CS 209A Project Report

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1. Project structure

```
├─main
│  ├─java
│  │  └─com
│  │      ├─dataviz
│  │      │  │  DatavizApplication.java
│  │      │  │  test.java
│  │      │  │
│  │      │  ├─controller
│  │      │  │      DatavizController.java
│  │      │  │      pageJumpController.java
│  │      │  │
│  │      │  └─model
│  │      │          CovidData.java
│  │      │          DataFilter.java
│  │      │          MetaData.java
│  │      │          MetaData2.java
│  │      │          MetaDataVizFormat.java
│  │      │          VizData.java
│  │      │          VizDataFilter.java
│  │      │
│  │      └─example
│  └─resources
│      │  application.properties
│      │
│      ├─static
│      │  │  owid-covid-data.csv
│      │  │
│      │  ├─css
│      │  │      charts.css
│      │  │      index.css
│      │  │
│      │  ├─image
│      │  │      bg.jpg
│      │  │      bg4.jpg
│      │  │
│      │  ├─js
│      │  └─json
│      │          world.json
│      │
│      └─templates
│              charts.html
│              index.html
│              test.html
│
└─test
    └─java
        └─com
            ├─dataviz
```

```
        |   └─build
        |           DatavizApplicationTests.java
        |
        └─example
```

2. Custom Classes and members

Overview: In this project, we built a **web-based** data display platform. We use **springboot** as our backend. The overall project programming model is **MVC** (model - controller - view). We use js and html as our front-end programming language. So our custom java classes mainly exist in the controller and model.

Model:

- Class **MetaData** and MetaData2: we use this class to store meta data of Covid data. There are 8 members in the classes.

```java
public String iso_code;
public String country;
public Date date;    // date is String type in the MetaData2
public String sdate;
public int new_cases;
public int new_deaths;
public int total_deaths;
public int total_cases;
```

These members are part of the columns in the source data file.

- Class **CoivdData**: This class is worked as a wrapper of the data structure MetaData. We defined a member *data* which is type of Arraylist. And there are functions to do data operations.

```java
public ArrayList<MetaData> get_data(); // return data of a CovidData object
public CovidData(); // constructor
public void readData(); // read data from a csv file and store them in the
memmber data.
public int fillZero(String s); //use to replace "" to zero for data cell.
Because there are many null values in the source data.
public void add_data(MetaData m); //append a new metaData to the total
CovidData
public void add_data(String iso_code, String country, String date, String
new_cases, String new_deaths, String total_deaths, String total_cases);
//Overload of add_data.
```

- Class **DataFilter**: This class are used to do data filter and provided source data for our dable view. There are three CovidData pointer members: original_data, current_data and search_data. Current_data points to the data shown in table_view. Original_data store the original data so we can rollback to the original state in the table_view.

```
public CovidData getCurrentPages(int pages, int pageSize); //return a
specific page of data using param pages and pageSize.
public void Search(int type, String content); // support search function
using type and content. support search iso_code, country and date.
public void SortData(); // provide sort function.
```

- Class **VizData** : The processed data is used for image visualization, the data will be packaged and sent to the front end according to the data format required by Echart

```
public String date; //date by month
public String label;//case label
public Map<String,Integer> data;// main data
public static SimpleDateFormat dateformat = new SimpleDateFormat("yyyy-
MM");//date format
```

- Class **VizDataFilter**: This class does some processing on VizData, Including the sorting of data, the classification of cases, and the formatting of data.

```
//four main case
public Map<String,VizData> totalCase;
public Map<String,VizData> newCase;
public Map<String,VizData> newDeath;
public Map<String,VizData> totalDeath;
public ArrayList<VizData> sort(Map<String,VizData> map);//Descending sort
public void processing......(DataFilter df);//Processing data for four case
public ArrayList<DateData> searchData(String country,String type);//search
country data
```

Controller

- class **DatavizController**: this class are used to deal with requests from front-end. Member: a object of DataFilter and VizDataFilter.

```
public DatavizController(); // constructor
public CovidData helloIndex(); // provide the CovidData for tableview in the
index page.
public CovidData getPage(Integer ID); // deal with get request using the url
'page'. return data in the No.ID page.
public void sort(String prop, String order); //sort Data in the DataFilter
according to the column name and order( ascending...)
public String search(String Type, String Content); //deal with get request
using the url 'search'.
public int pagesize(); // get pageSize and show it on the font_end
public ArrayList<VizData> get...Case();// get four case and show it on
VizView
```

- class **pageJumpController**: this class are used to control the jump link of page on font_end

```
public String toMainChart();// jump to chart request
public String toDashTable();// jump to DashTable
```

3. Demonstration

Table_view:

Sort function: eg. Sort according "new cases" ascending.

