A Thesis/Project/Dissertation Report

on

Covid-19 Real-Time Dashboard

Submitted in partial fulfillment of the requirement for the award of the degree of

Bachelors of Technology

Under The Supervision of
Dr. Medhavi Malik.
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CANDIDATE'S DECLARATION

I/We hereby certify that the work which is being presented in the thesis/project/dissertation, entitled **"COVID-19 REAL-TIME-DASHBOARD"** in partial fulfillment of the requirements for the award of the BTECH submitted in the School of Computing Science and Engineering of Galgotias University, Greater Noida, is an original work carried out during the period of December 2021 to May 2022 under the supervision of Dr. Medhavi Malik, Assistant Professor, Department of Computer Science and Engineering/Computer Application and Information and Science, of School of Computing Science and Engineering, Galgotias University, Greater Noida The matter presented in the thesis/project/dissertation has not been submitted by us for the award of any other degree of this or any other places.

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This is to certify that the above statement made by the candidates is correct to the best of my knowledge.

Dr. Medhavi Malik
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CERTIFICATE

The Final Thesis/Project/ Dissertation Viva-Voce examination of Puneet Bansal - 18SCSE1010094, Kashish Gupta -18SCSE101196 has been held on and his/her work is recommended for the award of Btech (CSE).

Signature of Examiner(s) **Signature of Supervisor(s)**

Signature of Project Coordinator **Signature of Dean**

Place: Greater Noida

ABSTRACT

The Covid-19 Real-time Tracker collects systematic information on policy measures that governments have taken to tackle COVID-19. The different policy responses are tracked since 1 January 2020, cover more than 180 countries, and are coded into 23 indicators, such as school closures, travel restrictions, and vaccination policy. These policies are recorded on a scale to reflect the extent of government action, and scores are aggregated into a suite of policy indices. The data can help decision-makers and citizens understand governmental responses in a consistent way, aiding efforts to fight the pandemic. Our core working paper (BSG-WP-2020/032) provides more information on methodology and data collection.

While the COVID-19 outbreak was reported to first originate from Wuhan, China, it was declared as a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 by WHO. It has spread to over 180 countries by the time of this paper. As the disease spreads around the globe, it has evolved into a worldwide pandemic, endangering the state of global public health and becoming a serious threat to the global community. To combat and prevent the spread of the disease, all individuals should be well-informed of the rapidly changing state of COVID-19. In the endeavor of accomplishing this objective, a COVID-19 real-time analytical tracker has been built to provide the latest status of the disease and relevant analytical insights. The real-time tracker is designed to cater to the general audience without advanced statistical aptitude. It aims to communicate insights through various straightforward and concise data visualizations that are supported by sound statistical foundations and reliable data sources. This paper aims to discuss the major methodologies which are utilized to generate the insights displayed on the real-time tracker, which include real-time data retrieval, normalization techniques, ARIMA time-series forecasting, and some APIs that provide us with real-time graphs. In addition to introducing the details and motivations of the utilized methodologies, the paper additionally features some key discoveries that have been derived in regard to COVID-19 using the methodologies.

CHAPTER-1

1.1 INTRODUCTION

As the Covid-19 is widespread over the world. With its disturbing storm of influenced Cases all through the world, lockdown, and mindfulness among individuals are found to be as it implied for limiting the community transmission. In a thickly populated nation like India, it is exceptionally troublesome to anticipate the community transmission indeed amid lockdown without social mindfulness and prudent measures taken by the individuals. As of late, a few control zones had been distinguished all through the nation and separated into white, orange, and green zones, separately. In this report, the white zones show the contamination hotspots, orange zones signify a few diseases, and green zones demonstrate a zone with no disease. We'll be explaining Biometric advances for mindfulness and safety measure reasons and how they can be utilized to diminish the rate of cases. A biometric framework may be an innovation able to distinguish an individual from an advanced unique mark from a still source. There are numerous strategies in which biometrics work, but in common, they work by comparing chosen highlights from given print with the thumb as well as comparing the unique mark inside a database. Utilizing this application we'll attempt to get to control, recognizable proof framework, and law requirement applications. This innovation is utilized in numerous areas such as biometrics for distinguishing proof, afterward which is clarified in our venture. Covid-19 is one of the most noteworthy wide-spreading issues all over the world. In this widespread time, the world wellbeing organization partitioned the covid cases into three zones as ruddy, orange, and green zones. Through this the ruddy zone means the passing cases, the orange zone means recouping cases and the green zone implies the recuperated cases all through all over the nations. Due to the expanding cases day by day the individuals require assistance to battle against the corona by solidarity. In this study, we are building the Covid-19 tracker of all the cases all around the world by JavaScript and PHP by using the Geoplugin API in Web Development & Design. In this following framework, the covid cases are isolated into three control zones as white means
total cases, orange means total deaths, and green zones imply recovered cases which are represented as a statistical form. Recently in India, companies, schools, and colleges at

their working places, this working situation, require several things such as a sanitizer, a suitable N-95 mask, and the covid report. So, with the assistance of PHP, the dataset is collected from the ShreeJi Govt. General Hospital which has a covid report of 200 patients appears the corona test details like title, lab-id, srf no., age, date, result, address, etc. which are shown through the biometric scan.

1.2 FORMULATION OF PROBLEM

This pandemic is much more than a health crisis. It requires a whole-of-government and whole-of-society response. The resolve and sacrifice of frontline health workers must be matched by every individual and every political leader to put in place the measures to end the pandemic. We're all in this together, and we will only succeed together. There is no time to waste. WHO's singular focus is on working to serve all people to save lives and stop the pandemic. Recently in India, companies, schools, and colleges at their working places, these working situations require several required things such as a sanitizer, a suitable N-95 mask, and the covid report. So, with the assistance of PHP, the dataset is collected from the ShreeJi Govt. General Hospital which has a covid report of 200 patients appears the corona test details like title, lab-id, srf no., age, date, result, address, etc. which are shown through the biometric scan.

