Title: **COVID-19 Analytics Dashboard Using IBM Cognos**

Team:

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1 INTRODUCTION

1.1 Overview

The COVID-19 Analytics Dashboard utilising IBM Cognos intends to offer thorough visualisations and analysis of COVID-19 data. In order to produce an engaging and insightful dashboard for tracking the pandemic, it makes use of the capabilities of IBM Cognos, a potent business intelligence and data analytics tool.

The dashboard compiles data from numerous sources, including government health agencies, and other trustworthy data suppliers. Numerous COVID-19 variables are covered, including the quantity of Total confirmed cases, Confirmed Indian National cases, Confirmed Foreign National cases deaths and recoveries. To give the most recent information, the data is often updated in near real-time or at regular intervals.

1.2 Purpose

This COVID-19 analytics dashboard using IBM Cognos is designed to offer a complete and data-driven solution for COVID-19 data analysis and visualization. In order to help stakeholders, make wise decisions and successfully address the issue, the dashboard intends to provide timely information, trends, and patterns relevant to the pandemic. The project aims to deliver real-time or nearly real-time updates, interactive visualizations, and customizable features that empower users to explore and comprehend COVID 19 data by utilizing the potent analytics capabilities of IBM Cognos. The ultimate objective is to assist in decision-making, resource allocation, and planning initiatives to lessen the pandemic's effects and safeguard public health.

2 LITERATURE SURVEY

2.1 Existing problem

The dilemma of inconsistent and poor-quality data from diverse sources is the current concern for the project COVID-19 analytics dashboard utilising IBM Cognos. When combining and comparing data from various governmental organisations, healthcare organisations, and academic research centres, there may be errors, missing information, and inconsistencies that produce inaccurate analysis and conclusions. The dynamic nature of COVID-19 data makes it difficult to guarantee prompt and accurate dashboard updates. In order to encourage stakeholders to use and profit from the dashboard's features and capabilities, adequate training and assistance are required. User adoption and engagement may also be a challenge.

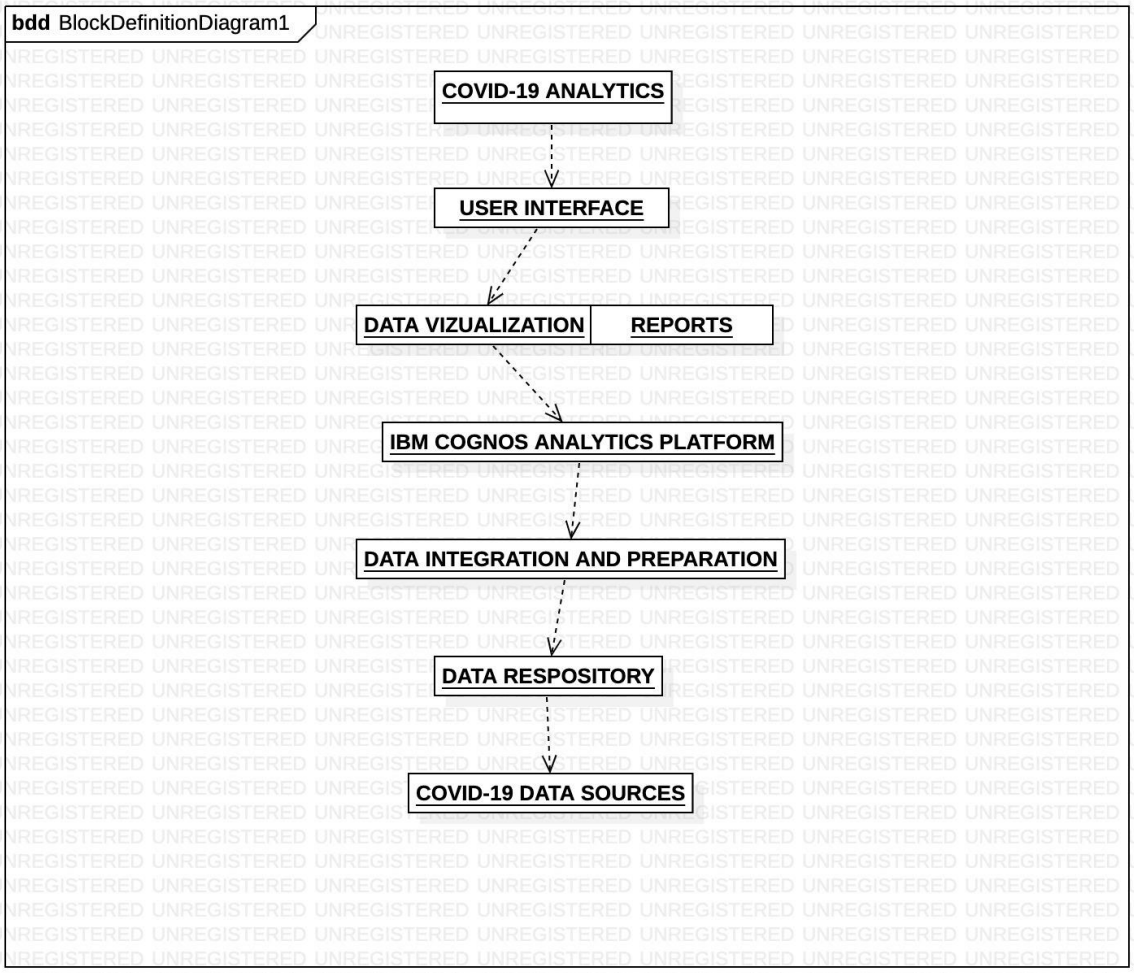
2.2 Proposed solution

To provide accurate and dependable COVID-19 data, we implemented automated data cleansing and data validation methods. Additionally, to facilitate the integration of COVID-19 data from various sources, we used data integration tools, standardized data formats, and established data mapping and transformation protocols.

We had to improve usability and boost user acceptance of the dashboard, user research was conducted, intuitive interfaces were designed, thorough user training and support were offered, and ongoing user feedback was gathered.

3 THEORITICAL ANALYSIS

3.1 Block diagram



3.2 Hardware / Software designing.

Hardware Requirements:

1) A multicore processor with a high clock speed to handle data processing.
2) RAM: A minimum of 8 GB Random Access Memory is recommended.
3) Network.
4) GPU.

Software Requirements:

1) IBM Cognos Analytics.

2) Any DBMS server like MYSQL, PostgreSQL.

3) Suitable Operating System like Windows, Mac, Linux etc...

4) Suitable Web browser like Chrome, Firefox, Brave etc…

5) Data Sources.

