FULL STACK -2 PROJECT

(2020-21)

Department of Computer Engineering and Applications

Mathura

COVID-19 TRACKER

Using React JS

PROJECT REPORT

Team Members:

Deepanshi Garg

(University Roll No- 181500206)

Megha Kansal

(University Roll No- 181500382)

Supervised By:

Mr. Pankaj Kapoor

Asst. Professor Department of Computer Engineering

and Applications

Declaration

We hereby declare that the work which is being presented in the FullStack-2 Project "Covid-19 Tracker", in partial fulfillment of the requirements for Full Stack Project is an authentic record of our own work carried under the supervision of Mr.Pankaj Kapoor.

Megha Kansal (181500382)

Deepanshi Garg (181500206)

Certificate

This is to certify that the project entitled “Covid-19 Tracker” carried out in FullStack-2 Project is a bonafied work done by Megha Kansal (181500382) and Deepanshi Garg (181500206) and is submitted in partial fulfillment of the requirement of the project to be submitted under FullStack-2 Project for 6th semester.

Signature of Supervisor:

Name of Supervisor: Mr. Pankaj Kapoor

Date: 10/05/2021

Acknowledgement

It gives us the immense pleasure to present the report of the B.Tech. Full Stack Project undertaken during B.Tech. 3rd Year. This project would never have seen the light of the day without the help and guidance that we have received.

Our heartiest thanks to **Dr. (Prof). Anand Singh Jalal, Head of Dept., Department of CEA** for providing us with an encouraging platform to develop this project, which thus helped us in shaping our abilities towards a constructive goal.

We owe special debt of gratitude to **Mr. Pankaj Kapoor**, for his constant support and guidance throughout the course of our work. He has showered us with all their extensively experienced ideas and has also taught us about the latest industry-oriented technologies.

We also do not like to miss the opportunity to acknowledge the contribution of all faculty members of the department for their kind guidance and cooperation during the development of our project.

Thanking You All,

Megha Kansal

Deepanshi Garg

Contents

Abstract

Most people in the world stay at home these days because of the lockdown. Most of you are frustrated about staying at home for a long time.

COVID-19 is killing people on a large scale. As of October 10, 2020, more than 7.7 million people across every state in the United States and its four territories had tested positive for COVID-19. The COVID-19 pandemic continues to evolve at a different pace in different parts of the world, with some countries combatting the first wave of infections whilst other countries have eased their confinement measures albeit with changes to daily life.

Analyzing the data of a deadly pandemic that has created a mess in this wonderful world and caused a lot of deaths is a need of this hour such that we can easily take preventive measures and hold this pandemic growth and eradicate it with certain measures and proper planning and a study is needed to analyse whether any inter-mediate hosts have facilitated the transmission of the virus to humans or vice versa and this could only be done if precise data is analysed.

Therefore, we made a COVID-19 tracking application and get pleasure about that we create a tracking application.

1. Objective

We all have been affected by the current COVID-19 pandemic. However, the impact of the pandemic and its consequences are felt differently depending on our status as individuals and as members of society. Our different social identities and the social groups we belong to determine our inclusion within society and, by extension, our vulnerability to epidemics.

We recognized that the pandemic has had and is having devastating effects on other minorities as well. The COVID- 19 pandemic that continues to circulate around the globe is affecting almost every aspect of daily life, including the very human need to connect to culture.

Countries dealing with existing humanitarian crises or emergencies are particularly exposed to the effects of COVID-19. Responding swiftly to the pandemic, while ensuring that humanitarian and recovery assistance reaches those most in need, is critical.

By analyzing the data of a deadly pandemic that has created a mess in this wonderful world and caused a lot of deaths is a need of this hour such that we can easily take preventive measures and hold this pandemic growth and eradicate it with certain measures. Therefore, we made a COVID-19 tracking application.

2. Introduction

2.1 Overview:

Many government agencies, universities and companies have launched the applications that helps analyzing real time situation or virus by providing us updates about number of corona virus cases in our surroundings so that conclusions could be made how to protect us from its widespread. Precise data representation and data modification is the main aim behind a website that serves figures related to any pandemic or healthcare issue.

The value of maps as a communication tool blossomed over the next 225 years in the service of understanding and tracking infectious diseases. Since then we have seen a revolution in applied health geography through Web-based tools. Now, as we deploy these tools to protect human lives, we can ingest big data from their sources and display results in interactive and near-real-time dashboards. These dashboards have become a pivotal source of information during the COVID-19 outbreak.

Mapping dashboards and applications for tracking the coronavirus epidemic and associated events as they unfold around the world. Some of these dashboards and applications are receiving data updates in near-real-time.

2.2 Importance:

When disease can travel so quickly, information has to move even faster. This is where map-based dashboards become crucial. Dashboards shows how eager people are to track health threats. Anyone with Internet access can learn, in a few short clicks, a tremendous amount of information about the COVID-19 virus from these resources.

Dashboard's interactive map locates and tallies confirmed infections, deaths and recoveries. Graphs detail virus progress over time. Viewers can see the day and time of the most recent data update and data sources.

Yet, the COVID-19 outbreak has been difficult to monitor, "*it is especially challenging to collect good data at a fine spatial resolution, which is what most people want to know, and without having real time data, it is hard to assess what the geographic risk profile will look like moving forward*".

Improved data sharing and real-time information to support critical decision-making. Dashboards exemplify those ideals and have been extremely popular in sharing and understanding the spread of SARS-CoV-2 coronavirus. Communication through map-based dashboards offers accessible information to people around the world eager to protect themselves and their communities. This tool type improves data transparency and helps authorities disseminate information. Certainly, dashboards have taken centre stage in COVID-19 outbreak awareness.

“We wanted people to be able to see this as something that brings us all together. It's not one country, or another country; it's one planet, and this is what our planet looks like today”.COVID-19 tracking tools are getting developed at a rapid pace by different governments in their respective countries.

2.2.1 Features of Covid-19 Tracker:

- COVID-19 tracker displays a country-wise breakdown of coronavirus cases under three categories: coronavirus cases, recovered, deaths.
- It offers a simple, dual-colored, interactive world map visualizing the impact of coronavirus across territories.
- It offers to the users from no page reloads to all corona virus related data under a single web page.
- It covers all scenarios to achieve the requirements of any user searching for worldwide or country wise details regarding corona virus.
- It tracks the state-wise spread of COVID-19 in each country.
- The data is collected by asynchronous API calls to disease.sh that provides dynamic data depending on the endpoint used during the call.
- In simple words disease.sh acts as a server to which we make GET request to provided endpoint and according to endpoint it gives JSON data in response.
- It helps citizens to stay up to date with the latest on the pandemic.

2.2.2 Impact of Covid-19:

The impact of covid-19 in different sectors is as following:

- **Unorganized Sector**

  This pandemic affected workers of unorganized sector mostly who are daily wager or those working in Micro, Small and Medium Enterprises (MSMEs) rand left them jobless, and rapidly increased the unemployment rate, left no alternate income source.After lockdown, giving them employment is a very necessary step, lack of which forced them to leave their home. They may not die from corona but will die definitely from starvation.

- **Agriculture and Food Processing**

  Agriculture is considered the backbone of the Indian economy. As Inter-state transportation services have shut down, farmers are unable to sell their crops in the market. They are incurring huge losses and forced to throw out their crops. They don't have any other source of income.

- **E-Commerce**

  The government has issued a special advisory for maintaining social distancing to prevent the community transfer of COVID-19 and asked the corporates to allow their employees to work from home. The nationwide lockdown will tremendously affect the operations of the E-commerce industry especially at a time when there is a huge demand for home delivery of goods.

- **Education**

  Due to the outbreak of the pandemic, most schools and educational institutions have closed down to prevent the transfer of disease among children. Though, we are safeguarding them, this will also negatively impact their academic progress. Now, we need to shift our focus from traditional to the virtual classroom.COVID-19 has changed the way of learning in the long term.