TOOLS & TECHNOLOGY USED

For front-end- Html, CSS, JavaScript, Bootstrapping.

For Back-end- Spring boot, PHP and use MySQL database to store the data.

1) HTML:

HTML stands for HyperText Markup Language. It is used to design web pages using a markup language. HTML is the combination of Hypertext and Markup language. Hypertext defines the link between the web pages. A markup language is used to define the text document within the tag which defines the structure of web pages. This language is used to annotate (make notes for the computer) text so that a machine can understand it and manipulate text accordingly. Most markup languages (e.g. HTML) are human-readable. The language uses tags to define what manipulation has to be done on the text. HTML is a markup language used by the browser to manipulate text, images, and other content, in

order to display it in the required format. HTML was created by Tim Berners-Lee in 1991. The first-ever version of HTML was HTML 1.0, but the first standard version was HTML 2.0, published in 1999.

Elements and Tags: HTML uses predefined tags and elements which tell the browser how to properly display the content. Remember to include closing tags. If omitted, the browser applies the effect of the opening tag until the end of the page.
HTML page structure: The basic structure of an HTML page is laid out below. It contains the essential building-block elements (i.e. doctype declaration, HTML, head, title, and body elements) upon which all web pages are created.

An HTML document can be created using any text editor. Save the text file using .html or .htm. Once saved as an HTML document, the file can be opened as a webpage in the browser.

2) CSS :

Cascading Style Sheets fondly referred to as CSS, is a simply designed language intended to simplify the process of making web pages presentable. CSS allows you to apply styles to web pages. More importantly, CSS enables you to do this independent of the HTML that makes up each web page. CSS is easy to learn and understand, but it provides powerful control over the presentation of an HTML document.

CSS saves time: You can write CSS once and reuse the same sheet on multiple HTML pages. Easy Maintenance: To make a global change simply change the style, and all elements in all the webpages will be updated automatically. Search Engines: CSS is considered a clean coding technique, which means search engines won't have to struggle to "read" its content. Superior styles to HTML: CSS has a much wider array of attributes than HTML, so you can give a far better look to your HTML page in comparison to HTML attributes. Offline Browsing: CSS can store web applications locally with the help of an offline cache. Using this we can view offline websites.

Sample code:

```
<style>
main {
width: 200px;
height: 200px;
```

```
padding: 10px;
background: beige;
}
h1 {
font-family: cursive;
color: olivedrab;
border-bottom: 1px dotted darkgreen;
}
p {
font-family: sans-serif;
color: orange;
}
</style>
```

3) JavaScript :

JavaScript is a lightweight, cross-platform, interpreted scripting language. It is well-known for the development of web pages, and many non-browser environments also use it. JavaScript can be used for Client-side developments as well as Server-side developments. JavaScript contains a standard library of objects, like Array, Date, and Math, and a core set of language elements like operators, control structures, and statements.

Client-side: It supplies objects to control a browser and its Document Object Model (DOM). Like if client-side extensions allow an application to place elements on an HTML form and respond to user events such as mouse clicks, form input, and page navigation. Useful libraries for the client-side are AngularJS, ReactJS, VueJS and so many others. Server-side: It supplies objects relevant to running JavaScript on a server. Like if the server-side extensions allow an application to communicate with a database, and provide continuity of information from one invocation to another of the application, or perform file manipulations on a server. The useful framework which is the most famous these days is node.js. JavaScript can be added to your HTML file in two ways: Internal JS: We can add JavaScript directly to our HTML file by writing the code inside the <script> tag. The <script> tag can either be placed inside the <head> or the

<body> tag according to the requirement. External JS: We can write JavaScript code in other file having an extension .js and then link this file inside the <head> tag of the HTML file in which we want to add this code.

Limitations of JavaScript: Performance: JavaScript does not provide the same level of performance as offered by many traditional languages as a complex program written in JavaScript would be comparatively slow. But as JavaScript is used to perform simple tasks in a browser, so performance is not considered a big restriction in its use. Complexity: To master a scripting language, programmers must have a thorough knowledge of all the programming concepts, core language objects, and client and server-side objects otherwise it would be difficult for them to write advanced scripts using JavaScript. Weak error handling and type checking

facilities: It is weakly typed language as there is no need to specify the data type of the variable. So wrong type checking is not performed by compile.

4) Bootstrapping :

Bootstrap is a free and open-source tool collection for creating responsive websites and web applications. It is the most popular HTML, CSS, and JavaScript framework for developing responsive, mobile-first websites. It solves many problems which we had once, one of which is the cross-browser compatibility issue. Nowadays, the websites are perfect for all the browsers (IE, Firefox, and Chrome) and for all sizes of screens (Desktop, Tablets, Phablets, and Phones). All thanks to Bootstrap developers -Mark Otto and Jacob Thornton of Twitter, though it was later declared to be an open-source project.

Why Bootstrap? Faster and Easier Web Development. It creates Platform-independent web pages. It creates Responsive Web-pages. It is designed to be responsive to mobile devices too. It is Free! Available on www.getbootstrap.com How to use Bootstrap 4 on a webpage: There are two ways to include Bootstrap on the website. Include Bootstrap from the CDN link. Download Bootstrap from getbootstrap.com and use it. BootStrap 4 from CDN: This method of installing Bootstrap is easy. It is highly recommended to follow this method.

5) Spring Boot :

The Spring Framework provides a comprehensive programming and configuration model Spring Boot is an open-source, microservice-based Java web framework. The Spring Boot framework creates a fully production-ready environment that is completely configurable using its prebuilt code within its codebase.

