< Visualization of global COVID-19 data on maps >

System Design Specification (SDS)

<Version #>
3.0
<Date>
2021/6/1

<Project team members>
陈可轩 **1930026012**
戴靓 **1930026020**
李涵 **1930026064**
齐子瞻 **1930026109**
吴越 **1930001085**

Computer Science and Technology Program

United International College

1.   Document Change Log

Change Date	Changed By	Version	Change Description
01/07/2012	*Lisa Lee*	*1.0*	*Prepared Document*
05/09/2021	*All group members*	*2.0*	*Prepared basic information*
06/01/2021	*All group members*	*3.0*	*Change some graphs and some introduction*

2. Table of Contents

3.   Design Overview

Through data visualization, we would show the changes of the number of patients who suffer from novel coronavirus and cured in countries all over the world. Some countries and regions with serious epidemic situation can be reflected by color shade and emphasis by the visualization in our group. Our project will target some news lovers or the public who still think the novel coronavirus is not important, and conclude that the novel coronavirus is serious and spread quickly, and should not be cheated by some foreign media with ulterior intentions.

We will use python and related packaging such as pandas, numpy, openpyxl, xlrd,   ,

and so on to finish the project, we may make changing if needed. And our groupmates will all participate in this group project.

4.   Tools and Standards

4.1.   Tools

We mainly use pycharm as our tools. And we use packages such as Pandas, Xlrd, Openpyxl, pychars for data analysis and visualization.

Packages like matplotlib, for data visualization.