- **Tourism and Hospitality Sector**

  The revenue of the tourism sector got down due to a strict ban on both domestic and international flights. Even many tourists got themselves cancelled. Earlier there were a huge number of Indian travelers to both domestic and international destinations but now nobody is willing to go anywhere.

- **Healthcare Industry**

  COVID-19 has exposed the vulnerabilities of healthcare systems. As we know that access to healthcare is a fundamental right but the fear of COVID-19 everywhere has in turn affected may people's primary healthcare provisions. This pandemic has taught a lesson that temples, statues and museums are not a necessary requirement but the hospital with world-class infrastructure is.

- **Defense and Security**

  The COVID-19 impacted the supply chains and production/manufacturing facilities of defense companies.

As they have to depend on different components on different sources located in affected countries. This will lead to a decrease in demand for defense equipment. COVID-19 has taught a lesson to defense industry that they need to explore the different aspects of risk planning.

In the end, it can be said that almost every sector got affected from the pandemic including aviation where all domestic and international flights got cancelled sports where cancellation of events lead to huge loss to organizers.

3. Requirements

3.1 Hardware Requirements Specification:

Processor	: Intel Core i5
Main Memory (RAM)	: 256 MB
Cache Memory	: 512 KB
Monitor	: 14 inch Color Monitor
Keyboard	: 108 Keys
Mouse	: Optical Mouse
Hard Disk	: 160 GB

3.2 Software Requirements Specification:

Front End/Language	: React JS and Material UI
Operating System	: Windows 7, 8, 9, 10, XP

3.2.1 Technologies Used:

A large number of npm packages like react, react-Dom, @material-ui etc. along with React JS and CSS library like Material UI has been used in order to code the website such that it results in an attractive, responsive and a beautiful project with a single technology that is JS and making API calls to collect worldwide data related to Corona virus, JSX (HTML inside JS), data representation in dynamic graphs.

- **React JS:**

  React is a JavaScript library created for building fast and interactive user interfaces for web and mobile applications. It is an open-source, component-based, front-end library responsible only for the application's view layer. In Model View Controller (MVC) architecture, the view layer is responsible for how the app looks and feels.

  React's popularity today has eclipsed that of all other front-end development frameworks. Here is why:

  - Easy creation of dynamic applications
  - Improved performance
  - Reusable components
  - Unidirectional data flow
  - Small learning curve
  - Dedicated tools for easy debugging
  - It can be used for the development of both web and mobile apps.

Features of React

- **JSX - JavaScript Syntax Extension**

  JSX is a syntax extension to JavaScript. It is used with React to describe what the user interface should look like. By using JSX, we can write HTML structures in the same file that contains JavaScript code. This makes the code easier to understand and debug, as it avoids the usage of complex JavaScript DOM structures.

- **Virtual DOM**

  React keeps a lightweight representation of the "real" DOM in the memory, and that is known as the "virtual" DOM (VDOM). Manipulating real DOM is much slower than manipulating VDOM because nothing gets drawn on the screen. When the state of an object changes, VDOM changes only that object in the real DOM instead of updating all of the objects.

- **Performance**

  React uses VDOM, which makes the web applications run much faster than those developed with alternate front-end frameworks. React breaks a complex user interface into individual components, allowing multiple users to work on each component simultaneously, thereby speeding up the development time.

- **Extensions**

  React goes beyond simple UI design and has many extensions that offer complete application architecture support. It provides server-side rendering, which entails rendering a normally client-side only web application on the server, and then sends a fully rendered page to the client.

- **One-way Data Binding**

  React's one-way data binding keeps everything modular and fast. A unidirectional data flow means that when a developer designs a React app, they often nest child components within parent components.

- **Debugging**

  React applications are easy to test due to a large developer community. Facebook even provides a small browser extension that makes React debugging faster and easier.

React Hooks

It allows you to use state and other React features without writing a class. Hooks are the functions which "hook into" React state and lifecycle features from function components. It does not work inside classes. Hooks are backward-compatible, which means it does not contain any breaking changes. Hooks are similar to JavaScript functions, but you need to follow these two rules when using them. Hooks rule ensures that all the stateful logic in a component is visible in its source code.

- **CSS:**

  Cascading Style Sheets, fondly referred to as CSS, is a simply designed language intended to simplify the process of making web pages presentable. Cascading Style Sheets is a style sheet language used for describing the presentation of a document written in a markup language such as HTML. CSS is a cornerstone technology of the World Wide Web, alongside HTML and JavaScript.

  CSS handles the look and feel part of a web page. Using CSS, you can control the color of the text, the style of fonts, the spacing between paragraphs, how columns are sized and laid out, what background images or colors are used, layout designs, and variations in display for different devices and screen sizes as well as a variety of other effects.

  More importantly, CSS enables you to do this independent of the HTML that makes up each webpage. CSS is easy to learn and understood but it provides powerful control over the presentation of an HTML document.

Advantages of CSS:

- CSS saves time.
- Pages load faster.
- Easy maintenance.
- Superior styles to HTML.
- Multiple Device Compatibility.

- **Material UI:**

  Material UI is a component library for React teeming with powerful components, can provide you with solid pre-styled components that will get the job done. Material-UI components work without any additional setup, and don't pollute the global scope.

Components of Material UI:

- **Grid**
  The Grid component gives you the ability to create the layout for your section of the DOM.

- **Paper**
  It gives a section some lift and a drop shadow to produce a paper-like look. This is perfect for any cards you are making.

- **Material Icons**
  Material UI provides a set of icons that are easily imported and implemented. No more digging around the internet or trying to figure out how Font Awesome icons work. Material UI has them built in for free.

- **Snack bar**
  It is one of the most fun and useful ways to tell your user when

something has happened on your app. Or if you want to let the user know their user's name has been taken, the Snack bar might be the right component for the job.

- **Tooltip**
  It helps users get an idea of what exactly each of your icons is doing. If your icons are not immediately intuitive, users may not know what they mean unless they have a tooltip.

➢ **API Calls:**

The data is collected by asynchronous API calls to disease.sh that provides dynamic data depending on the endpoint used during the call. In simple words disease.sh acts as a server to which we make GET request to provided endpoint and according to endpoint it gives JSON data in response.

https://disease.sh/v3/covid-19/all
https://disease.sh/v3/covid-19/countries

4. Methodology

1. Basic structure of the application was created before implementation of any code. The structure was designed in such a way the whole UI looks as a single web page.