6) PHP:

PHP was conceived sometime in the fall of 1994 by Rasmus Lerdorf. Early non-released versions were used on his home page to keep track of who was looking at his online resume. The first version used by others was available sometime in early 1995 and was known as the Personal Home Page Tools. It consisted of a very simplistic parser engine that only understood a few special macros and a number of utilities that were in common use on home pages back then. A guestbook, a counter, and some other stuff. The parser was rewritten in mid-1995 and named PHP/FI Version 2. The FI came from another package Rasmus had written which interpreted HTML form data. He combined the Personal Home Page tools scripts with the Form Interpreter and added mSQL support and PHP/FI was born. PHP/FI grew at an amazing pace and people started contributing code to

It is difficult to give any hard statistics, but it is estimated that by late 1996 PHP/FI was in use on at least 15,000 websites around the world. By mid-1997 this number had grown to over 50,000. Mid-1997 also saw a change in the development of PHP. It changed from being Rasmus' own pet project that a handful of people had contributed to, to being a much more organized team effort. The parser was rewritten from scratch by Zeev Suraski and Andi Gutmans and this new parser formed the basis for PHP Version 3. A lot of the utility code from PHP/FI was ported over to PHP3 and a lot of it was completely rewritten.

Today (end-1999) either PHP/FI or PHP3 ships with a number of commercial

products such as C2's StrongHold web server and RedHat Linux. A conservative estimate based on an extrapolation from numbers provided by NetCraft (see also Netcraft Web Server Survey) would be that PHP is in use on over 1,000,000 sites around the world. To put that in perspective, that is more sites than run Netscape's flagship Enterprise server on the Internet.

Also as of this writing, work is underway on the next generation of PHP, which will utilize the powerful Zend scripting engine to deliver higher performance, and will also support running under web servers other than Apache as a native server module.

7) MySql :

A database is a separate application that stores a collection of data. Each database has one or more distinct APIs for creating, accessing, managing, searching and replicating the data it holds. Other kinds of data stores can also be used, such as files on the file system or large hash tables in memory, but data fetching and writing would not be so fast and easy with those type of systems. Nowadays, we use relational database management systems (RDBMS) to store and manage huge volume of data. This is called relational database because all the data is stored into different tables and relations are established using primary keys or other keys known as Foreign Keys. A Relational DataBase Management System (RDBMS) is a software that: Enables you to implement a database with tables, columns and indexes. Guarantees the Referential Integrity between rows of various tables. Updates the indexes automatically. Interprets an SQL Query and combines information from various tables.

MySQL is a fast, easy-to-use RDBMS being used for many small and big businesses. MySQL is developed, marketed and supported by MySQL AB, which is a Swedish company. MySQL is becoming so popular because of many good reasons: MySQL is released under an open-source license. So you have nothing to pay to use it. MySQL is a very powerful program in its own right. It handles a large subset of the functionality of the most expensive and powerful database packages. MySQL uses a standard form of the

well-known SQL data language. MySQL works on many operating systems and with many languages including PHP, PERL, C, C++, JAVA, etc. MySQL works very quickly and works well even with large data sets. MySQL is very friendly to PHP, the most appreciated language for web development. MySQL supports large databases, up to 50 million rows or more in a table. The default file size limit for a table is 4GB, but you can increase this (if your operating system can handle it) to a theoretical limit of 8 million terabytes (TB). MySQL is customizable. The open-source GPL license allows programmers to modify the MySQL software to fit their own specific environments.

CHAPTER-2

2.1 LITERATURE SURVEY

The section of the COVID-19 real-time tracker contains two different pages to separately highlight the most current states of COVID-19 in the states within Germany and countries around the globe. The two pages share the same features and elements. The top of the page has three odometer boxes to display the total confirmed cases, total deaths, and total recovered cases along with their respective daily new counts. The bottom half of the page contains a user interactive control panel and a display window. The users are able to apply population normalization or log transformation to the visualizations in the display window through the widgets in the control panel.

2.2 DESIGNING & IMPLEMENTATION

In this Designing Structure, the work is partitioned into four- part which have diverse working completely different zones but interconnect to each other. As for the imperative data giving or getting concerning corona, CEI will interface and offer assistance their concerns, through the Authorized members as giving the covid report by means of biometric print.

Fig 1. Architectural Design for Proposed System

2.2.1 Covid-19 Tracker Implementation

For building the Covid-19 Status of all the cases all around the world by JavaScript and PHP by using the Geoplugin API in Web Development & Design. In this following framework, the covid cases are isolated into three control zones as white means total cases, orange means total deaths, and green zones imply recovered cases which are represented as a statistical form.

When the user enter into the page the GeoPlugin (an type of API which is used for find the IP Address of the user and return the user country code) getting the country code of the

user and then use the array called country list to find the country name based on the country code. After getting the nation code from the user, at that point with the use of the array we called the country list to discover the country title based on the country code.
Country list dataset With the help of the country list dataset the country code generate display the country name. The Geoplugin is used to add the script function which return the country codes and then with the help of ForEach() function, the country code will be checked if its same as we get from API Geoplugin. The corona cases data collect from January 2020 to April, 2021.

Finally the country name send to the API and get all the statistics to the user as shown in Graph 1. Covid-19 Tracking in statistically Form CEI Implementation CEI stands for Corona Emergency Information which use the imperative data giving or getting concerning corona, CEI will interface and offer assistance their concerns. The local user feed the information in the website which store into the database.

By the use of this, the Authorized member resolves the concern of users to corona which is educated by the admin from the database. In this database the fundamental data will feed into the biometric database so, the individual covid report will be effortlessly identified.

