

BSc (Hons.) in Information Technology 2023

IT31063 -Service Oriented Computing Mini Project

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1. Use the Rest Countries API (<https://restcountries.com/>)

- a) Display all Asian country information (Flag, Country Name, Capital City, Region, Subregion, Currencies, Country Code) on the “country.php” page. Example as follows.





Asian Countries						
Flag	Country Name	Capital City	Region	Subregion	Currencies	Country Code
	Azerbaijan	Baku	Asia	Western Asia	Azerbaijani manat(₼)	AZ
	Maldives	Malé	Asia	Southern Asia	Maldivian rufiyaa(ރ.)	MV
	Timor-Leste	Dili	Asia	South-Eastern Asia	United States dollar(\$)	TL
	Hong Kong	City of Victoria	Asia	Eastern Asia	Hong Kong dollar(\$)	HK
	Malaysia	Kuala Lumpur	Asia	South-Eastern Asia	Malaysian ringgit(RM)	MY
	Nepal	Kathmandu	Asia	Southern Asia	Nepalese rupee(Rs)	NP
	North Korea	Pyongyang	Asia	Eastern Asia	North Korean won(₩)	KP
	Pakistan	Islamabad	Asia	Southern Asia	Pakistani rupee(Rs)	PK

Figure 1Example1(country.php)

- i. Output of the country.php

Flag	Country Name	Capital City	Region	Subregion	Currencies	Country Code	
	Jordan	Amman	Asia	Western Asia	Jordanian dinar(ل.د)	JO	<a href="#">view</a>
	Lebanon	Beirut	Asia	Western Asia	Lebanese pound(ل.ل)	LB	<a href="#">view</a>
	Mongolia	Ulan Bator	Asia	Eastern Asia	Mongolian tögrög(₮)	MN	<a href="#">view</a>
	Thailand	Bangkok	Asia	South-Eastern Asia	Thai baht(฿)	TH	<a href="#">view</a>
	Armenia	Yerevan	Asia	Western Asia	Armenian dram(֏)	AM	<a href="#">view</a>
	Brunei	Bandar Seri Begawan	Asia	South-Eastern Asia	Brunei dollar(Singapore dollar(\$))	BN	<a href="#">view</a>
	Turkey	Ankara	Asia	Western Asia	Turkish lira(₺)	TR	<a href="#">view</a>
	Maldives	Malé	Asia	Southern Asia	Maldivian rufiyaa(ރ.)	MV	<a href="#">view</a>
	Laos	Vientiane	Asia	South-Eastern Asia	Lao kip(₭)	LA	<a href="#">view</a>
	Bhutan	Thimphu	Asia	Southern Asia	Bhutanese ngultrum(Nu.)Indian rupee(₹)	BT	<a href="#">view</a>
	Palestine	Ramallah	Asia	Western Asia	Egyptian pound(£)Israeli new shekel(₪)Jordanian dinar(JD)	PS	<a href="#">view</a>
	Iraq	Baghdad	Asia	Western Asia	Iraqi dinar(د.ع)	IQ	<a href="#">view</a>
	Azerbaijan	Baku	Asia	Western Asia	Azerbaijani manat(₼)	AZ	<a href="#">view</a>
	Qatar	Doha	Asia	Western Asia	Qatari riyal(ر.ق)	QA	<a href="#">view</a>
	Kuwait	Kuwait City	Asia	Western Asia	Kuwaiti dinar(د.ك)	KW	<a href="#">view</a>
	India	New Delhi	Asia	Southern Asia	Indian rupee(₹)	IN	<a href="#">view</a>

Figure 2country.php(output)

## ii. Complete Code for country.php

```

1 <?php
2 $path="https://restcountries.com/v3.1/region/asia";
3
4 //to read json file through php
5 $data=json_decode(file_get_contents($path),true); //decode json file
6 //var_dump($data); //to see the data inside of $data
7
8 <?>
9
10 <html>
11 <head>
12 <meta charset="UTF-8">
13 <title>Countries Details</title>
14 <link rel="stylesheet" href="bootstrap-5.0.2-dist/css/bootstrap.min.css" />
15 </head>
16 <body>
17 <div class="container">
18 <h2 class="text-md-start"><center>Asian Countries</center></h2>
19
20 <style>
21 .button {
22 background-color: #04AA6D;
23 border: none;
24 color: white;
25 padding: 10px 20px;
26 text-align: center;
27 text-decoration: none;
28 display: inline-block;
29 font-size: 16px;
30 border-radius: 5px;
31 }
32 </style>
33
34 <table border="1" class="table table-striped">
35 <tr>
36 <th>Flag</th>
37 <th>Country Name</th>
38 <th>Capital City</th>
39 <th>Region</th>
40 <th>Subregion</th>
41 <th>Currencies</th>
42 <th>Country Code</th>
43 </tr>
44
45 <tr>
46 <td colspan="7"><?php foreach($data as $v) { ?>
47 <td></td>
48 <td><?php echo $v['name']; ?></td>
49 <td><?php echo $v['capital']; ?></td>
50 <td><?php echo $v['region']; ?></td>
51 <td><?php echo $v['subregion']; ?></td>
52 <td><?php echo $v['currencies']; ?></td>
53 <td><?php echo $v['country_code']; ?></td>
54 <td><a href="#">view</a></td>
55 </tr>
56 </table>
57 </body>
58 </html>

```

Figure 4country.php(code part-1)

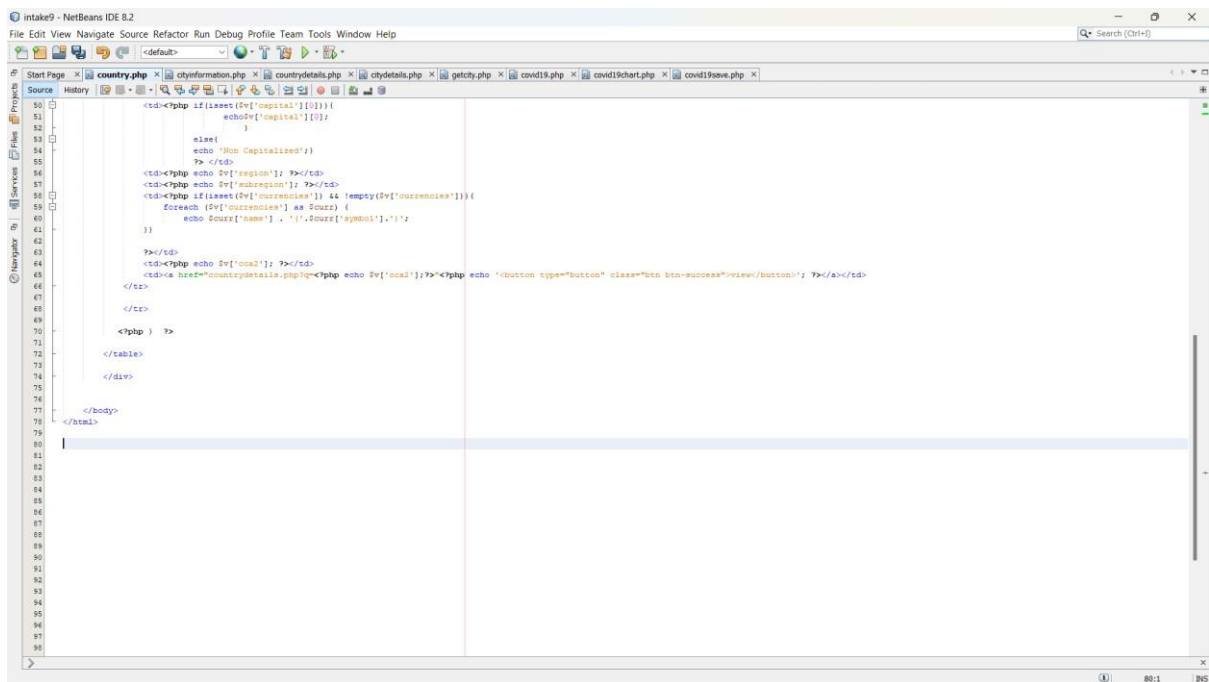


Figure 3country.php(code part-2)

- The script starts by defining the variable \$pathc, which holds the URL of a JSON file containing information about Asian countries.
- It then uses the file\_get\_contents function to retrieve the contents of the JSON file and json\_decode to decode the JSON data into a PHP array. The resulting array is stored in the variable \$datac.

### iii. Country.php full code as a text.

```
<?php
```

```
    $pathc="https://restcountries.com/v3.1/region/asia";
```

```
    //to read json file through php
```

```
    $datac=json_decode(file_get_contents($pathc),true); //decode json file
```

```
    //var_dump($datac); //to see the data inside of $data
```

```
?>
```

```
<html>
```

```
    <head>
```

```
        <meta charset="UTF-8">
```

```
        <title>Countries Details</title>
```

```
        <link rel="stylesheet" href="bootstrap-5.0.2-dist/css/bootstrap.min.css" />
```

```
    </head>
```

```
    <body>
```

```
<div class="container">

    <h2 class="text-md-start"><center>Asian Countries</center></h2>

</div>

<style>

.button {

    background-color: #04AA6D;

border: none;  color: white;

padding: 10px 20px;

    text-align: center;  text-

decoration: none;  display:

inline-block;  font-size: 16px;

border-radius: 8px;

}

</style>
```

```
<table border="1" class="table table-striped">
```

```
<tr>
```

```
<th>Flag</th>
```

```
<th>Country Name</th>
```

```
<th>Capital City</th>
```

```
<th>Region</th>
```

```
<th>Subregion</th>
```

```
<th>Currencies</th>
```

```
<th>Country Code</th>
```

```
<th></th>
```

```
</tr>
```

```
<?php foreach($data as $v){ ?>
```

```
<tr>
```

```
<td></td>
```

```
<td><?php echo $v['name']['common']; ?></td>
```



```

        <td><?php if(isset($v['capital'][0])){
echo$v['capital'][0];
        }
else{
        echo 'Non
Capitalized';}
        ?> </td>

        <td><?php echo $v['region']; ?></td>

        <td><?php echo $v['subregion']; ?></td>

        <td><?php if(isset($v['currencies']) && !empty($v['currencies']))){
foreach ($v['currencies'] as $curr) {
                echo $curr['name'] .
                '('. $curr['symbol'].')';
        }}
        ?></td>

        <td><?php echo $v['cca2']; ?></td>

        <td><a href="countrydetails.php?q=<?php echo $v['cca2'];?>"><?php echo '
button
type="button" class="btn btn-success">view</button>; ?></a></td>

</tr>

</tr>

<?php } ?>

</table>

</div>

</body>

</html>

```

- b) Once you click on the view button, it is going to display selected country information on “countrydetails.php” page. Example as follows.

