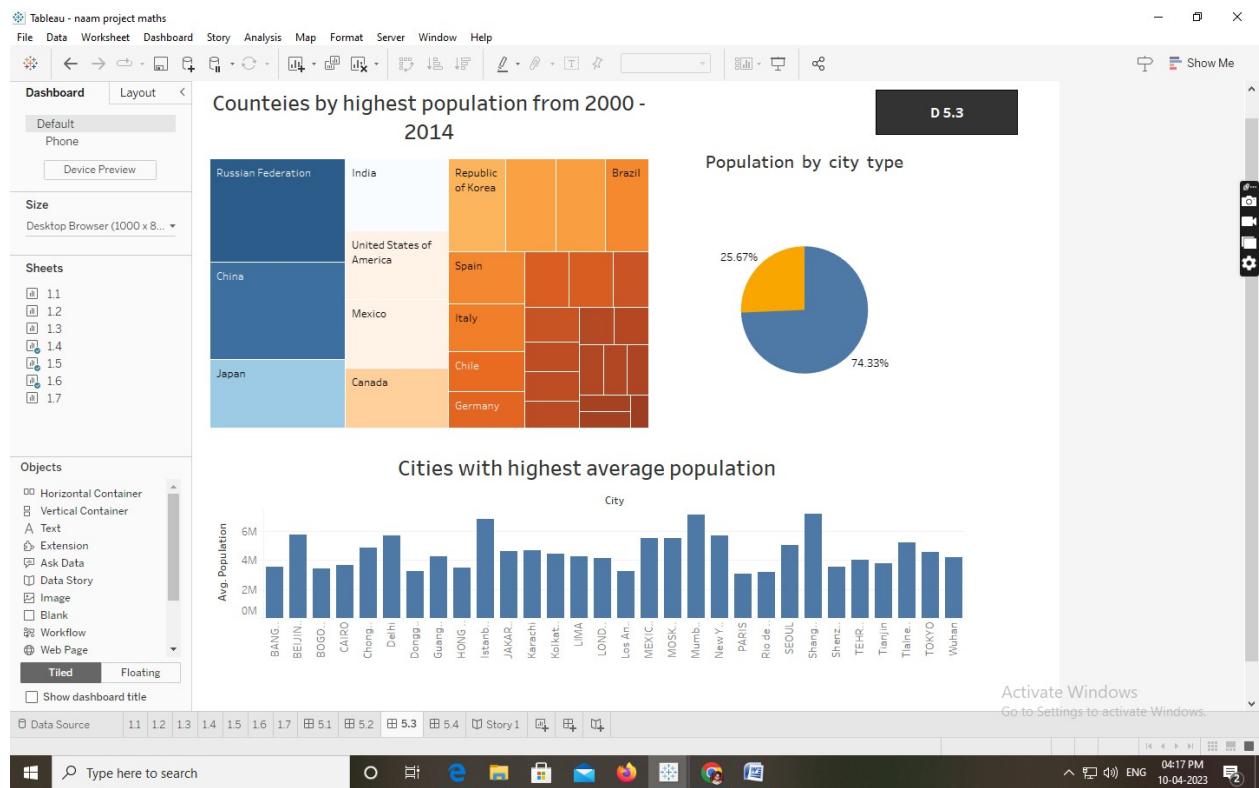
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Data Source 11 12 13 14 15 16 17 5.1 5.2 5.3 5.4 Story 1



## Milestone 6: Story

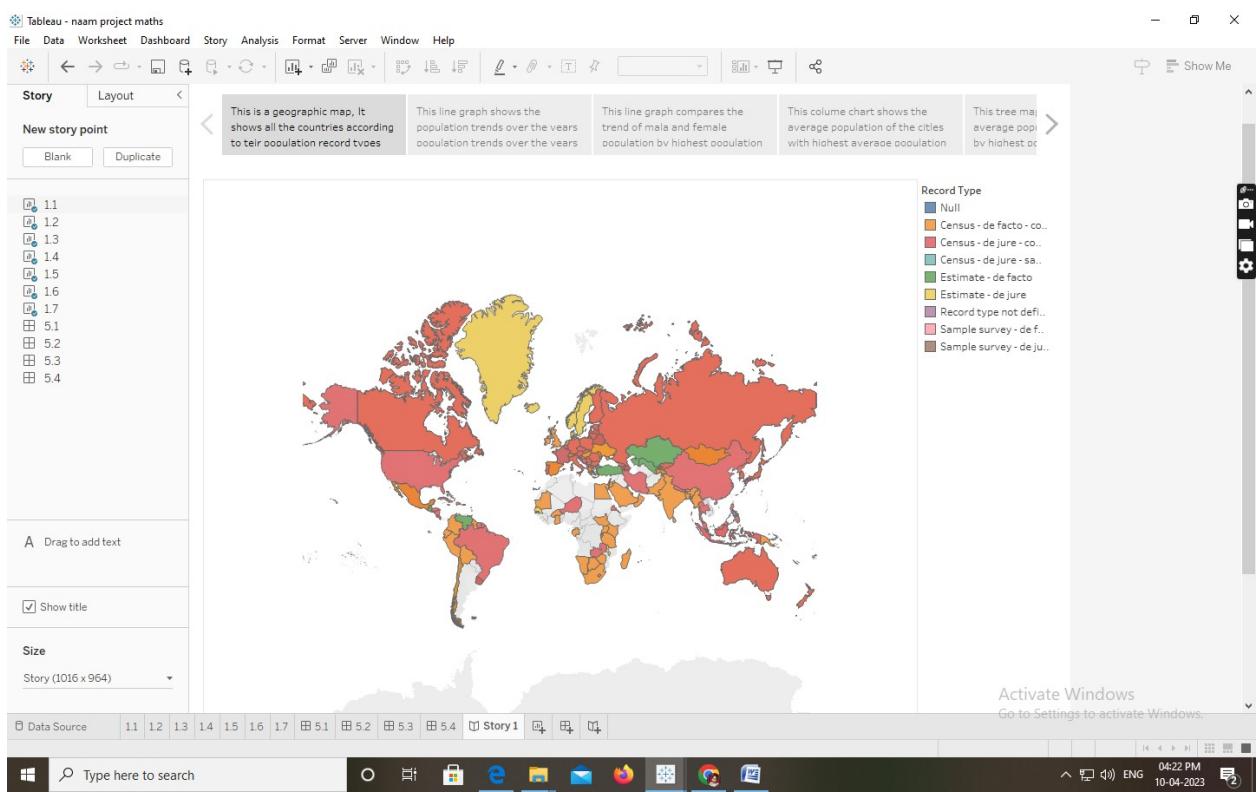
A data story is a way of presenting data and analysis in a narrative format, with the goal of making the information more engaging and easier to understand. A data story typically includes a clear introduction that sets the stage and explains the context for the data, a body that presents the data and 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.