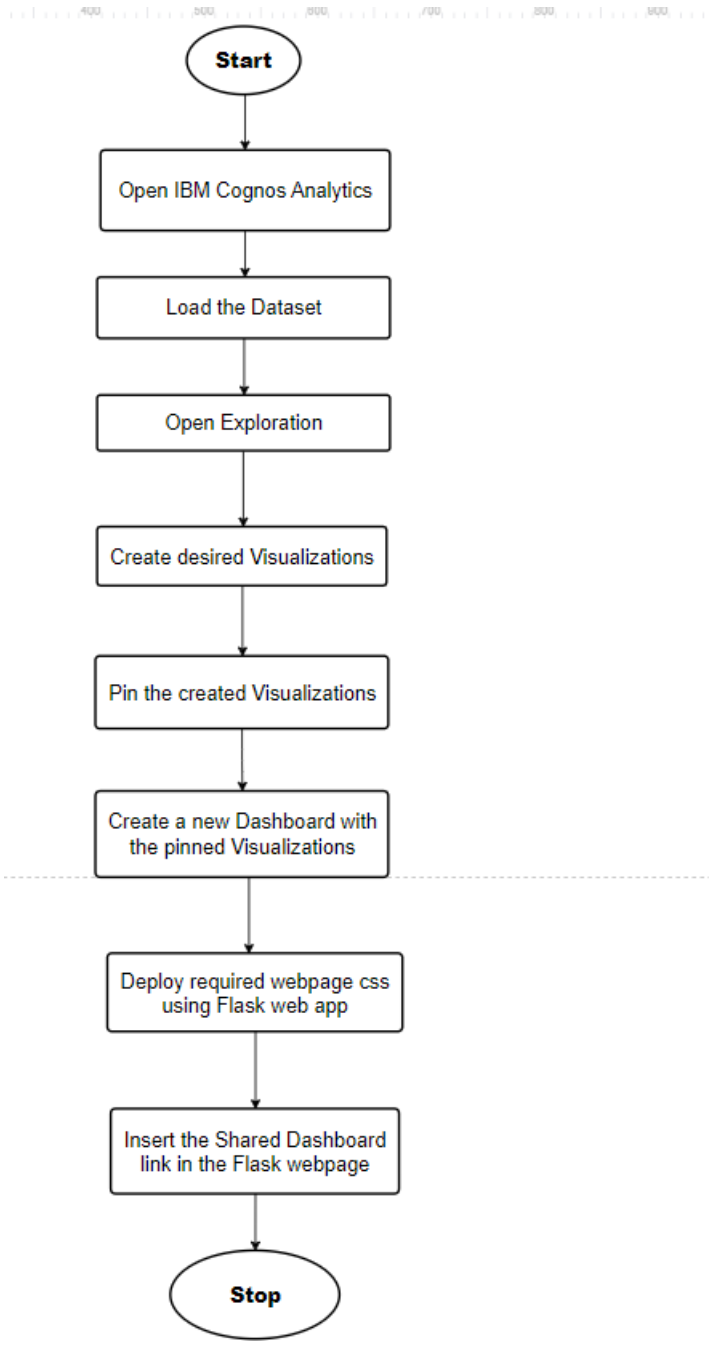
6) Python interpreter for flask application.

7) VS Code editor.

4 EXPERIMENTAL INVESTIGATIONS

To assure data accuracy and dependability, we had performed exploratory data analysis and data cleansing. Also, we had done Performance testing that evaluates how responsive, scalable, and resource-efficient the dashboard is under various data loads and concurrent user counts. To find areas for improvement and usability testing that looks at user experience, interface design, and navigation. We had created visualizations such as charts, graphs, maps, and dashboards using IBM Cognos to present the COVID-19 data in a meaningful and actionable format. Analysing the visualizations to derive insights and communicate key findings to stakeholders.