## Azerbaijan



Official Name	Republic of Azerbaijan
Capital	Baku
Code	AZ
Currency	Azerbaijani manat
Subregion	Western Asia
Continent	Asia
Languages	Azerbaijani, Russian
Borders	Armenia, Georgia, Iran, Russia, Turkey,
Population	10,110,116
Area	86,600

Figure 5 Example output(countrydetails.php)

### i. Output of countrydetails.php


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view

[localhost/intake9/REST/countrydetails.php?q=LK](#)

[Gmail](#)
[YouTube](#)
[Maps](#)
[Flash Environment...](#)
[C++ Arrays \(With E...](#)
[News](#)
[Translate](#)
[W3Schools Online...](#)
[1-Communication...](#)
[https://www.google...](#)
[Microsoft Office 20...](#)
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## Sri Lanka



Official Name	Democratic Socialist Republic of Sri Lanka
Capital	Sri Jayawardenepura Kotte
Code	LK
Currency	Sri Lankan rupee( Rs රු)
Subregion	Southern Asia
Continent	Asia
Languages	Sinhala, Tamil
Borders	IND
Population	21,919,000
Area	65,610

Figure 6 countrydetails.php

## ii. Complete Code for countrydetails.php

The screenshot shows the NetBeans IDE interface with a PHP file named `countrydetails.php` open. The code is a PHP script that uses `curl` to fetch data from a public API (https://restcountries.com/v3.1/alpha/fo) and generates an HTML table with Bootstrap styling. The table displays the name, common name, and flag of the country.

```

1 <?php
2 $url = "https://restcountries.com/v3.1/alpha/fo";
3
4 $path = "https://restcountries.com/v3.1/alpha/fo";
5 $data = json_decode(file_get_contents($path), true);
6 foreach ($data as $v) {
7     if ($v['countryName'] == 'fo') {
8         $code = $v['countryCode'];
9         $continent = $v['continentName'];
10        $capital = $v['capitalName'];
11        $lat = $v['capitalLatitude'];
12        $lon = $v['capitalLongitude'];
13    }
14 }
15
16 $path = "https://restcountries.com/v3.1/alpha/fo";
17 $data = json_decode(file_get_contents($path), true);
18 //var_dump($data[0]);
19
20 $flag = $data[0]['flags']['png'];
21
22 //echo $flag;
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50

```

Figure 7countrydetails.php code part-1

The image shows the NetBeans IDE 8.2 interface. The top menu bar includes File, Edit, View, Navigate, Source Refactor, Run, Debug, Profile, Team, Tools, Window, and Help. Below the menu is a toolbar with various icons. The main editor area displays a file named 'countrydetails.php' with the following PHP code:

```
30 </tr>
31 <tr>
32 <th>Official Name </th>
33 <th><?php echo $data['name']['official']; ?> </th>
34 </tr>
35 <tr>
36 <th>Capital </th>
37 <th><?php echo $data['capital'][0]; ?>
38 </tr>
39 <tr>
40 <th>
41 <th>Code </th>
42 <th><?php echo $data['code2']; ?></th>
43 </tr>
44 <tr>
45 <th>Currency </th>
46 <th>
47 <?php
48 if(isset($data['currencies'])) {
49 foreach ($data['currencies'] as $currency) {
50 echo $currency['name'] . ' ( ' . $currency['symbol'] . ' )';
51 }
52 } else {
53 echo 'No currency';
54 }
55 ?>
56 </th>
57 </tr>
58 <tr>
59 <th>Subregion </th>
60 <th><?php echo $data['subregion']; ?></th>
61 </tr>
62 <tr>
63 <th>Continent </th>
64 <th><?php echo $data['continents'][0]; ?> </th>
65 </tr>
66 <tr>
67 <th>
68 <th>Languages </th>
69 <?php
70 $arr1=$data['languages'];
71 echo join(", ",$arr1);
72 ?>
73 </th>
74 </tr>
75 <tr>
76 <th>
77 <th>
78 <th>
79 <th>Borders </th>
80 <th>
81 </tr>
```

The IDE interface includes a sidebar on the left with 'Project', 'Files', and 'Services' views. The 'Project' view shows a tree structure with 'countrydetails.php' selected. The 'Files' view shows the file's location in the project. The 'Services' view is empty. The bottom status bar shows the current line and column (1, 22:18).

Figure 9countrydetails.php code part-2

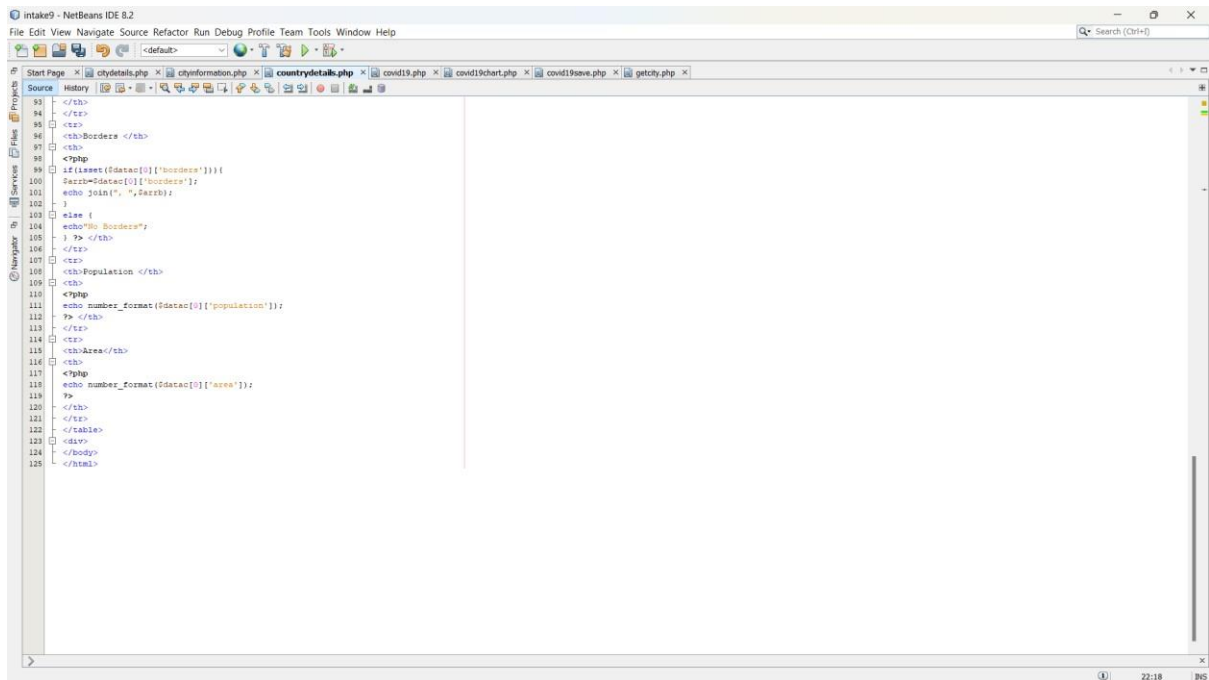


Figure 8countrydetails.php code part-3

- The script retrieves the country code from the query parameter using `$_GET['q']` and assigns it to the variable `$c`.
- The script defines the URL (`$pathc`) to fetch country data based on the country code using the REST Countries API.
- The population and area values are formatted with the **number\_format** function for easiness.

### iii. Countrydetails.php complete code as text.

```
<?php
```

```
$c=$_GET['q'];
```

```
/*$path="Datasets/country-capitals.json";
```

```
$data=json_decode(file_get_contents($path),true);
```

```
foreach ($data as $v){ if($v['CountryName']==$c){
```

```
    $cCode= $v['CountryCode'];
```

```
    $cContinent= $v['ContinentName'];
```

```
    $cCapital= $v['CapitalName'];
```

```
    $cLat= $v['CapitalLatitude'];
```

```
    $cLon= $v['CapitalLongitude'];
```

```

    }
}
*/

$pathc="https://restcountries.com/v3.1/alpha/$c";
$datac=json_decode(file_get_contents($pathc),true);

//var_dump($datac[0]);

$flag=$datac[0]['flags']['png'];

//echo $flag;

?>
<html>

<head>

<meta charset="UTF-8">

<title>view</title>

<link rel="stylesheet" href="bootstrap-5.0.2-dist/css/bootstrap.min.css" /> <div>

<div class="row">

<div class="col-2">&nbsp;</div>

<div class="col-8">

<div class="clearfix">&nbsp;</div>

<table class="table table-striped">

<tr>

<td colspan="2" style="text-align: center">

<h1><center><?php echo $datac[0]['name']['common']; ?></center></h1>

<div>

<div class="row">

<div class="col-2">&nbsp;</div>

<div class="col-8">

<div class="clearfix">&nbsp;</div>

<table class="table table-striped">

<tr>

```

```

<td colspan="2" style="text-align: center">

</td>
</tr>
<tr>
<th>Official Name </th>
<th><?php echo $datac[0]['name']['official']; ?> </th>
</tr>
<tr>
<th>Capital </th>
<th><?php echo $datac[0]['capital'][0]; ?>
</th>
</tr>
<tr>
<th>Code </th>
<th><?php echo $datac[0]['cca2']; ?></th>
</tr>
<tr>
<th>Currency </th>
<th><?php
if(isset($datac[0]['currencies'])) { foreach
($datac[0]['currencies'] as $currency) { echo
$currency['name'] . ' ( ' . $currency['symbol'] . ');
}
} else {
echo 'No currency';
}
?>
</th>
</tr>
<tr>
<th>Subregion </th>

```

```

<th><?php echo $datac[0]['subregion'];?></th>

</tr>

<tr>

<th>Continent </th>

<th><?php echo $datac[0]['continents'][0]; ?> </th>

</tr>

<tr>

<th>Languages </th>

<th>

<?php

$arrl=$datac[0]['languages']; echo

join(" ",$arrl);

?>

</th>

</tr>

<tr>

<th>Borders </th>

<th><?php

if(isset($datac[0]['borders'])){

$arrb=$datac[0]['borders']; echo

join(" ",$arrb);

}

else {

echo"No Borders";

} ?> </th>

</tr>

<tr>

<th>Population </th>

<th><?php echo

number_format($datac[0]['population']);

?> </th>

</tr>

```

```
<tr>
<th>Area</th>
<th> <?php echo
number_format($datac[0]['area']);
?>
</th>
</tr>
</table>
<div>
</body>
</html>
```

2. Use the City and State Search API - City and State Search API API Documentation (devXprite) | RapidAPI and the Google Map API (Use API Keys | Maps JavaScript API | Google Developers).

URL : <https://rapidapi.com/devXprite/api/city-and-state-searchapi/>

URL:<https://developers.google.com/maps/documentation/javascript/get-api-key>

- a) Type city name to search cities (use AJAX) and display information (ID, City Name, State Name, Country Name) as a sample.



City Information				
Search Cities:		<input type="text" value="colombo"/>		
ID	City Name	State Name	Country Name	
11328	Colombo	Paraná	Brazil	<a href="#">City Details</a>
66461	Colombo	Western Province	Sri Lanka	<a href="#">City Details</a>
66462	Colombo District	Western Province	Sri Lanka	<a href="#">City Details</a>
140356	Monte Colombo	Emilia-Romagna	Italy	<a href="#">City Details</a>