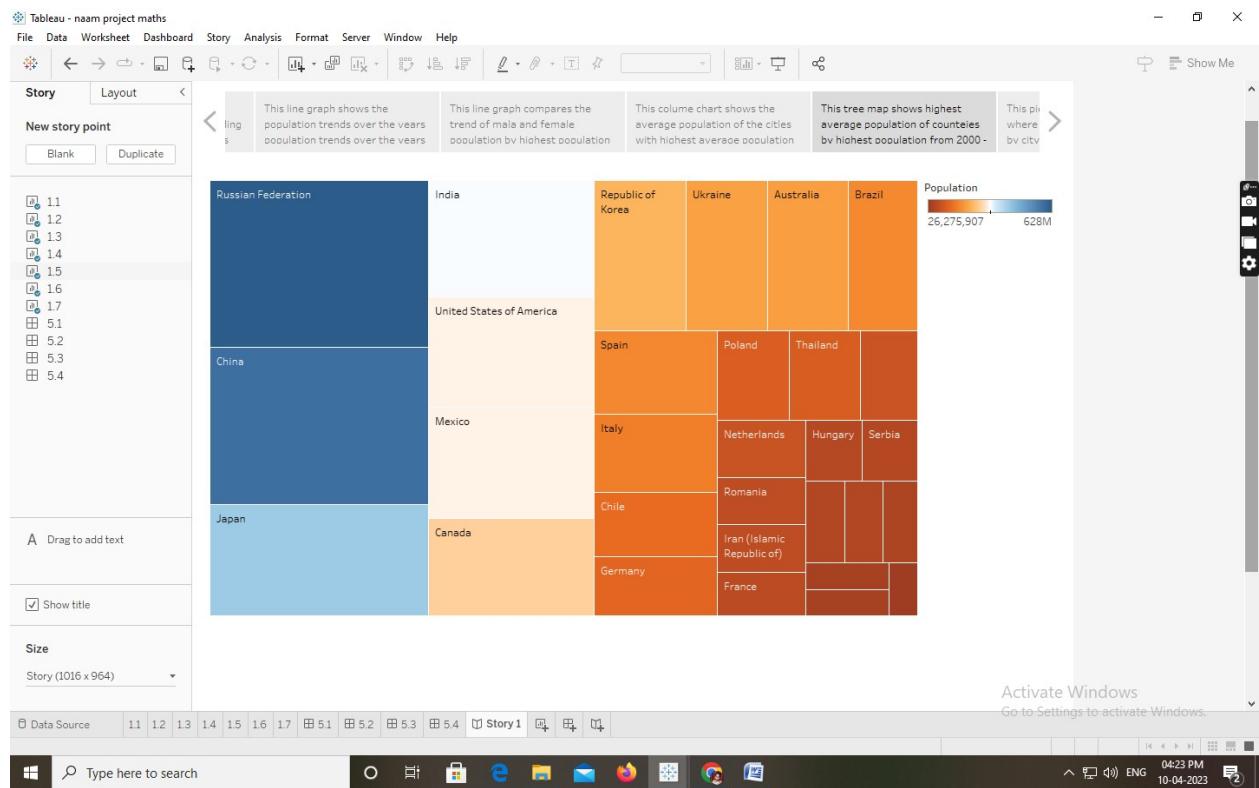
### Activity:1- No of Scenes of Story

The number of scenes in a storyboard for a data visualization analysis of population growth across the cities ,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.