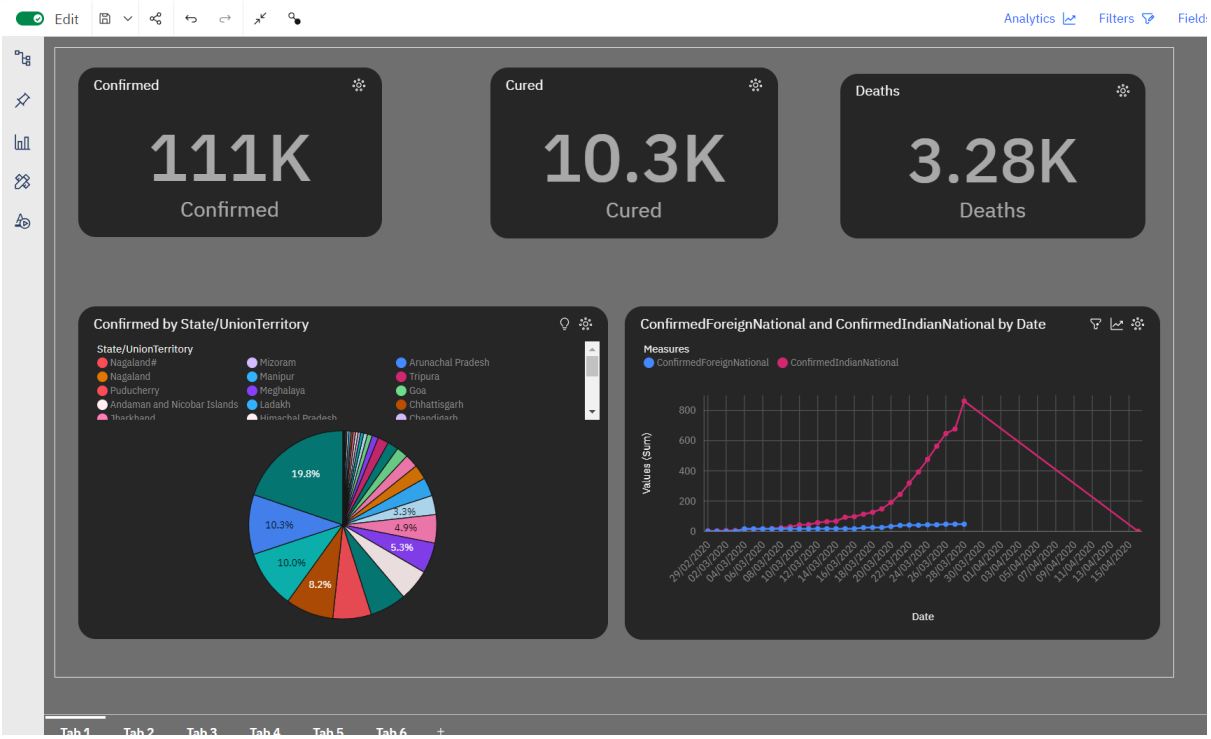
5 FLOWCHART

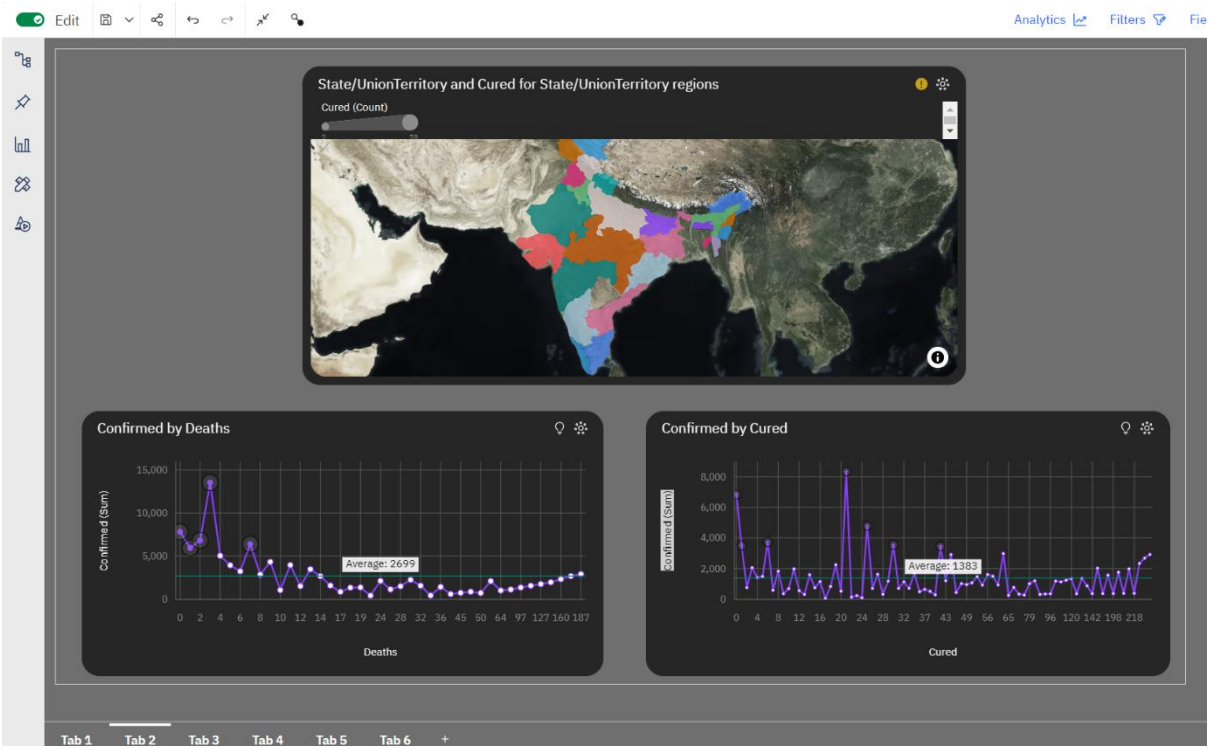

Start
Open IBM Cognos Analytics
Load the Dataset
Open Exploration
Create desired Visualizations
Pin the created Visualizations
Create a new Dashboard with the pinned Visualizations
Deploy required webpage css using Flask web app
Insert the Shared Dashboard link in the Flask webpage
Stop

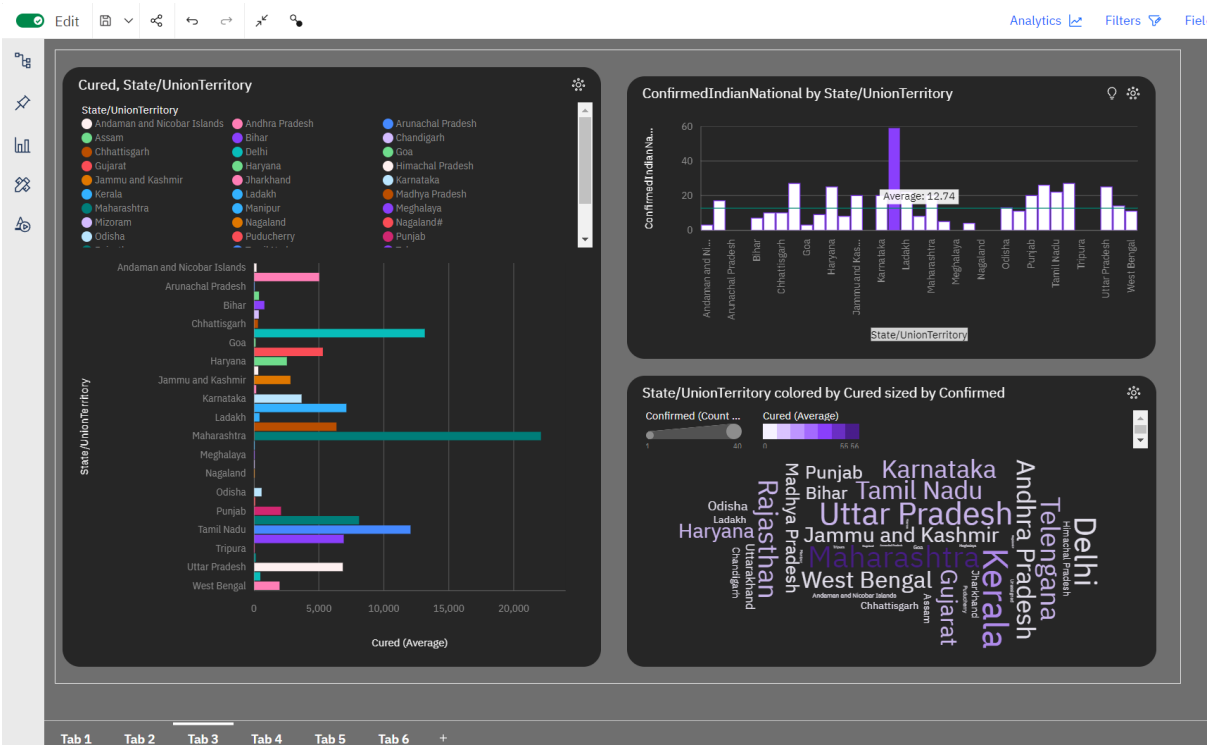
6 RESULT

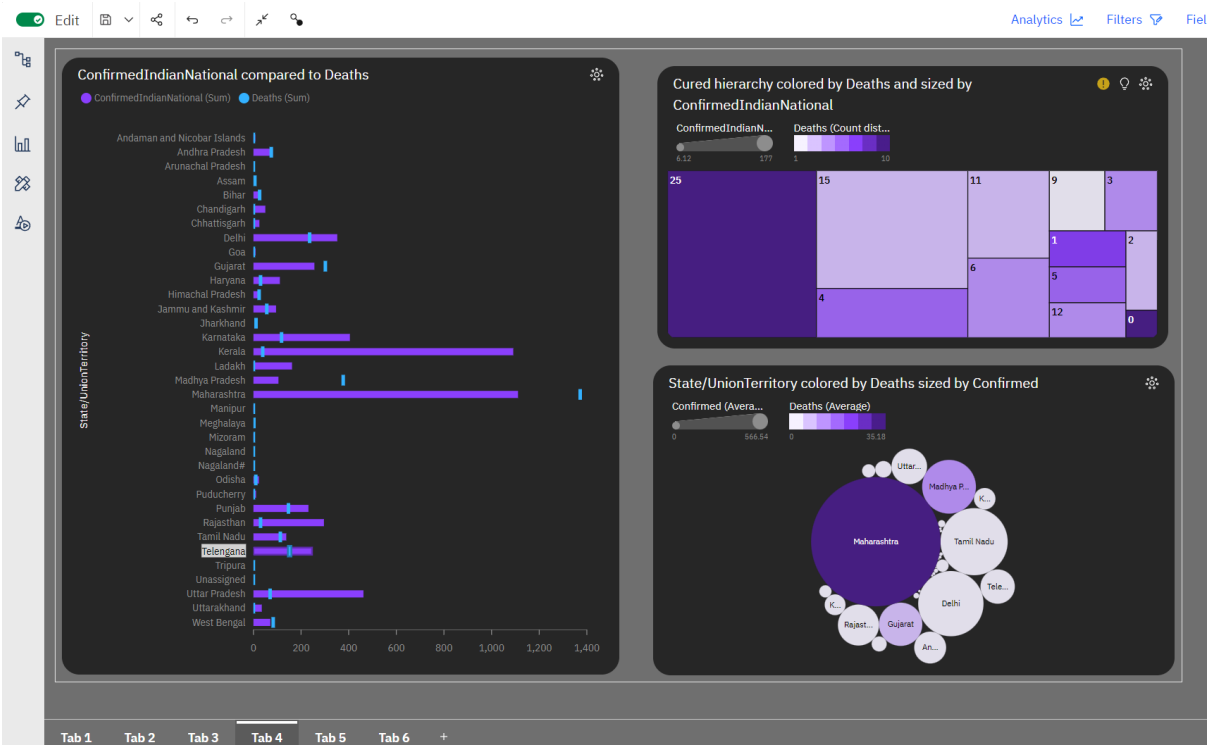
Real-time visualisations and analysis of COVID-19 data, which offer insights into the transmission of the virus, hotspot detection, and resource allocation, are included in the project's final conclusions or output of the COVID-19 analytics dashboard using IBM Cognos. Stakeholders can use the dashboard to monitor important metrics, make data-driven choices, and assess the success of actions. By giving stakeholders fast and reliable information, it improves situational awareness, encourages proactive planning, and promotes the management of the pandemic.

