



# IBM Hack Challenge 2020

Project ID:SPS\_PRO\_1486

## *Twitter Sentiment analysis -covid19 Visualization Dashboard*

**Team Name :** Info Note

**Project Title :** Sentiment Analysis on covid19 -visualization  
Dashboard

**Problem Statement :**

Build a sentiment analysis model on twitter data to analyse the sentiment of the people in the lockdown. And also find how people will react is the lockdown is extended.

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# ***1.. Introduction:***

## ***1.1.. Overview :***

Sentiment is the best part of our everyday life. And in this lockdown the government and other private organizations Is in the need of finding the sentiment and emotions of people during this lockdown situation. They can make the further decision based on the mind set of the people all around the world. ***Sentiment analysis using ML/DL on the twitter data*** can find the solution for this problem. In this project we build a sentiment and Emotions analysis application that can ***effectively analyse and visualize the sentiment and emotions of the people*** in this lockdown. Also that can predict the sentiment of the people ***“if the lockdown is extended”***. We developed a web dashboard application that can visualize the sentiment and emotions of people world wide and that dashboard keep on updating every 5 seconds. Additionally the dashboard can provide the total death, confirm, active cases in the world and also visualize the mortality rate that helps in finding the condition of a country For this project we followed the following steps.

- Collect live tweets from the twitter node in the Node-red IBM.
- Create the sentiment and emotion analysis with the help of Tone analyser, NLU (Natural Language Understanding) present in the Node-red.
- Build a live, attractive and user interactive dash (plotly, python web framework) web application .
- Visualize the results coming from the Tone analyser, NLU node using the dash plotly web application.
- Create a CovidBot using Watson assistant and Watson discovery.
- Integrate the Watson assistant and the Watson discovery using the IBM cloud function .
- Deploy the app in IBM cloud.

## ***1.2.. Purpose:***

The purpose of this application is to

- Provide a live information about the Covid19 all around the world
- Provide very helpful analysis to government and other organization to their decision making process.
- Provide user interactive dashboard with better design and quality.
- Provide a great conversation platform to the user to get the information from the chatbot.
- Provide some general information about the Covid19 along with the analysed sentiment and emotion.

## ***2.. Literature survey :***

### ***2.1.. Existing problem:***

*Existing* sentiment analysis models are hard to code and can give bad results some times. For training the model we need more data and high computation power. Giving more data lead the model to overfitting. And to predict the sentiment of people “if the lockdown is extended” we don’t have any training data. Without the training data it is difficult or impossible to say whether they are happy or sad about the lockdown extension. The existing web application can load only in the high internet connection, because of the high computational work. New technologies that will rectify all the above problems is needed.

## ***2.2..Proposed Solution:***

So for the above problems a new method should be carry out for the requirement of the problem statement. And the method should be in less line of code and more effective, should predict the sentiment and emotions of the people in a less time period. By using the ***IBM cloud, Node-red, NLU and Tone analyser*** service we can make the ***prediction process more easier and less time consumer***. We can get a better and accurate results in very short time period. So, I our project we are using the tone analyser and Natural Language understanding services of IBM and Node-red platform to integrate all those things. There are many ways to collect the live tweets, but in our project we are using ***Twitter node in the Node-red***, it is pretty good because that can easily connect to the Tone analyser, NLU node in the node-red. Sentiment of the people can be predicted easily with the help of NLU and the emotions of the people can be predicted easily with the help of Tone analyser under 5 classes namely ***“angry, joy, fear, sadness, disgust”***. For tweet collection we are collecting the tweets using the keywords ***“covid19, corona virus, lockdown, work from home, pandemic, death”*** for better accuracy and analysis.