Explanation video link:

[https://drive.google.com/file/d/1RgEatbDQ4\\_UxGtonCNRUz0qbhwImykc1/view?usp=share\\_link](https://drive.google.com/file/d/1RgEatbDQ4_UxGtonCNRUz0qbhwImykc1/view?usp=share_link)

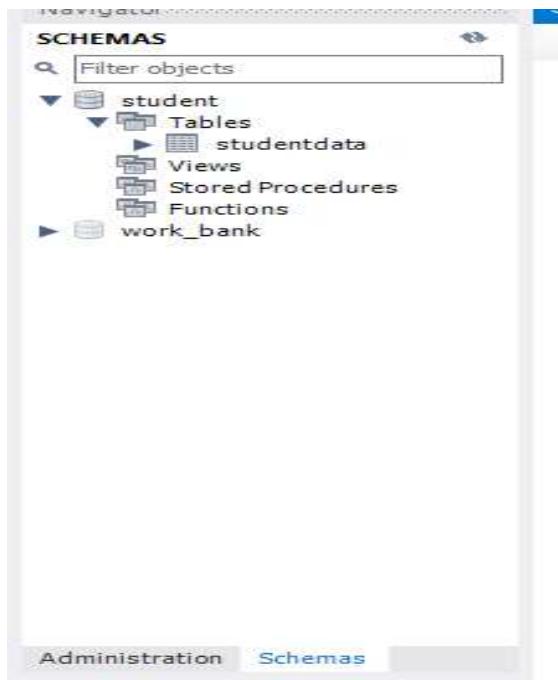


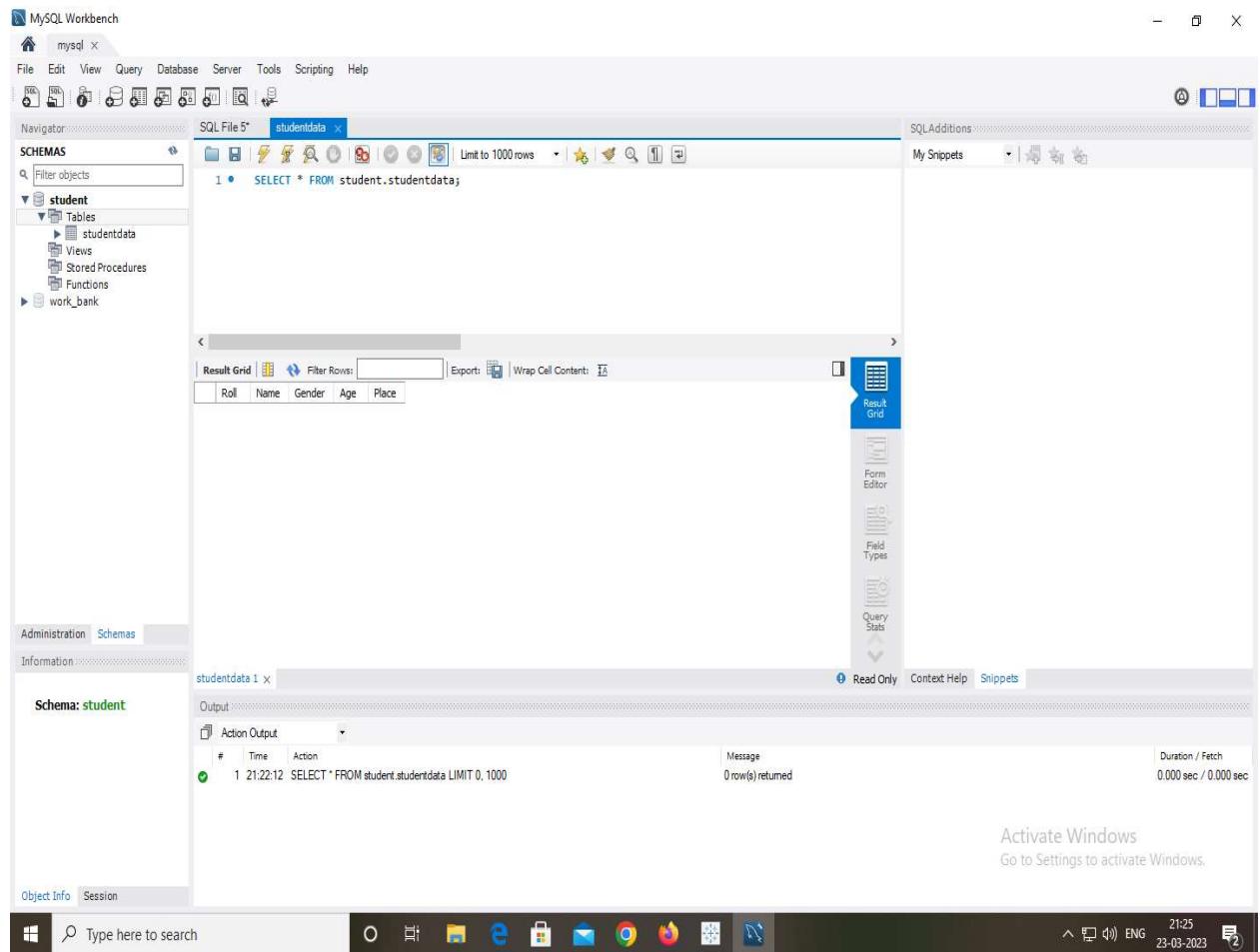


## Milestone 7: Performance Testing

### Activity 1: Amount of Data Rendered to DB

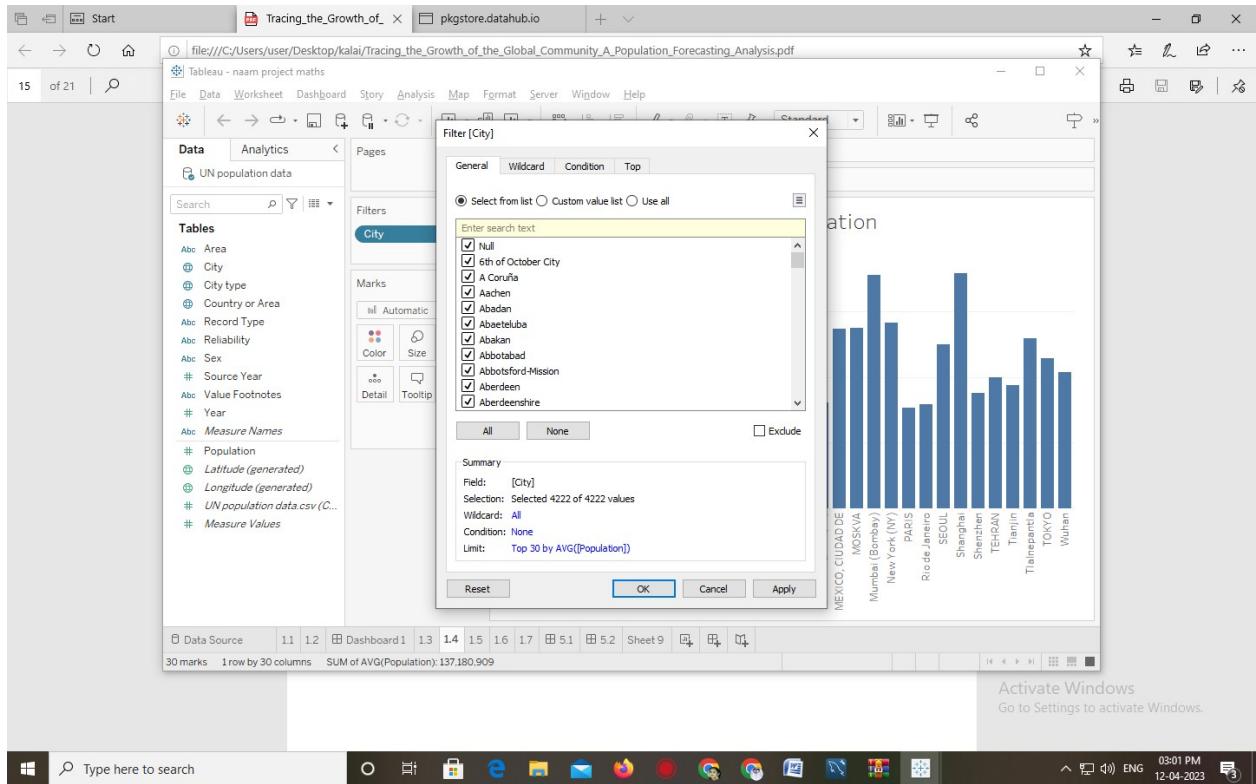
- The amount of data that is rendered to a database depends on the size of the dataset and the capacity of the database to store and retrieve data.
- Open the MySQL Workbench, go to the database then click to expand the tables, select the table and click on (i) button to get the information related to table such as column count, table rows etc.

