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| Date: |  |
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Diseases models through computational approaches

Part I. Explore a computer program that simulates a zombie apocalypse:

nS = # susceptible

nI = # infected

nZ = # zombies

pZ = probability of infected ghost becoming zombie

pI = probability of a zombie infecting a ghost

1. Working in pairs, run the simulation and graph the data. Screenshot your results and copy-paste them here. You may use excel for this activity or, if you are brave, you can try to make plots in Jupyter/Python (download the example notebook in the website and call me. I’ll provide some guiding).

2. Change the parameters of the simulation. How do your results depend on the increases and decreases in the parameter? Be specific, and relate your answer to specific characteristics of infectious diseases.

a. number of subjects in the simulation (nT)

b. probability of an infected subject becoming a zombie (pZ)

c. probability of a zombie infecting a subject (pI)

3. Name specific diseases that the zombies simulation could represent.

Part II. Now run the GhostsV simulation, which introduces a new parameter, pV.

1. How does the addition of this parameter change your results?
2. What do you think the new parameter represents?
3. Relate your observations to the characteristics of infectious diseases we discussed in class.

Part III. The simulations we just explored would not be a good model for the flu (caused by the influenza virus). How would you modify the model to explore a disease like the flu? Be specific and concrete (assume you are giving commands to a computer, i.e. pseudocode)