Figure 10Example cityinformation.php

## i. Output of the cityinformation.php

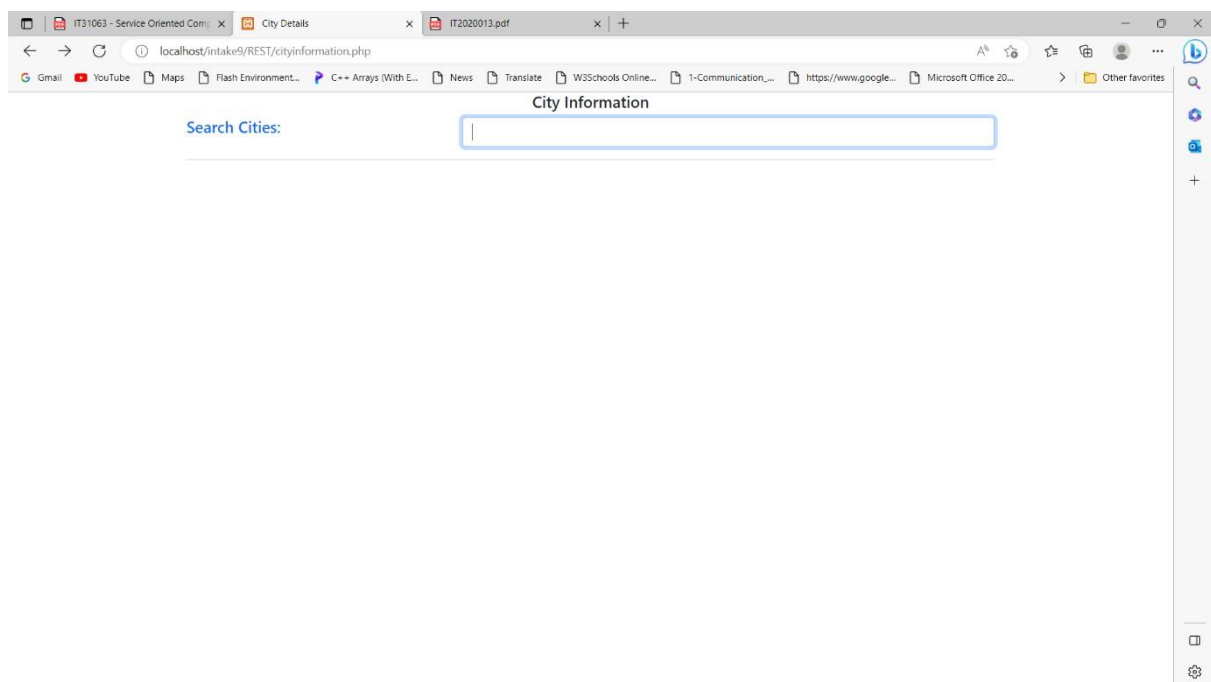


Figure 11Output for cityinformation.php

ii. Complete code for cityinformation.php

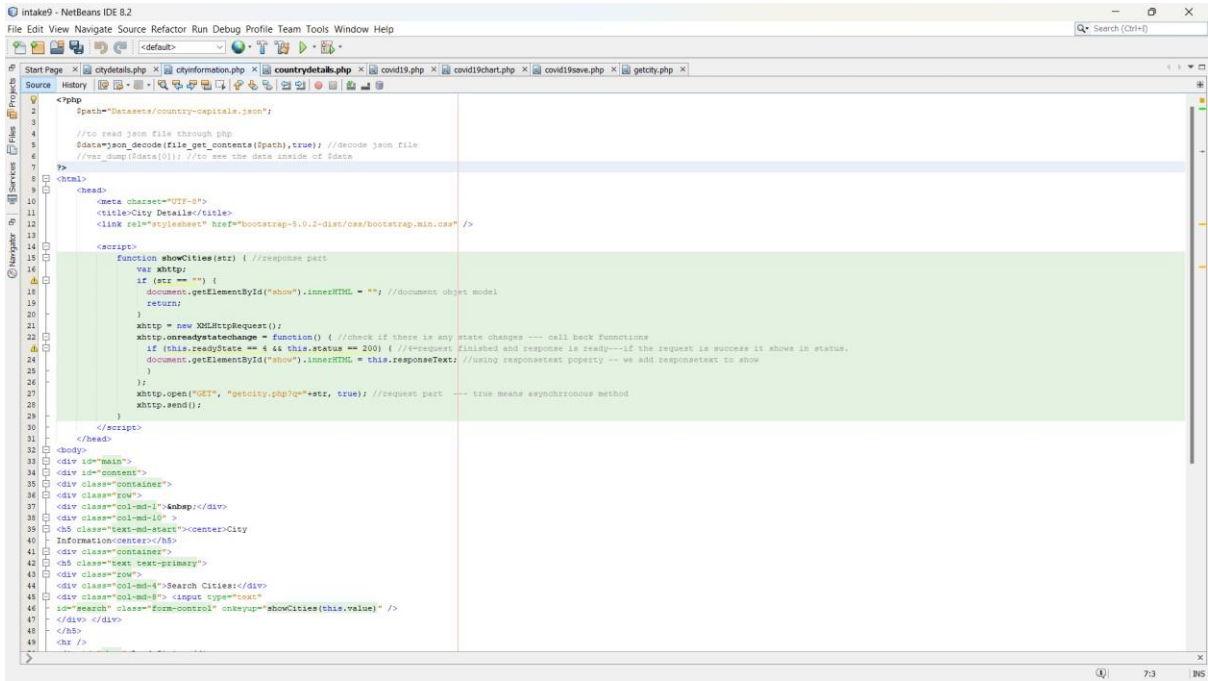


Figure 12Cityinformation.php code part-1

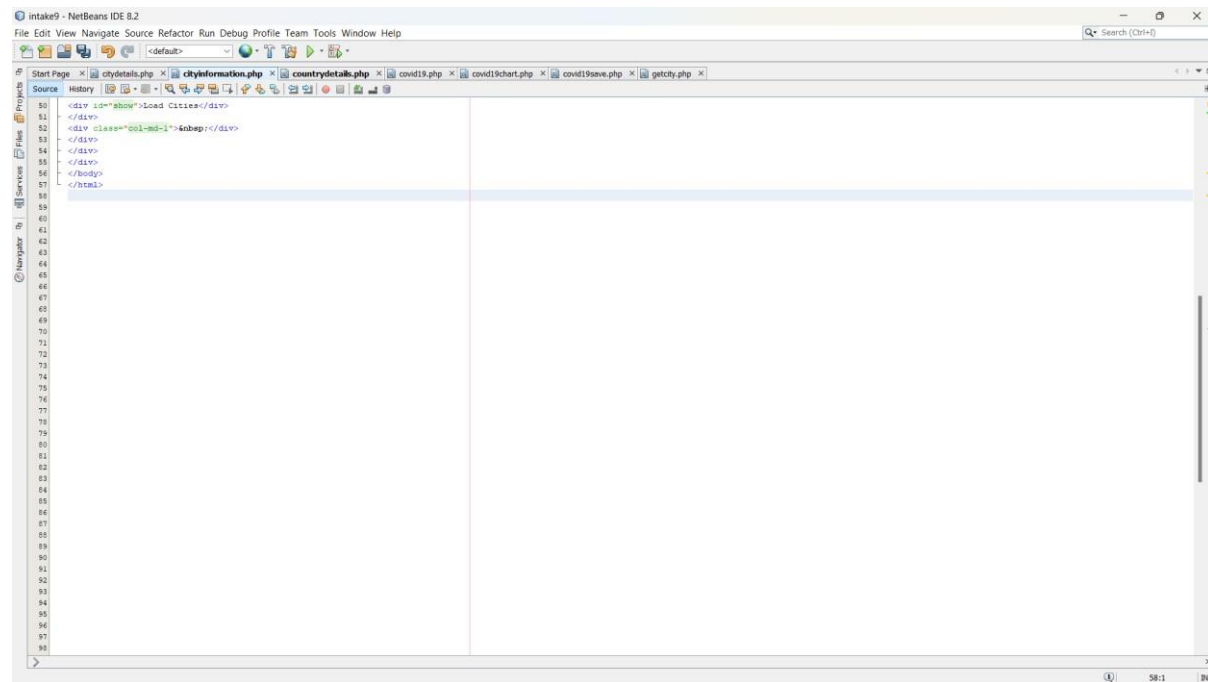


Figure 13cityinformation code part-2

iii. Complete code for cityinformation.php as text.

```
<?php
    $path="Datasets/country-capitals.json";

    //to read json file through php
    $data=json_decode(file_get_contents($path),true); //decode json file
    //var_dump($data[0]); //to see the data inside of $data
?>
<html>
    <head>
        <meta charset="UTF-8">
        <title>City Details</title>
        <link rel="stylesheet" href="bootstrap-5.0.2-dist/css/bootstrap.min.css" />

    <script>
        function showCities(str) { //response part
            var xhttp;
            if (str == "") {
                document.getElementById("show").innerHTML = ""; //document objet model
                return;
            }
            xhttp = new XMLHttpRequest();
            xhttp.onreadystatechange = function() { //check if there is any state changes --- call back
funnnctions
                if (this.readyState == 4 && this.status == 200) { //4=request finished and response is ready--
if the request is success it shows in status.
                    document.getElementById("show").innerHTML = this.responseText; //using responsetext
property -- we add responsetext to show
                }
            };
        }
    }
};
```

```

        xhttp.open("GET", "getcity.php?q="+str, true); //request part --- true means asynchronous
method

        xhttp.send();

    }

</script>

</head>

<body>

<div id="main">

<div id="content">

<div class="container">

<div class="row">

<div class="col-md-1">&nbsp;</div>

<div class="col-md-10" >

<h5 class="text-md-start"><center>City
Information<center></h5>

<div class="container">

<h5 class="text text-primary">

<div class="row">

<div class="col-md-4">Search Cities:</div> <div class="col-md-8">

<input type="text" id="search" class="form-control"
onkeyup="showCities(this.value)" />

</div> </div>

</h5>

<hr />

<div id="show">Load Cities</div>

</div>

<div class="col-md-1">&nbsp;</div>

</div>

</div>

</div>

</body>

</html>