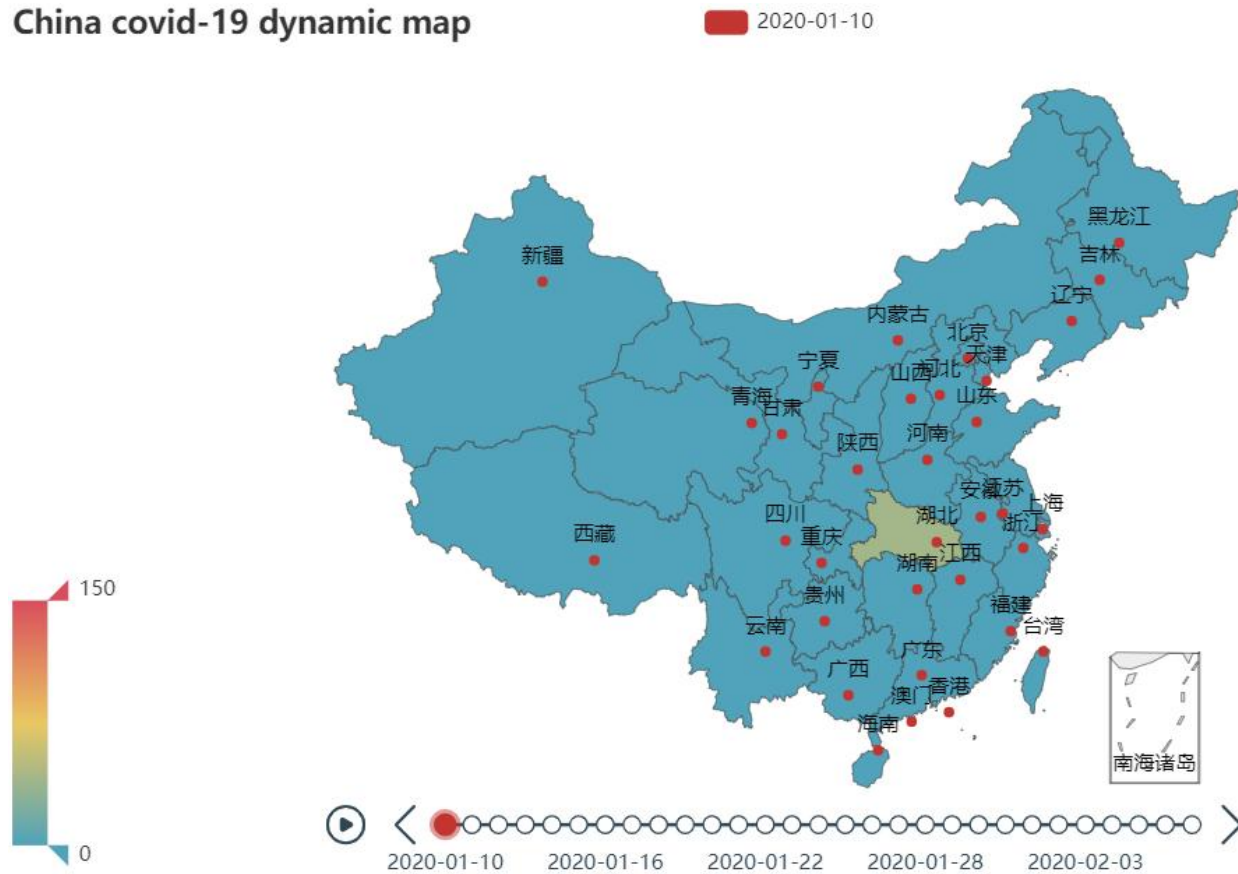## 4.2.   Standards

Runs on the windows platform and mac os.