2.2.2 Biometric Scan Implementation

This Biometric innovations for mindfulness and precaution reasons and how they can be utilized to diminish the rate of cases. A biometric framework could be an innovation able to distinguish a person's covid points of interest from an advanced unique finger impression from a still source. Biometric as the special key confirmation of personality, which checks coordinate against the spared database to endorse the covid positive patients. The dataset collected from the ShreeJi Govt. General Hospital which has a covid report of 200 patients appears the corona test details like title, lab-id, srf no., age, date, result, address, etc. which are shown through the biometric scan. Shree ji Govt. General Hospital When the user starts to scan the biometric protocol engine activates and sends the callback url to the cloud server through communication packets. This protocol engine is responsible for receiving and sending data to the Cloud systems and the biometric device. In this, The

Callback URL is used for communication from the device to our server which exposes the URL at our server which will be a callback. After that, the virtual server (cloud system) sends to the database via Restful URL. Finally, the database reads the biometric through the Aadhar card and throws back the output to the user.

CHAPTER-3

3.1 FUNCTIONALITY & WORKING

It is a responsive website used to see the spread of Covid-19 across all the countries. When the user enters our website, we will use a plugin called Geoplugin API, this will use IP address based on users country and then it will return country code of the users. So the country code is a 2-digit code which is a universal code. Different countries have their unique country codes. After getting the country code we use an Array or a List to figure out the country name based on the country code. Then again we will send the country name to an another API called Rapid Covid-19 Tracker API and get all the statistics back to the user.

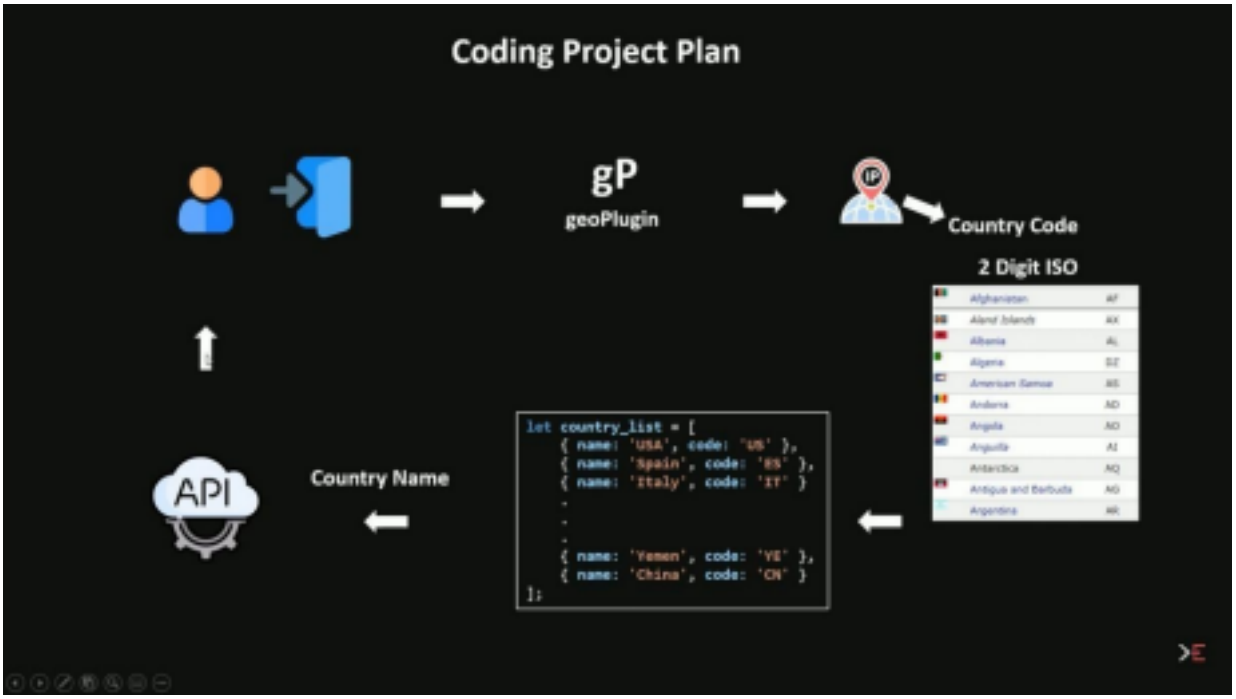

FIG: DATA FLOW DIAGRAM or WORKING

Statistics Covers total-cases, recovered cases & total-deaths. It will also show the graphical representation of Statistics.