Search Function: eg. search using country name.

Download table

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国家名称 ⌄ China 🔍

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要对 table.xlsx 执行什么操作?

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centerView of country

Dash_Table Charts

case
total case
new cases
new deaths
total deaths

(COVID-19) Total Case
date: *2020,1 – 2021,10*

20-01
20-02
20-03
20-04
20-05
20-06
20-07
20-08
20-09
20-10
20-11
20-12
21-01
21-02
21-03
21-04
21-05
21-06
21-07
21-08
21-09
21-10

High

Spain   3284353
Turkey   3317182
Italy   3584899
United Kingdom 4359982
Russia   4494234
France   4705186
India   12221665
Brazil   12748747
United States 30528170

Low

Spain
Turkey
Italy
United Kingdom
Russia
France
United States
India
Brazil

detials View

Russia

✕

Total Case

| 10,000,000 |
| 8,000,000 |
| 6,000,000 |
| 4,000,000 |
| 2,000,000 |
| 0 |

2020-01 2020-04 2020-07 2020-10 2021-01 2021-04 2021-07 2021-10

Switch

China

✕

Total Case

- 0.53%
- 4.26%
- 4.38%
- 4.46%
- 4.47%
- 4.49%
- 4.54%
- 4.58%
- 4.59%
- 4.63%
- 4.65%
- 4.68%
- 4.82%
- 4.84%
- 4.85%
- 4.88%
- 4.9%
- 4.94%
- 5%
- 5.11%
- 5.17%
- 5.23%