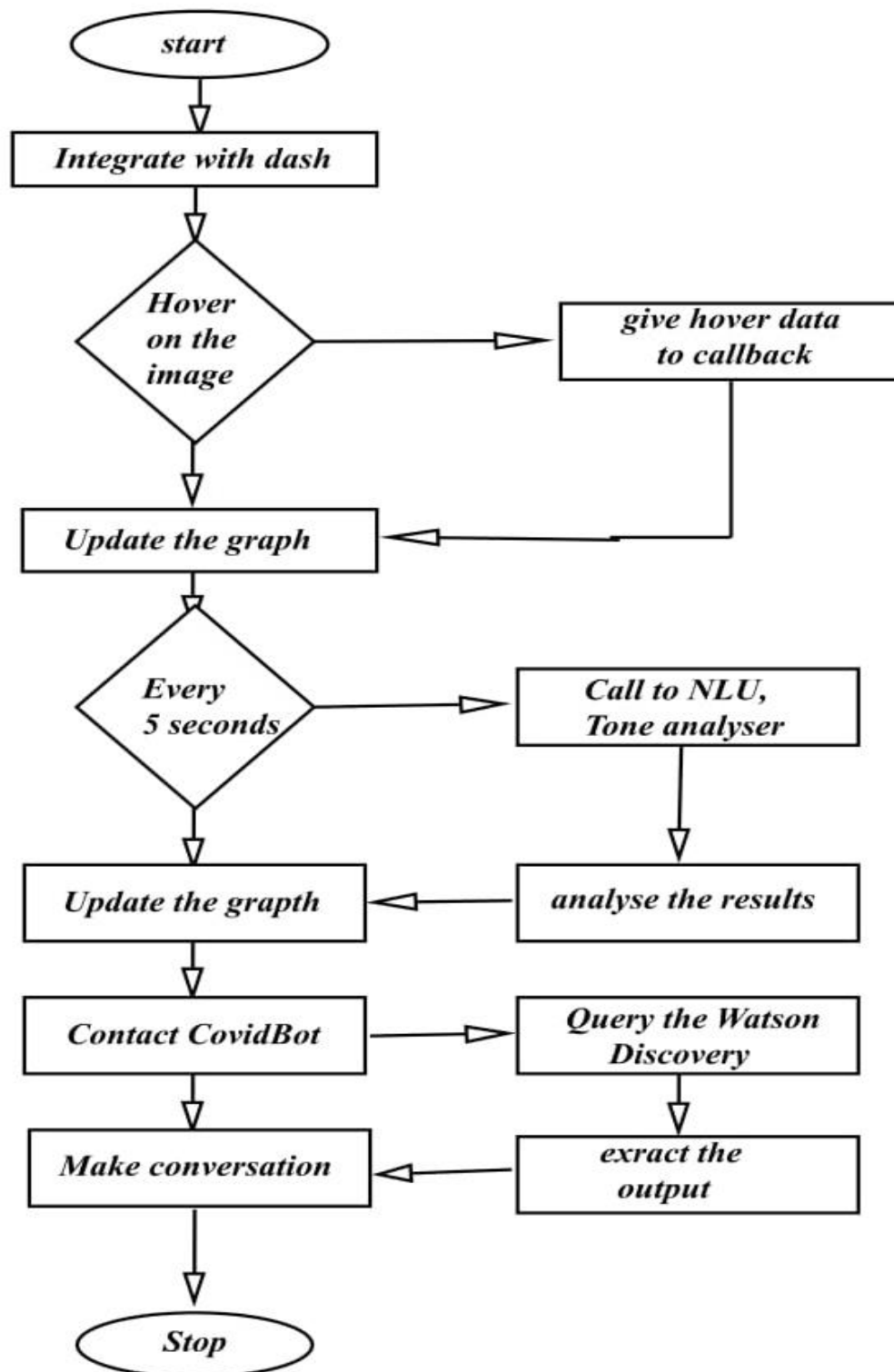
The main goal of this project is to predict the sentiment of people “if the lockdown is extended’ for that we collect the live tweets with the keywords ***“lockdown extension, work from home extension “and analyse the sentiment of people based on the tweets collected, it gives us the better results.***

UI must be more user interactive and should be updated every 5-10 seconds duration. Then only we can know the correct information about our world having. For better visualization experience, we developed our web application using the ***dash (python web app framework)***. Our dashboard is ***fully user interactive, attractive and live streaming every 2 seconds***. One can download the visualization images to their local machine easily.

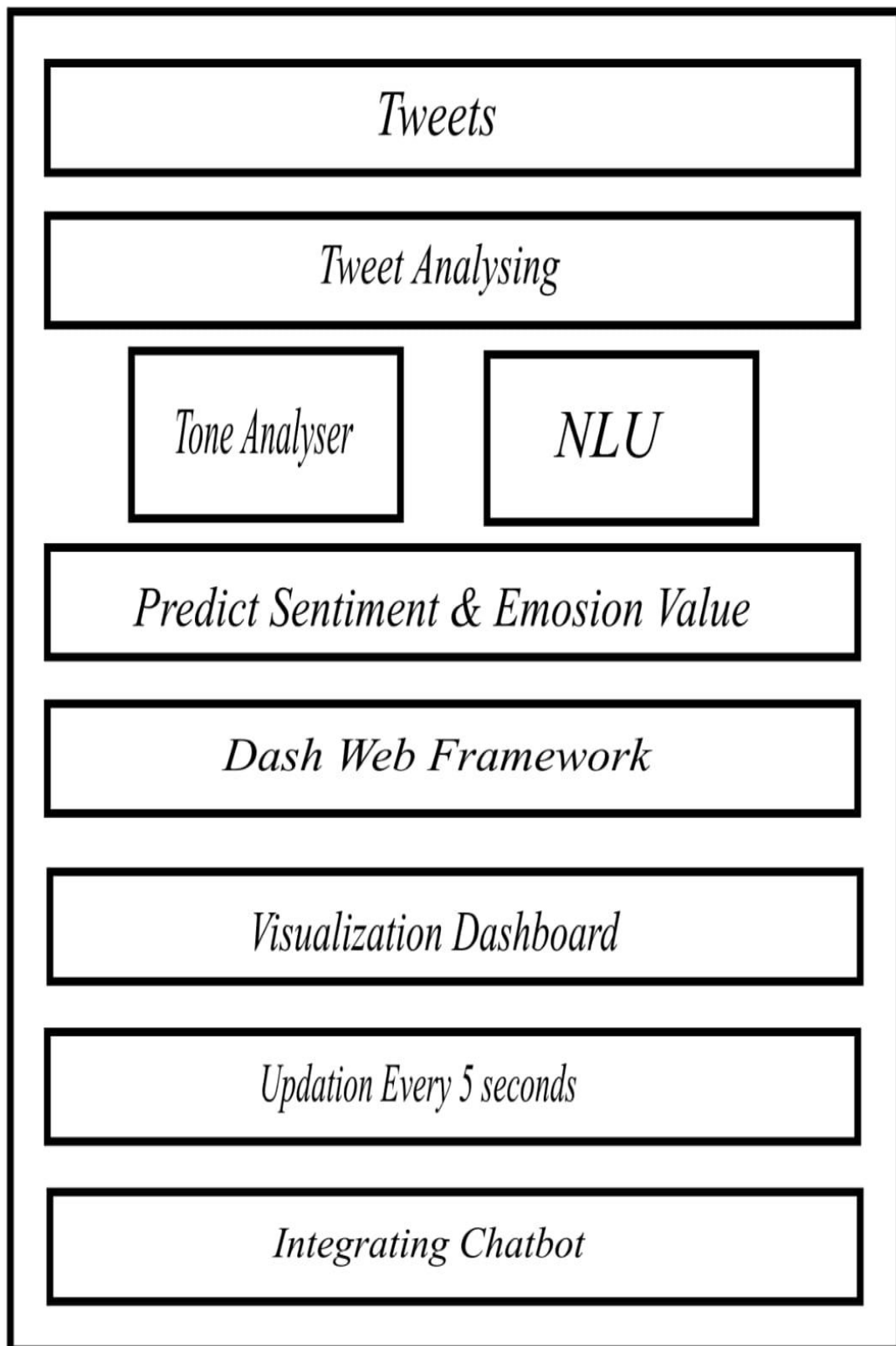
It is always better to get the answers by the conversation. So, we trained one AI based CovidBot that can answer the users questions about the covid19 like what can It do?, what is the available treatment?, what is the medicine?, what is the death rate of particular country?, what is the sentiment od people?, what is the emotion of people? ,etc.