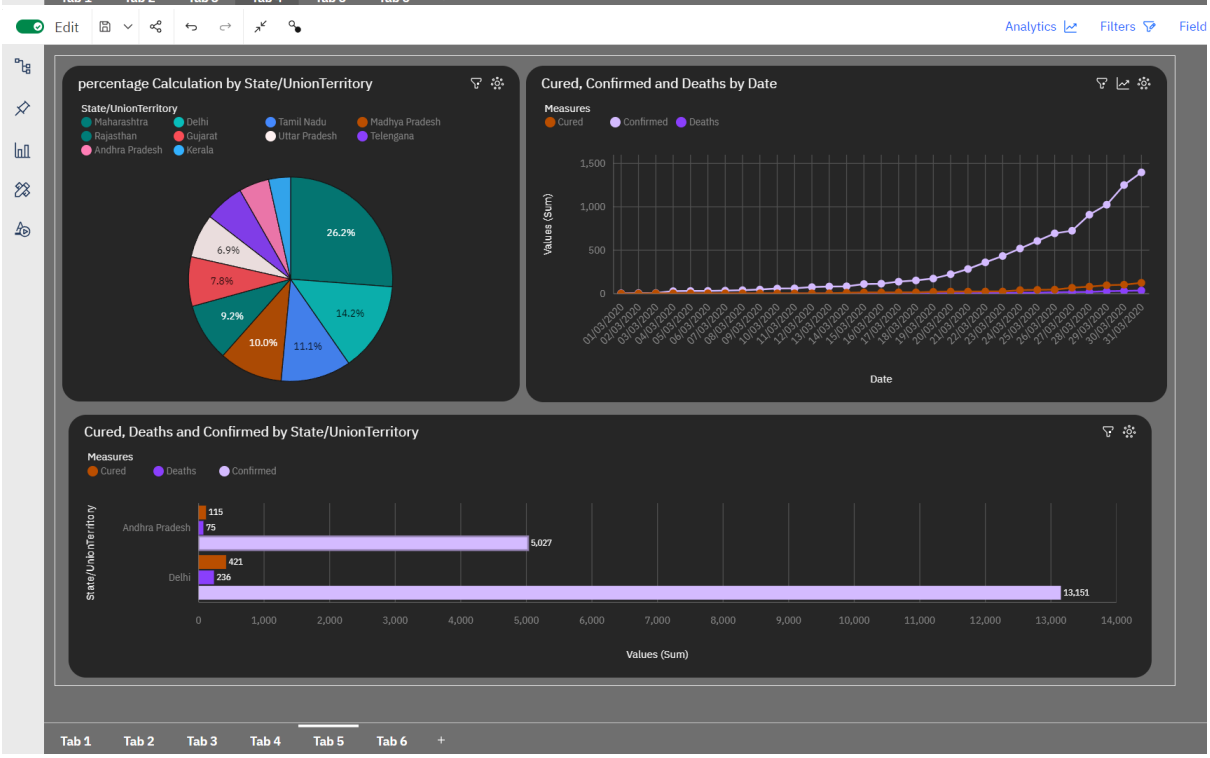
Ouptut images of Dashboard:

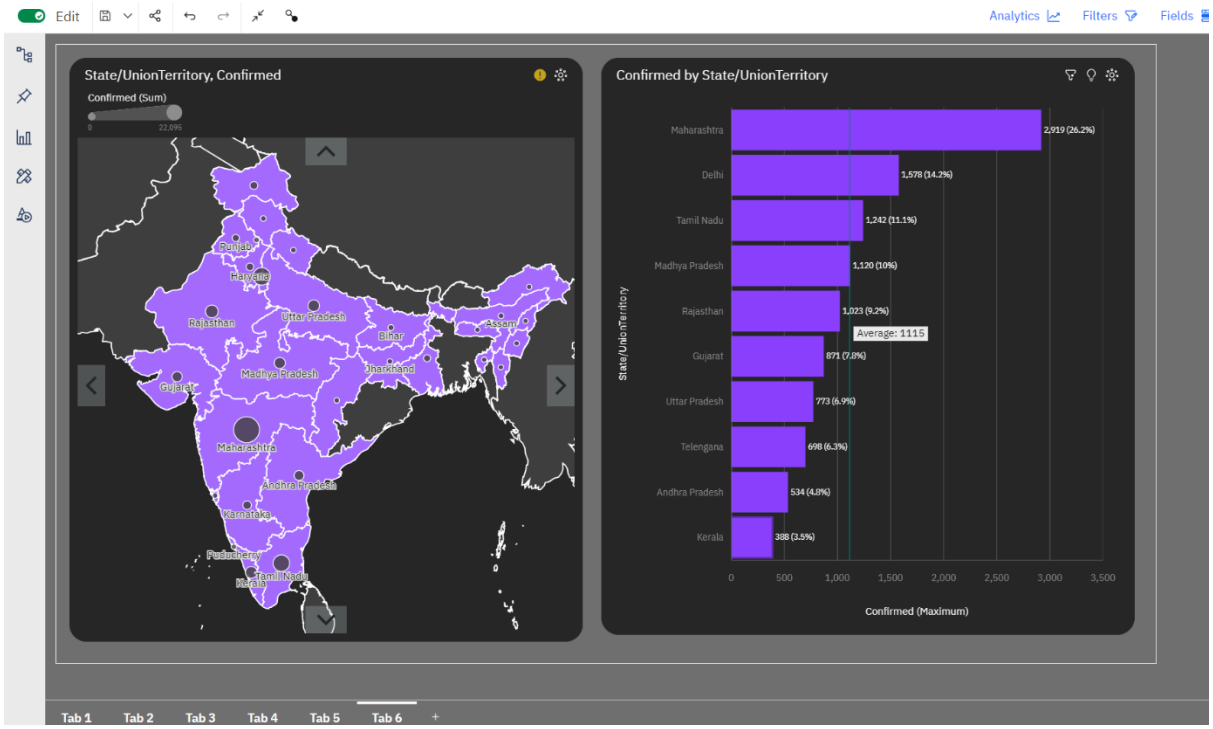



Edit
Analytics
Filters
State/UnionTerritory and Cured for State/UnionTerritory regions
Cured (Count)
Confirmed by Deaths
Confirmed (Sum)
Average: 2699
Deaths
Confirmed by Cured
Confirmed (Sum)
Average: 1383
Cured
Tab 1
Tab 2
Tab 3
Tab 4
Tab 5
Tab 6

