

Name: James Hernandez #109178400

Partners: Khai Pham  
David Rodriguez

For our project we chose option two which comprised of my group creating a simulation based on how COVID-19 would spread in a population using a 10x10 grid. When creating this simulation there were factors that we had to consider such as; what would we use as our agents, what is it that makes the virus spread, how likely are you to contract the virus after coming into contact with someone with the virus, and what safety measures could be place in our simulation to represent on how people act. Well our first challenge was separating our agents and for this we decided to go with two different agents being a Healthy Agent and a Sick Agent. For this we gave a Sick Agent a sick variable and initialized it to 1 and our healthy agent had a sick variable of 0. Reason we did this was to symbolize that the sick agent now has the virus. So now that we had our agents, we had to figure out how to represent them in our model. For this we passed the number of TOTAL agents that were going to be placed on the grid and our model would place them in a random position on (x,y) and we would only place ONE sick person in our grid and the rest would be healthy people so that we could see how many people will be affected by that one sick person. Next we had to figure out how that one sick person could transmit the virus (1) onto another person (0). So as of now what we have on our visualizations we have our grid, our agents laid on it, Sick = Red Circle: Healthy = Green Circle, so now we have to figure what are the chances to actually giving the virus to someone but we couldn't get the math down so we decided to use random chances. How we did this is that our framework Mesa has a function to allow multiple agents to occupy the same grid cell and a random function that we can use for agents interacting with each other. So how we did this was for every grid cell there's a random chance that the agents will pass on values to each other if and only the agent is sick(1) but if all agents in grid cell are healthy then no pass is done but if there is a sick agent in the cell, then it would randomly give the virus to another agent turning them from green to red(sick). We did this because just because you meet the virus, if you take the proper precautions then you should be fine but there are those who wont, so they get it. All in all, working on this project introduced us to two new things; One how bad the current situation is, Two how we can model hypothesis to see how likely outcomes are to be using simulations.