COVID-19 Government Response Tracker

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Application Description

- Web-based application that studies and compares the response of the governments of 177 countries to the novel COVID-19 virus.
- Includes parameters such as confirmed cases, deaths, closures, investments and overall stringency of implementation
- Studying these parameters shows which measures were most effective in containing the virus

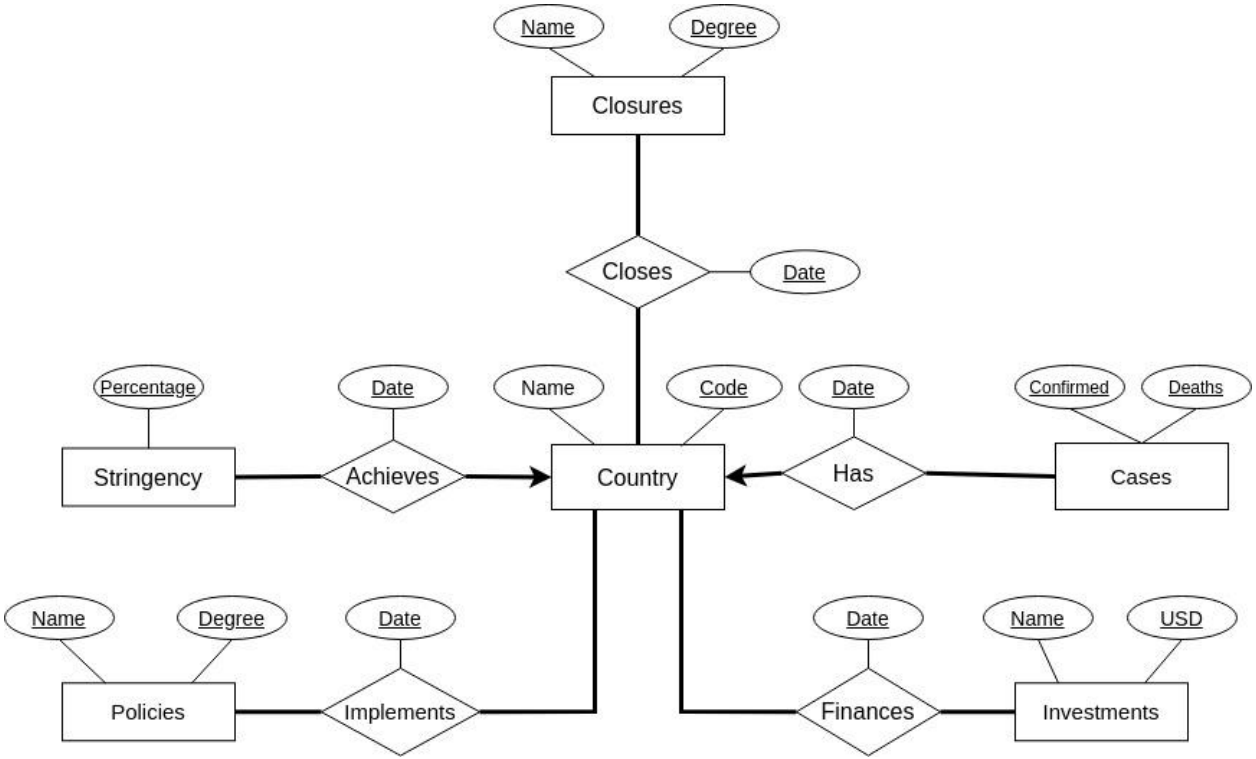
Why a Database?

