

Comp306 Database Management Systems

Project Report

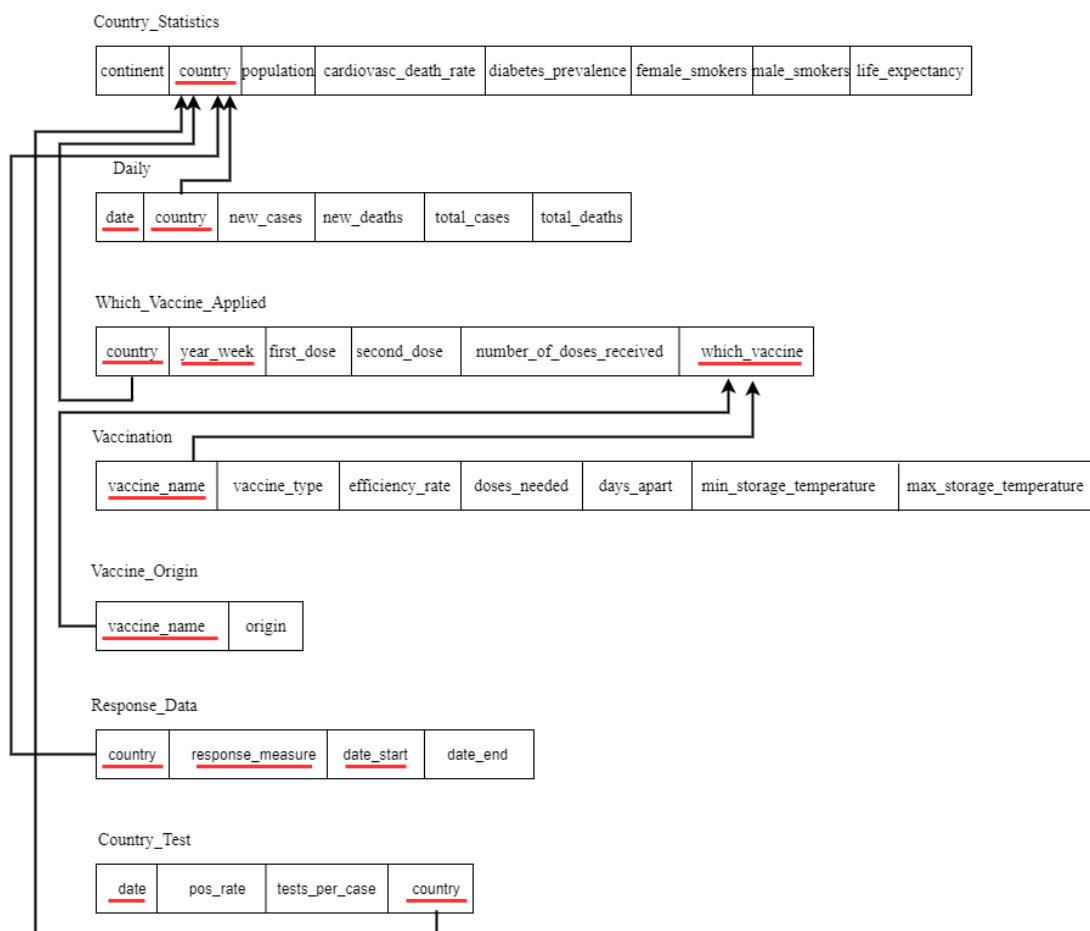
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1) We have developed a web-application for health authorizations around the globe consisting of COVID-19 information. We have used HTML, CSS and PHP in our front-end. With this application, countries will be able to get to know other countries' statistics and take action inspired from them. For instance, countries are able to prioritize their vaccination process for their citizens according to the data such as diabetes prevalence or smoking rate. Moreover they can see the efficiency of the response measures taken in other countries and decreasing trends following these responses, so that they are able to consider their own country to take the same/similar measures. Main target user group is governments, ministries of health and researchers.

2)



