Mini Project

MADE BY: VARDHAN YADAV

BACKGROUND OF PROJECT:

The COVID-19 pandemic is unlike anything humans have seen in our lifetime. To navigate these unprecedented times, data and analytics can provide clarity and support for clinical and operational decision-making.Usually the data is quantitative, and the goal is to show it graphically.Data visualization is a way to communicate and make sense of information. As people going through a very challenging global health crisis, we are craving narratives and information to help us understand what is happening.In this project we had use COVID19 dataset consisting of the data related cumulative number of confirmed, recovered, and deaths cases to use data visualization of COVID-19.

METHODOLOGY:

- Numpy offers mathematical functions,random number generators and many more functions.

  =>Used to Generate random covid cases within the defined range and perform various calculations.

- Matplotlib is used for creating static and animated visualizations which are embedded in Graphical User Interference.

  => Used to create Plot and Animation

- RGB Tuples is used to encode health status of people as uninfected,infected,recovered and death.
- Dictionary is used to hold information specific to COVID-19.
- **Virus Class** is created which hold all functionality.The constructor of class will take one Argument grams which is a dictionary with information about such as Basic Reproduction Number,incubation period and distribution of mild and severe cases among many other parameters.

    - Polar plot with circular graph has been used to show spreading of Virus from center to outwards
        - Member variables day,total infected number,currently infected,recovered and Number of deaths all initialized to zero
    - Basic Reproduction Number R0 is a measure of the contagiousness of disease,Rate of mild cases and severe cases and fatalities.
    - Dictionary called Mild and Severe created.Dictionary Mild used to track mild cases.Key signify recovery time in days for infected people with mild symptoms and the value of each key is another dictionary with 2 value pairs for theta and r respectively initialized with empty lists but they will get populated with theta and r values specify the individuals with mild symptoms that recover on that given day ***functions***

    - initial_population function initializes plot with a population of4500,currently and total infected to 1.

- thetas and rs list comprise of 4500 data points each defined by theta and r coordinate pair using Golden spiral method with size of 5 and gray color.
- spread_virus function calculates the number of newly infected people.
- assign_symptoms function calculates number of mild cases and severe cases in new wave of people using the information stored in params.We had randomly choose a set of indices from new infected indices that gets assigned mild symptoms using NPR
- update_status function updates the color of plot points when recovery and death occurs
- update_text function updates the text member variables which track the day as well as amount of infections recoveries and deaths
- animate function shows a plot to update continuously while the program is running.Animation will repeatedly spread_virus until every infecting case has reached its outcome in each wave and we update the color of points for new ones and existing ones that have reached an outcome.

RESULTS:

Data Visualization of COVID-19 pandemic was performed using python and python libraries such as Numpy,Matplotlib.Dataset consisting of Number of confirmed cases,recovered and death cases used to create data visualization.

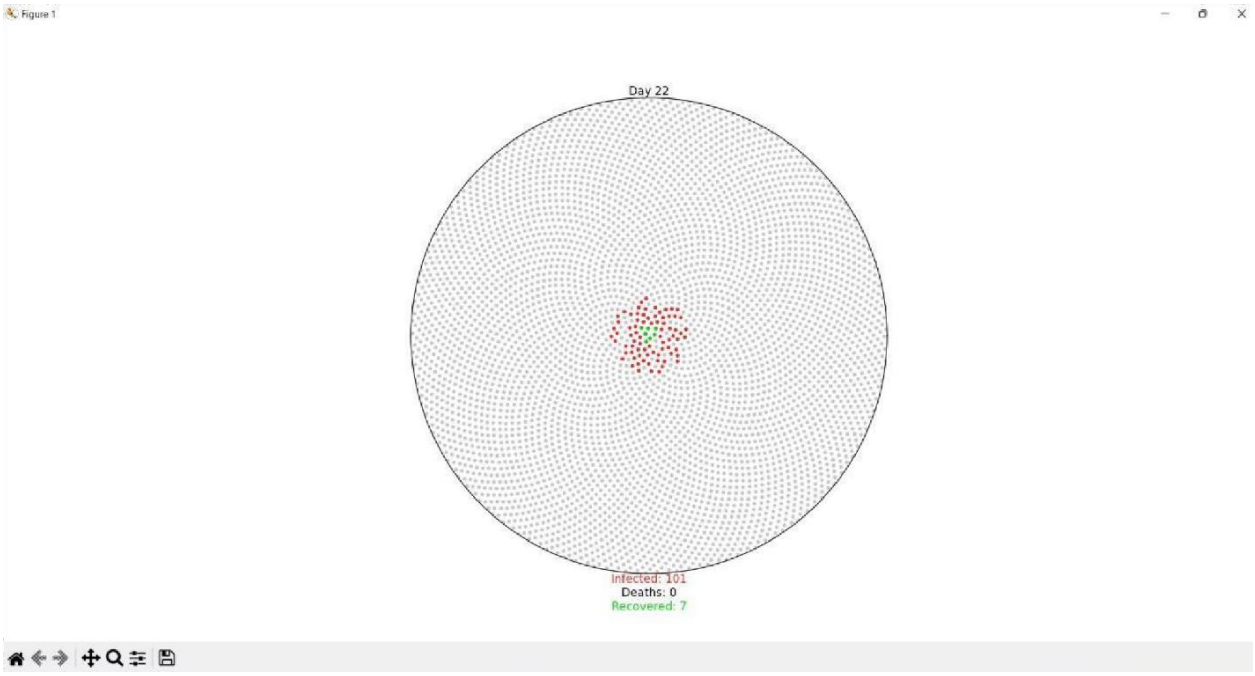
Figure 1
Day 22
Infected: 101
Deaths: 0
Recovered: 7