```

b) `getcity.php`

i. Output of getcity.php

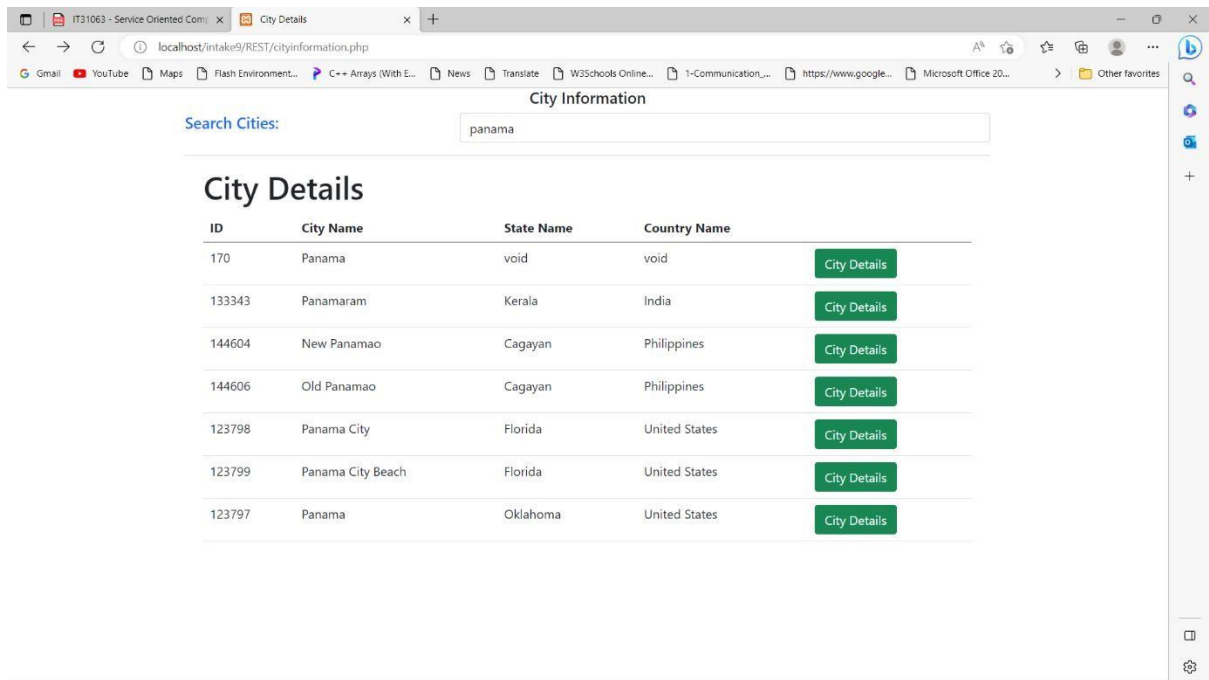


Figure 14output of getcity.php

ii. Complete code of getcity.php

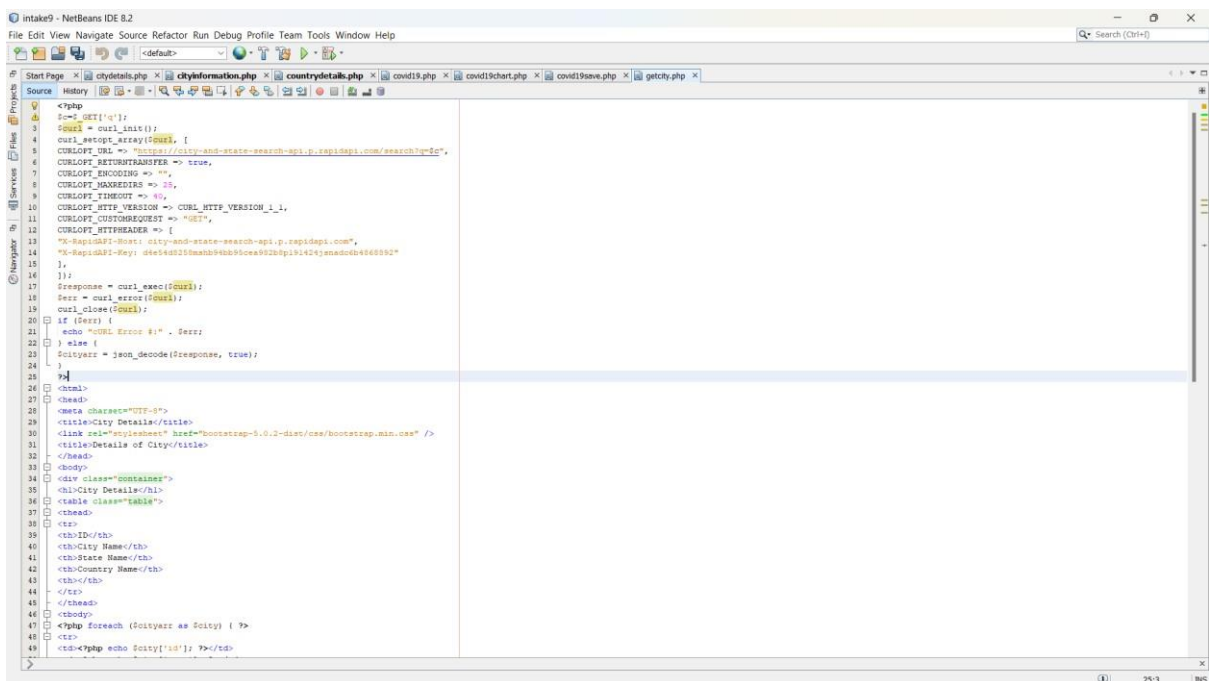


Figure 15 getcity.php code part-1

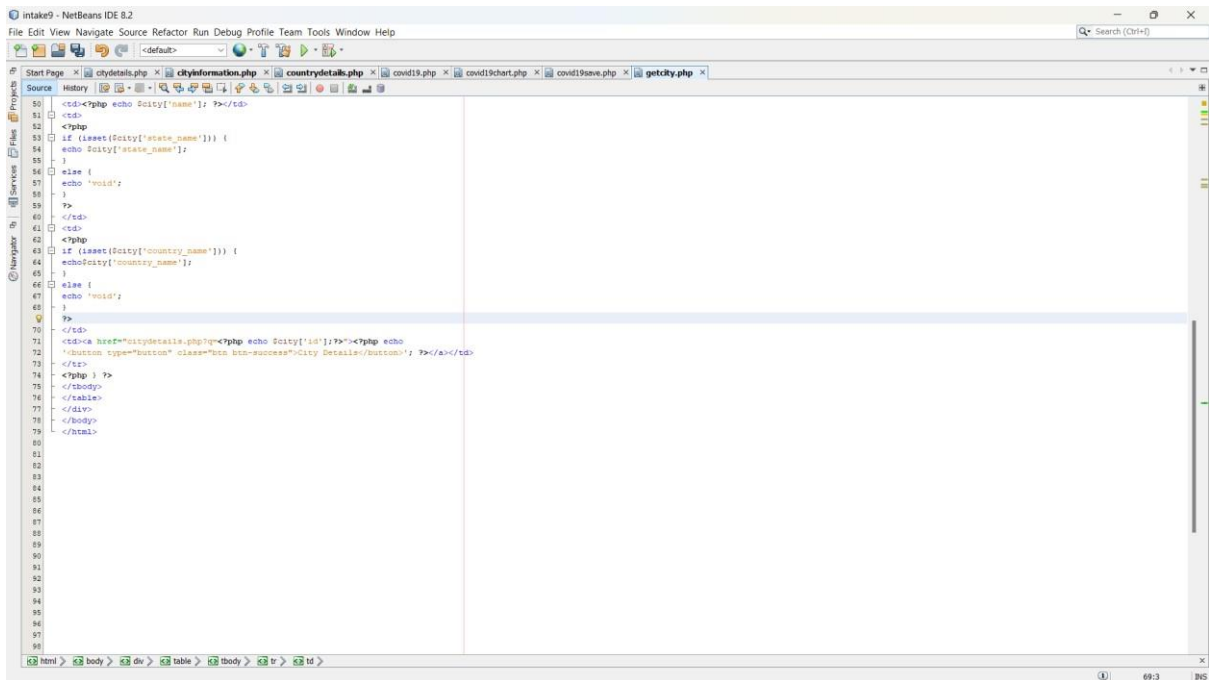


Figure 16 getcity.php code part-2

### iii. Complete code of getcity.php as text.

```

<?php
$c=$_GET['q'];
$curl = curl_init(); curl_setopt_array($curl,
[
CURLOPT_URL => "https://city-and-state-search-api.p.rapidapi.com/search?q=$c",
CURLOPT_RETURNTRANSFER => true,
CURLOPT_ENCODING => "",
CURLOPT_MAXREDIRS => 25,
CURLOPT_TIMEOUT => 40,
CURLOPT_HTTP_VERSION => CURL_HTTP_VERSION_1_1,
CURLOPT_CUSTOMREQUEST => "GET",
CURLOPT_HTTPHEADER => [
"X-RapidAPI-Host: city-and-state-search-api.p.rapidapi.com",
"X-RapidAPI-Key: d4e54d8258mshb94bb95cea982b8p191424jsnadc6b4868892"
],
]);

```

```
$response = curl_exec($curl); $err
= curl_error($curl);
curl_close($curl);
if ($err) { echo "cURL Error
#:" . $err;
} else {
$cityarr = json_decode($response, true);
}
?>

<html>
<head>
<meta charset="UTF-8">
<title>City Details</title>
<link rel="stylesheet" href="bootstrap-5.0.2-dist/css/bootstrap.min.css" />
<title>Details of City</title>
</head>
<body>
<div class="container">
<h1>City Details</h1>
<table class="table">
<thead>
<tr>
<th>ID</th>
<th>City Name</th>
<th>State Name</th>
<th>Country Name</th>
<th></th>
</tr>
</thead>
<tbody>
<?php foreach ($cityarr as $city) { ?>
<tr>
```

```

<td><?php echo $city['id']; ?></td>
<td><?php echo $city['name']; ?></td>
<td> <?php
if (isset($city['state_name'])) { echo
$city['state_name'];
}
else { echo
'void';
}
?>
</td>
<td>
<?php
if (isset($city['country_name'])) { echo$city['country_name'];
}
else { echo
'void';
}
?>
</td>
<td><a href="citydetails.php?q=<?php echo $city['id'];?>"><?php echo
'<button type="button" class="btn btn-success">City Details</button>'; ?></a></td>
</tr>
<?php } ?>
</tbody>
</table> </div>
</body>
</html>

```

**Explanation for cityinformation.php code** • The script includes JavaScript code that defines the showCities function.



- The showCities function is triggered when the user enters input in the search field (<input>). It checks if the input is empty and if not, it creates an XMLHttpRequest object.
- The onreadystatechange event handler is set for the XMLHttpRequest object to handle the response from the server.

### Explanation for getcity.php and citydetails.php codes

- The script initializes a cURL request using curl\_init() and sets various cURL options using curl\_setopt\_array() [1].
- The cURL options include the URL of the RapidAPI endpoint with the user-provided query ("https://city-and-state-search-api.p.rapidapi.com/search?q=\$c"), enabling the return of the response as a string (CURLOPT\_RETURNTRANSFER => true), and setting necessary headers including the RapidAPI host and key