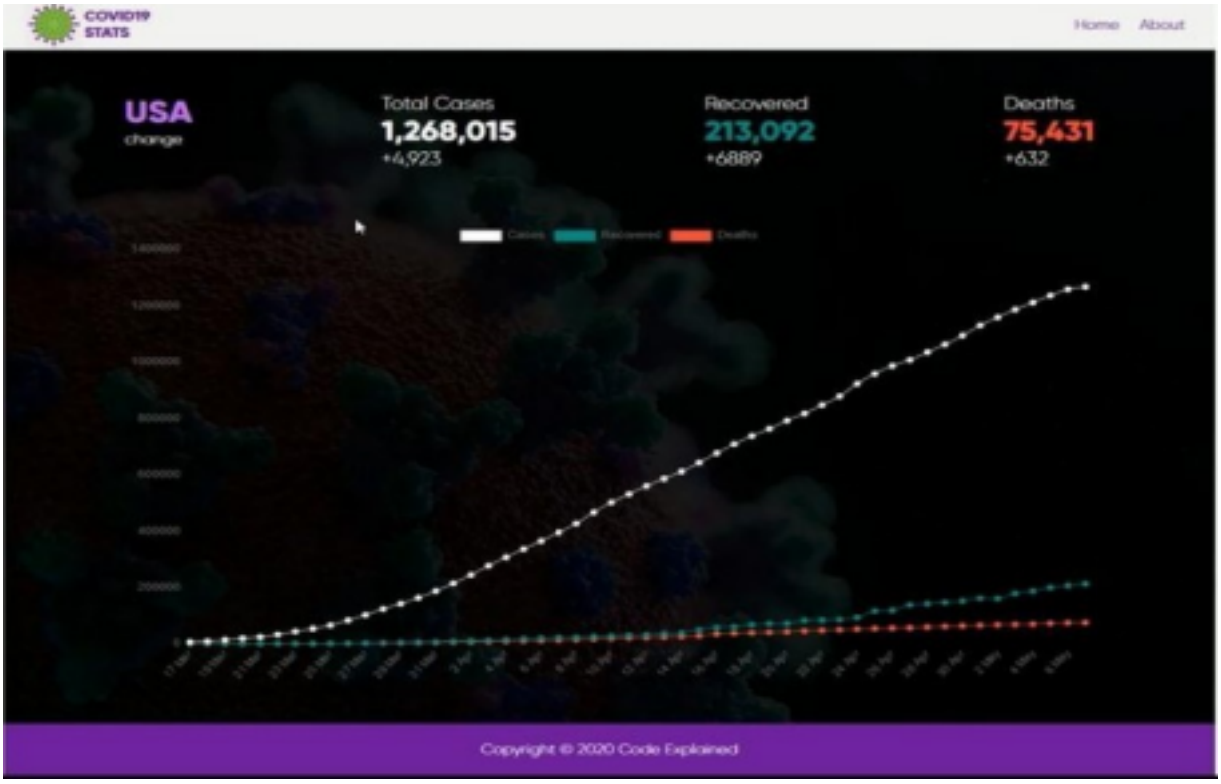

Figure-1

We can also change the country name using search-box and show the Covid-19 status for that particular country. Following figures will show how we can change the country name using the search-box provided there.

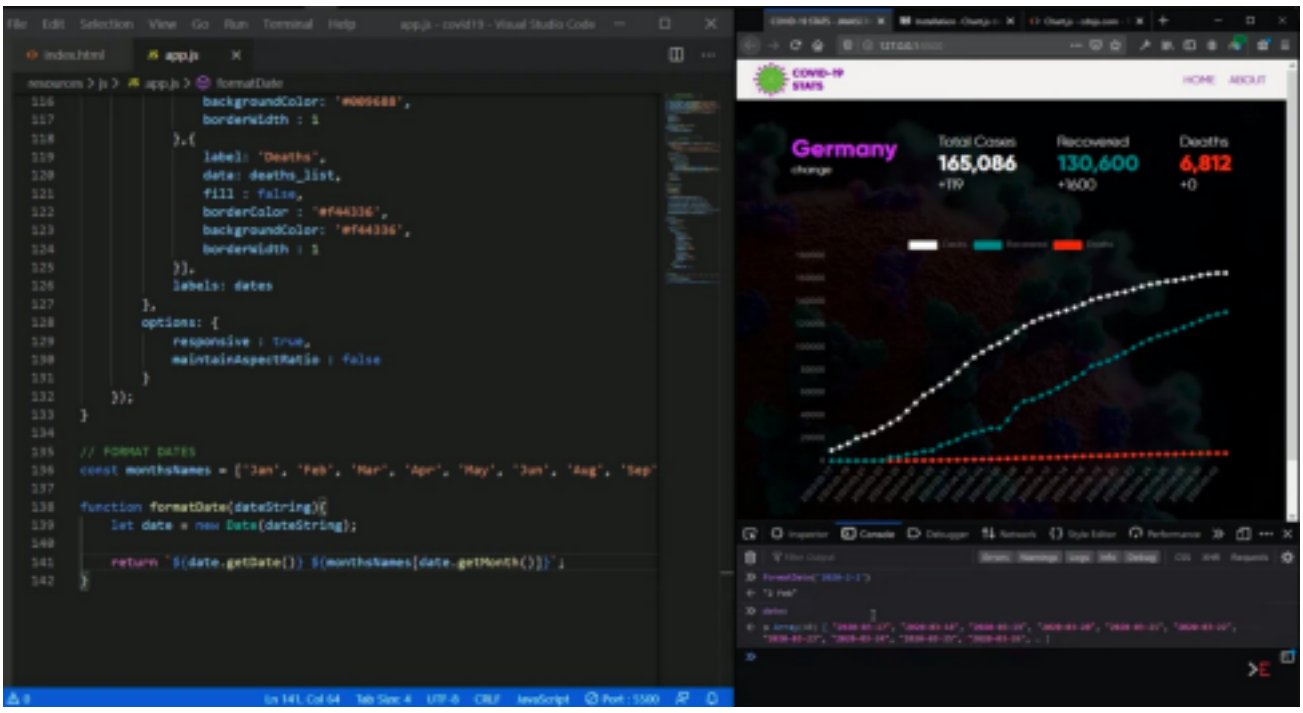

Figure-2

The purpose of this feature is to provide the audience with an aggregated view of the severity of COVID-19 in different locations and inform the audience of the latest status of the disease at a first glance. The options of applying log transformation and population normalization allow the audience to observe the state of COVID-19 from different perspectives while the interactive table allows the audience to explore specific metrics of their interest.