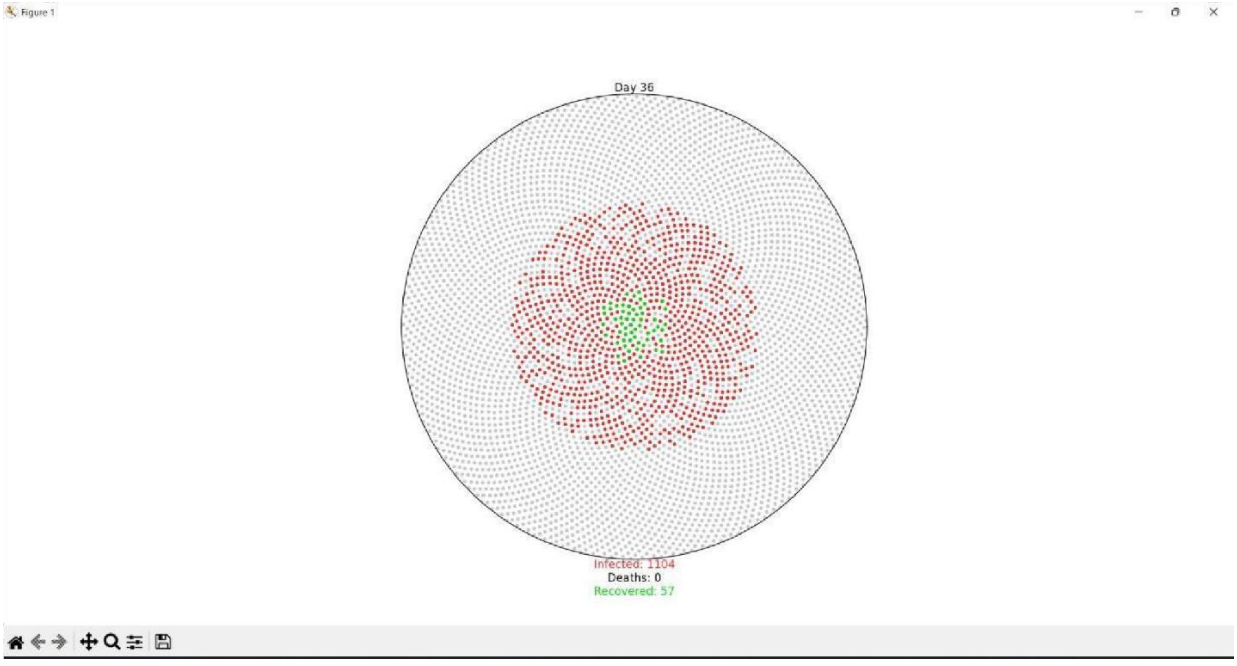
Figure 1
Day 36
Infected: 1104
Deaths: 0
Recovered: 57