5.   User Interface Design
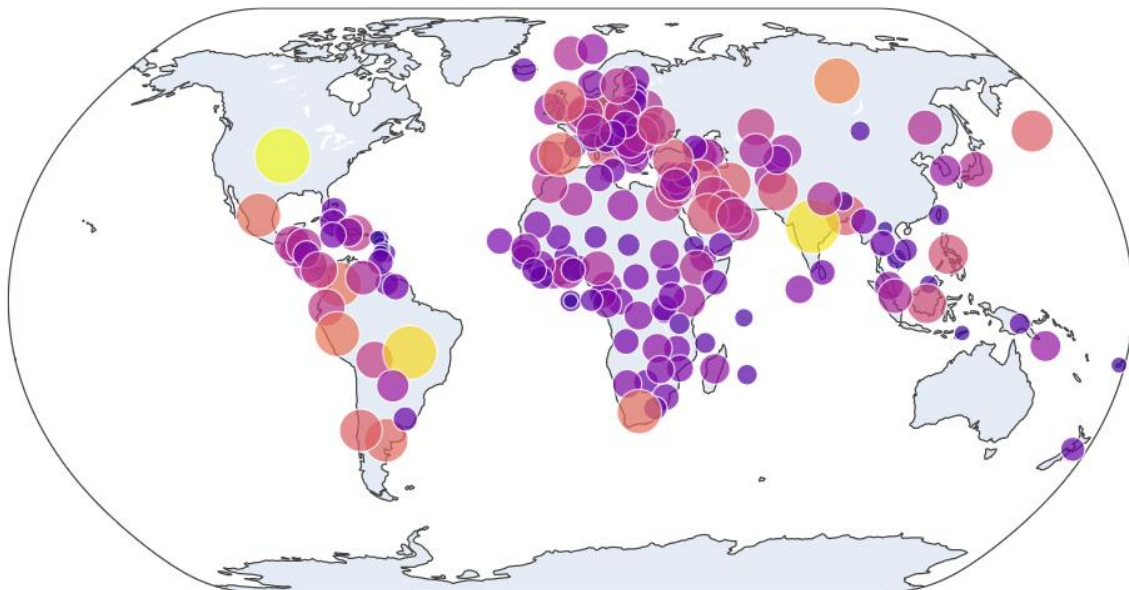
5.1.   **Usage Scenario 1**

The final image we're going to render is going to look something like this：

USA COVID-19 cases

date=2020-09-15

2020-01-21   2020-03-07   2020-04-22   2020-06-07   2020-07-23   2020-09-07   2020-10-23   2020-12-08   2021-01-23
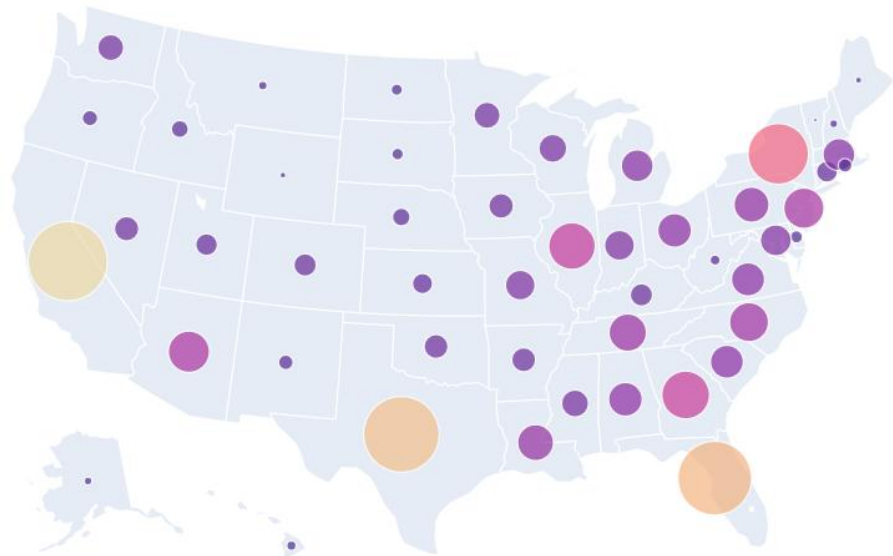
Our image will show the national and global epidemic map over time. Users can view the epidemic data of each location on the map at each time period by moving the mouse. You can present multiple maps at the same time or only show one map over time. If the map changes over time, we will provide the option to change the time or allow the map to change automatically over time, and the changes will stop when the user is looking at the map.

5.2.   **Usage Scenario 2**

The global pandemic map would look something like this. And it would be changed followed by date. We will also have a visual map to show the each countries changing rate.
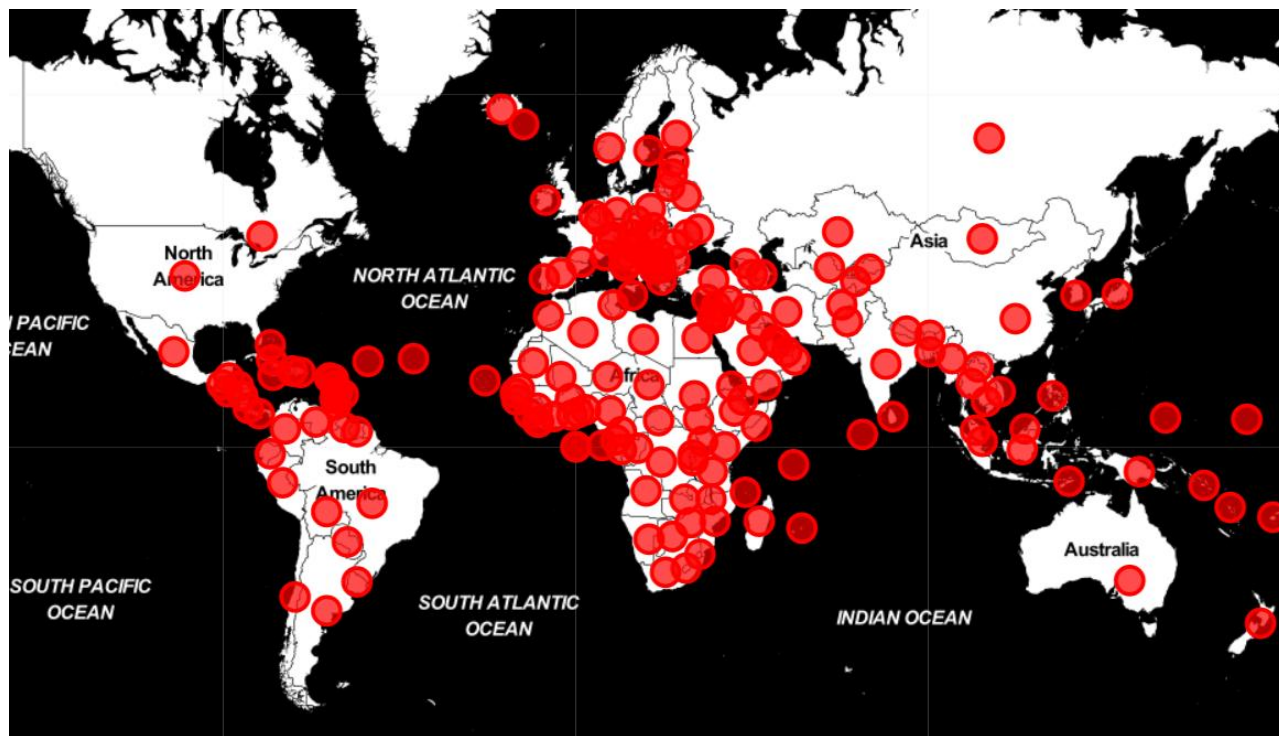
5.3   Histograms of COVID-19 in China