Sample code:

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8" />
<meta name="viewport" content="width=device-width, initial-scale=1.0" /> <link rel="stylesheet" href="./resources/css/style.css" />
<title>COVID-19 STATS - JAVASCRIPT</title>
</head>
<body>
<center>
<br />
<h1>Any Support From Your Side Will Be Appreciated</h1> <h1><a href="https://paypal.me/CodeExplained">Paypal ME</a></h1> <br />
</center>
<header>
<div class="logo">
<img src="./resources/img/logo.png" alt="" />
<p>COVID-19<br />STATS</p>
</div>
</main>
<footer>
<div class="footer-container">
<div class="copyright">
<p>Copyright © 2020 Code Explained</p>
</div>
</div>
</footer>
<script
src="https://cdnjs.cloudflare.com/ajax/libs/Chart.js/2.9.3/Chart.min.js"
integrity="sha256-R4pqcOYV8lt7snxMQO/HSbVCFRPMdrhAFMH+vr9giYI="
crossorigin="anonymous"
></script>
<script src="resources/js/countries.js"></script>
<script src="resources/js/app.js"></script>
</body>
</html>
// SELECT ALL ELEMENTS
```

```
const country_name_element = document.querySelector(".country .name"); const total_cases_element = document.querySelector(".total-cases .value");
const new_cases_element = document.querySelector(".total-cases .new-value"); const recovered_element = document.querySelector(".recovered .value"); const new_recovered_element = document.querySelector(".recovered .new-value"); const deaths_element = document.querySelector(".deaths .value");const new_deaths_element = document.querySelector(".deaths .new-value"); const ctx = document.getElementById("axes_line_chart").getContext("2d"); // APP VARIABLES
let app_data = [],
cases_list = [],
recovered_list = [],
deaths_list = [],
deaths = [],
formatedDates = [];
// GET USERS COUNTRY CODE
fetch("https://api.ipgeolocation.io/ipgeo?
apiKey=14c7928d2aef416287e034ee91cd360d")
.then((res) => {
return res.json();
})
.then((data) => {
let country_code = data.country_code2;
let user_country;
country_list.forEach((country) => {
if (country.code == country_code) {
user_country = country.name;
}
});
fetchData(user_country);
});
/* -------------------------------------------- */
/*
FETCH API
*/
/* ---------------------------------------------- */function fetchData(country) { user_country = country;
country_name_element.innerHTML = "Loading...";
(cases_list = []),
(recovered_list = []),
(deaths_list = []),
(dates = []),
(formatedDates = []);
var requestOptions = {
method: "GET",
redirect: "follow",
};
const api_fetch = async (country) => {
await fetch(
"https://api.covid19api.com/total/country/" + country + "/status/confirmed", requestOptions
)
```

```
.then((res) => {
return res.json();
})
.then((data) => {
data.forEach((entry) => {
dates.push(entry.Date);
cases_list.push(entry.Cases);
});
});
await fetch("https://api.covid19api.com/total/country/" + country + "/status/recovered",
requestOptions
)
.then((res) => {
return res.json();
})
.then((data) => {
data.forEach((entry) => {
recovered_list.push(entry.Cases);
});
});
await fetch(
"https://api.covid19api.com/total/country/" + country + "/status/deaths", requestOptions
)
.then((res) => {
return res.json();
})
.then((data) => {
data.forEach((entry) => {
deaths_list.push(entry.Cases);
});
});
updateUI();
};
api_fetch(country);
}// UPDATE UI FUNCTION
function updateUI() {
updateStats();
axesLinearChart();
}
function updateStats() {
const total_cases = cases_list[cases_list.length - 1];
const new_confirmed_cases = total_cases - cases_list[cases_list.length - 2]; const
total_recovered = recovered_list[recovered_list.length - 1]; const new_recovered_cases =
total_recovered - recovered_list[recovered_list.length -
2];
const total_deaths = deaths_list[deaths_list.length - 1];
const new_deaths_cases = total_deaths - deaths_list[deaths_list.length - 2];
country_name_element.innerHTML = user_country;
total_cases_element.innerHTML = total_cases;
new_cases_element.innerHTML = `+${new_confirmed_cases}`;
```

```
recovered_element.innerHTML = total_recovered;
new_recovered_element.innerHTML = `+${new_recovered_cases}`;
deaths_element.innerHTML = total_deaths;
new_deaths_element.innerHTML = `+${new_deaths_cases}`;
// format dates
dates.forEach((date) => {
formatedDates.push(formatDate(date));
});
}
// UPDATE CHARTlet my_chart;
function axesLinearChart() {
if (my_chart) {
my_chart.destroy();
}
my_chart = new Chart(ctx, {
type: "line",
data: {
datasets: [
{
label: "Cases",
data: cases_list,
fill: false,
borderColor: "#FFF",
backgroundColor: "#FFF",
borderWidth: 1,
},
{
label: "Recovered",
data: recovered_list,
fill: false,
borderColor: "#009688",
backgroundColor: "#009688",
borderWidth: 1,
},
{
label: "Deaths",
data: deaths_list,
fill: false,
borderColor: "#f44336",backgroundColor: "#f44336",
borderWidth: 1,
},
],
labels: formatedDates,
},
options: {
responsive: true,
maintainAspectRatio: false,
},
});
}
```