### ***3.. Theoritical Analysis:***

#### ***3.1.. Block diagram***



### ***3.2 Hardware / Software designing:***

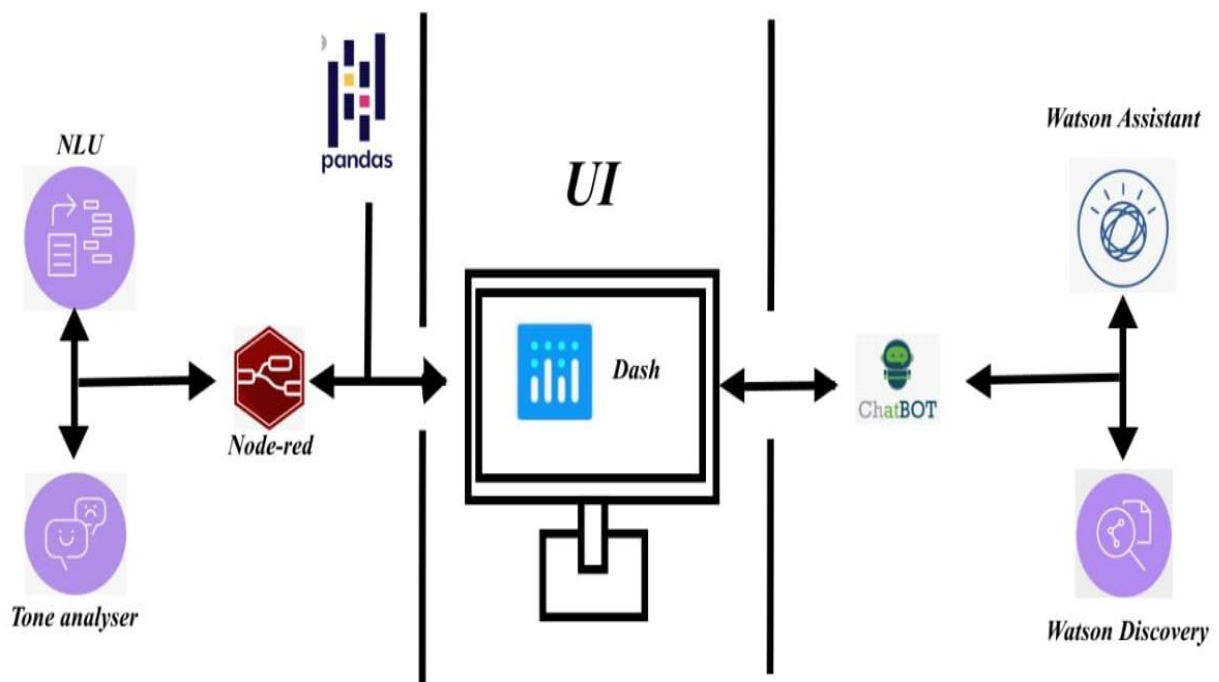


## 4.. *Experimental investigations:*

To make a live streaming, user interactive sentiment analysis dashboard we were in the need of learning new technologies and languages. In this process we searched for a best analysing and visualization tools. And investigated many visualization tools and searched for the one which could give a live streaming dashboard. By analyzing all the available tools and its working process we can come to the decision and build the model. In this journey we investigated the following tools and services.