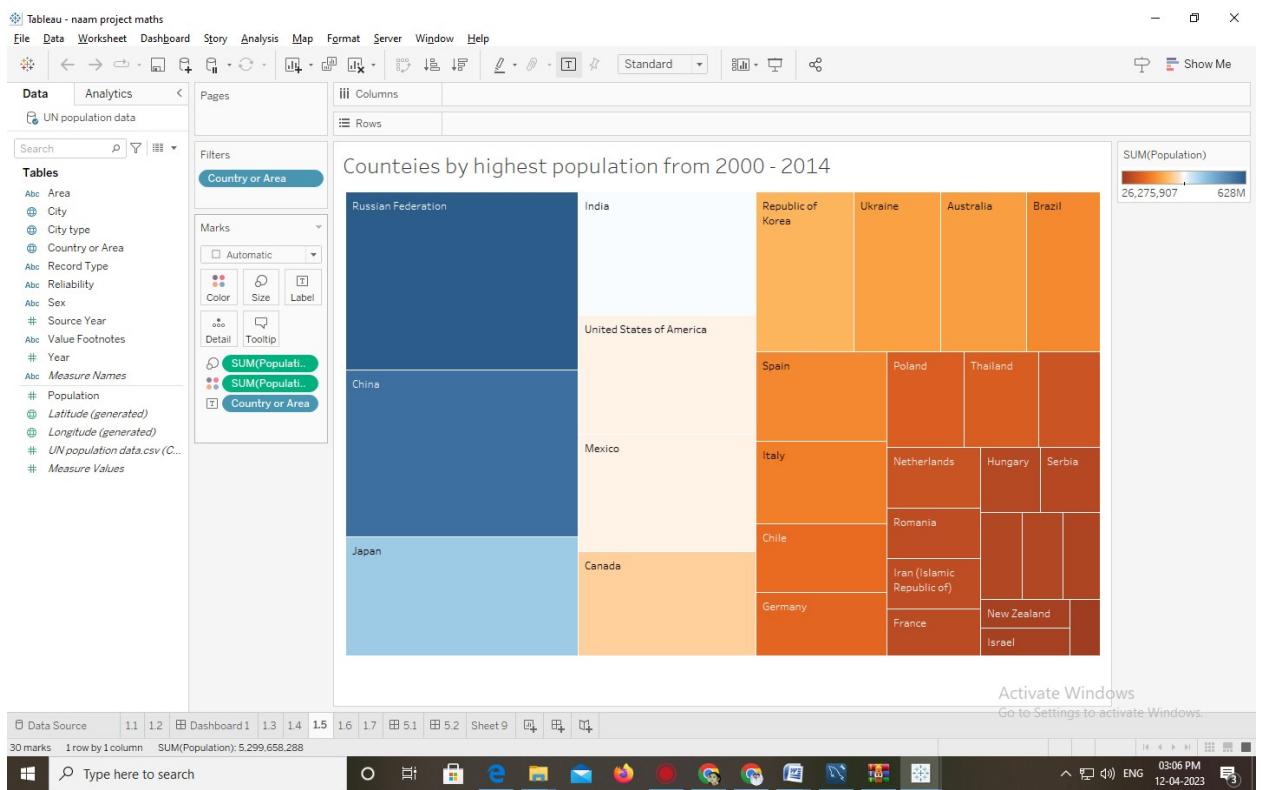
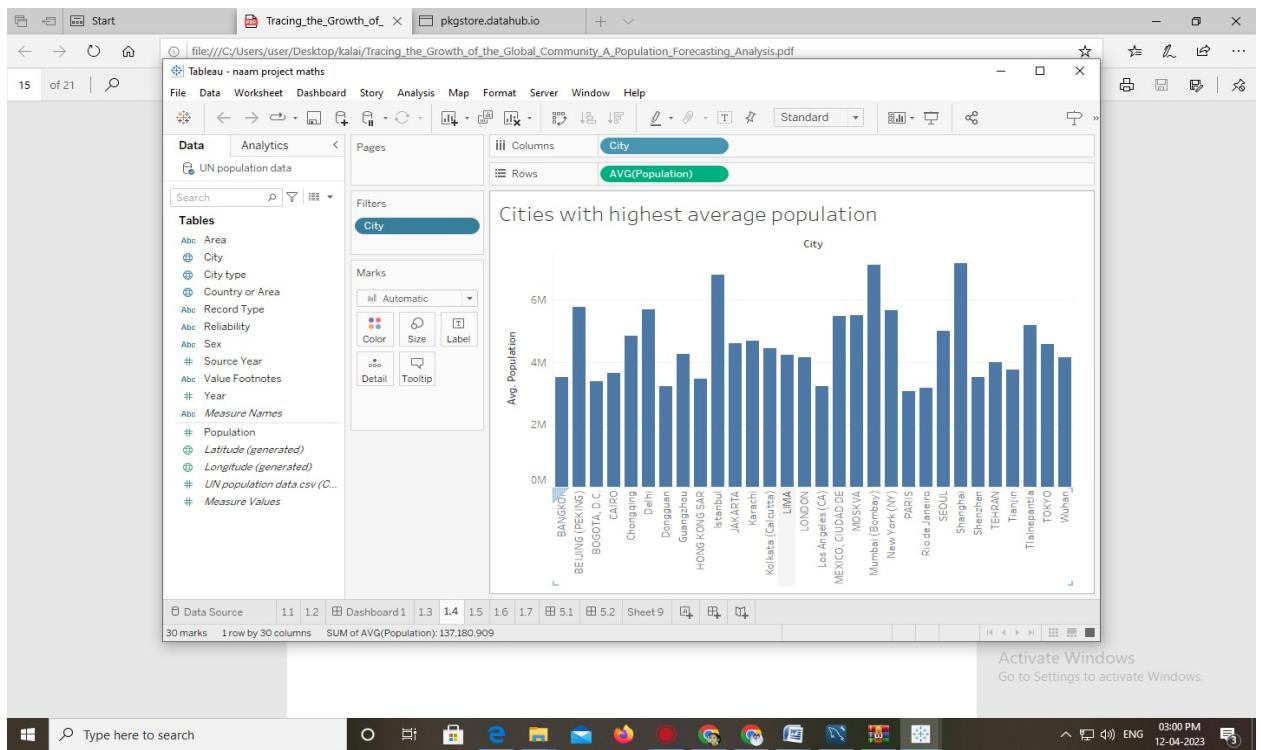




The amount of data that is rendered to a database depends on the size of the dataset and the capacity of the database to store and retrieve data with the help of the schemas in MySQL Workbench.