```
// FORMAT DATES
const monthsNames = [
"Jan",
"Feb",
"Mar",
"Apr",
"May",
"Jun",
"Jul",
"Aug",
"Sep",
"Oct",
"Nov",
"Dec",
];
function formatDate(dateString) {
let date = new Date(dateString);return `${date.getDate()} ${monthsNames[date.getMonth()]}`;
}
// ALL COUNTRY NAMES WITH THEIR ISO CODE let country_list = [
{ name: 'USA', code: 'US' },
{ name: 'Spain', code: 'ES' },
{ name: 'Italy', code: 'IT' },
{ name: 'France', code: 'FR' },
{ name: 'Germany', code: 'DE' },
{ name: 'UK', code: 'GB' },
{ name: 'Turkey', code: 'TR' },
{ name: 'Iran', code: 'IR' },
{ name: 'Russia', code: 'RU' },
{ name: 'Belgium', code: 'BE' },
{ name: 'Brazil', code: 'BR' },
{ name: 'Canada', code: 'CA' },
{ name: 'Netherlands', code: 'NL' },
{ name: 'Switzerland', code: 'CH' },
{ name: 'Portugal', code: 'PT' },
{ name: 'India', code: 'IN' },
{ name: 'Ireland', code: 'IE' },
{ name: 'Austria', code: 'AT' },
{ name: 'Peru', code: 'PE' },
{ name: 'Sweden', code: 'SE' },
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{ name: 'Sao Tome and Principe', code: 'ST' },
{ name: 'South Sudan', code: 'SD' },
{ name: 'Anguilla', code: 'AI' },
{ name: 'Saint Pierre Miquelon', code: 'PM' },
{ name: 'Yemen', code: 'YE' },
{ name: 'China', code: 'CN' }
// SELECT SEARCH COUNTRY ELEMENTS
const search_country_element = document.querySelector(".search-country"); const country_list_element = document.querySelector(".country-list"); const chang_country_btn = document.querySelector(".change-country"); const close_list_btn = document.querySelector(".close");
const input = document.getElementById('search-input')
// CREATE TE COUNTRY LIST
function createCountryList(){
const num_countries = country_list.length;
let i = 0, ul_list_id;
country_list.forEach( (country, index) => {
if( index % Math.ceil(num_countries/num_of_ul_lists) == 0){ ul_list_id = `list-${i}`;
country_list_element.innerHTML += `<ul id='${ul_list_id}'></ul>`;
i++;
}
}
})
document.getElementById(`${ul_list_id}`).innerHTML += ` <li onclick="fetchData('${country.name}')" id="${country.name}"> ${country.name}
</li>
`;
let num_of_ul_lists = 3;create CountryList();
// SHOW/HIDE THE COUTRY LIST ON CLICK EVENT
chang_country_btn.addEventListener("click", function(){ input.value = "";
resetCountryList();
```