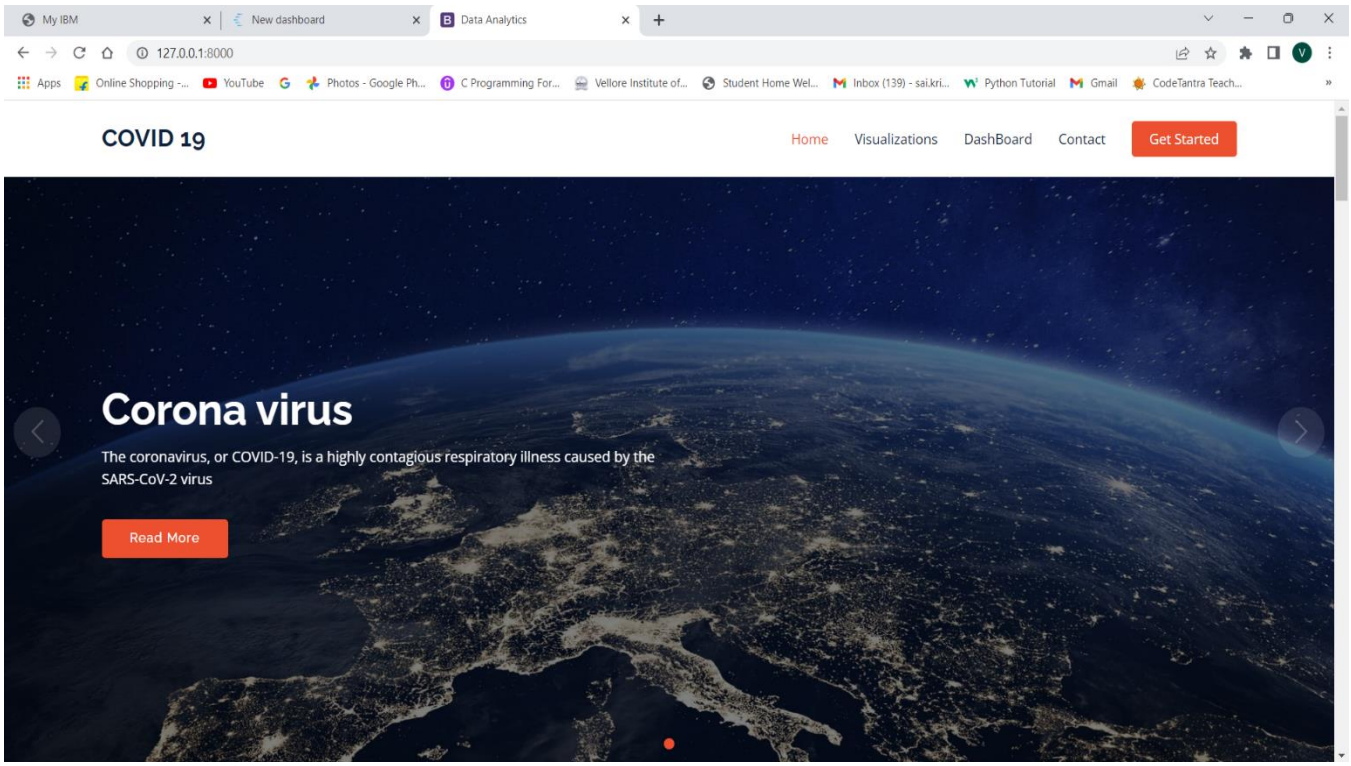

Edit
Analytics
Filters
Cured, State/UnionTerritory
State/UnionTerritory
Andaman and Nicobar Islands
Andhra Pradesh
Arunachal Pradesh
Assam
Bihar
Chandigarh
Chhattisgarh
Delhi
Goa
Gujarat
Haryana
Himachal Pradesh
Jammu and Kashmir
Jharkhand
Karnataka
Kerala
Ladakh
Madhya Pradesh
Maharashtra
Manipur
Meghalaya
Mizoram
Nagaland
Nagaland#
Odisha
Puducherry
Punjab
State/UnionTerritory
Cured (Average)
ConfirmedIndianNational by State/UnionTerritory
ConfirmedIndianNa...
Average: 12.74
State/UnionTerritory
State/UnionTerritory colored by Cured sized by Confirmed
Confirmed (Count ...
Cured (Average)
Tab 1
Tab 2
Tab 3
Tab 4
Tab 5
Tab 6