Number of confirmed cases of COVID-19 in China
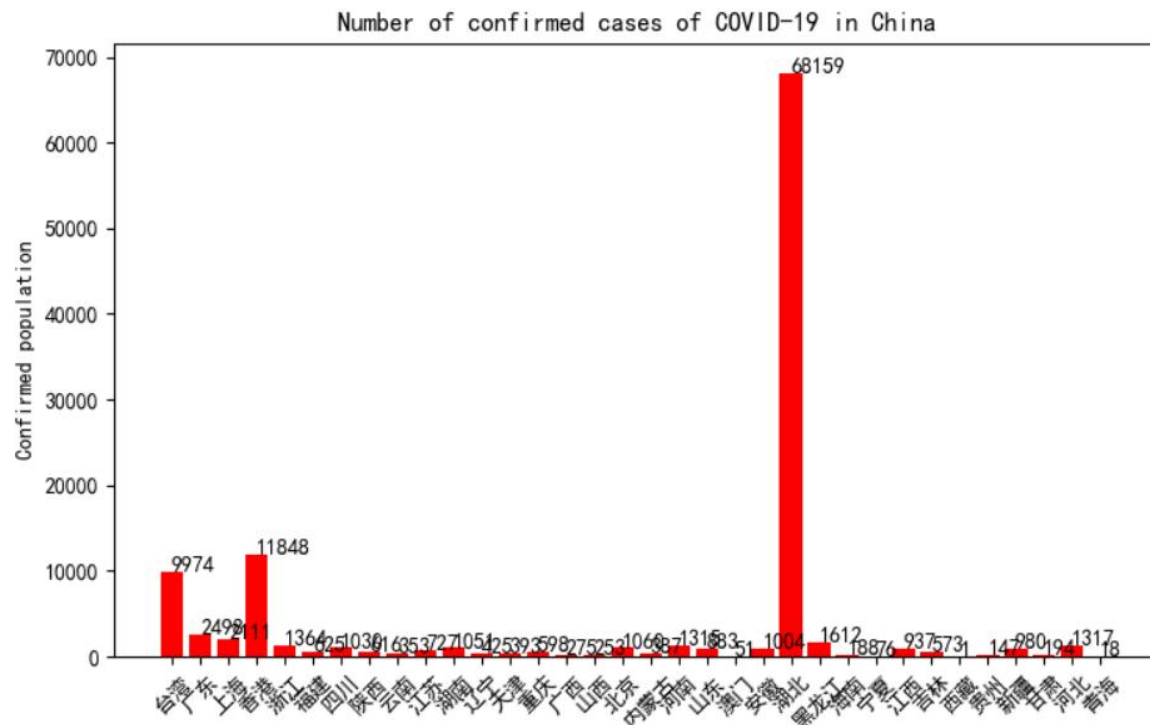
5.4   Animation of global COVID-19 changes