3)

```
CREATE TABLE `country_statistics` (  
  `continent` varchar(45) DEFAULT NULL,  
  `country` varchar(45) NOT NULL,  
  `population` int DEFAULT NULL,  
  `cardiovasc_death_rate` float DEFAULT NULL,  
  `diabetes_prevalence` float DEFAULT NULL,  
  `female_smokers` float DEFAULT NULL,  
  `male_smokers` float DEFAULT NULL,  
  `life_expectancy` double DEFAULT NULL,  
  PRIMARY KEY (`country`)  
) ENGINE=InnoDB DEFAULT CHARSET=utf8;
```

```
CREATE TABLE `country_test` (  
  `date` varchar(45) NOT NULL,  
  `pos_rate` double DEFAULT NULL,  
  `test_per_case` double DEFAULT NULL,  
  `country` varchar(45) NOT NULL,  
  PRIMARY KEY (`date`, `country`),  
  FOREIGN KEY (`country`)  
    REFERENCES country_statistics (`country`)  
) ENGINE=InnoDB DEFAULT CHARSET=utf8;
```

```
CREATE TABLE `daily` (  
  `date` varchar(45) NOT NULL,  
  `country` varchar(45) NOT NULL,  
  `new_cases` int DEFAULT NULL,  
  `new_deaths` int DEFAULT NULL,  
  `total_cases` int DEFAULT NULL,  
  `total_deaths` int DEFAULT NULL,  
  PRIMARY KEY (`date`, `country`),  
  FOREIGN KEY (`country`)  
    REFERENCES country_statistics (`country`)  
) ENGINE=InnoDB DEFAULT CHARSET=utf8;
```

```

CREATE TABLE `Response_Data` (
  `Country` varchar(50) NOT NULL,
  `Response_measure` varchar(80) NOT NULL,
  `date_start` datetime NOT NULL,
  `date_end` datetime DEFAULT NULL,
  PRIMARY KEY (`Country`,`Response_measure`,`date_start`),
  FOREIGN KEY (`country`)
    REFERENCES country_statistics (`country`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8;

```

```

CREATE TABLE `vaccination` (
  `vaccine_name` varchar(45) NOT NULL,
  `vaccine_type` varchar(50) NOT NULL,
  `efficiency_rate` double DEFAULT NULL,
  `doses_needed` int NOT NULL,
  `days_apart` int DEFAULT NULL,
  `min_storage_temperature` int DEFAULT NULL,
  `max_storage_temperature` int DEFAULT NULL,
  PRIMARY KEY (`vaccine_name`),
  FOREIGN KEY (`vaccine_name`)
    REFERENCES Which_vaccine_applied (`which_vaccine`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8;

```

```

CREATE TABLE `vaccine_origin` (
  `vaccine_name` varchar(45) NOT NULL,
  `origin` varchar(50) DEFAULT NULL,
  PRIMARY KEY (`vaccine_name`),
  FOREIGN KEY (`vaccine_name`)
    REFERENCES Which_vaccine_applied (`which_vaccine`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8;

```

```

CREATE TABLE `Which_vaccine_applied` (
  `Country` varchar(45) NOT NULL,

```

```

`Year_Week` varchar(45) NOT NULL,
`FirstDose` int DEFAULT NULL,
`SecondDose` int DEFAULT NULL,
`NumberDosesReceived` int DEFAULT NULL,
`Which_vaccine` varchar(45) NOT NULL,
PRIMARY KEY (`Country`, `Year_Week`, `Which_vaccine`),
FOREIGN KEY (`country`)
REFERENCES country_statistics (`country`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8;

```

4) We have done a broad research while we were collecting our data. Some open source websites are:

<https://data.humdata.org/dataset/novel-coronavirus-2019-ncov-cases>

<https://covid19.tubitak.gov.tr/bilimsel-kaynaklar/veri-setleri>

<https://www.ecdc.europa.eu/en/covid-19/data>

<https://www.kaggle.com/sudalairajkumar/novel-corona-virus-2019-dataset>

We have used mySQL Workbench most of the time and after preprocessing the data, we have exported our data to our previously created tables with the above queries.

5) We have written more than 11 sql queries, However, some are for only inserting new tuples into the tables which can be considered as basic. So we are not declaring them here, these 6 are some sql queries that someone can consider as complex/sophisticated, these queries are separated in different .php files for grader to observe them easily..(Their corresponding files are: first.php, second.php, third.php, fourth.php, fifth.php, sixth.php):

This query takes date as input and looks for the daily data in that particular date and returns the country and that day's total death in an descending manner so that user can understand the upward or downward trend in that country:

```

-$query = "SELECT distinct(daily.country), daily.total_deaths
FROM comp306.country_statistics join comp306.daily
where country_statistics.country = daily.country and daily.date = '$date'
ORDER BY total_deaths DESC;";

```

This query takes count as available vaccines available in a country and as an input and returns the sum of the number of doses received, country name, response measure and

the starting date of that response measure that had been taken. The goal is to give user the response measures that countries taken over the vaccination process, so that according to their own situation of availability of vaccines in their country, they have an insight about how to put rules:

```
-$query = "SELECT  Which_vaccine_applied.country,  SUM(NumberDosesReceived)as  
sum, Response_Data.Response_measure as ResponseMeasure, Response_Data.date_start as  
date  
FROM Which_vaccine_applied, Response_Data  
WHERE Which_vaccine_applied.country = Response_Data.country  
GROUP BY NumberDosesReceived, Response_measure, country,Response_Data.date_start  
having count(*) > '$count' and sum > 0  
order by  sum asc;"
```