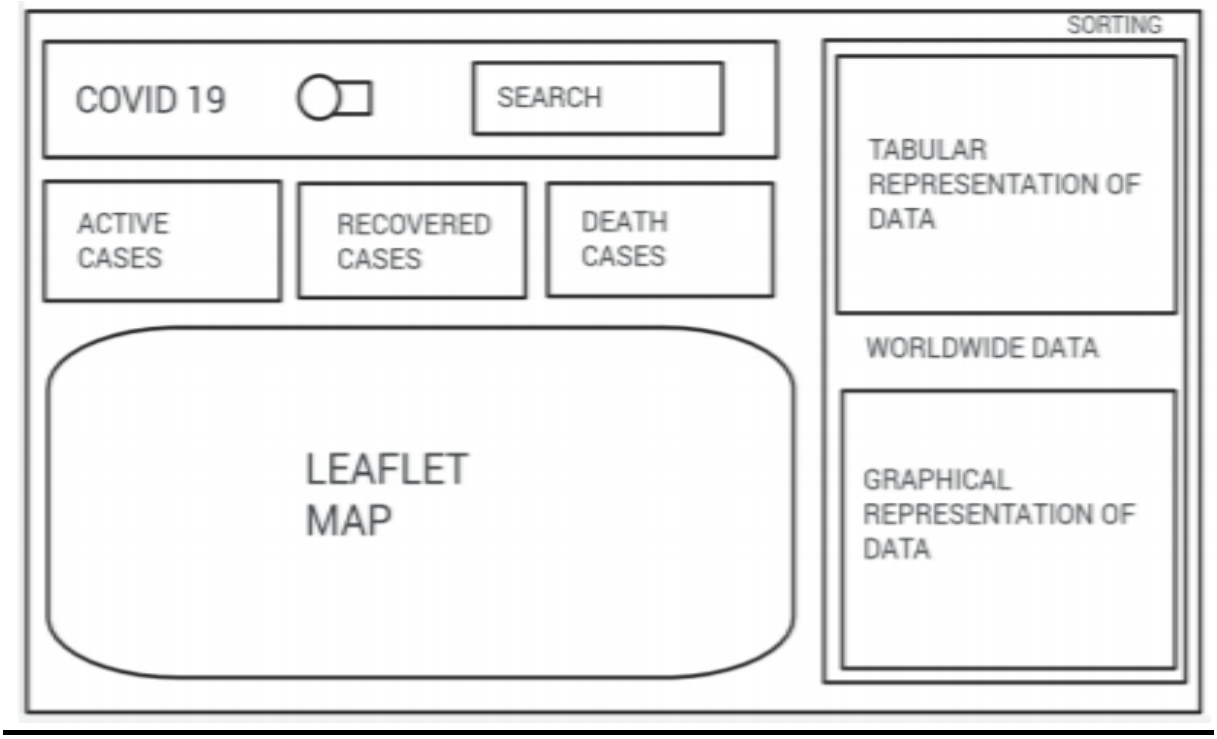


Fig.4.1: Basic structure of application

2. Coding phase of the website was initiated and was planned in such a way that when a particular variable changes the component in the DOM associated to it is automatically changed. For example: Map automatically changes as soon as you search.

3. The coding was performed in a hierarchical manner such that parent component was implanted first after that implementation of child components was performed.

4. API call were made to disease.sh in order to get data. GET requests were made to endpoints provided by disease.sh.

5. All data fetching calls were made under use Effect () hook provided by React JS that takes two parameters one as an async function describing what to do and second argument as when to run that function.

6. After collection of the data the data was transformed in the required formats as required format for graphs is X, Y coordinates.

7. CSS and Material UI are also used as a helping hand to make this website much more attractive.

5. Code Repository Link

Our source code is available at both below repositories you can use any of the given below link to access the code of our FullStack-2 Project, “Covid-19 Tracker”.

1 - Megha Kansal

Repository link: -https://github.com/meghakansal12/covid-19_tracker

2- Deepanshi Garg

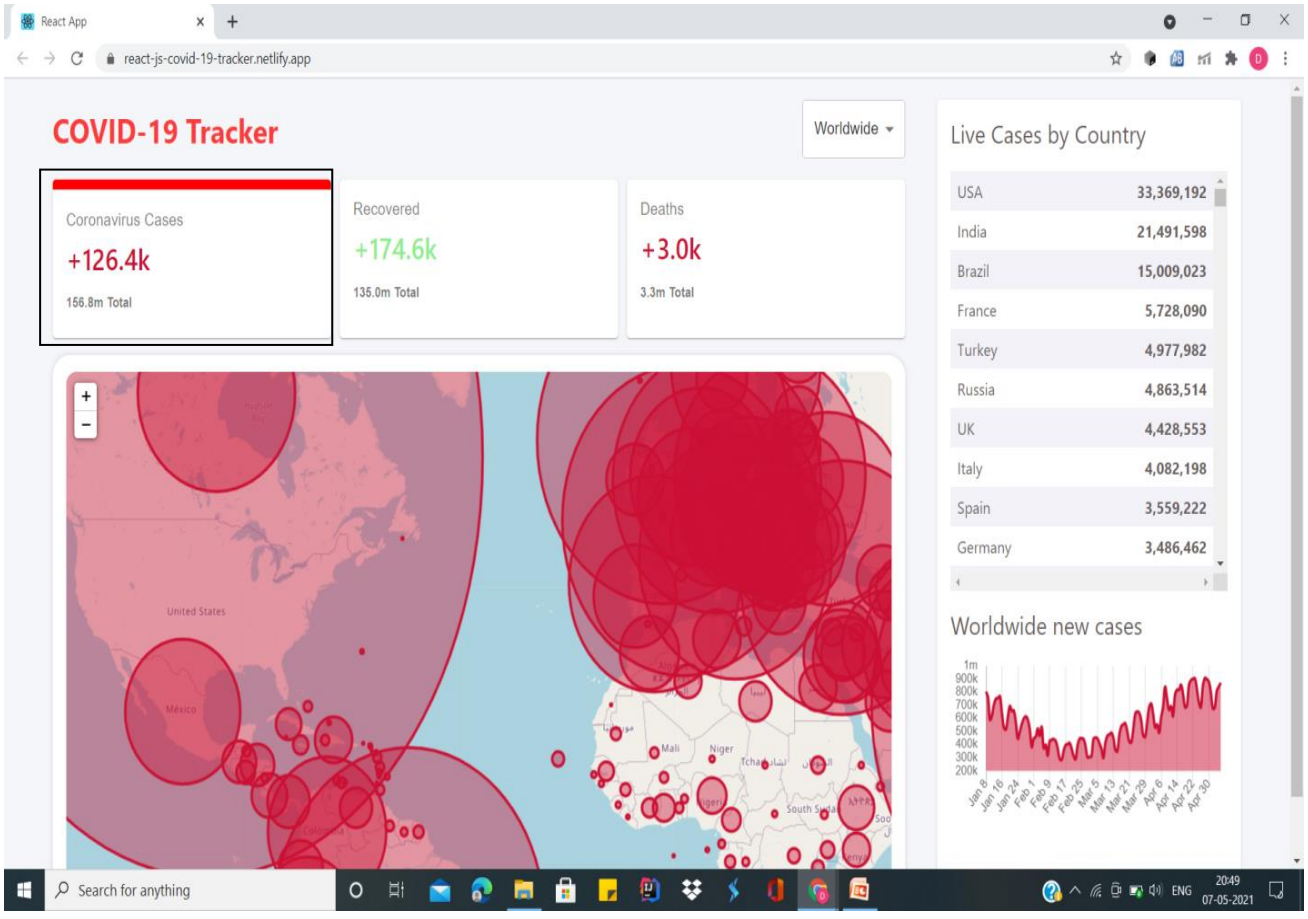
Repository link: -https://github.com/garg-deepanshi/Covid-19_Tracker.git