## Activity 2: Utilization of Data Filters





## Activity 3: No of Calculation Fields

The screenshot shows the Tableau Data pane. At the top, there are tabs for 'Data' and 'Analytics', with 'Data' selected. Below the tabs, it says 'UN population data'. There is a search bar and a refresh button. The main area is titled 'Tables' and lists the following items:

- Abc Area
- (@) City
- (@) City type
- (@) Country or Area
- Abc Record Type
- Abc Reliability
- Abc Sex
- # Source Year
- Abc Value Footnotes
- # Year
- Abc Measure Names
- # Population
- (@) Latitude (generated)
- (@) Longitude (generated)
- # UN population data.csv (C...)
- # Measure Values

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

Tableau - kalai123

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Dashboard Layout < Default Phone Device Preview

Size Desktop Browser (1000 x 800)

Sheets

- 11
- 12
- 13
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- 15
- 16
- 17
- Sheet1

Objects

- Horizontal Container
- Vertical Container
- A Text
- Extension
- Ask Data
- Data Story
- Image
- Blank
- Workflow
- Web Page

Tiled Floating Show dashboard title

Share via Tableau Server or Tableau Cloud

Server: https://public.tableau.com Connect Cancel

Quick Connect Tableau Cloud

Don't have a Tableau Server or Tableau Cloud account? Quickly create a Tableau Cloud site to share your work. Create Site >

Population by highest population from 1970 - 2015

Population Sex

- NULL
- Female
- Male

Year

Population

Year

Activate Windows Go to Settings to activate Windows.

60 marks 1 row by 1 column SUM(Population): 6,199,282,491

Type here to search

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This screenshot shows a Tableau dashboard titled 'kalai123'. It features a world map where countries are colored based on their population. Below the map is a line chart titled 'Population by highest population from 1970 - 2015' showing the population trend over time. A floating dialog box is overlaid on the interface, prompting the user to share the visualization via Tableau Server or Tableau Cloud. The dialog includes fields for entering a server URL, a 'Connect' button, and a 'Cancel' button. It also provides options to 'Quick Connect' to Tableau Cloud or 'Create Site >' if no account exists. The bottom of the screen shows a Windows taskbar with various application icons and system status information.

Tableau - kalai123

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Dashboard Layout < Default Phone Device Preview

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- Workflow
- Web Page

Tiled Floating Show dashboard title

Sign in to https://public.tableau.com

+ a b l e a u

You can now access Tableau Public using your Tableau account. If this is your first time signing to Tableau Public this way, you can set your Tableau account password with reset password.