Number of COVID-19 diagnosed in the world
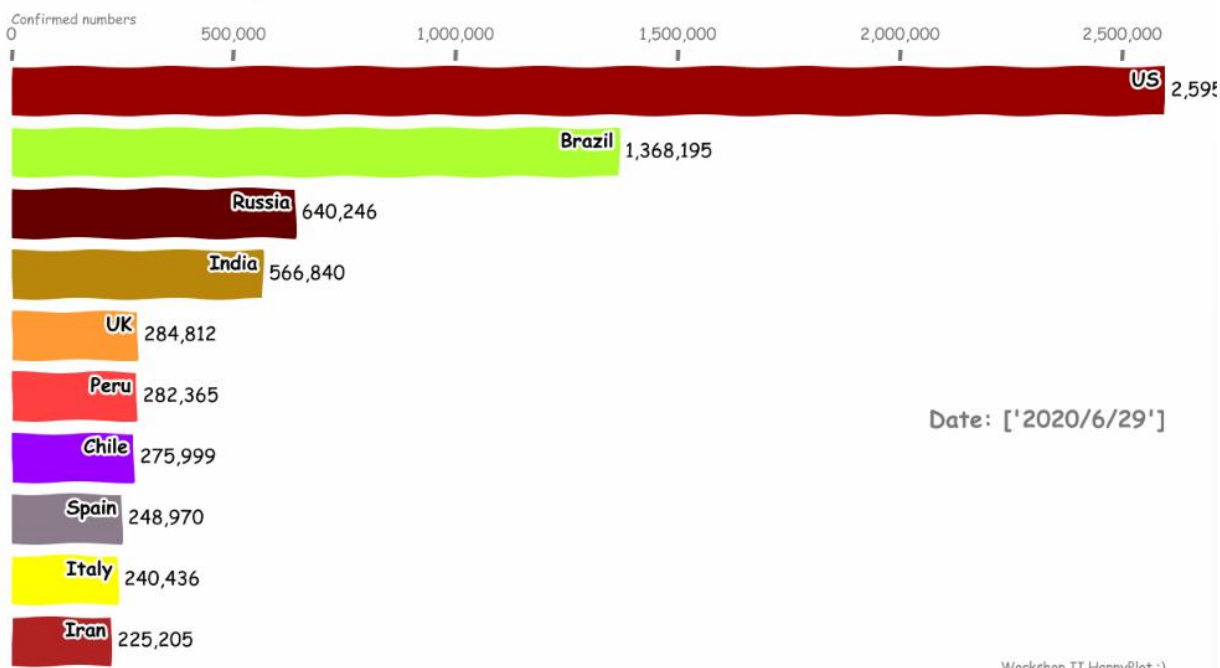
6.   Database Design (If Applicable)

No database

7.   Diagrams

<C Programming course: Control Flow diagram; Java: Class Diagram>

```
                                                    │
                                                    ▼
                                          ┌──────────────────────┐
                                          │  Fill color to images │
                                          │  and animation base   │
                                          │       on data         │
                                          └──────────────────────┘
          ╭─────────────╮                            │
          │    Start     │                           ▼
          ╰─────────────╯                 ┌──────────────────────┐
                │                          │  Conectn function in  │
                ▼                          │         GUI           │
    ┌──────────────────────┐              └──────────────────────┘
    │  Read data from csv   │                         │
    │  file or website      │                         ▼
    └──────────────────────┘              ┌──────────────────────┐
                │                          │                      │
                ▼                          │       Run GUI        │
    ┌──────────────────────┐              │                      │
    │                      │              └──────────────────────┘
    │  Establish functions  │                         │
    │                      │                          ▼
    └──────────────────────┘              ┌──────────────────────┐
                │                          │  Click different      │
                ▼                          │  buttons will show    │
    ┌──────────────────────┐              │  different result of  │
    │     Define map or     │              │      functions        │
    │ histograms visualization│            └──────────────────────┘
    │       functions        │                         │
    └──────────────────────┘                          ▼
                │                              ╭─────────────╮
                ▼                              │     End     │
    ┌──────────────────────┐                  ╰─────────────╯
    │  Fill color to images │
    │  and animation base   │
    │       on data         │
    └──────────────────────┘
                │
```