- IBM cloud
- Node-red
- Tone analyser service of IBM
- Natural Language Understanding service of IBM
- DB2
- Cloudant
- Watson assistant
- Watson discovery
- Dash (plotly)
- Watson cognitive dashboard
- Zoho writer

## 5.. **Flowchart:**

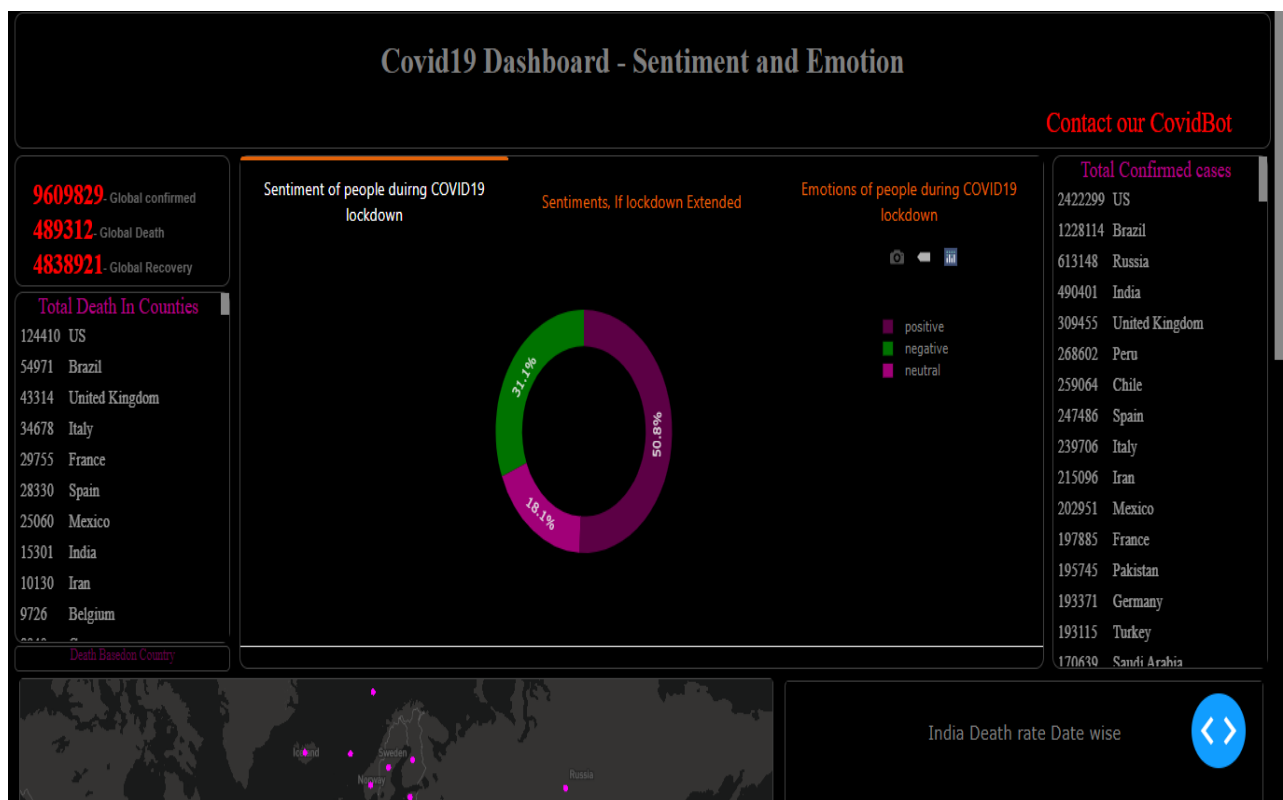




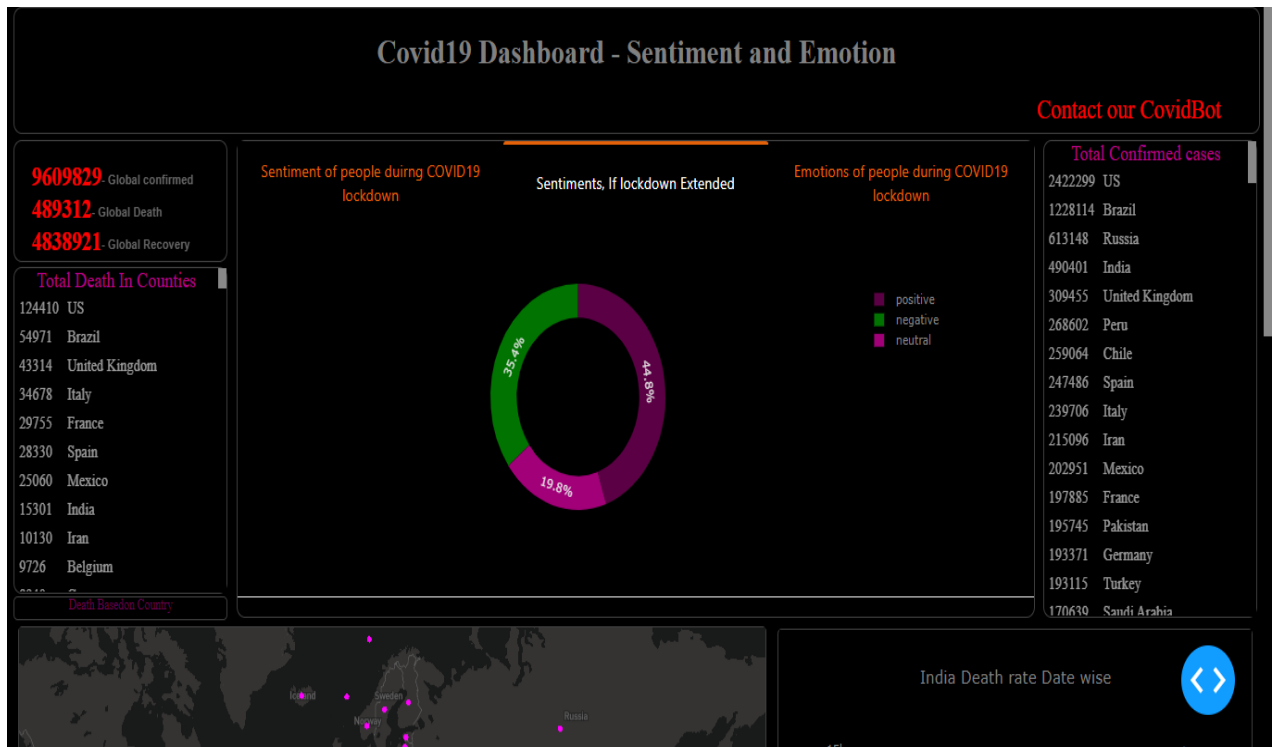