Sign In

Email

Password

Remember me

SIGN IN

FORGOT PASSWORD | CREATE AN ACCOUNT

Population

Year

Population

Year

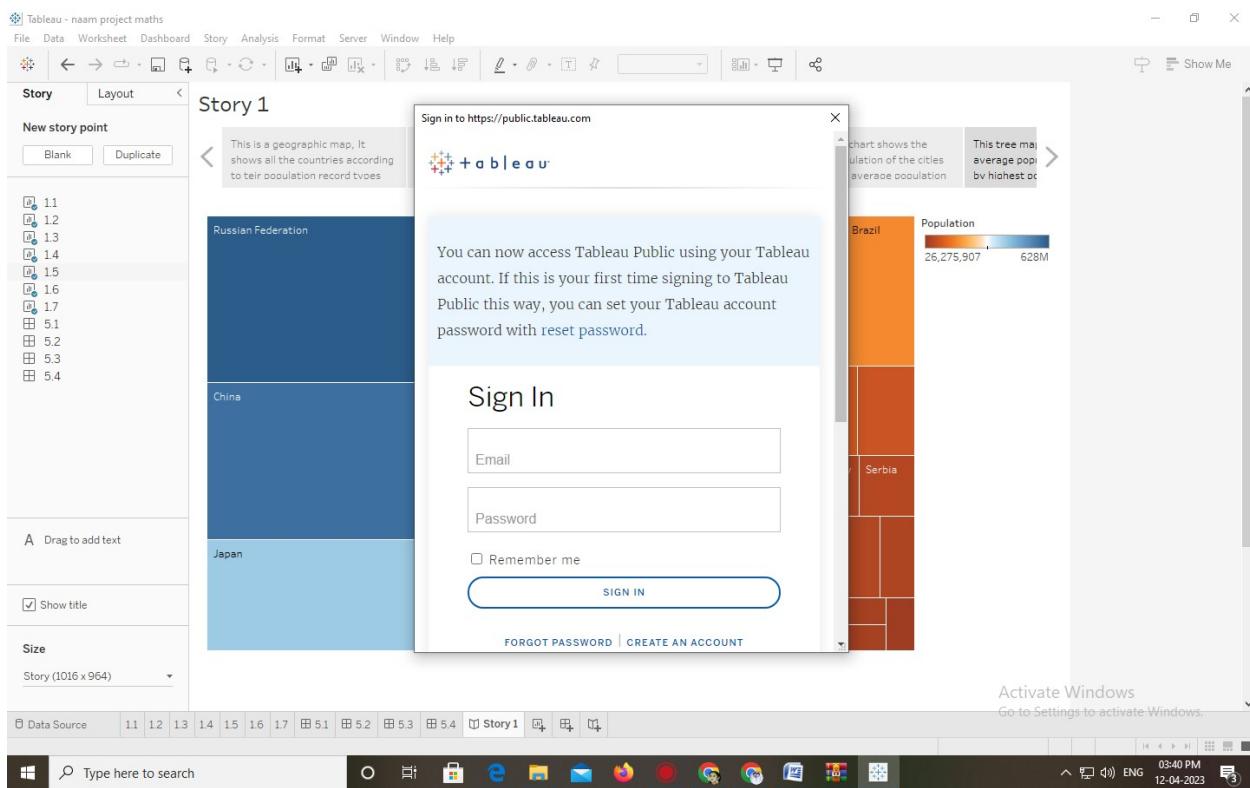
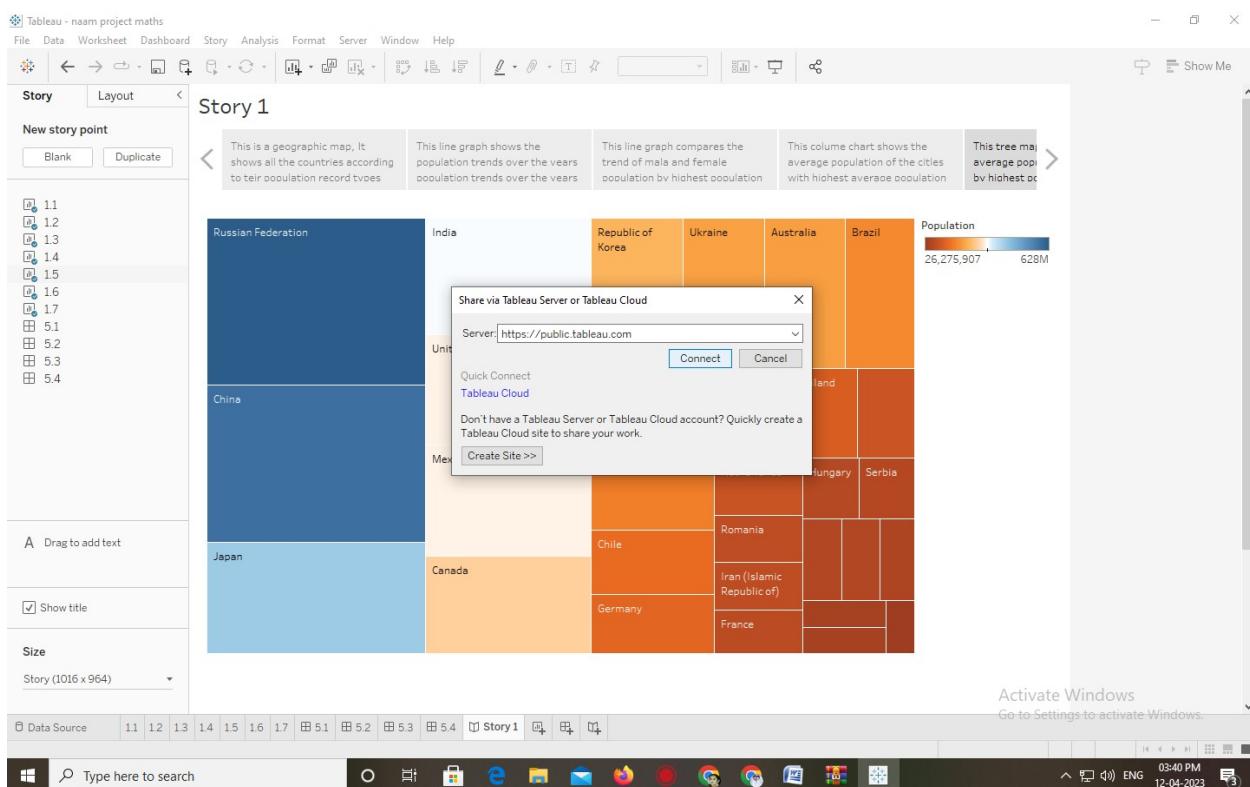
Activate Windows Go to Settings to activate Windows.