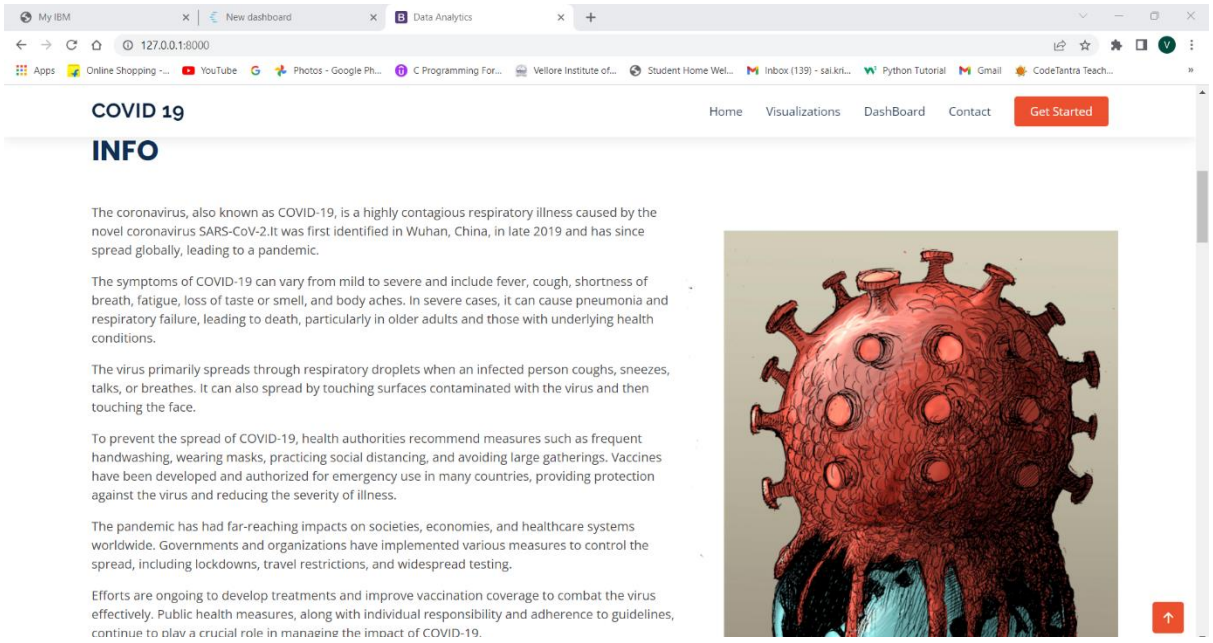

Edit
Analytics
Filters
Fiel
ConfirmedIndianNational compared to Deaths
ConfirmedIndianNational (Sum)
Deaths (Sum)
State/UnionTerritory
Andaman and Nicobar Islands
Andhra Pradesh
Arunachal Pradesh
Assam
Bihar
Chandigarh
Chhattisgarh
Delhi
Goa
Gujarat
Haryana
Himachal Pradesh
Jammu and Kashmir
Jharkhand
Karnataka
Kerala
Ladakh
Madhya Pradesh
Maharashtra
Manipur
Meghalaya
Mizoram
Nagaland
Nagaland#
Odisha
Puducherry
Punjab
Rajasthan
Tamil Nadu
Telengana
Tripura
Unassigned
Uttar Pradesh
Uttarakhand
West Bengal
0
200
400
600
800
1,000
1,200
1,400
Cured hierarchy colored by Deaths and sized by ConfirmedIndianNational
ConfirmedIndianN...
6.12
177
Deaths (Count dist...
1
10
25
15
11
9
3
1
2
6
5
4
12
0
State/UnionTerritory colored by Deaths sized by Confirmed
Confirmed (Avera...
0
566.54
Deaths (Average)
0
35.18
Uttar...
Madhya P...
K...
Maharashtra
Tamil Nadu
Tele...
Delhi
K...
Rajast...
Gujarat
An...
Tab 1
Tab 2
Tab 3
Tab 4
Tab 5
Tab 6
+

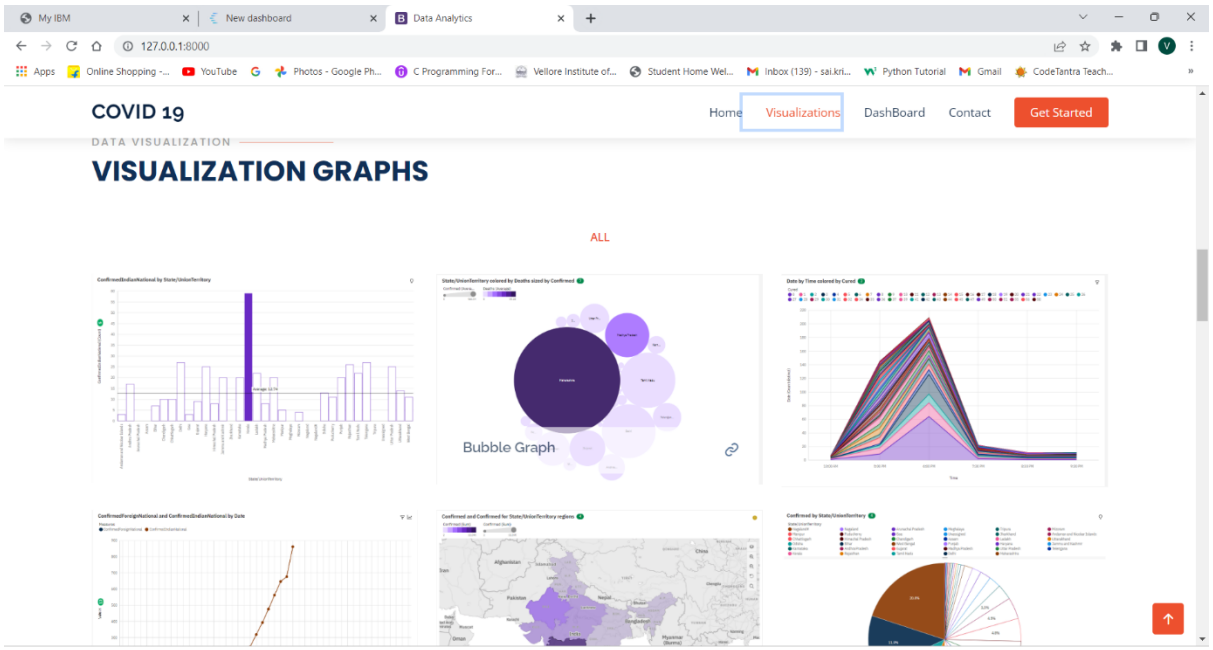

Edit
Analytics
Filters
Field
percentage Calculation by State/UnionTerritory
State/UnionTerritory
Maharashtra
Delhi
Tamil Nadu
Madhya Pradesh
Rajasthan
Gujarat
Uttar Pradesh
Telengana
Andhra Pradesh
Kerala
26.2%
14.2%
11.1%
10.0%
9.2%
7.8%
6.9%
Cured, Confirmed and Deaths by Date
Measures
Cured
Confirmed
Deaths
Values (Sum)
1,500
1,000
500
0
Date
Cured, Deaths and Confirmed by State/UnionTerritory
Measures
Cured
Deaths
Confirmed
State/UnionTerritory
Andhra Pradesh
115
75
5,027
Delhi
421
236
13,151
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
9,000
10,000
11,000
12,000
13,000
14,000
Values (Sum)
Tab 1
Tab 2
Tab 3
Tab 4
Tab 5
Tab 6
+