#### c) Citydetails.php

##### i. Output of Citydetails.php

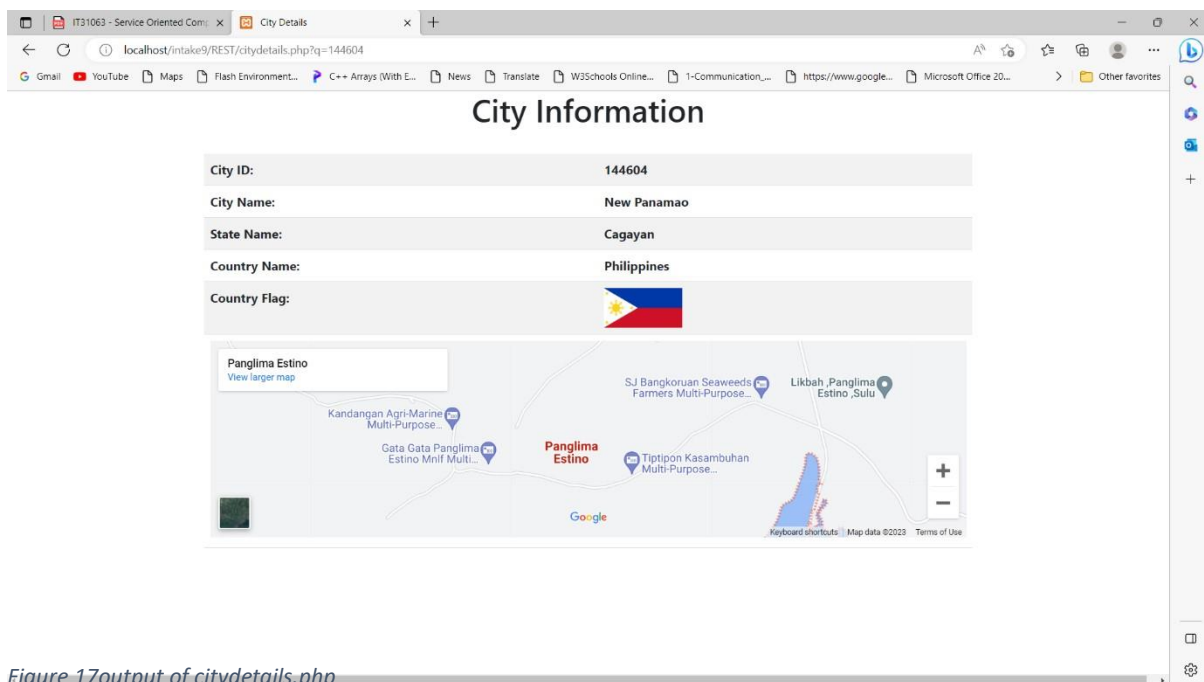


Figure 17 output of citydetails.php

i. Complete code of citydetails.php

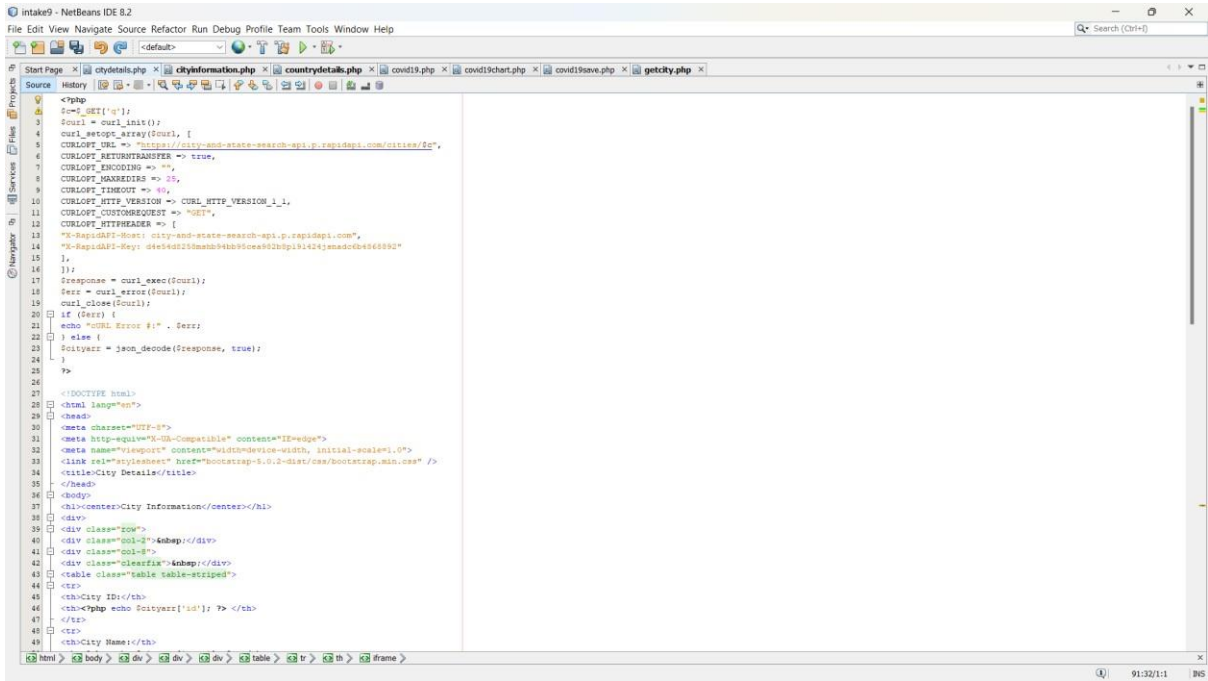


Figure 18citydetails.php code part-1

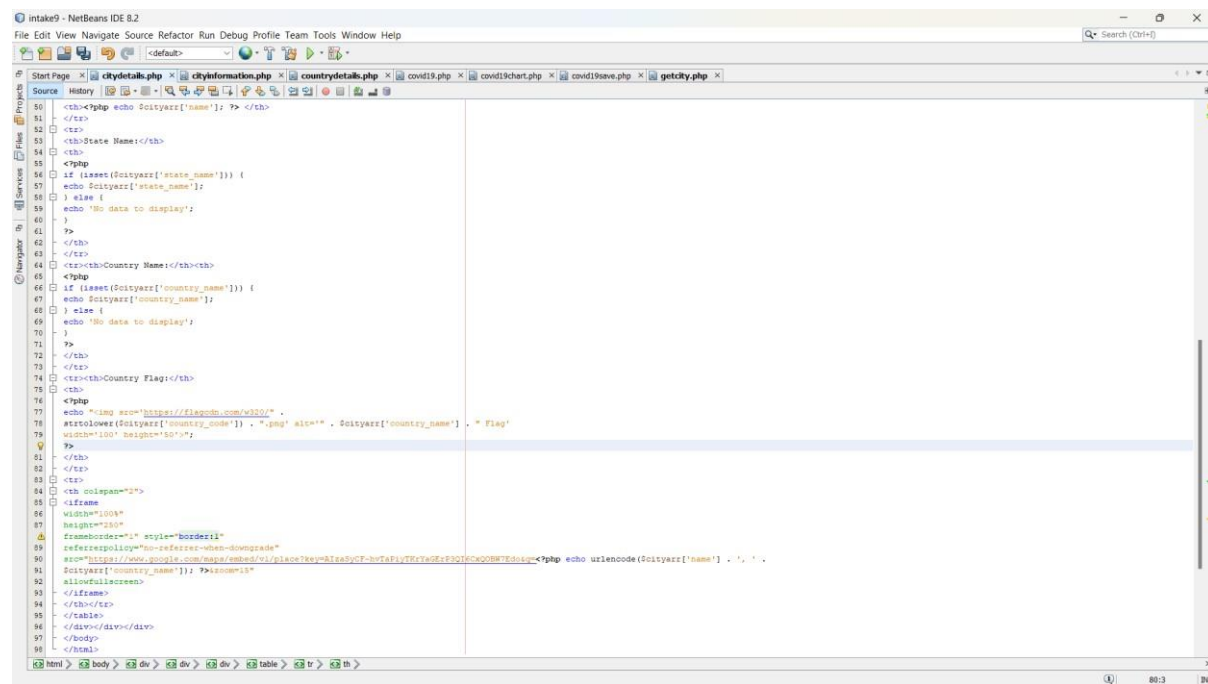


Figure 19citydetails.php code part-2

iii. Complete code of Citydetails.php as text.

```
<?php
```

```

$c=$_GET['q'];
$curl = curl_init(); curl_setopt_array($curl,
[
CURLOPT_URL => "https://city-and-state-search-api.p.rapidapi.com/cities/$c",
CURLOPT_RETURNTRANSFER => true,
CURLOPT_ENCODING => "",
CURLOPT_MAXREDIRS => 25,
CURLOPT_TIMEOUT => 40,
CURLOPT_HTTP_VERSION => CURL_HTTP_VERSION_1_1,
CURLOPT_CUSTOMREQUEST => "GET",
CURLOPT_HTTPHEADER => [
"X-RapidAPI-Host: city-and-state-search-api.p.rapidapi.com",
"X-RapidAPI-Key: d4e54d8258mshb94bb95cea982b8p191424jsnadc6b4868892"
],
]);
$response = curl_exec($curl);
$error = curl_error($curl);
curl_close($curl); if ($error) {
echo "cURL Error #:" . $error;
} else {
$cityarr = json_decode($response, true);
}
?>

```

```

<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<meta http-equiv="X-UA-Compatible" content="IE=edge">
<meta name="viewport" content="width=device-width, initial-scale=1.0">
<link rel="stylesheet" href="bootstrap-5.0.2-dist/css/bootstrap.min.css" />
<title>City Details</title>

```

```

</head>

<body>

<h1><center>City Information</center></h1>

<div>

<div class="row">

<div class="col-2">&nbsp;</div>

<div class="col-8">

<div class="clearfix">&nbsp;</div>

<table class="table table-striped">

<tr>

<th>City ID:</th>

<th><?php echo $cityarr['id']; ?> </th>

</tr>

<tr>

<th>City Name:</th>

<th><?php echo $cityarr['name']; ?> </th>

</tr>

<tr>

<th>State Name:</th>

<th><?php
if (isset($cityarr['state_name'])) { echo
$cityarr['state_name'];
} else {
echo 'No data to display';
}
?>
</th>

</tr>

<tr><th>Country Name:</th><th>

<?php
if (isset($cityarr['country_name'])) { echo
$cityarr['country_name'];

```

```

} else {
echo 'No data to display';
}
?>
</th>
</tr>
<tr><th>Country Flag:</th>
<th> <?php echo "<img
src='https://flagcdn.com/w320/" .
strtolower($cityarr['country_code']) . ".png'
alt='\" . $cityarr['country_name'] . " Flag'
width='100' height='50'>";
?>
</th>
</tr>
<tr>
<th colspan="2"> <iframe width="100%"
height="250" frameborder="1"
style="border:1" referrerpolicy="no-referrer-
when-downgrade"
src="https://www.google.com/maps/embed/v1/place?key=AlzaSyCFhvTaPiyTKrYaGEP3QI6CxQOBW
7Edo&q=<?php echo urlencode($cityarr['name']) . ', ' .
$cityarr['country_name']); ?>&zoom=15"
allowfullscreen> </iframe>
</th></tr>
</table>
</div></div></div>
</body>
</html>

```

1. Use COVID-19 API Documentation : COVID-19 API  
Documentation (api-sports) | RapidAPI

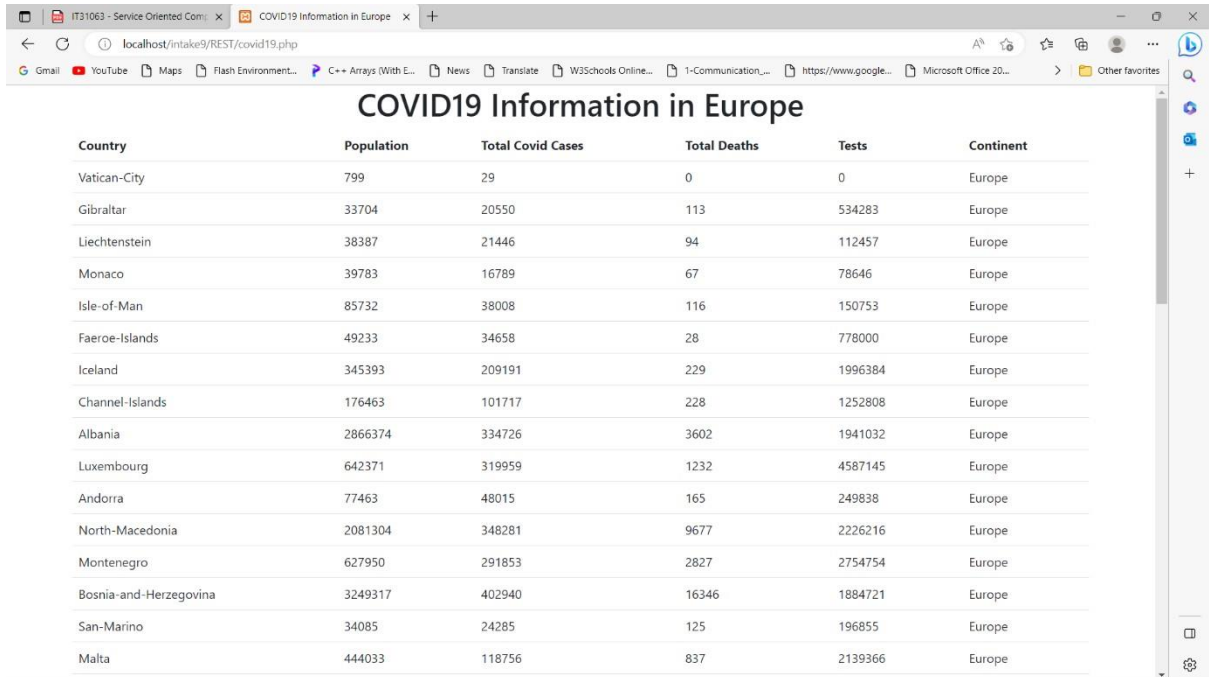
URL: <https://rapidapi.com/api-sports/api/covid-193/>

a) Display European countries COVID-19 information (Country, Population, Total Covid Cases, Total Deaths, Tests, Continent) on “covid19.php” page. Example as follows.