```
search_country_element.classList.toggle("hide");
search_country_element.classList.add("fadeIn");
});
close_list_btn.addEventListener("click", function(){
search_country_element.classList.toggle("hide");
});
country_list_element.addEventListener ("click", function(){
search_country_element.classList.toggle("hide");
});
// COUNTRY FILTER
/* input event fires up whenever the value of the input changes */
input.addEventListener("input", function()
{
let value = input.value.toUpperCase();
})
country_list.forEach( country => {
if( country.name.toUpperCase().startsWith(value)){
document.getElementById(country.name).classList.remove("hide"); }else{
document.getElementById(country.name).classList.add("hide"); }
})
// RESET COUNTRY LIST (SHOW ALL THE COUNTRIES ) function resetCountryList(){
country_list.forEach( country => {
document.getElementById(country.name).classList.remove("hide");} })
```

Chapter 4:

System Design

We use Convolutional Neural Network and Deep Learning for Real Time Detection and Recognition of Human Faces, which is simple face detection and recognition system is proposed in this paper which has the capability to recognize human faces in single as well as multiple face images in a database in real time with masks on or off the face. Pre-processing of the proposed frame work includes noise removal and hole filling in colour images. After pre-processing, face detection is performed by using CNNs architecture. Architecture layers of CNN are created using Keras Library in Python. Detected faces are augmented to make computation fast. By using Principal Analysis Component (PCA) features are extracted from the augmented image. For feature selection, we use Sobel Edge Detector.

Two-Tier:

Two-tier architecture: The two-tier architecture is similar to a basic client-server model. The application at the client end directly communicates with the database at the server-side. APIs like ODBC, JDBC are used for this interaction. The server side is responsible for providing query processing and transaction management functionalities. On the client-side, the user interfaces and application programs are run. The application on the client-side establishes a connection with the server-side in order to communicate with the DBMS. An advantage of this type is that maintenance and understanding are easier, compatible with existing systems. However, this model gives poor performance when there are a large number of users.

Three-Tier :

Three Tier architecture: In this type, there is another layer between the client and the server. The client does not directly communicate with the server. Instead, it interacts with an application server which further communicates with the database system and then the query processing and transaction management takes place. This intermediate layer acts as a medium for the exchange of partially processed data between server and client. This type of architecture is used in the case of large web applications. The application tier, also known as the logic tier or middle tier, is the heart of the application. In this tier, information collected in the presentation tier is processed - sometimes against other information in the data tier - using business logic, a specific set of business rules. The application tier can also add, delete or modify data in the data tier. The application tier is typically developed using Python, Java, Perl, PHP or Ruby, and communicates with the data tier using API calls.

Conclusion:

In this paper we develop a new way to estimate the effective reproduction number of an infectious disease. Our estimation method exploits a structural mapping between and the growth rate of the number of infected individuals derived from the basic SIR model. The new methodology is straightforward to apply in practice, and according to our simulation checks, it yields accurate estimates. We use the new method to track of COVID-19 around the world, and assess the effectiveness of public policy interventions in a sample of European countries.

The current paper faces several limitations. First, a local-level specification for the growth rate implicitly assumes that the growth rate of the number of infected individuals remains forever in flux. However, in the long-run, this growth rate must converge to zero. Since our model does not capture this feature, it seems likely that our estimated confidence bounds are overly conservative in the late stages of an epidemic. Second, when applying the model to cross-country data, one may achieve important gains in statistical efficiency if the model is estimated jointly for all countries (for example, by estimating a multivariate local-level model). Finally, for assessing the effects of NPIs more accurately, it would be desirable to collect data for a larger sample of countries.

Our estimates of for COVID-19 are based on a structural relationship derived from the SIR model. By using the SIR model, we omit some features of the disease that are likely important when modeling its spread. In particular, the SIR model abstracts away from incubation periods as well as transmission during the incubation period. Nevertheless, we prefer the SIR specification, for two reasons. First, in simulations, we find that our estimator produces accurate estimates even when the true model is SEIR rather than SIR, as we show in S1 Appendix (Section A.5). Second, we believe that the SIR model is likely to produce more reliable estimates in practice. To use the SEIR model, we would have to estimate the number of currently exposed individuals. Doing so would triple the number of model parameters. In

particular, we would have to calibrate the (i) average duration of the incubation period ($\kappa-1$); and (ii) relative infectiousness of exposed and infectious individuals (ϵ); see S1 Appendix (Section A.5) for details. While κ is arguably constant across countries, unlikely to be fixed over countries and over time. For example, greater mask usage is likely to reduce by differentially affecting transmission by symptomatic and pre- or asymptomatic individuals. Allowing for such time variation in ϵ, in addition to time-varying transmission rates (βt), is challenging. That said, it is possible to extend this paper's ideas to models that are richer than the SIR model. Doing so may be an exciting avenue for future research.

Relative to existing methods for estimating we combine basic epidemiological theory with standard time-series filtering techniques, particularly Kalman filtering. This approach leads to a transparent closed-form estimator. The simplicity of the estimator allows us to study some of its properties analytically (e.g., the effects of potential data problems). Differently from most existing approaches, our method can be applied using both Bayesian and frequentist techniques, and it does not require any tuning parameters beyond specifying the average serial interval. On the other hand, relative to less structural approaches such as that of Cori et al [3], our estimator may be more sensitive to potential model miss specification. Empirically, we find that our estimates and estimates obtained by the Cori et al method are highly positively correlated (average correlation: 0.80). However, the correlations are not perfect, suggesting that there is value in combining both estimators when tracking infectious diseases. Hence, our methodology brings an additional instrument to the researcher's toolbox.

In our empirical application, we find that lock downs, measures of self-isolation, and social distancing all have statistically significant effects on reducing of COVID-19. However, we also demonstrate the importance of accounting for voluntary changes in behavior. In particular, most of the decline in mobility in our sample took place before lock downs were introduced. This finding suggests that people respond to

the risk of contracting the virus by changing their mobility patterns and reducing social interactions. Failing to account for such voluntary changes in behavior yields estimated effects of NPIs that are arguably too large.

Given that even our best estimates may still be biased, it is important to interpret these results cautiously. However, from an economic perspective, these findings point to large private incentives to avoid infection. These incentives can induce a contraction in economic activity as people voluntarily choose to self-isolate [48–50]. As a result, even if countries lift the NPIs that are currently in place, it is not clear whether people would voluntarily return to their pre-pandemic mobility and consumption patterns. Our real-time estimator may be used to track the dynamics of COVID-19 as the current restrictions are relaxed.

Result:

The first part of the analysis presents unsupervised models of COVID-19 based on weighted search query frequencies. Queries and their weightings are determined using the first few hundred (FF100) surveys on COVID-19 conducted by the NHS/PHE in the UK. FF100 identified 19 symptoms associated with confirmed COVID-19 cases and their probability of occurrence (Supplementary Table 1). There exist other studies, such as the findings by Carfi et al.[26], that corroborate the outcomes of the FF100 survey. Our choice to use it was based on the substantial size of the cohort (381 patients) and the comprehensive presentation of outcomes. In addition to the symptoms identified by FF100, we also include queries that mention COVID-19- related keywords (e.g. “covid-19” or “coronavirus”) as a separate category. Unsupervised models for COVID-19 in 8 countries are depicted in Fig. 1. We observe exponentially increasing rates that exceed the estimated seasonal average (previous 8 years) during their peak period in all investigated countries, as well as a steep drop of the score after the application of physical distancing or lockdown measures in most countries which is in concordance with clinical surveillance reports[27]. In the time series where we have attempted to minimize the effect of news by maintaining a proportion of the signal (Eqs. (3), (4), and (5)), we observe more conservative estimates in all locations, including altered trends during the peak period. Compared to the original scores (no minimization of news media effects), there is an average reduction of the signals by 16.4% (14.2%–18.7%) in a period of 14 days prior to and after their peak moments; their corresponding average linear correlation during this period is equal to 0.822 (0.739–0.905). Outside of the peak periods, the reduction is a moderate 3.3% (2.7%–4.0%), indicating that there is an association between the extent of media impact and the estimated disease prevalence. For the US, Australia, Canada, and Italy, the

signal is visibly flattened during the time period around their respective peaks. Countries that took measures earlier in the epidemic curve (e.g., Greece) demonstrate a more pronounced pattern of decrease, with scores that go below the expected seasonal average.

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Letter of Acceptance

Dear Author(s),
Puneet Bansal, Kashish Gupta, and Dr. Medhavi Malik
Title: COVID-19 Real-Time Tracker and Analytical Report

Reference your article, I would like to inform you that the 1st round evaluation of your manuscript has been completed. Based on the reviewer's recommendations, I am delighted to inform you that your manuscript has been initially accepted. The article as well as has been processed utilizing the peer-review process and has been ***accepted for publication****. The article will be published in International Journal of Health Sciences (IJHS) on* ***2022, Vol. 6, No. S1.***
DOI/URL:

Thank you very much for submitting your article to "International Journal of Health Sciences."
e-ISSN: 2550-696X, p-ISSN: 2550-6978

Journal Impact Factor
(SJIF 2020: 6.553)
(Google-based Impact Factor 2021: 3.722)
Citations: 367, h-index: 11, i10-index: 15

Abstracting and Indexing (click to view):
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Thank you for your contribution to the Journal and we are looking forward to your future participation!

Best Regards,

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