60 marks 1 row by 1 column SUM(Population): 6,199,282,491

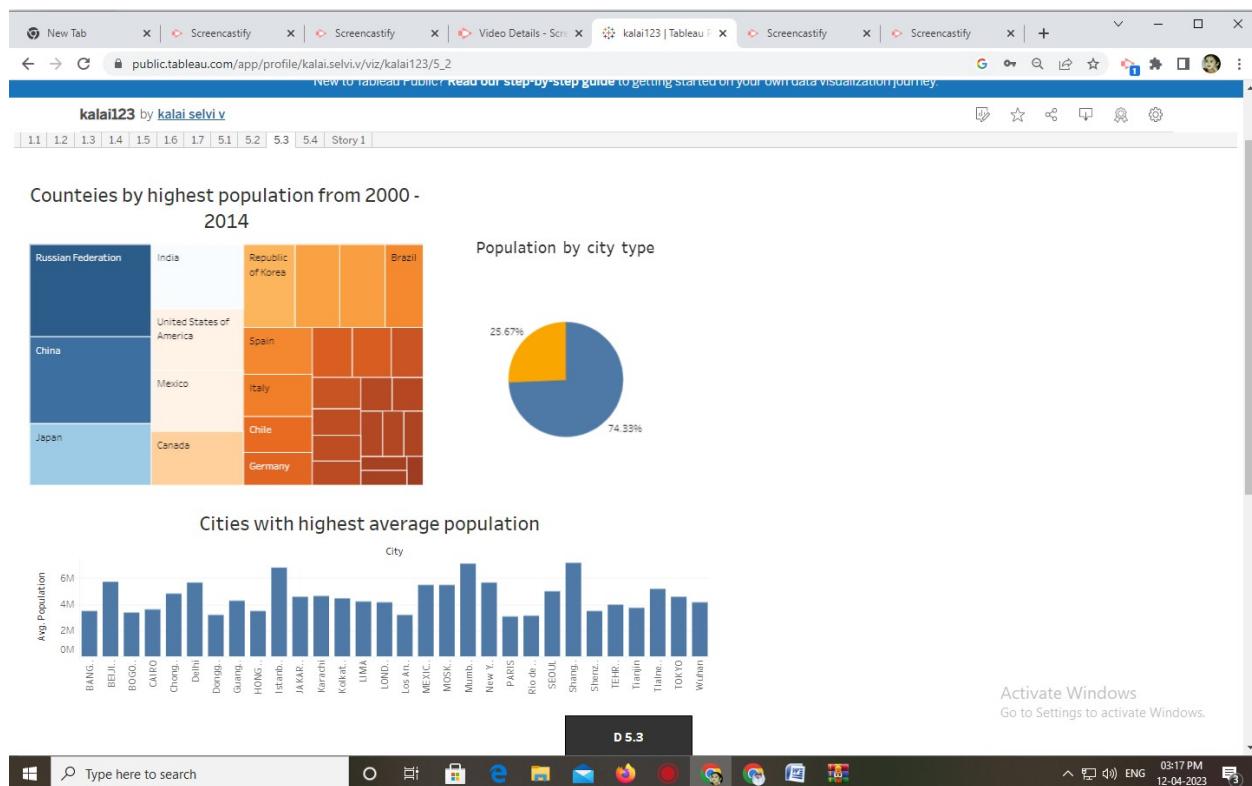
Type here to search

03:31 PM ENG 12-04-2023

This screenshot shows the same Tableau dashboard as the previous one, but the 'Share via Tableau Server or Tableau Cloud' dialog has been replaced by a 'Sign In' dialog. The dialog is part of the Tableau Public sign-in process, prompting the user to enter their email and password. It also includes a 'Remember me' checkbox and 'SIGN IN' and 'CREATE AN ACCOUNT' buttons. The rest of the interface, including the world map and line chart, remains visible in the background.



Give the server address of your tableau public account and click on connect. Explanation Video:[https://drive.google.com/file/d/1jCi8LAZPlQGNhFXCgUWcwNxbQLj8wdS-/view?usp=share\\_link](https://drive.google.com/file/d/1jCi8LAZPlQGNhFXCgUWcwNxbQLj8wdS-/view?usp=share_link).



## Advantages and disadvantages:

### Advantages :

- Data visualization.
- Quickly Create Interactive visualizations.
- Ease of Implementation.
- Tableau can handle large amounts of data.

- Use of other scripting languages in Tableau
- Mobile Support and Responsive Dashboard
- Tableau Company Strategy
- In Tableau there is an option where the user can make “live” to connections to different data sources like SQL etc.,

### **Disadvantages:**

- Scheduling or notification of reports
- No Custom Visual Imports.
- Custom formatting in Tableau.
- Static and single value parameters
- Screen Resolution on Tableau Dashboards
- Limited Data Preprocessing
- Scaling and Pricing for Enterprise
- Therefore, there is always some manual effort required when users need to update the data in the back-end.
- Tableau is not a complete open tool.
- Unlike other tools developers can create custom visuals that can be easily imported Tableau.

## **Applications :**

- Tableau is greatly used because data can be analyzed very quickly with it.
- The visualizations are generated as dashboards and worksheets.
- Tableau allows one to create dashboards that provide actionable insights and drive the business forward.
- Tableau products always operate in virtualized environments when they are configured with the proper underlying operating system and hardware.
- Tableau is used by data scientists to explore data with limitless visual analytics.

## **Conclusion :**

In this project, we learnt different ways to create calculated fields in Tableau as well as different types of calculated fields and plotting the appropriate graph. Our data sources will not have all the possible fields we want to use in our analysis. Calculated fields allow us to derive values based on logic and expressions; they ultimately add more flexibility and drive more insights into our Tableau dashboards.

## **Future Scope :**

- A tableau is a powerful tool for data visualization and analysis. Data analysts can use the tool to create valuable reports that help them make intelligent decisions quickly and easily.
- Creating data visuals immediately and switching among the types to easily find the model that suits your data.
- A wide range of choice is there in selecting the models to represent the data.
- Data representation can be done by selecting any form in which you want to showcase it i.e. by graphics, tables, maps etc.
- Even the beginner can come up with the acceptable visual appearances.
- The user interface is well designed to customize the view within a few clicks versus various views.
- It's simple and supple execution allows the user to customize and represent the data with the help of menus enclosing several options.
- Learning tableau enhances the growth of any organization by scrutinizing its data in an appropriate way and analyzing the reasons for the drawback of the organization/business.
- Within a short period of time, one can gain expertise and implement the same at their workplace