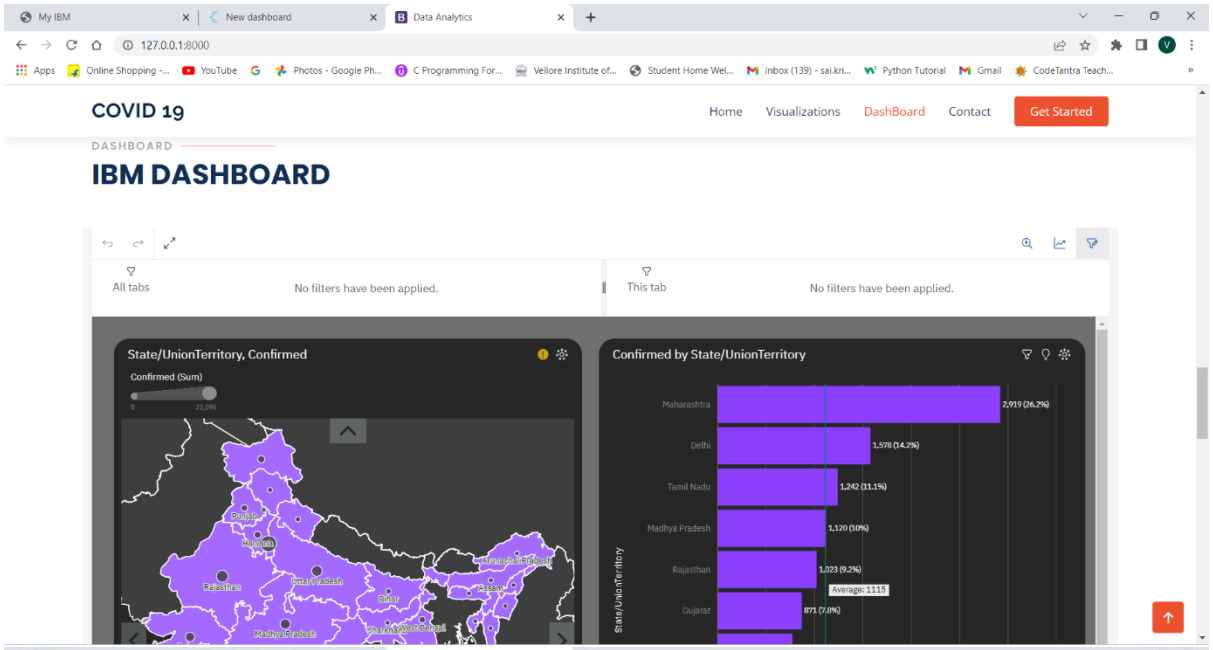


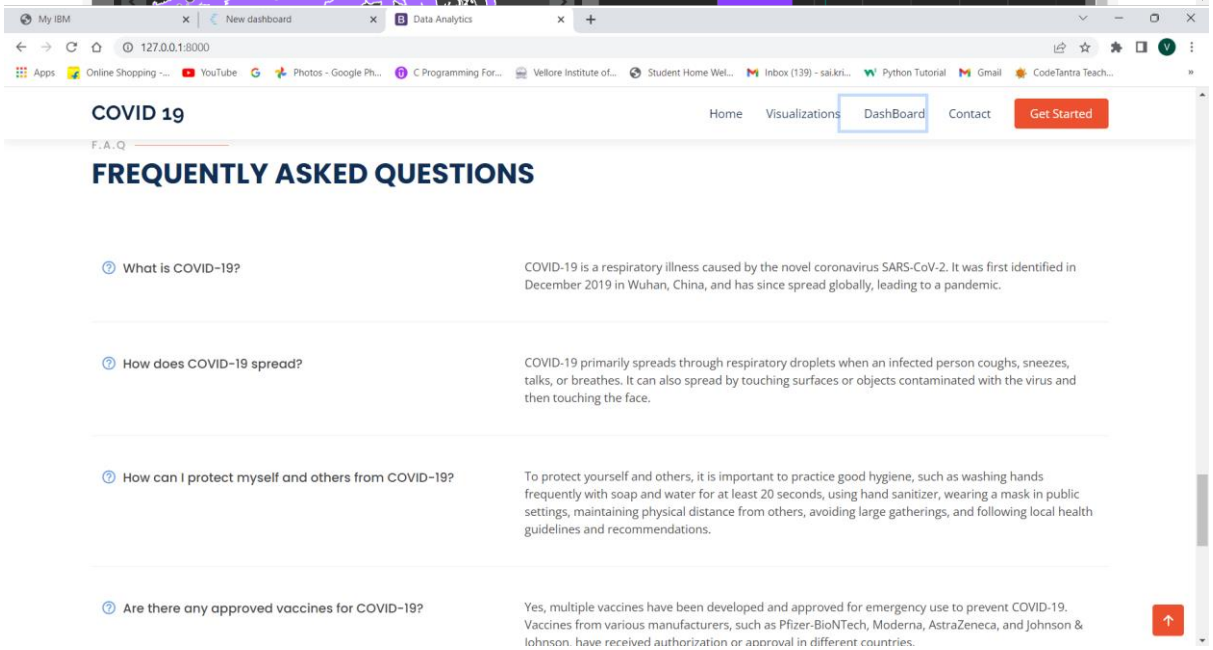
Output Images of Webpage after flask web app integration:

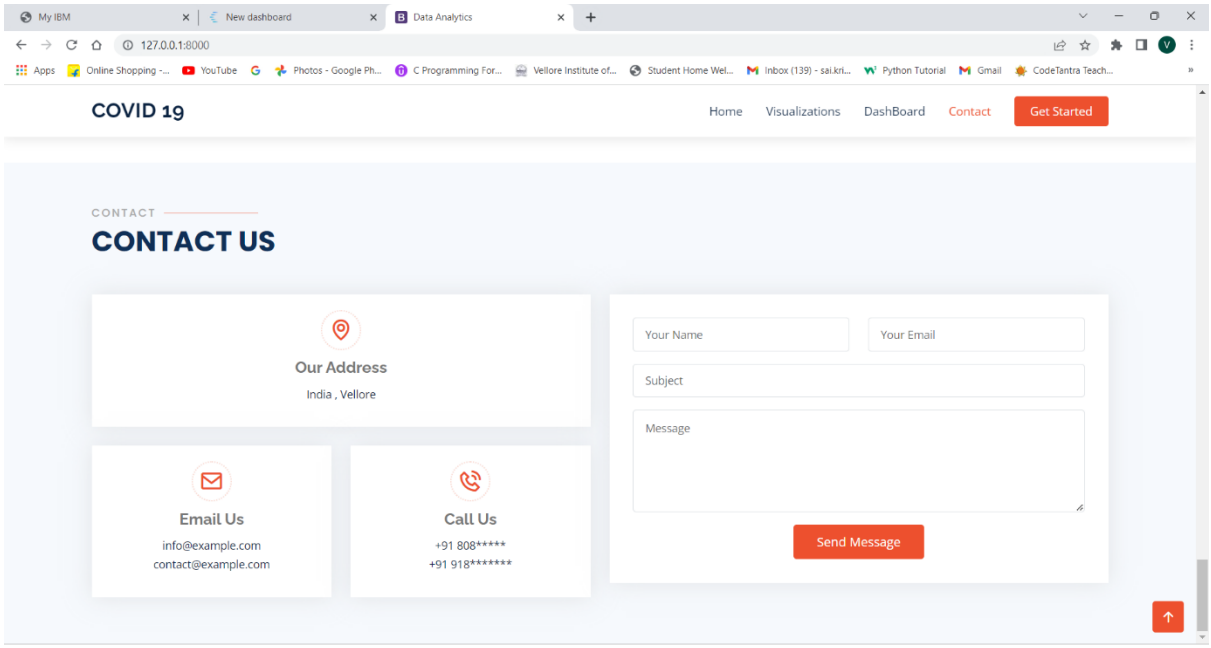



My IBM
New dashboard
Data Analytics
127.0.0.1:8000
COVID 19
Home
Visualizations
DashBoard
Contact
Get Started
INFO
The coronavirus, also known as COVID-19, is a highly contagious respiratory illness caused by the novel coronavirus SARS-CoV-2.It was first identified in Wuhan, China, in late 2019 and has since spread globally, leading to a pandemic.
The symptoms of COVID-19 can vary from mild to severe and include fever, cough, shortness of breath, fatigue, loss of taste or smell, and body aches. In severe cases, it can cause pneumonia and respiratory failure, leading to death, particularly in older adults and those with underlying health conditions.
The virus primarily spreads through respiratory droplets when an infected person coughs, sneezes, talks, or breathes. It can also spread by touching surfaces contaminated with the virus and then touching the face.
To prevent the spread of COVID-19, health authorities recommend measures such as frequent handwashing, wearing masks, practicing social distancing, and avoiding large gatherings. Vaccines have been developed and authorized for emergency use in many countries, providing protection against the virus and reducing the severity of illness.
The pandemic has had far-reaching impacts on societies, economies, and healthcare systems worldwide. Governments and organizations have implemented various measures to control the spread, including lockdowns, travel restrictions, and widespread testing.
Efforts are ongoing to develop treatments and improve vaccination coverage to combat the virus effectively. Public health measures, along with individual responsibility and adherence to guidelines, continue to play a crucial role in managing the impact of COVID-19.