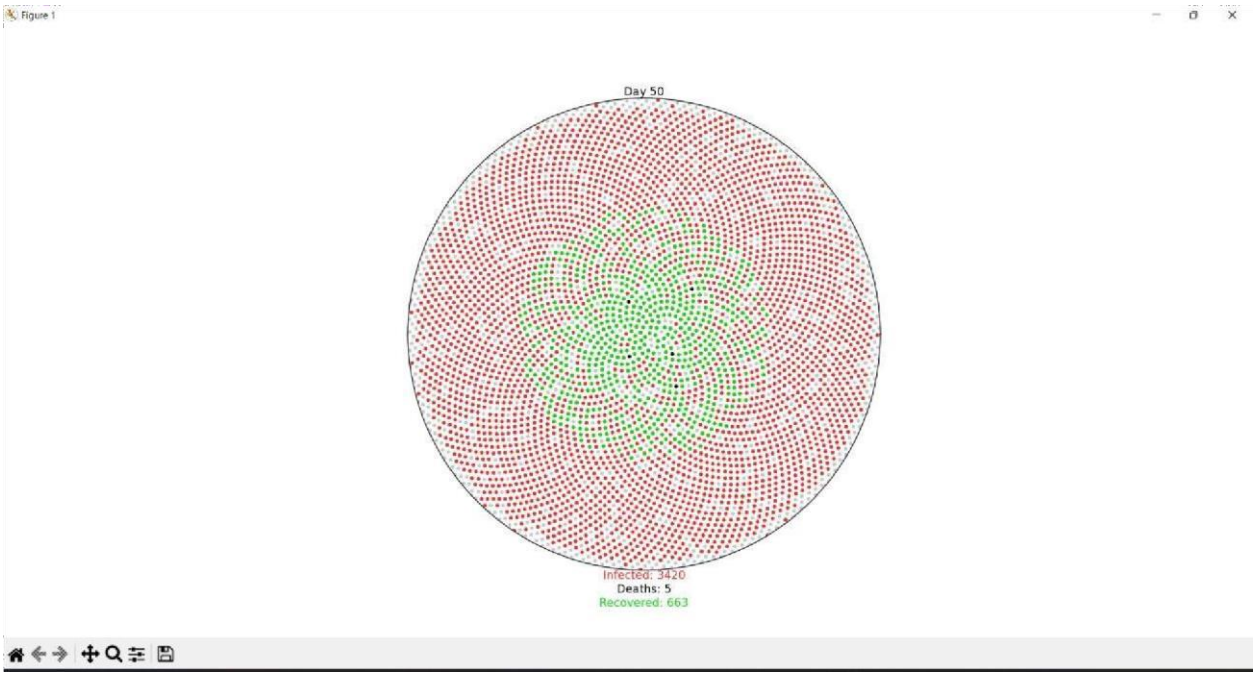
Figure 1
Day 50
Infected: 3420
Deaths: 5
Recovered: 663

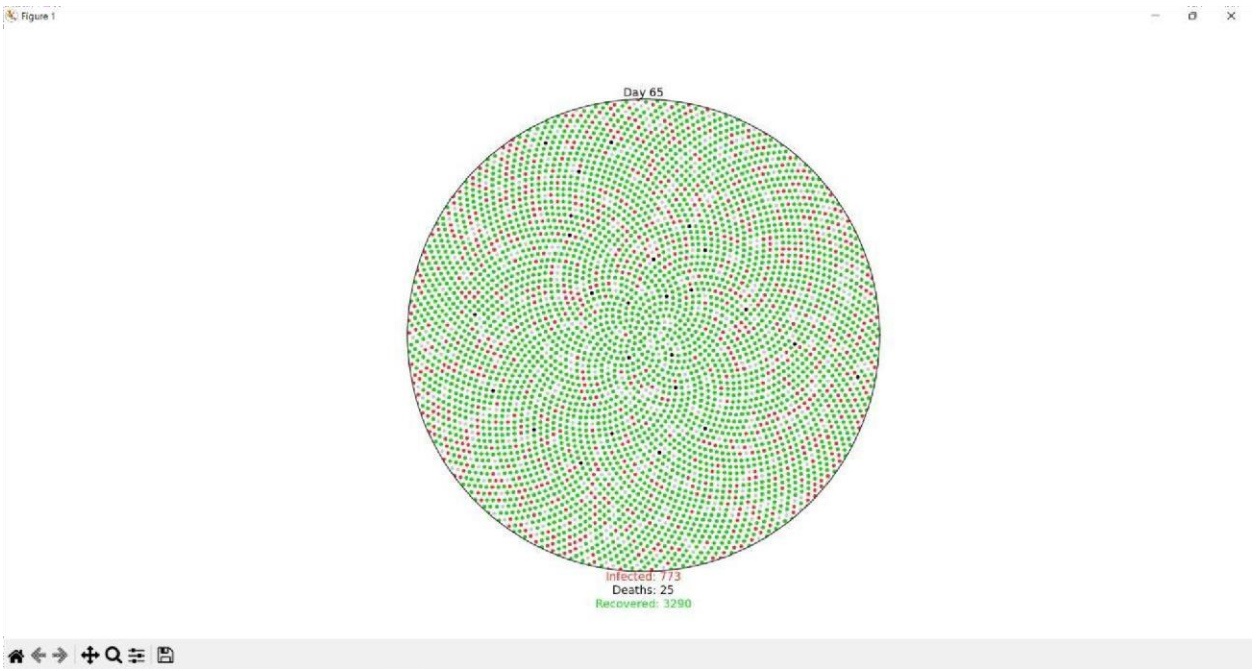
Figure 1
Day 65
Infected: 773
Deaths: 25
Recovered: 3290