COVID19 Information in Europe					
Country	Population	Total Covid Cases	Total Deaths	Tests	Continent
Vatican-City	799	29	0	0	Europe
Isle-of-Man	85,732	38,008	116	150,753	Europe
Faeroe-Islands	49,233	34,658	28	778,000	Europe
Liechtenstein	38,387	21,437	91	112,457	Europe
Gibraltar	33,704	20,550	113	534,283	Europe
Monaco	39,783	16,178	67	78,646	Europe
San-Marino	34,085	23,961	123	196,855	Europe
Andorra	77,463	47,945	165	249,838	Europe
Belarus	9,432,800	994,037	7,118	13,646,641	Europe
Luxembourg	642,371	297,757	1,133	4,412,567	Europe
Iceland	345,393	209,191	229	1,996,384	Europe
Channel-Islands	176,463	101,717	228	1,252,808	Europe
Moldova	4,013,171	619,510	12,100	3,216,305	Europe

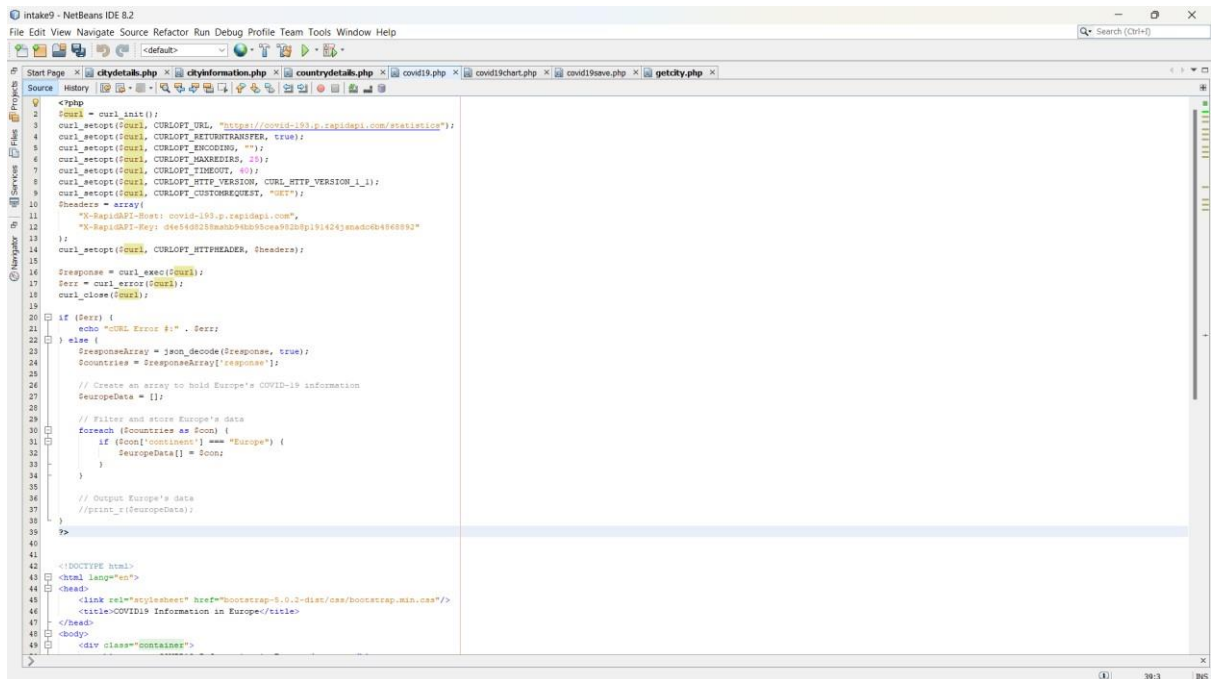
Figure 20 Example for covid19.php

## i. Output of covid19.php



Country	Population	Total Covid Cases	Total Deaths	Tests	Continent
Vatican-City	799	29	0	0	Europe
Gibraltar	33704	20550	113	534283	Europe
Liechtenstein	38387	21446	94	112457	Europe
Monaco	39783	16789	67	78646	Europe
Isle-of-Man	85732	38008	116	150753	Europe
Faeroe-Islands	49233	34658	28	778000	Europe
Iceland	345393	209191	229	1996384	Europe
Channel-Islands	176463	101717	228	1252808	Europe
Albania	2866374	334726	3602	1941032	Europe
Luxembourg	642371	319959	1232	4587145	Europe
Andorra	77463	48015	165	249838	Europe
North-Macedonia	2081304	348281	9677	2226216	Europe
Montenegro	627950	291853	2827	2754754	Europe
Bosnia-and-Herzegovina	3249317	402940	16346	1884721	Europe
San-Marino	34085	24285	125	196855	Europe
Malta	444033	118756	837	2139366	Europe

## ii. Complete code of covid19.php



```
<?php
1 $curl = curl_init();
2 curl_setopt($curl, CURLOPT_URL, "https://covid-19-3.p.rapidapi.com/statistics");
3 curl_setopt($curl, CURLOPT_RETURNTRANSFER, true);
4 curl_setopt($curl, CURLOPT_ENCODING, "");
5 curl_setopt($curl, CURLOPT_HTTPHEADER, array(
6     'X-RapidAPI-Key: d4e548258a3b942b950ea902b1914245eada0b4f68892'
7 ));
8 curl_setopt($curl, CURLOPT_HTTP_VERSION, CURL_HTTP_VERSION_1_1);
9 curl_setopt($curl, CURLOPT_CUSTOMREQUEST, "GET");
10 $headers = array(
11     'X-RapidAPI-Host: covid-19-3.p.rapidapi.com'
12 );
13 curl_setopt($curl, CURLOPT_HTTPHEADER, $headers);
14 $response = curl_exec($curl);
15 $err = curl_error($curl);
16 curl_close($curl);
17
18 if ($err) {
19     echo "CURL Error #: " . $err;
20 } else {
21     $responseArray = json_decode($response, true);
22     $countries = $responseArray['countries'];
23
24     // Create an array to hold Europe's COVID-19 information
25     $europeData = [];
26
27     // Filter and store Europe's data
28     foreach ($countries as $country) {
29         if ($country['continent'] === "Europe") {
30             $europeData[] = $country;
31         }
32     }
33
34     // Output Europe's data
35     // print_r($europeData);
36
37 }
38
39 <?DOCTYPE html>
40 <html lang="en">
41 <head>
42     <link rel="stylesheet" href="bootstrap-5.0.2-dist/css/bootstrap.min.css"/>
43     <title>COVID-19 Information in Europe</title>
44 </head>
45 <body>
46     <div class="container">
```

Figure 21covid19.php code part-1

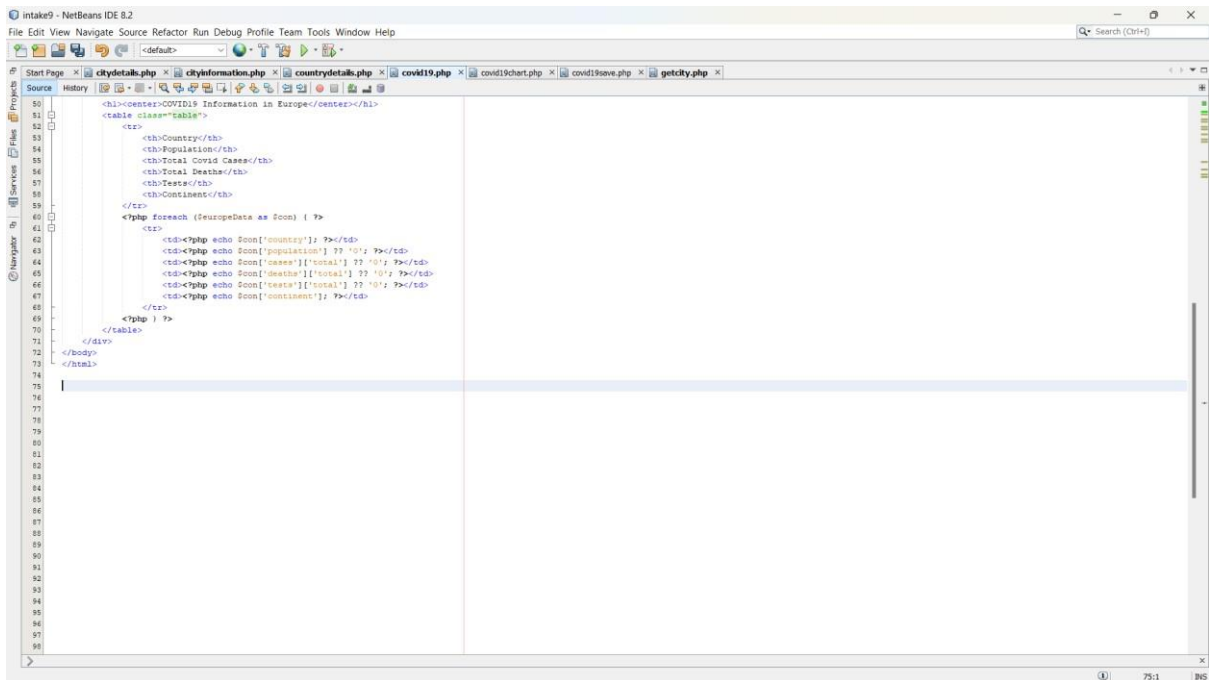


Figure 22 covid19.php code part-2

iii. Complete code of covid19.php as a text.

```

<?php
$curl = curl_init();

curl_setopt($curl, CURLOPT_URL, "https://covid-193.p.rapidapi.com/statistics");
curl_setopt($curl, CURLOPT_RETURNTRANSFER, true); curl_setopt($curl,
CURLOPT_ENCODING, ""); curl_setopt($curl, CURLOPT_MAXREDIRS, 25);
curl_setopt($curl, CURLOPT_TIMEOUT, 40); curl_setopt($curl,
CURLOPT_HTTP_VERSION, CURL_HTTP_VERSION_1_1); curl_setopt($curl,
CURLOPT_CUSTOMREQUEST, "GET");

$headers = array(
    "X-RapidAPI-Host: covid-193.p.rapidapi.com",
    "X-RapidAPI-Key: d4e54d8258mshb94bb95cea982b8p191424jsnadc6b4868892"
);

curl_setopt($curl, CURLOPT_HTTPHEADER, $headers);

```



```

$response = curl_exec($curl); $err
= curl_error($curl);
curl_close($curl);

if ($err) {
    echo "cURL Error #:" . $err;
} else {
    $responseArray = json_decode($response, true);
    $countries = $responseArray['response'];

    // Create an array to hold Europe's COVID-19 information
    $europeData = [];

    // Filter and store Europe's data
    foreach ($countries as $con) {        if
($con['continent'] === "Europe") {
        $europeData[] = $con;
    }
}

    // Output Europe's data
    //print_r($europeData);
}
?>

```

```

<!DOCTYPE html>
<html lang="en">
<head>
    <link rel="stylesheet" href="bootstrap-5.0.2-dist/css/bootstrap.min.css"/>
    <title>COVID19 Information in Europe</title>

```

```
</head>

<body>

  <div class="container">

    <h1><center>COVID19 Information in Europe</center></h1>

    <table class="table">

      <tr>

        <th>Country</th>

        <th>Population</th>

        <th>Total Covid Cases</th>

        <th>Total Deaths</th>

        <th>Tests</th>

        <th>Continent</th>

      </tr>

      <?php foreach ($europeData as $con) { ?>

        <tr>

          <td><?php echo $con['country']; ?></td>

          <td><?php echo $con['population'] ?? '0'; ?></td>

          <td><?php echo $con['cases']['total'] ?? '0'; ?></td>

          <td><?php echo $con['deaths']['total'] ?? '0'; ?></td>

          <td><?php echo $con['tests']['total'] ?? '0'; ?></td>

          <td><?php echo $con['continent']; ?></td>

        </tr>

      <?php } ?>

    </table>

  </div>

</body>

</html>
```

b) Use Google Charts: Charts | Google Developers URL: <https://developers.google.com/chart> Display European COVID cases vs. countries in the bar chart on the “covid19chart.php” page. Example as follows.