## 6.. Result:

It presents live streaming, fully user interactive, all-in-one dashboard with live sentiment and emotions of people across the world about the COVID19 lockdown.

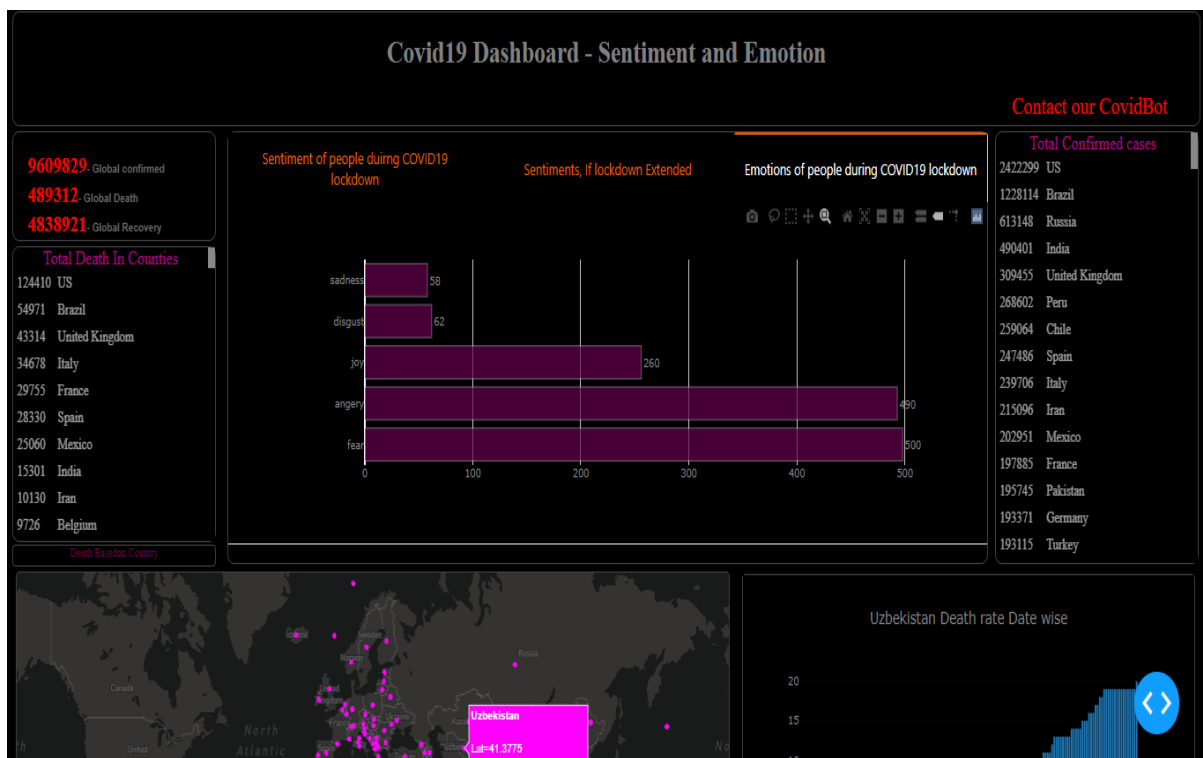
- Center part first visualize the Sentiment of people through the pie chart and hover on the pie chat will give you the general information and number of tweets under the category. This is updated every 5 seconds.