- **Live Testing Link:-**

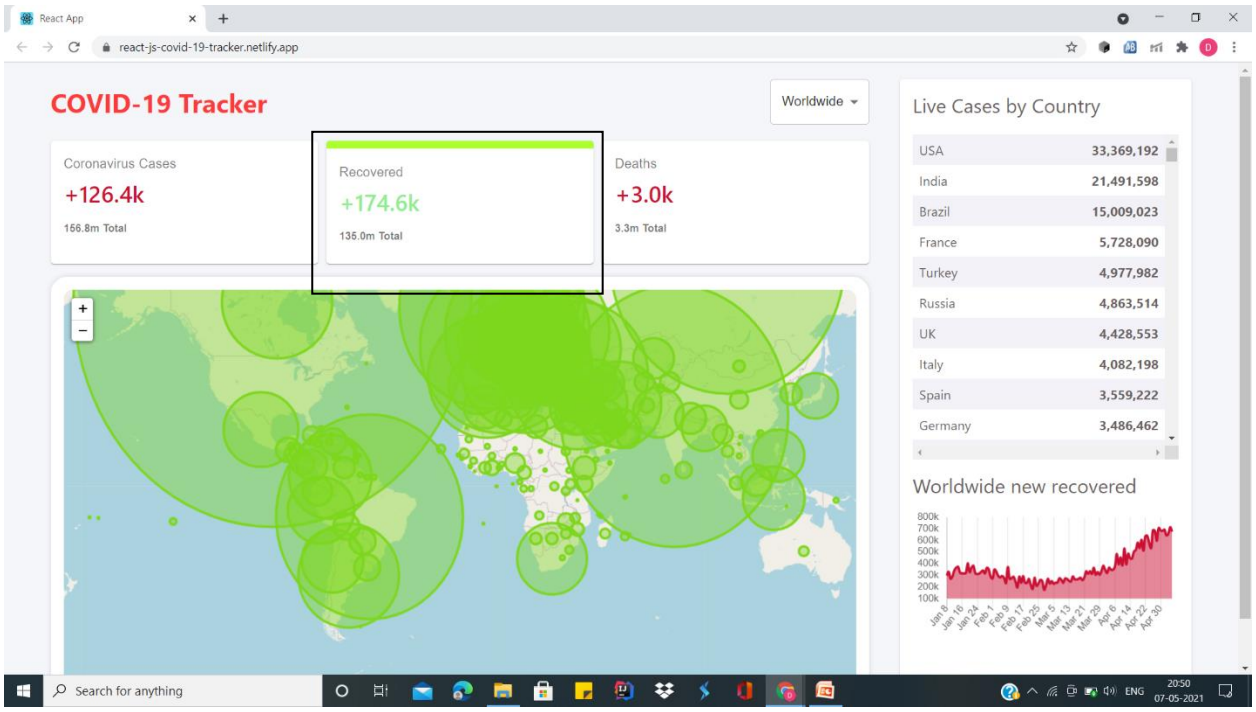
https://react-js-covid-19-tracker.netlify.app/