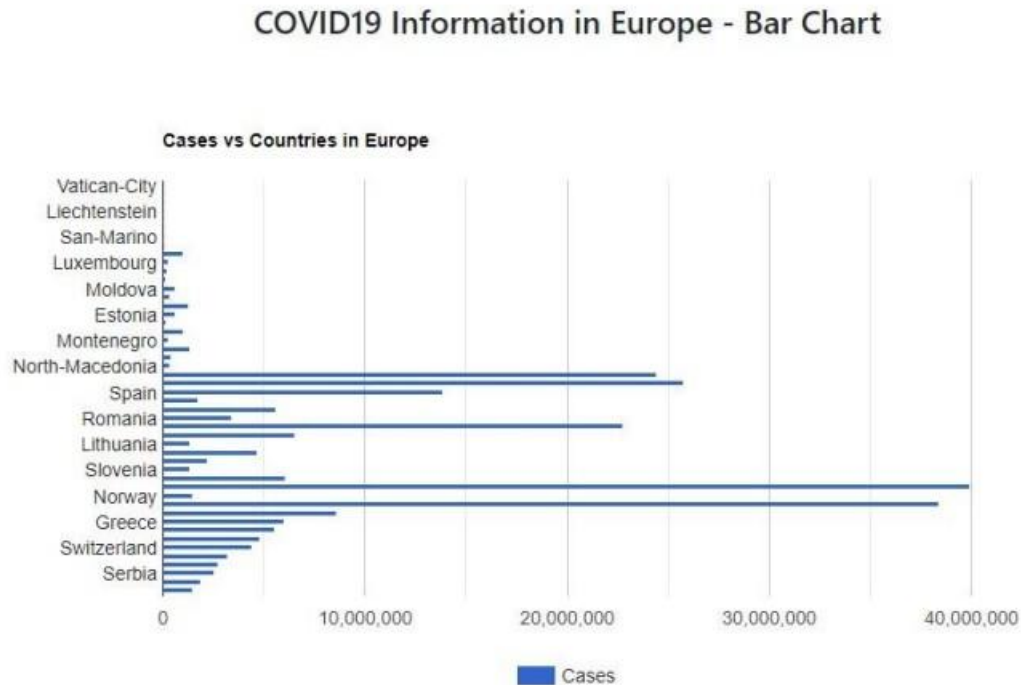


Figure 23 Example of covid19chart.php

## i. Output of Covid19chart.php

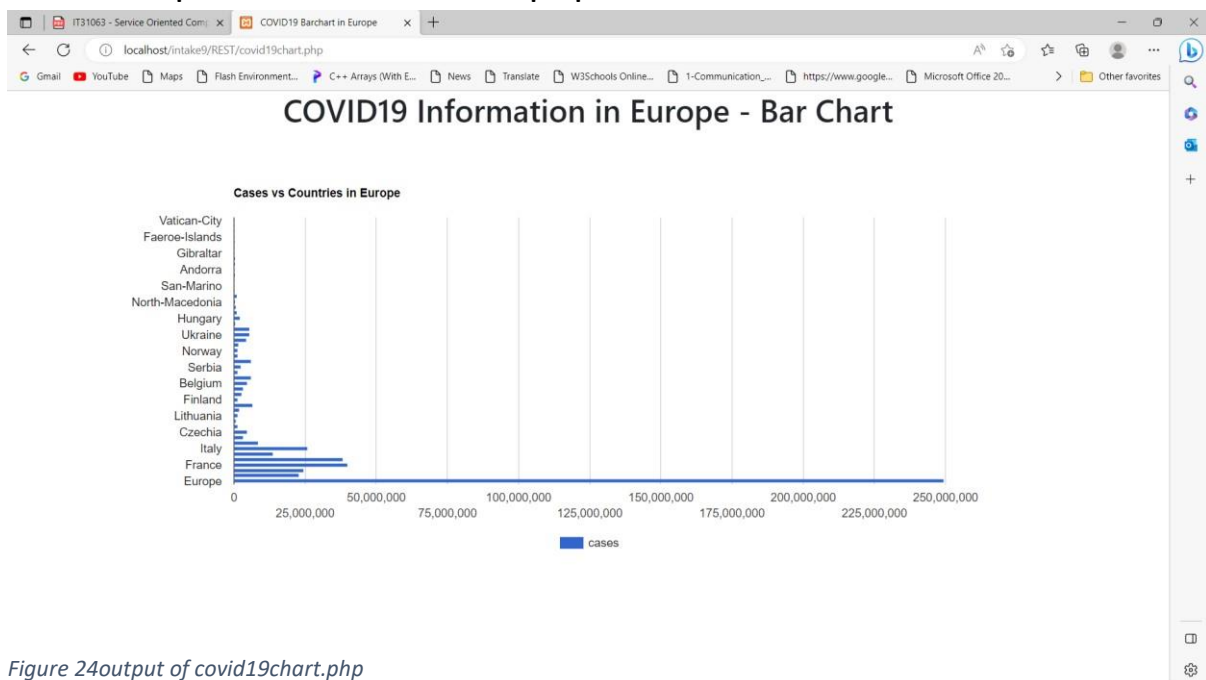


Figure 24 output of covid19chart.php

## ii. Complete code of covid19chart.php

```

1  <?php
2  $curl = curl_init();
3  curl_setopt($curl, CURLOPT_URL, "https://covid-19-p.rapidapi.com/statistics");
4  curl_setopt($curl, CURLOPT_RETURNTRANSFER, true);
5  curl_setopt($curl, CURLOPT_ENCODING, "");
6  curl_setopt($curl, CURLOPT_MAXREDIRS, 20);
7  curl_setopt($curl, CURLOPT_TIMEOUT, 40);
8  curl_setopt($curl, CURLOPT_HTTP_VERSION, CURL_HTTP_VERSION_1_1);
9  curl_setopt($curl, CURLOPT_CUSTOMREQUEST, "GET");
10 $headers = array(
11     "X-RapidAPI-Host: covid-19-p.rapidapi.com",
12     "X-RapidAPI-Key: d4e5d8238aadb94ab050ea992d8p1914243mad6cb466892"
13 );
14 curl_setopt($curl, CURLOPT_HTTPHEADER, $headers);
15
16 $response = curl_exec($curl);
17 $err = curl_error($curl);
18 curl_close($curl);
19
20 if ($err) {
21     echo "cURL Error #: " . $err;
22 } else {
23     $responseArray = json_decode($response, true);
24     $countries = $responseArray['response'];
25 }
26
27 <DOCTYPE html>
28 <html lang="en">
29 <head>
30     <link rel="stylesheet" href="bootstrap-5.0.2-dist/css/bootstrap.min.css"/>
31     <title>COVID19 BarChart in Europe</title>
32 </head>
33 <script type="text/javascript">
34     src="https://www.gstatic.com/charts/loader.js"></script>
35     <script type="text/javascript">
36         // Load the Visualization API and the corechart package.
37         google.charts.load({current: 'packages!/'}, {packages: ['corechart']});
38         // IT used as a callback when google visualization API loaded.
39         google.charts.setOnLoadCallback(drawChart);
40         // Callback that creates and populates a data table,
41         // instantiates the bar chart, passes in the data and
42         // draws it.
43         function drawChart() {
44             // Create the data table.
45             var data = new google.visualization.DataTable();
46             data.addColumn('string', 'country');
47             data.addColumn('number', 'cases');
48             // Add rows for each country in Europe
49         }
50     </script>
51 </html>

```

Figure 25 covid19chart code part-1

```

50 <?php
51 foreach ($countries as $con) {
52     // Check if the country is in Europe
53     if ($con['continent'] == 'Europe') {
54         // Get the country name and number of cases
55         $countryName = $con['country'];
56         $cases = $con['cases'];
57         // Add the row to the data table
58         echo "data.addRow(['$countryName', '$cases'])";
59     }
60 }
61
62 // Set chart options
63 var options = {
64     'title': 'Cases vs Countries in Europe',
65     'width': 1100,
66     'height': 1100,
67     'legend': { position: 'bottom' }
68 };
69 // Instantiate and draw our chart, passing in some options.
70 var chart = new google.visualization.BarChart(document.getElementById('chart_div'));
71 chart.draw(data, options);
72
73 <script>
74 <title></title>
75 </head>
76 <body>
77 <div class="container">
78     <h1><center>COVID19 Information in Europe - Bar Chart</center></h1>
79     <div id="chart_div"></div>
80 </div>
81 </body>
82 </html>

```

Figure 26covid19chart code part-2

iii. Complete code of covid19chart.php as text.

```

<?php
$curl = curl_init(); curl_setopt($curl, CURLOPT_URL, "https://covid-
193.p.rapidapi.com/statistics"); curl_setopt($curl, CURLOPT_RETURNTRANSFER,
true); curl_setopt($curl, CURLOPT_ENCODING, ""); curl_setopt($curl,
CURLOPT_MAXREDIRS, 25); curl_setopt($curl, CURLOPT_TIMEOUT, 40);
curl_setopt($curl, CURLOPT_HTTP_VERSION, CURL_HTTP_VERSION_1_1);
curl_setopt($curl, CURLOPT_CUSTOMREQUEST, "GET");
$headers = array(
    "X-RapidAPI-Host: covid-193.p.rapidapi.com",
    "X-RapidAPI-Key: d4e54d8258mshb94bb95cea982b8p191424jsnadc6b4868892"
);
curl_setopt($curl, CURLOPT_HTTPHEADER, $headers);

$response = curl_exec($curl); $err
= curl_error($curl);
curl_close($curl);

if ($err) {    echo "cURL Error
#:" . $err;
} else {
    $responseArray = json_decode($response, true);
    $countries = $responseArray['response'];
}
?>

<!DOCTYPE html>
<html lang="en">
<head>
    <link rel="stylesheet" href="bootstrap-5.0.2-dist/css/bootstrap.min.css"/>
    <title>COVID19 Barchart in Europe</title>
</head>
<script type="text/javascript" src="https://www.gstatic.com/charts/loader.js"></script>

```

```

<script type="text/javascript">
// Load the Visualization API and the corechart package.
google.charts.load('current', {'packages':['corechart']}); // IT
used as a callback when google visualization API loaded.
google.charts.setOnLoadCallback(drawChart);
// Callback that creates and populates a data table, //
instantiates the bar chart, passes in the data and
// draws it.
function drawChart() { // Create the data table.
var data = new google.visualization.DataTable();
data.addColumn('string', 'countryes');
data.addColumn('number', 'cases');
// Add rows for each country in Europe
<?php foreach ($countries as
$con) { // Check if the country is in
Europe if ($con['continent'] ==
'Europe') {
// Get the country name and number of cases
$countryName = $con['country'];
$cases = $con['cases']['total']; // Add the row to
the data table echo
"data.addRow(['$countryName', $cases]);";
}
}
?>
// Set chart options var options = {'title':'Cases vs
Countries in Europe',
'width':1300,
'height':550,
'legend': { position: 'bottom' }};
// Instantiate and draw our chart, passing in some options. var chart =
new

```

```
google.visualization.BarChart(document.getElementById('chart_div'));
chart.draw(data, options);
}
</script>
<title></title>
</head>
<body>
<div class="container">
<h1><center>COVID19 Information in Europe - Bar Chart</center></h1>
<div id="chart_div"></div>
</div>
</body>
</html>
```

c) Write a code to save COVID-19 global information into a database using PHP and MySQL on the covid19save.php page  
Database: covid2023 Table: covidcases Fields: id, countryName, population, totalcases, deaths, tests, continent, date.

i. Database: Covid2023 & Table: covidcases.