Switch

China

Total Case

64,814.81

2020-12
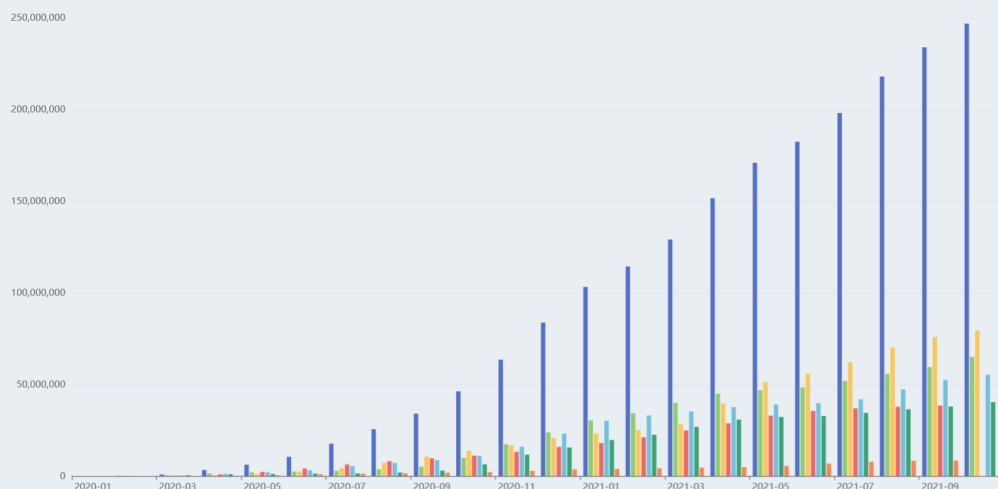● China **87,117**
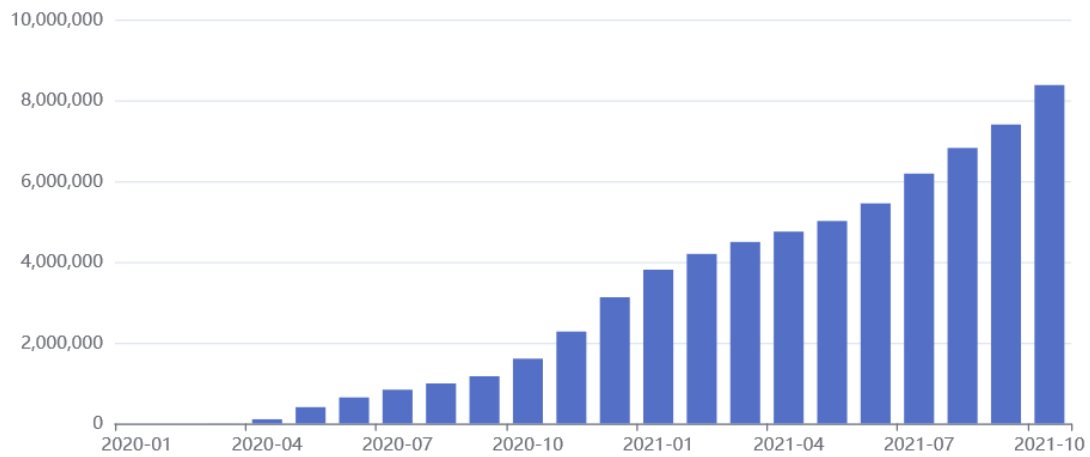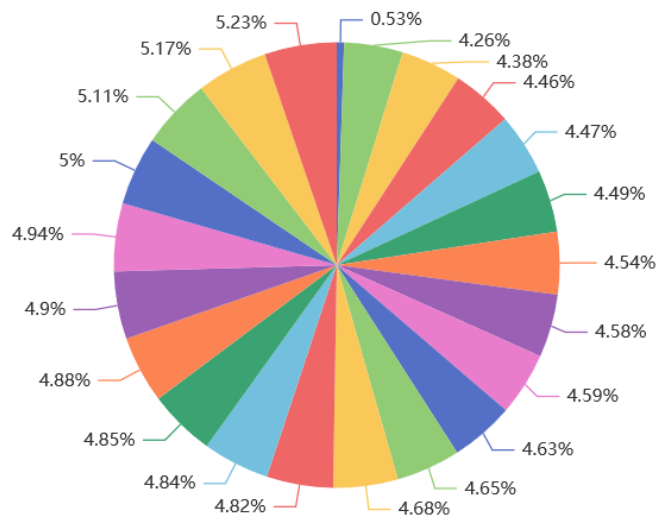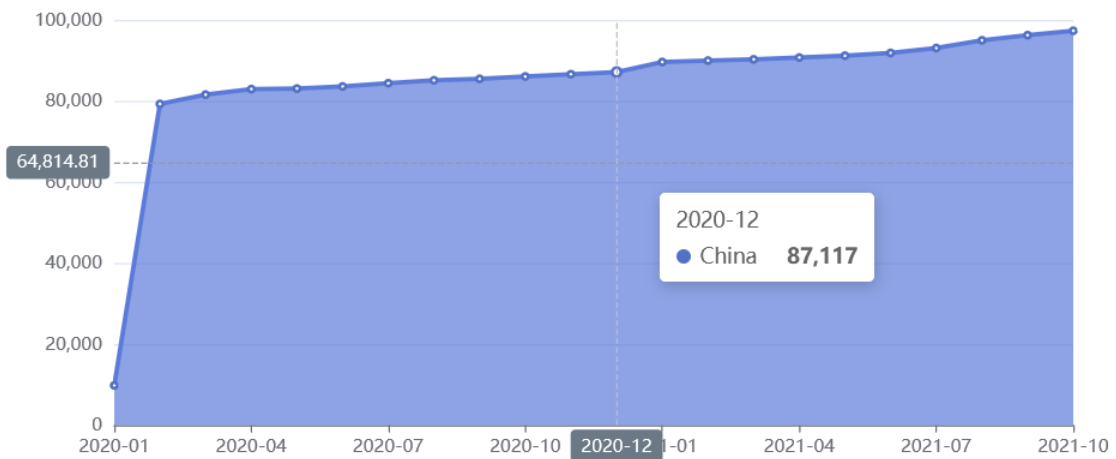
Switch

Region situation

Dash_Table Charts

Situation by Region(Total Case)   World   Europe   Asia   South America   North America   European Union   Africa

Dash_Table Charts

Situation by Region(Total Case)   World   Europe   Asia   South America   North America   European Union   Africa