**COVID-19 Pandemic Simulator – by Ryan Burczak**

During the months of May and June 2020, I worked on a project to simulate the spread of the novel coronavirus (COVID-19). It was the perfect task to take on, since people aren’t doing much in the presence of this pandemic.

**What does the simulator do?**

This simulator models a hypothetical microcosm of the public, with people moving around and engaging in their everyday life. However, a small percentage of the population starts out having the infamous scourge of 2020, the novel coronavirus! As people (represented by dots) move around and interact with one another, they run the risk of catching this infectious virus. When a person is infected, they stay in place for 14 days and, based on their health, either recover or die before the recovery period is finished. The total number of infections, recoveries and deaths is tallied and recorded every day.

A perfectly healthy person will be represented by a green dot. A person who has coronavirus will be represented by a red dot. A person who has recovered from the coronavirus will be represented by a yellow dot. A person who was killed by coronavirus will be represented by a black dot.

The user is allowed to set parameters, such as the dimensions of the field of study, the number of people in the study, the length (in days) of the study, the radius of infection (how far can this virus travel from one person), how far people can move in a day, etc. For the people, 85% of them move “locally,” or within a maximum distance set by the user. The other 15% move “globally,” or at most a particular percentage of the dimension(s) of the field of study. The user is not allowed to change constants; for example, the number of days a person roams around asymptomatic before stopping in place (2 days), and the total time to recovery (14 days).

Social distancing guidelines were not considered for this project. Therefore, well dots (green and yellow) do not stay far away from sick dots (red). Additionally, it has been recently discovered that just because someone recovers from the virus and develops immunity does not mean they cannot become re-infected. This has not been taken into account; as a result, the yellow dots cannot become red again.

**What did I get out of this project?**

I wrote my program in Python because it is the language that is expanding the most rapidly. I wrote my code in a program called Spyder, which allows for easy editing and running of Python code. In taking on this project, I learned how to code animation, which is a potentially important skill for students who take interest in modeling or simulating data. This program simply envisions a hypothetical scenario; it does not take in any concrete data. Perhaps the inclusion of real-time data could be a next step were this project to be extended.