My IBM
New dashboard
Data Analytics
127.0.0.1:8000
COVID 19
Home
Visualizations
DashBoard
Contact
Get Started
DATA VISUALIZATION
VISUALIZATION GRAPHS
ALL
Bubble Graph


My IBM
New dashboard
Data Analytics
127.0.0.1:8000
COVID 19
Home
Visualizations
DashBoard
Contact
Get Started
DASHBOARD
IBM DASHBOARD
All tabs
No filters have been applied.
This tab
No filters have been applied.
State/UnionTerritory, Confirmed
Confirmed (Sum)
Confirmed by State/UnionTerritory
Maharashtra
2,919 (26.2%)
Delhi
1,578 (14.2%)
Tamil Nadu
1,242 (11.1%)
Madhya Pradesh
1,120 (10%)
Rajasthan
1,023 (9.2%)
Average: 1115
Gujarat
871 (7.8%)
State/UnionTerritory


My IBM
New dashboard
Data Analytics
127.0.0.1:8000
COVID 19
Home
Visualizations
DashBoard
Contact
Get Started
F.A.Q
FREQUENTLY ASKED QUESTIONS
What is COVID-19?
COVID-19 is a respiratory illness caused by the novel coronavirus SARS-CoV-2. It was first identified in December 2019 in Wuhan, China, and has since spread globally, leading to a pandemic.
How does COVID-19 spread?
COVID-19 primarily spreads through respiratory droplets when an infected person coughs, sneezes, talks, or breathes. It can also spread by touching surfaces or objects contaminated with the virus and then touching the face.
How can I protect myself and others from COVID-19?
To protect yourself and others, it is important to practice good hygiene, such as washing hands frequently with soap and water for at least 20 seconds, using hand sanitizer, wearing a mask in public settings, maintaining physical distance from others, avoiding large gatherings, and following local health guidelines and recommendations.
Are there any approved vaccines for COVID-19?
Yes, multiple vaccines have been developed and approved for emergency use to prevent COVID-19. Vaccines from various manufacturers, such as Pfizer-BioNTech, Moderna, AstraZeneca, and Johnson &



7 ADVANTAGES

1) **Comprehensive Data Analysis:** IBM Cognos has strong analytical capabilities that make it possible to thoroughly analyse COVID-19 data. Users can explore and visualise data from many sources, spot trends, patterns, and correlations, and learn more about how the pandemic has affected society.

2) **Decision Support for Stakeholders:** The COVID-19 analytics dashboard using IBM Cognos empowers stakeholders, including policymakers, healthcare professionals, and researchers, with data-driven insights for effective decision-making, resource allocation, and planning.

3) **Interactive visualizations**: Charts, graphs, maps, and dashboards are just a few of the interactive visualisation possibilities that IBM Cognos provides. These visualisations make it simpler to comprehend complicated data, spot trends, and efficiently share findings with stakeholders.

4) **Customization and Personalization:** Depending on the requirements and preferences of various users, the dashboard may be modified and personalised. To concentrate on the information that is most pertinent to them, users can choose particular metrics, use filters, and customise views.

5) IBM Cognos makes it easier to collaborate and share insights within the dashboard when making decisions together. Users can exchange reports, visualisations, and findings, facilitating group decision-making and encouraging a coordinated response to the pandemic.

DISADVANTAGES

1) **Cost:** IBM Cognos is a commercial software product; hence its price is very high significantly based on the version and licencing choices selected.

2) **Integration Obstacles:** Integrating data from several sources into IBM Cognos can be difficult, especially if the data must be extensively transformed or is stored in multiple formats.

3) **Data Limitations:** Dashboard significantly depends on the reliability and integrity of the underlying data. Incomplete or inaccurate data from the sources can result in biased conclusions and analytical restrictions.

4) **User Adoption and Training:** It can be difficult to ensure user engagement and adoption with the dashboard. To use the analytics dashboard successfully and analyse the data, users may need assistance and training.

5) **Security and Privacy Considerations:** Storing and processing sensitive COVID-19 data within IBM Cognos requires robust security measures to safeguard data privacy and protect against potential breaches.

8 APPLICATIONS

1) **Healthcare Resource Planning**: The dashboard helps healthcare professionals estimate the demand for hospital beds, ventilators, and other essential resources, enabling proactive planning and allocation to locations with the greatest need.

2) **Policy-Making:** Based on the current COVID-19 situation, policymakers can use the dashboard's findings to make data-driven decisions on lockdown measures, travel restrictions, and other mitigation strategies.

3) **Business Continuity Planning**: Organisations may make educated decisions to maintain business continuity and resilience in the face of COVID-19 problems by using the dashboard to monitor the pandemic's impact on their operations, spot trends in consumer behaviour, and more.

4) **Epidemiological Research:** For more investigation and the creation of public health initiatives, researchers can use the dashboard to analyse COVID-19 data, pinpoint risk factors, examine transmission patterns, and obtain knowledge about the efficacy of treatments.

5) **Public Education and Awareness:** The dashboard makes it easier for the general public to receive accurate and current COVID-19 information, encouraging acceptance of preventive practises and vaccination efforts.

9 CONCLUSION

In conclusion, the COVID-19 analytics dashboard implementation project utilising IBM Cognos delivers a strong and complete solution for analysing, visualising, and gaining insights from COVID-19 data. The dashboard offers dynamic visualisations and customizable features that provide stakeholders the power to decide wisely, allocate resources wisely, and prepare for pandemics in advance. The initiative has the potential to dramatically impact public health management, policy decision-making, healthcare resource planning, research, public awareness, and business continuity despite the difficulties with data integration, quality, and user uptake. The initiative contributes significantly to the fight against the COVID-19 pandemic and the promotion of data-driven policies to safeguard public health and well-being by utilising IBM Cognos capabilities.

10 FUTURE SCOPE

With several potential areas of development and advancement. Some key aspects of future focus include more engaging and natural user experience can be achieved by incorporating immersive and interactive visualisation techniques, such as virtual reality (VR) and augmented reality (AR). Real-time insights on the ambient conditions and occupancy levels of various sites can be obtained by integrating data from Internet of Things (IoT) devices, such as occupancy trackers or temperature sensors. The dashboard may easily get updated COVID-19 data, such as case counts, vaccination rates, and test results, by connecting with public health APIs and data sources. Data on social determinants of health, such as socioeconomic variables and demography of the community, can be used to identify vulnerable populations and develop interventions that are appropriate for them.

11 BIBILOGRAPHY

References:

1)https://newintelligence.ca/cognos-analytics-creates-trusted-covid-19-data-for-communities/

2)https://www.ibm.com/blog/creating-trusted-covid-19-data-for-communities/

3)https://support.weather.com/s/article/COVID-19-Dashboard-IBM-Cognos-Analytics?language=en_US

4) https://hayne.co/trusted-covid-19-data-ibm-cognos-analytics/

5) https://www.youtube.com/watch?v=3woVajvxnmk

6) https://www.youtube.com/watch?v=DjKjydS2ZuY

7) https://mediacenter.ibm.com/media/IBM+Cognos+Analytics+with+Watson+-+How+to+share+dashboard+content/1_bib2p456

Appendix

Source code

https://drive.google.com/drive/folders/1OpPkYEyw8YnCYgbU2Nb0rKvySzwWvfV?usp=sharing

Project Demo Videos Folder Link:

https://drive.google.com/drive/folders/11azCinohCOKVvjDgHwihpgVUB3vhWssy?usp=sharing