6. Output Screenshots

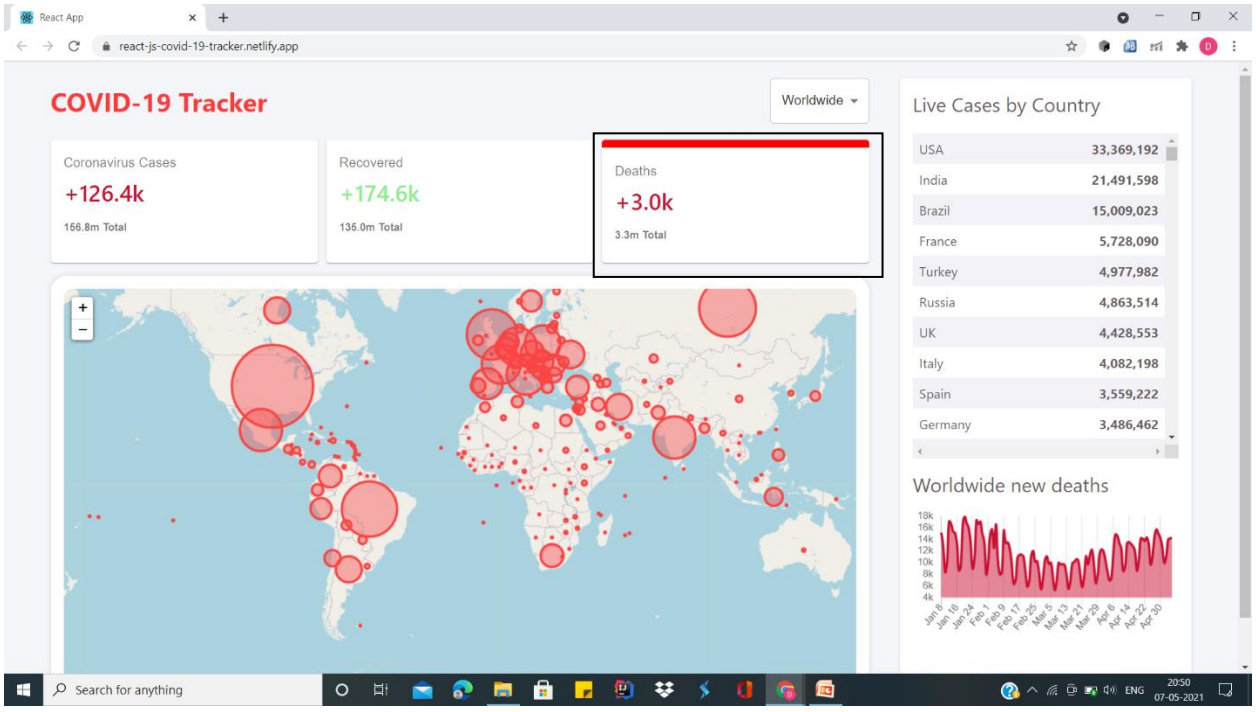
- Coronavirus Cases



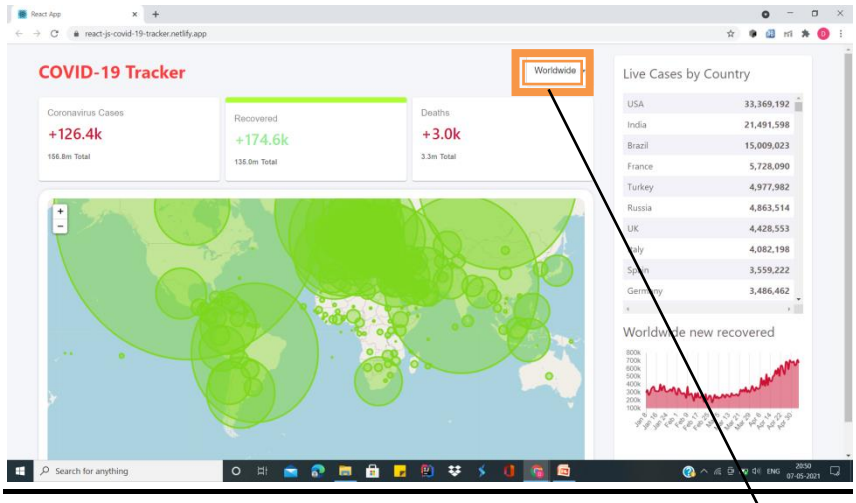
- Recovered Cases

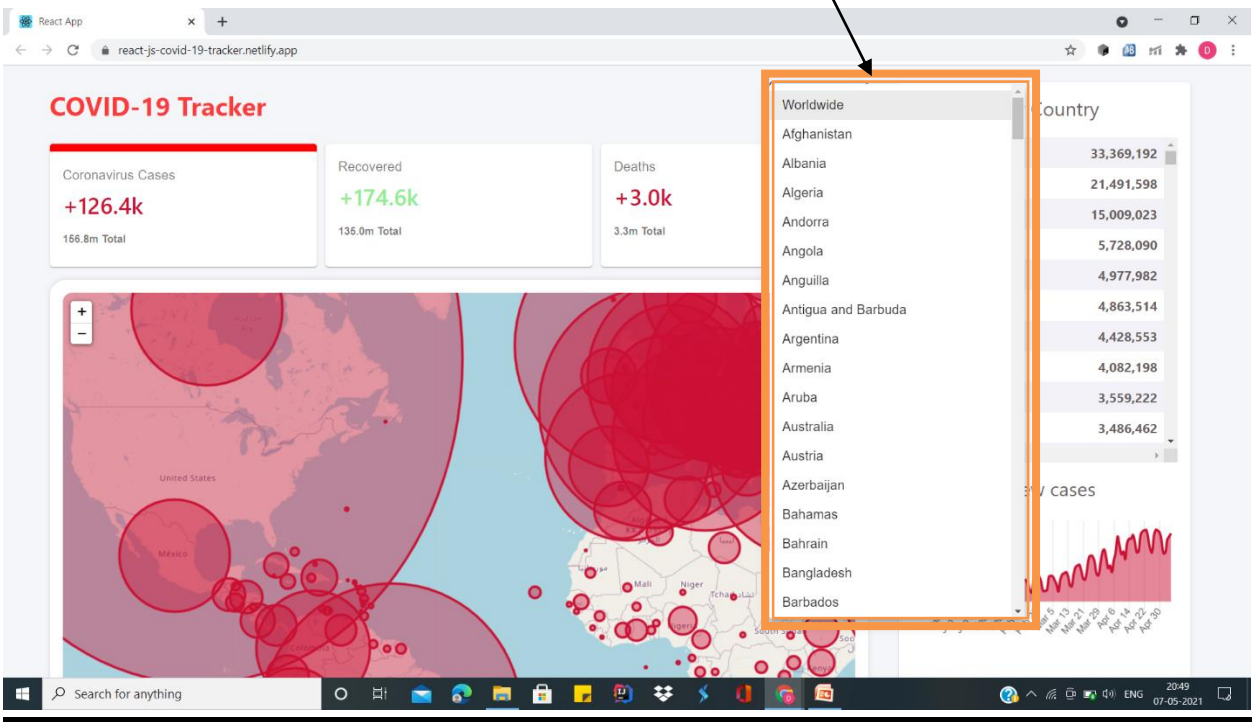


- Deaths Cases

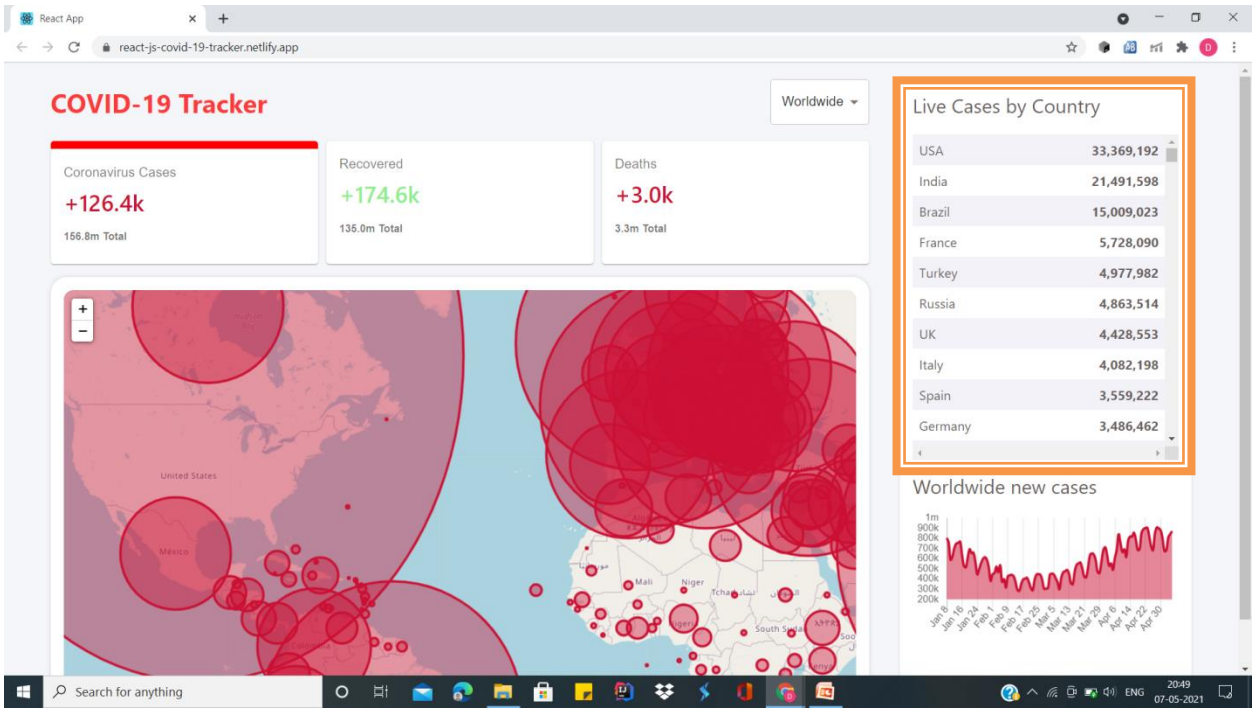


- Country Selector

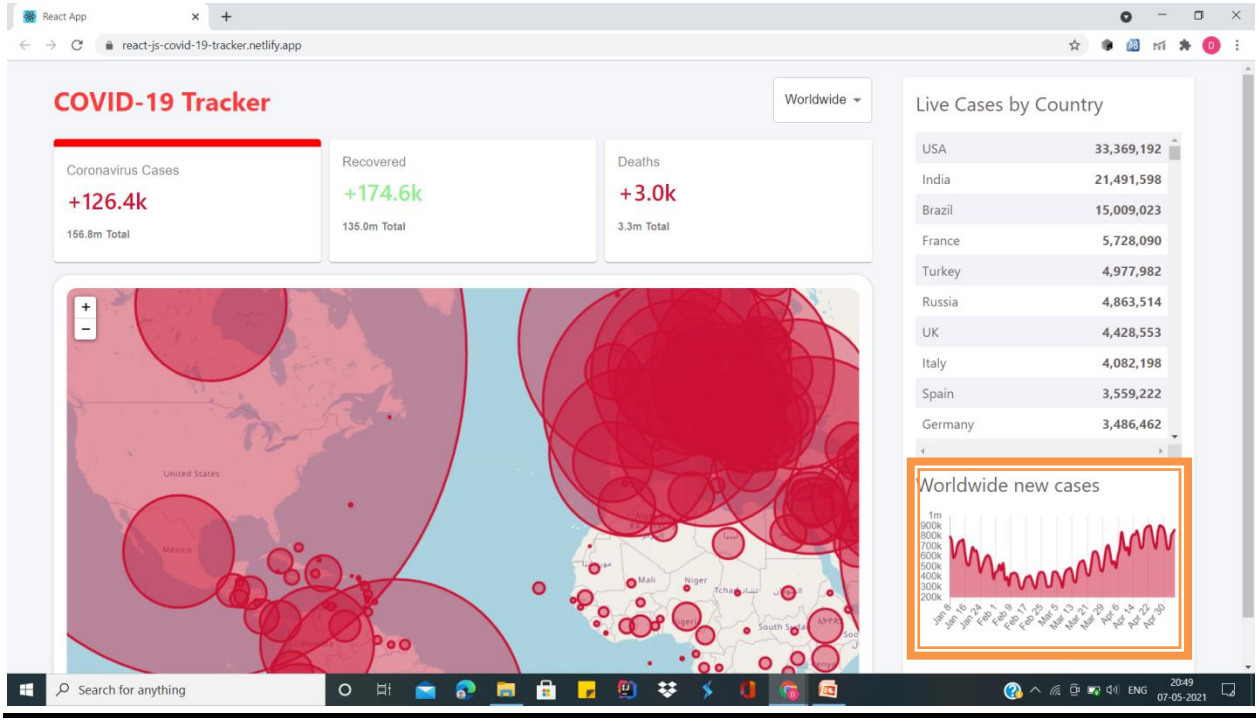




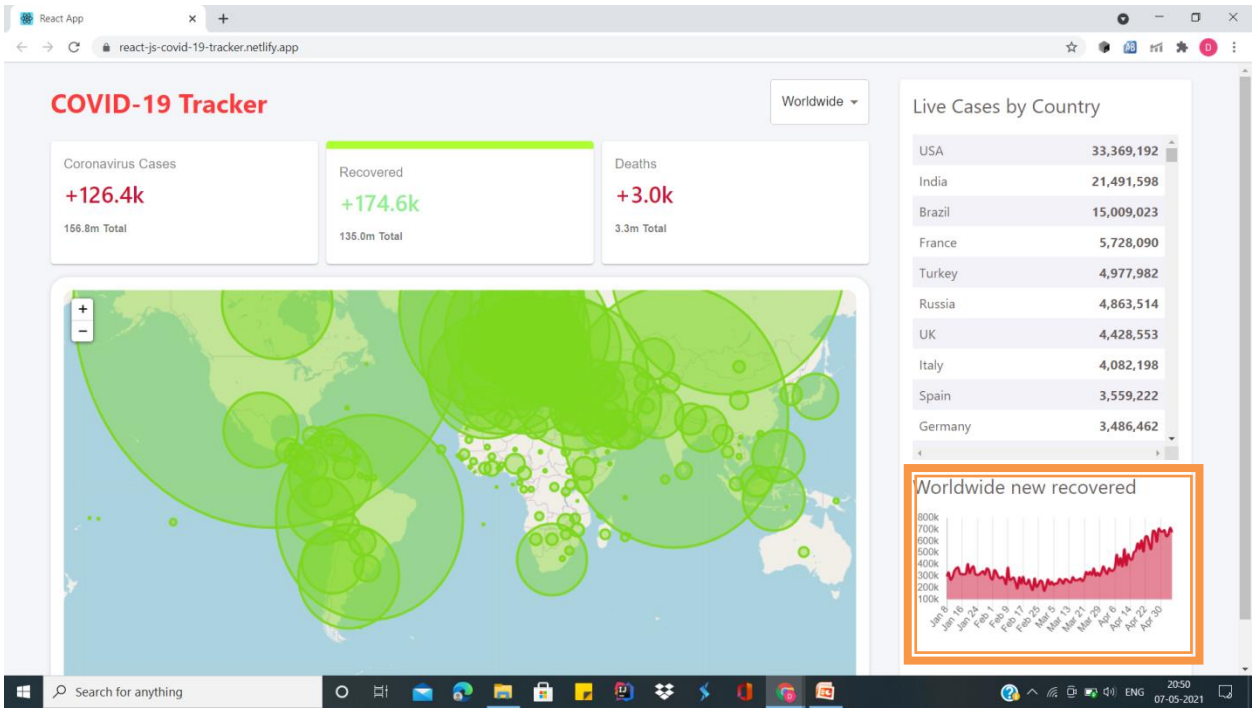
- Table of Live Cases by Country



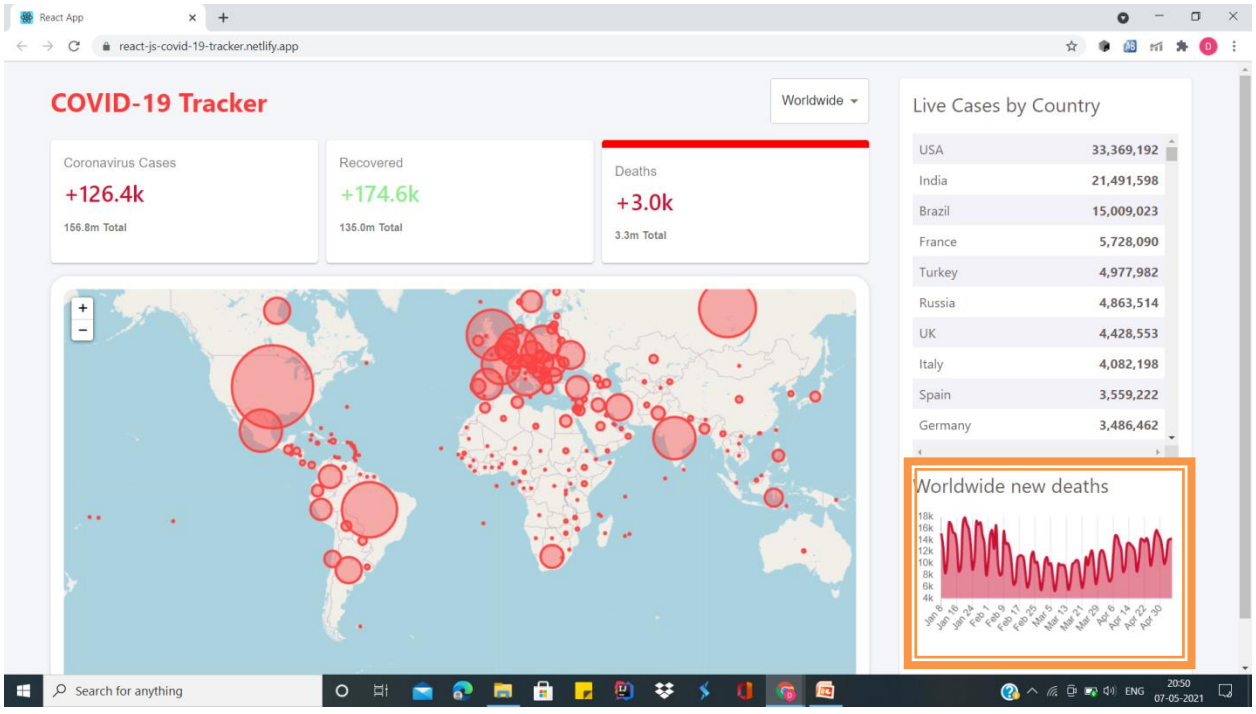
- Worldwide New Corona Cases Graph



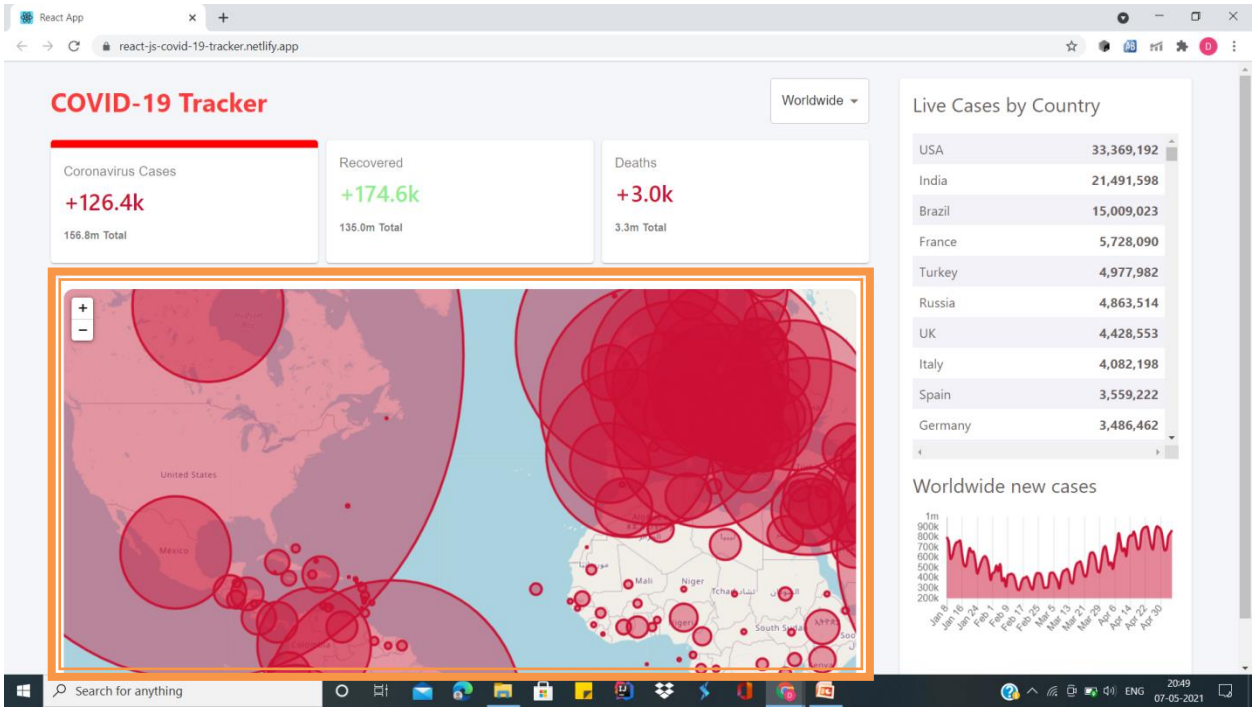