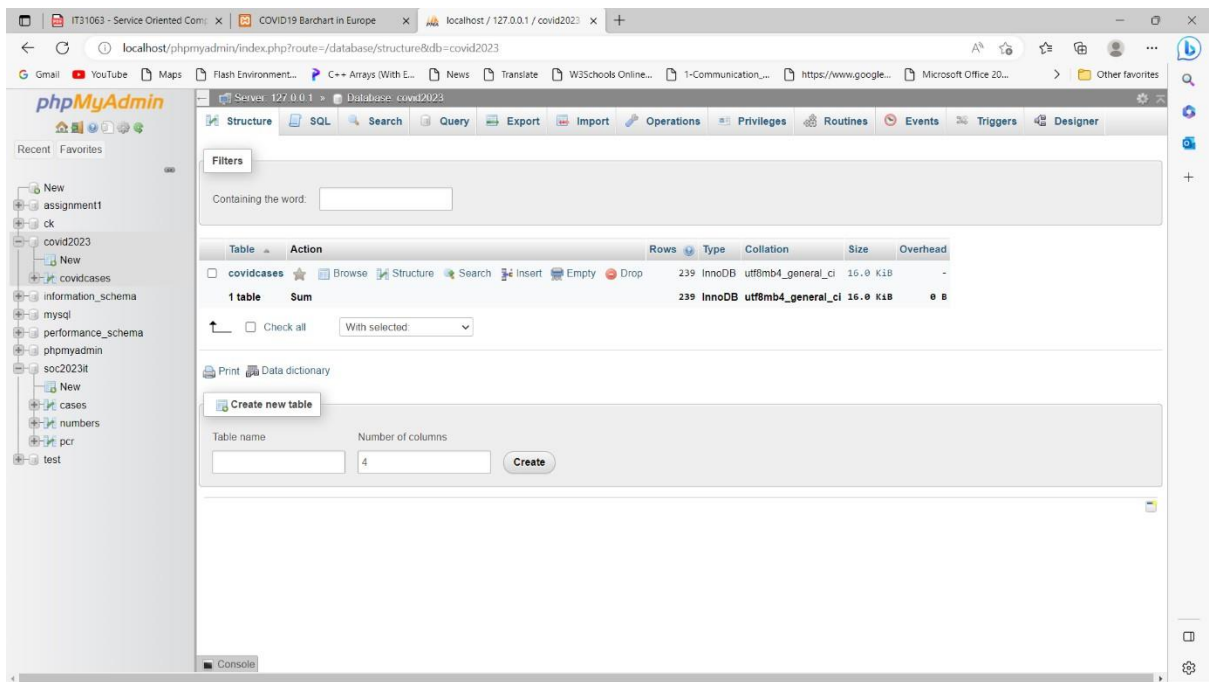


Figure 27 database; covid2023 and the table; covidcases

ii. Complete code of Covid19save.php



```

1 <?php
2 // creating variables to connect with the database
3 $servername = "localhost";
4 $username = "root";
5 $password = "";
6 $dbname = "covid2023";
7 $conn = new mysqli($servername, $username, $password, $dbname); // Create connection
8 if ($conn->connect_error) {
9     die("Connection failed: " . $conn->connect_error); // Check connection
10 }
11 $curl = curl_init();
12 curl_setopt_array($curl, [
13     CURLOPT_URL => "https://covid-193.p.rapidapi.com/statistics",
14     CURLOPT_RETURNTRANSFER => true,
15     CURLOPT_ENCODING => "",
16     CURLOPT_MAXREDIRS => 10,
17     CURLOPT_TIMEOUT => 60,
18     CURLOPT_HTTP_VERSION => CURL_HTTP_VERSION_1_1,
19     CURLOPT_CUSTOMREQUEST => "GET",
20     CURLOPT_HTTPHEADER => [
21         "X-RapidAPI-Host: covid-193.p.rapidapi.com",
22         "X-RapidAPI-Key: 6e54d237aabb94b050ee9428b194243e6ad6b4968992"
23     ],
24 ]);
25
26 $response = curl_exec($curl);
27 $err = curl_error($curl);
28 curl_close($curl);
29 if ($err) {
30     echo "CURL Error: " . $err;
31 } else {
32     $responseArray = json_decode($response, true);
33     $countries = $responseArray['countries'];
34 }
35
36 foreach ($countries as $con) {
37     $countryName = $con['country'];
38     $population = $con['population'];
39     $totalcases = $con['cases']['total'];
40     $deaths = $con['deaths']['total'];
41     $tests = $con['tests']['total'];
42     $continent = $con['continent'];
43     $date = $con['day'];
44     // Insert data to the table covidcases
45     $sql = "INSERT INTO covidcases (countryName, population, totalcases, deaths, tests,
46         continent, date)
47     VALUES ('$countryName', '$population', '$totalcases', '$deaths', '$tests',
48         '$continent', '$date')";
49 }
50

```

Figure 28covid19save.php code part-1

```

51 if ($conn->query($sql) === TRUE) {
52 } else {
53     echo "Error: " . $sql . "<br>" . $conn->error;
54 }
55
56 echo "Data have been successfully inserted";
57 // Close the connection
58 $conn->close();
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```

Figure 29covid19save.php code part-2

iii. Complete code of Covid19save.php as text.

```
<?php
```

```
// creating variables to connect with the database
```

```
$servername = "localhost";
```

```

$username = "root";
$password = "";
$dbname = "covid2023";

$conn = new mysqli($servername, $username, $password, $dbname);// Create connection
if ($conn->connect_error) { die("Connection failed: " . $conn->connect_error);// Check
connection
}

$curl = curl_init(); curl_setopt_array($curl,
[
    CURLOPT_URL => "https://covid-193.p.rapidapi.com/statistics",
    CURLOPT_RETURNTRANSFER => true,
    CURLOPT_ENCODING => "",
    CURLOPT_MAXREDIRS => 25,
    CURLOPT_TIMEOUT => 40,
    CURLOPT_HTTP_VERSION => CURL_HTTP_VERSION_1_1,
    CURLOPT_CUSTOMREQUEST => "GET",
    CURLOPT_HTTPHEADER => [
        "X-RapidAPI-Host: covid-193.p.rapidapi.com",
        "X-RapidAPI-Key: d4e54d8258mshb94bb95cea982b8p191424jsnadc6b4868892"
    ],

]);

$response = curl_exec($curl); $err
= curl_error($curl);
curl_close($curl);

if ($err) {
    echo "cURL Error #:" . $err;
} else {
    $responseArray = json_decode($response, true);
    $countries = $responseArray['response'];
}

```

```

foreach ($countries as $con) {
    $countryName = $con['country'];
    $population = $con['population'];
    $totalcases = $con['cases']['total'];
    $deaths = $con['deaths']['total'];
    $tests = $con['tests']['total'];
    $continent = $con['continent'];
    $date = $con['day'];

    // Insert data to the table covidcases
    $sql = "INSERT INTO covidcases (countryName, population, totalcases, deaths, tests, continent,
    date)
    VALUES ('$countryName', '$population', '$totalcases', '$deaths', '$tests',
    '$continent', '$date')";

    if ($conn->query($sql) === TRUE) {
    } else { echo "Error: " . $sql . "<br>" .
    $conn->error;
    }
    }

    echo "Data have been successfully Inserted";

    // Close the connection
    $conn->close();

    ?>

```

### **Covid19.php code explanation**

- The script initializes a cURL session using `curl_init()` and sets various cURL options using `curl_setopt()`.
- The cURL options include the URL of the RapidAPI endpoint for COVID-19 statistics ("<https://covid-193.p.rapidapi.com/statistics>"), enabling the return of the response as a string (`CURLOPT_RETURNTRANSFER => true`), and setting necessary headers including the RapidAPI host and key.
- The script executes the cURL request using `curl_exec()` and stores the response in the variable `$response`. It also checks for any cURL errors using `curl_error()` and assigns the error message to the variable `$err`. Finally, it closes the cURL session using `curl_close($curl)`.

### Covid19chart.php code explanation

- PHP code uses the Google Visualization API to load the necessary packages ('corechart') and sets a callback function drawChart() to be executed when the API is loaded. Inside the drawChart() function, a data table is created using google.visualization.DataTable(). It has two columns: 'countryes' (string) and 'cases' (number).
- Finally, the chart is instantiated using google.visualization.BarChart() and drawn in the <div> element with the id "chart\_div" using chart.draw(data, options)

### Covid19save.php code explanation

- It establishes a connection to the MySQL database using the mysqli class and the new mysqli() constructor.
- Inside the for each loop, it extracts various data points for each country, such as the country name, population, total cases, deaths, tests, continent, and date.
- It constructs an SQL INSERT statement to insert the data into the covidcases table, using the extracted data as values for the respective columns in the table.
- The INSERT INTO statement is executed using \$conn->query(\$sql) to insert the data into the table. If there is an error in the query, it is displayed using echo.
- After the loop completes, the code outputs a success message indicating that the data has been successfully inserted into the table.
- Finally, the script closes the database connection using \$conn->close().

#### iv. Output of the covid19save.php

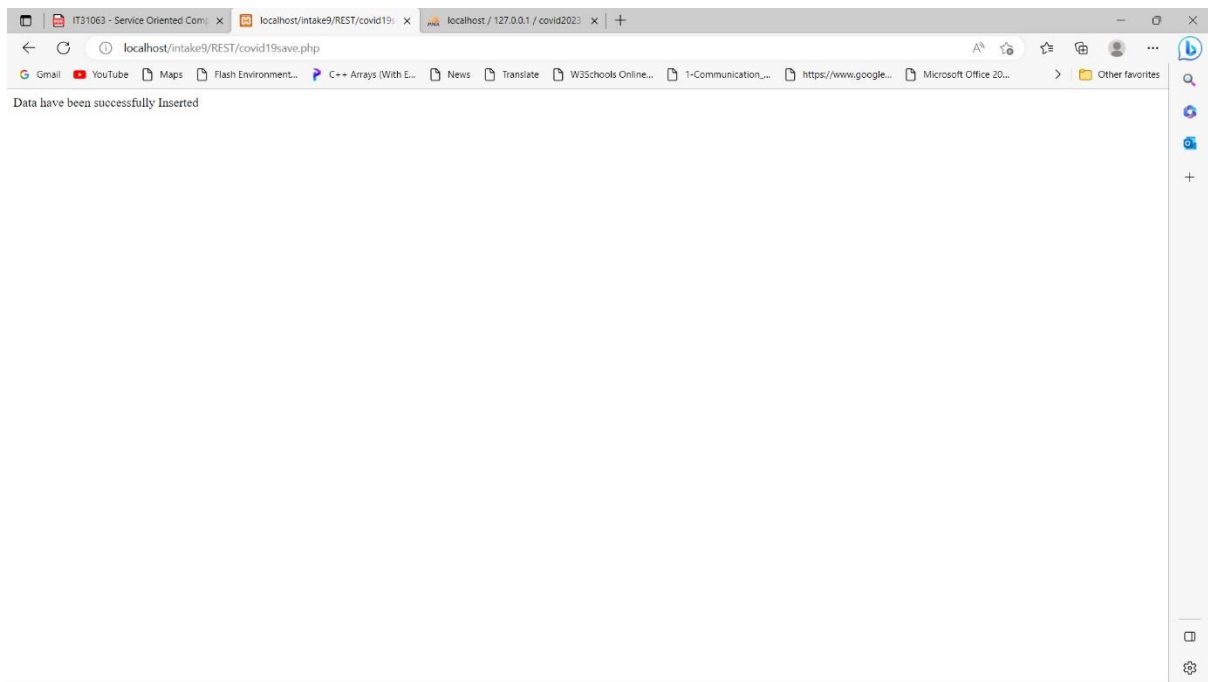


Figure 30 output of the covid19save.php

v. Stored data through covid19save.php to the database: covid2023.

The screenshot shows the phpMyAdmin interface with the `covid2023` database selected. The `covidcases` table is displayed, showing 19 rows of data. The table structure and data are as follows:

id	countryName	population	totalcases	deaths	tests	continent	date
1	Dominica	72344	15760	74	229344	North-America	2023-05-29
2	Dominica	72344	15760	74	229344	North-America	2023-05-29
3	Djibouti	1016097	15690	189	305941	Africa	2023-05-29
4	CAR	5016678	15368	113	81294	Africa	2023-05-29
5	Greenland	56973	11971	21	164926	North-America	2023-05-29
6	Yemen	31154867	11945	2159	329592	Asia	2023-05-29
7	Eritrea	3662244	10189	103	23693	Africa	2023-05-29
8	Niger	26083860	9931	312	254538	Africa	2023-05-29
9	Antigua-and-Barbuda	99509	9106	146	18901	North-America	2023-05-29
10	British-Virgin-Islands	30596	7305	64	107339	North-America	2023-05-29
11	Anguilla	15230	3904	12	51382	North-America	2023-05-29
12	Saint-Pierre-Miquelon	5759	3452	2	25400	North-America	2023-05-29
13	Tuvalu	12066	2805	0	0	Oceania	2023-05-29
14	Saint-Helena	6115	2166	0	0	Africa	2023-05-29
15	Falkland-Islands	3539	1930	0	8632	South-America	2023-05-29
16	Montserrat	4965	1403	8	17762	North-America	2023-05-29
17	Diamond-Princess	0	712	13	0		2023-05-29
18	Vatican-City	769	29	0	0	Europe	2023-05-29
19	Western-Sahara	626161	10	1	0	Africa	2023-05-29

Figure 31v. Stored data through covid19save.php to the database: covid2023.