- Secondly the main part of the project is “**sentiment if the lockdown is extended** “ will also give you the pie chart with future predicted sentiments about the lockdown, with hover information.

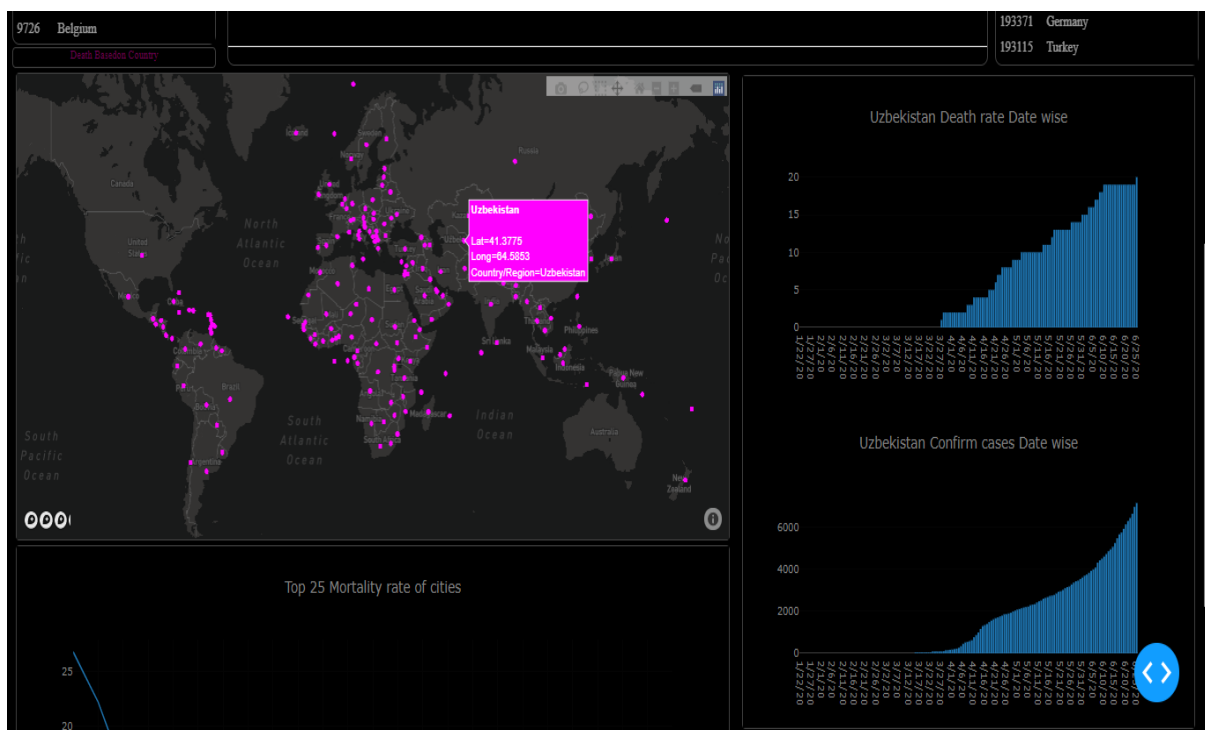


- Third “Emotion of the people during covid19 “ visualizes the bar chat for 5 emotions and updated every 5 seconds.