This query takes the diabetes prevalence rate(0-100) as an input as a lower bound and returns the country name, positivity rate, prevalence rate, and the date of the countries. The goal is to give the relevant information about diabetes prevalence and positivity rate to the user:

```
-$query = "SELECT  distinct  country_statistics.country ,  max(country_test.pos_rate) as  
posRate, country_statistics.diabetes_prevalence as DiabetesPrev, country_test.date  
FROM country_statistics natural join country_test  
where country_statistics.country = country_test.country  
group      by      country_statistics.diabetes_prevalence,      country_statistics.country,  
country_test.pos_rate, country_test.date  
having country_statistics.diabetes_prevalence > '$rate'  
order by posRate desc;  
" ;
```

This query takes the diabetes male smoking rate(0-100) as an input as a lower bound and returns the country name, positivity rate, male smoking prevalence rate, and the date of the countries. The goal is to give the relevant information about male smoking prevalence and positivity rate to the user:

```
-$query = "SELECT  distinct  country_statistics.country ,  max(country_test.pos_rate) as  
posRate, country_statistics.male_smokers as MSmokers, country_test.date  
FROM country_statistics natural join country_test
```

```

where country_statistics.country = country_test.country and date = '4/8/21'
group by country_statistics.male_smokers, country_statistics.country, country_test.pos_rate,
country_test.date
having country_statistics.male_smokers > 2
order by country_statistics.male_smokers desc;" ;

```

This query shows the life expectancy (this can be changed with other country statistics) of the countries that vaccinated their citizens for X number of weeks. This could show the relationship between the vaccinations and the countries' other statistics.

```

-$query = "select country,life_expectancy
from country_statistics
where country in
(select country
from Which_vaccine_applied
where NumberDosesReceived > '$num'
group by country
having count(*)> '$count')
group by country
order by life_expectancy desc;" ;

```

This query takes a count as an input from the user which represents the number of doses received.(A lower bound). Query returns name and the sum of the number of doses received of those countries whose number of doses exceed the given user input.

```

-$query = "select Which_vaccine_applied.country ,sum(NumberDosesReceived) as
numdoses
from Which_vaccine_applied
group by Which_vaccine_applied.Country
having sum(NumberDosesReceived) > '$count'" ;

```

6) Our web-application front-end prototype(main page) looks like this:

Welcome to the COVID-19 Data Center

Covid-19 Database Management WebSite for Health Authorizations around the World.

How to use this website effectively:

- Users are able to reach current COVID-19 Cases/Deaths/Vaccinations.
- Users are able to reach Response Measurements of the countries around the world.
- Users can add new data to the website related to their country's COVID19 info.

To find out the number of doses which the countries have applied; Enter an lower bound as number of doses received:

Number of Doses Received:

To find out the correlation between life expectancy and number doses received, Enter count as 'consecutive days which countries have applied vaccination' and enter number of doses as in which amount:

Count:

Number of Doses Received:

To find out the correlation between 'Male Smoking rate' and 'positivity rate', enter a number representing lower bound of the Male Smoking Rate(0-100):

Rate:

To find out the correlation between 'diabetes prevalence' and 'positivity rate', enter a number representing lower bound of the prevalence rate(0-100):

Rate:

To find out the correlation between 'vaccine availability' and 'measurements had to be taken in a country', enter a number representing count of different vaccines available in a country:

Count:

To find out exact death numbers of countries enter a date:

Date:

[←](#) | [↻](#) | Not Secure | 192.168.64.2/index.php

To Enter Into Vaccine Origin Table:

Vaccine Name:	
Origin:	

To Enter Into Country Testing Table:

Date:	
Positivity rate:	
Test Per Case:	
Country:	

To Enter Into Country Statistics Table:

Continent:	
Country:	
Population:	
cardiovasc_death_rate:	
diabetes_prevalence:	
female_smokers:	
male_smokers:	
life_expectancy:	

To Enter Into Daily Table:

Date:	
Country:	
New Cases:	
New Deaths:	
Total Cases:	
Total Deaths:	

To Enter Into Response Measurements Table:

Country:	
Response Measurement:	
Date Start:	
Date End:	

To Enter Into Vaccination Table:

Vaccine Name:	
Vaccine Type:	
Efficiency Rate:	
Doses Needed:	