- Worldwide New Recovered Cases Graph



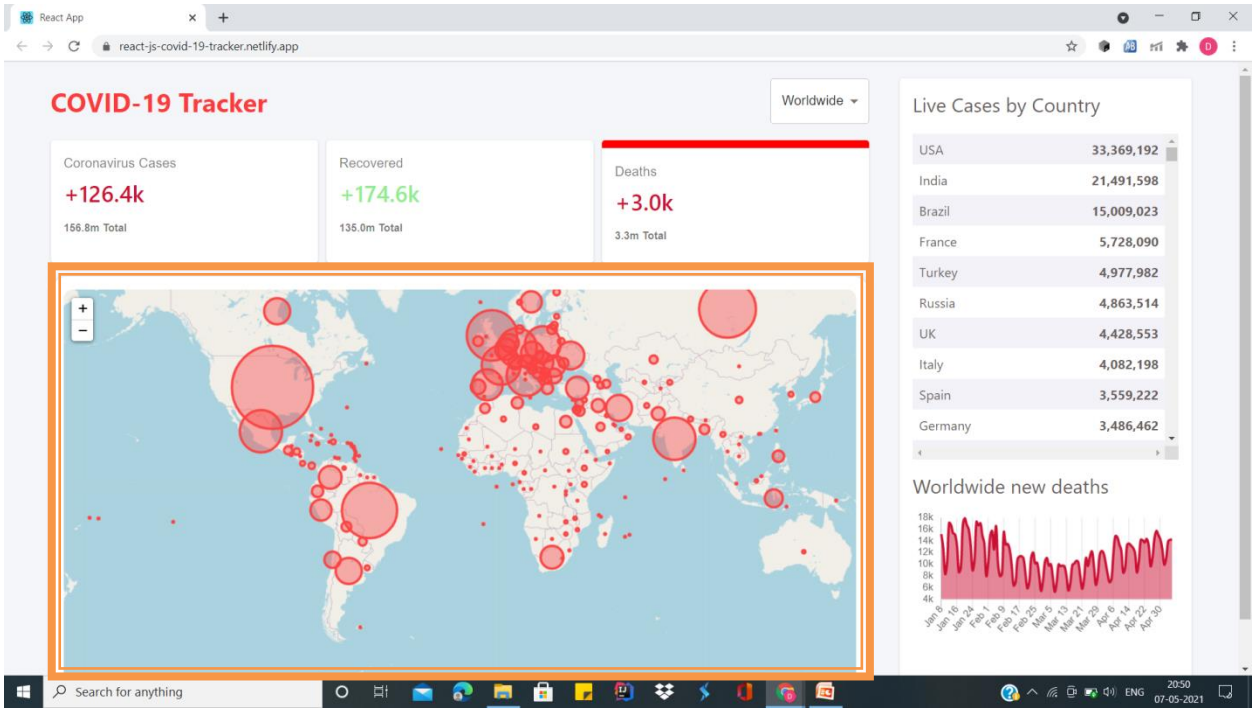
- Worldwide New Death cases Graph



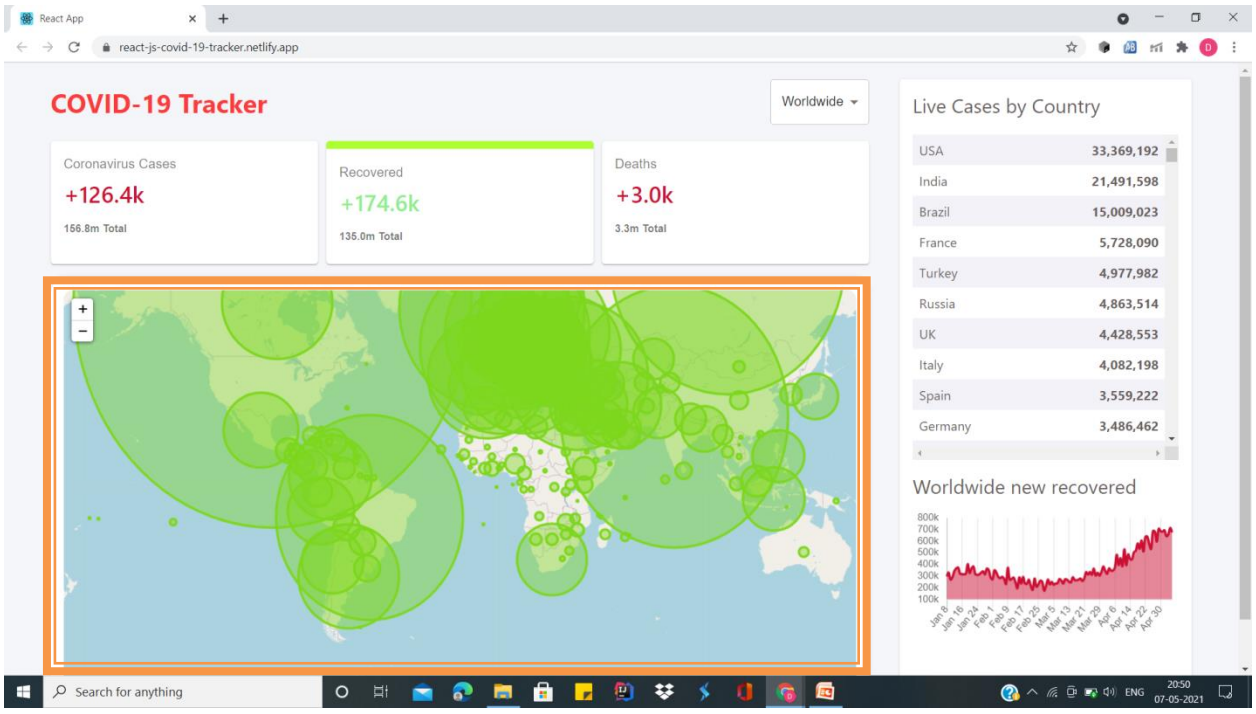
- Worldwide Map for Coronavirus cases



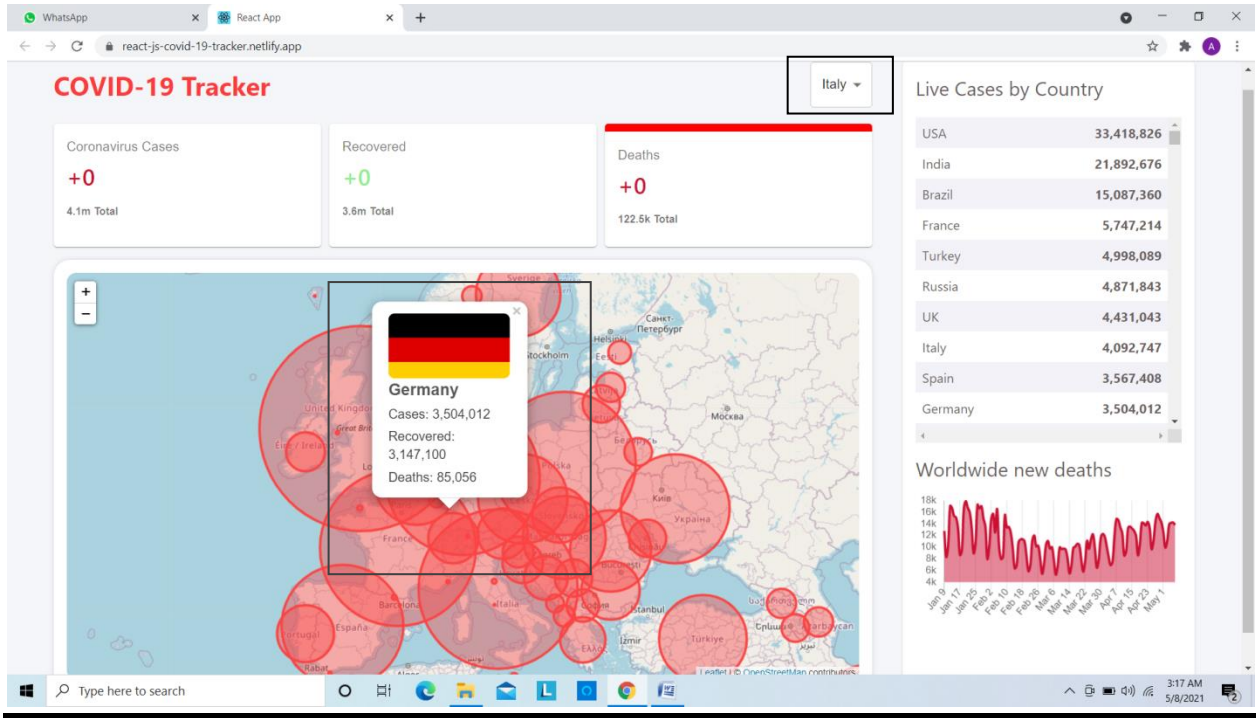
- Worldwide Map for Death cases



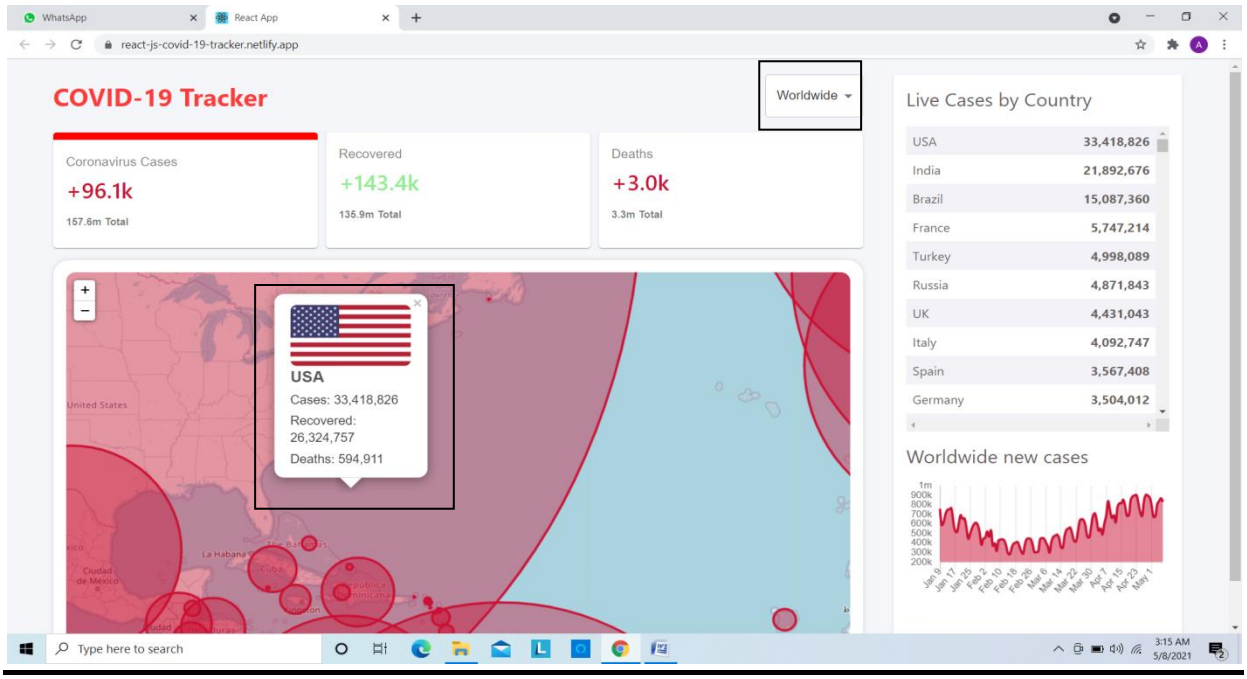
- Worldwide Map for Recovered cases



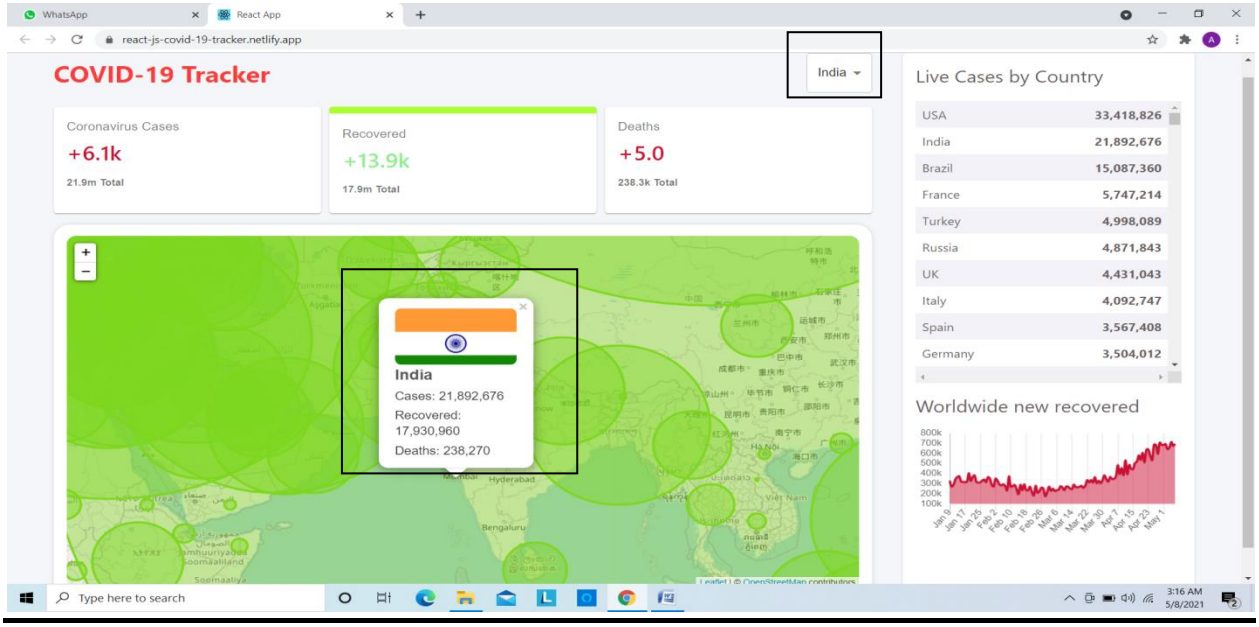
- Click on Map of Death Cases of Italy



- Click on Map of Corona Cases of Worldwide



- Click on Map of Recovered Cases of India



7. Future Scope and Conclusion

Further implementation of some exciting features like disease prediction on the basis of symptoms and direction of further steps such as finding an appropriate doctor nearby user area would add wonders to this application. These will be helpful in understanding and developing new algorithms for finding doctor's for users according to their area. This is a booming project topic which is still going on for surveillance of large crowds in real time applications.

From this application, we conclude that how React JS and some basic concepts of frontend development can lead to such an exciting web application with a bunch of features. Though the application is a pretty basic for now but it has a great scope for further implementation of some advanced topics and some more technologies and for now the application is serving its aim to the fullest for which it is developed.

8. References

We referred to the following resources:

- Google Search
- YouTube Videos
- https://www.beta-labs.in/
- https://www.w3schools.com/