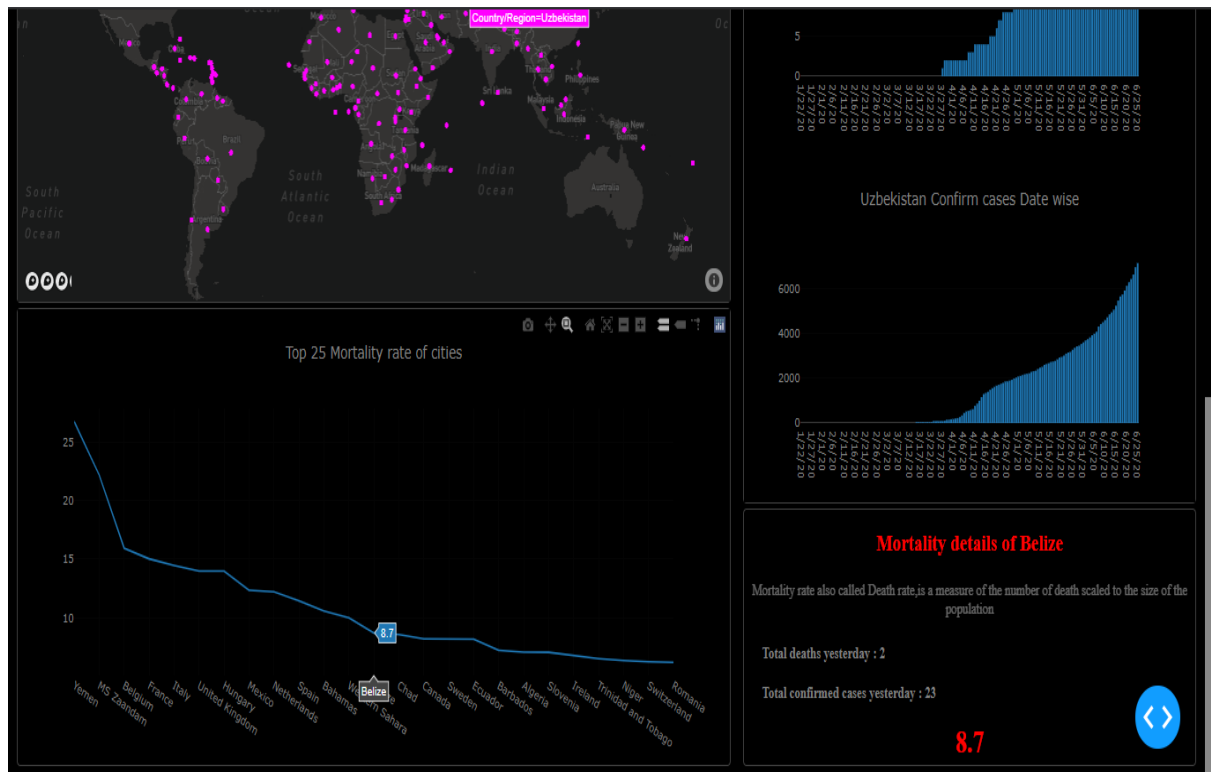


At the right and left side of the dashboard you can see the total death, confirmed and active cases and a list of death and confirmed cases country-wise. This will update you more about covid19 and ordered in descending order. So, the country which has the highest count will appear first.

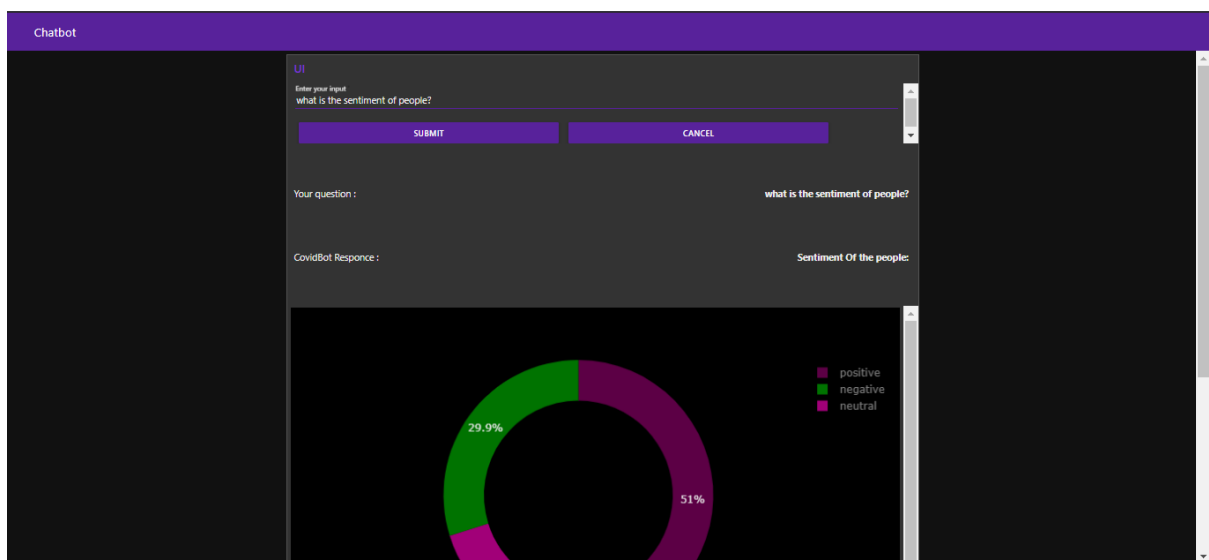
- **World map** is plotted with all the countries in the world and updated every day. When hover on one country, this will generate two graph showing death and confirmed cases corresponding to the country name, “*from May to now*” day-wise. This graph is fully user interactive, when user hover on the world map the graph keeps on updating, corresponding to every point they hovering.