- Over 30,000 tuples: Has data for each country from 01/01/2020
- Easy to establish patterns with well organized data
- Can obtain and compare statistics for each country to establish which measures were most effective

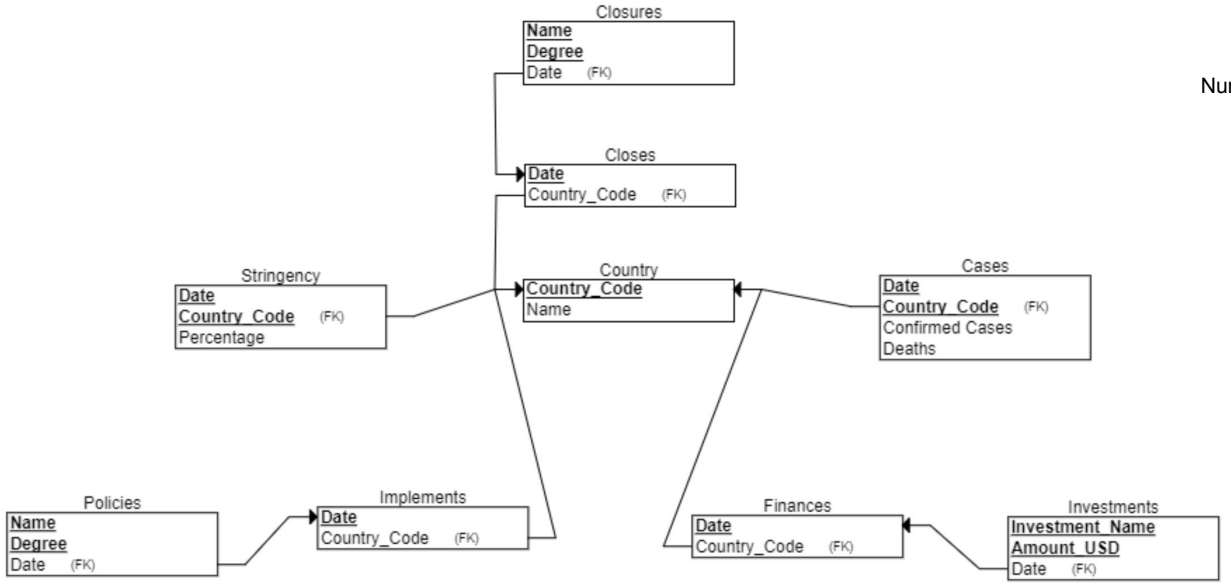
Dataset and Database

- Obtained dataset from University of Oxford study that is updated on a daily basis
- Original data has around 35,000 entries and 30 parameters
- Limited data to 30,000 entries and 13 columns
- Performed data cleaning on CSV using java - resulting in a total of 9 tables

ER Diagram



Relational Model



Number of tuples in each table:

Country	177
Cases	32467
Stringency	32467
Closes	194801
Closures	25
Implements	64934
Policies	7
Finances	64934
Investments	305

A total of nine tables in the database

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Implementation

- MySQL used for our DBMS
- Interface written in HTML and CSS
- Javascript and JQuery used for more complex GUI elements (range sliders) as well as AJAX calls to PHP scripts when a button is pressed or a slider value is changed
- PHP used for all server-side functionality, namely constructing and executing queries based on user input sent from JS functions or post requests from the front-end.
- Database and code hosted on a web server

Demonstration

Web-app Demonstration

Evaluation

Evaluation of the application would involve:

- Evaluation of the database with specific queries:
  - Example: Finding the total number of deaths for all countries from 01/01/20 to 06/27/20 and seeing if the returned value is sensible
- Evaluation of the overall functionality of the GUI:
  - Testing if all component of the GUI are functional and display accurate information (Done in demonstration)

Evaluation of Queries

Evaluating the example query

```
mysql> select sum(maxDeaths)
    -> from(
    -> select max(deaths) as maxDeaths, couCode from cases group by couCode) as sumTable;
```

```
+-----------------+
| sum(maxDeaths) |
+-----------------+
|         511045 |
+-----------------+
1 row in set (1.20 sec)
```

The returned value is sensible (The total deaths as of July 26 are 645,000)

Conclusion

- Learned how to use a relational database in the context of a real and practical problem
- Learned how to build a website and connect it to a database using PHP and Javascript
- Further additions that could be made: Graphical visualization of data to make analysis easier, could apply machine learning techniques to predict outcomes based on training data

Thank you!

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