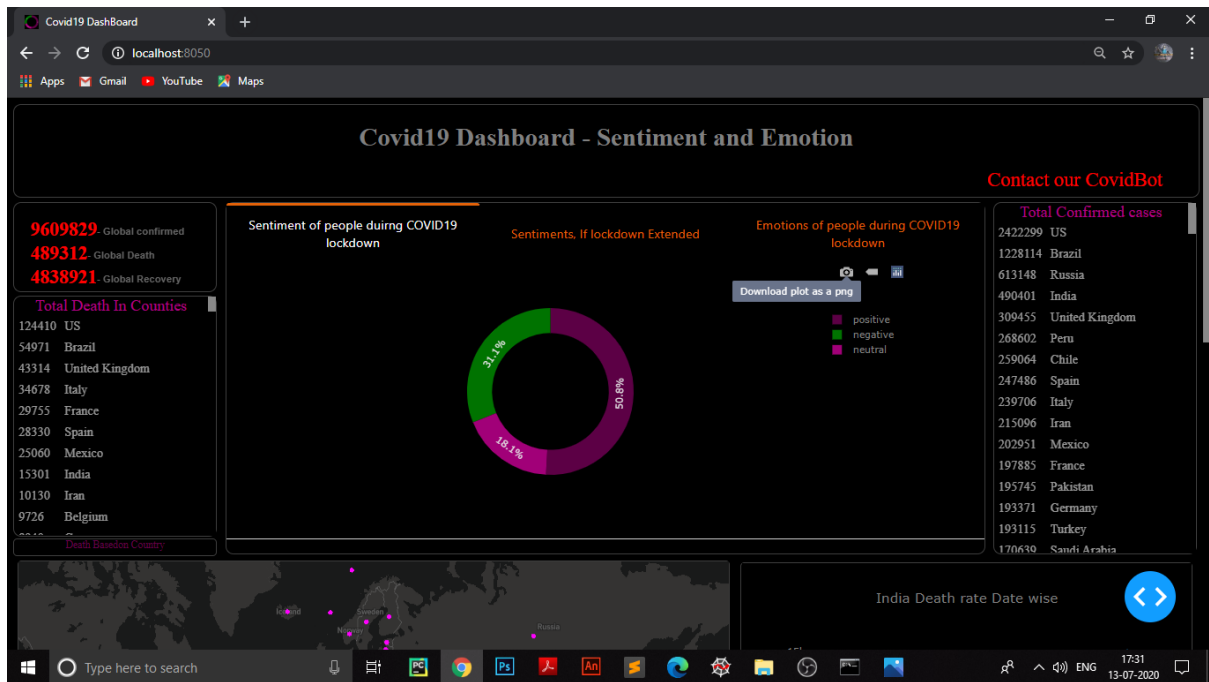
- **Mortality rate** – mortality rate is nothing but the death rate. Through the mortality rate we can decide the covid19 condition in the country.



- **AI Based CovidBot-** dashboard is available with the *CovidBot* through that we can contact with our AI chatbot and make communication about the general information, treatment and medical related queries, origin, present condition, sentiment and emotion analytics graph, death and confirmed cases county-wise and more.



- You can download any images by the camera icon on the images.



## 7.. Advantages & Disadvantages:

### Advantages:

- Less coding for prediction process.
- Fully user interactive.
- High performance.
- Don't need to explicitly train the model.
- Don't need any training and testing data.
- Quick updating speed.
- Download the images into the users local machine easily.

### Disadvantages:

- Need to pay for the IBM cloud.
- Need high internet connection for live update.

## 8.. Applications:

- The Covid19 sentiment dashboard is used to analyse the emotions and sentiment of the people during this lockdown. It will help the government & other private organization to make decision according to the sentiment of the people. And can make the decision about the lockdown extension.
- It is used to get the live information about the covid19 every day. We can monitor each countries condition due to corona.
- Get the live update about the death and confirmed cases from every country as well as from the whole world.

## 9.. Conclusion:

It presents live streaming, fully user interactive, all-in-one dashboard with live sentiment and emotions of people across the world about the COVID19 lockdown.

- This app will give you the covid19 death and confirmed cases information for whole world as well as for each country. You can get the daily update on covid19 through the dashboard.
- The main parts of the dashboard is “Sentiment of people about covid19, Emotion of people about covid19 and the main **Sentiment of people If the lockdown is extended**”.
- They are updated every 5 seconds.
- **World map** is plotted with all the countries in the world and updated every day. When hover on one country ,this will generate two graph showing death and confirmed cases corresponding to the country from may to now day-wise. This graph is fully user interactive, when user hover on it the graph keep updating corresponding to every point they hovering.
- **Mortality rate** – mortality rate is nothing but the death rate. Through the mortality rate we can decide the covid19 condition in the country.
- **AI Based CovidBot-** dashboard is available with the CovidBot through that we can contact with our AI chatbot and make communication about the general information, treatment and medical related queries, origin, present condition, sentiment and emotion analytics graph, death and confirmed cases county-wise and more.

## ***10.. Future Scope:***

- We will connect the dashboard to the well trained covidbot to get even better results.
- We will update the sentiment and emotion graph based on the country region we select, it will make better understanding in decision making process.
- We will make dashboard more responsive.

## ***11.. Bibilography:***

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***Project Title :*** Sentiment Analysis on covid19 -visualization Dashboard

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- 1) IBM Cloud: <https://www.ibm.com/cloud/get-started>
- 2) Node-red tutorial: <https://developer.ibm.com/tutorials/how-to-create-a-node-red-starter-application/>
- 3) About API: [https://www.youtube.com/watch?v=s7wmiS2m\\_SXY&feature=youtu.be](https://www.youtube.com/watch?v=s7wmiS2m_SXY&feature=youtu.be)
- 4) Watson services and product: <https://www.ibm.com/watson/products-services>
- 5) Dash(plotly) : <https://dash.plotly.com/>
- 6) IBM Watson Discovery: <https://developer.ibm.com/articles/introduction-watson-discovery/>

## ***12.. Appendix :***

Link to node-red flow creation: [https://github.com/pavi-ninjaac/Sentiment\\_analyse\\_node-red](https://github.com/pavi-ninjaac/Sentiment_analyse_node-red)

Link to chatbot creation : <https://github.com/pavi-ninjaac/Covid19Bot>

Link to dash app creation : <https://github.com/pavi-ninjaac/IBMHACK2020>