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CS 2120 – Assignment 2

1. Fix the value of p_lose at zero. How does varying the value of p_regain affect the time to save the world?

If p_lose is set to zero, p_regain affects the time to save the world positively, as there is less of a chance for the world to become more infected. p_lose set to 0 results in most results being between 3-5

Output from: time_to_save_world(my_world, 0.5, 0): 5

2. Fix the value of p_lose at 0.1. How does varying the value of p_regain affect the time to save the world?

If p_regain is changed to a higher value with p_lose set to 0.1, it is more likely to run longer, and regaining the world will take a longer amount of time.

Output from time_to_save_world(my_world, 0.6, 0.1): 3

3. Fix the value of p_regain at 0.5. How does varying the value of p_lose affect the time to save the world?

Fixing p_regain to 0.5 results in a slower time in regaining world, if p_lose is higher than p_regain, then it takes a very long time for world to be regained. any time that p_regain is fixed at a lower rate, with a close (but lower p_lose), it is important to note that this will add the number of steps for the world to be saved.

Output from: time_to_save_world(my_world, 0.5, 0.2): 4

4. Pick three pairs of p_regain and p_lose values that you think are interesting. Run 500 simulations for them (e.g, end_world_many_times(500, your_value, your_value). What does the distribution of times to the end of the world look like? If you've taken a stats course: is it normal (Gaussian)? (If you haven't taken stats, just ignore that question).

The simulations seem to have a range of how many steps it takes to complete is based on the relation of p_regain and p_lose. Because of this, the distribution ranges between 10,000 steps and as low as 7 in my testing. I have not taken a stats course, so i cannot comment on the distribution and if it is (or is not) gaussian. Please see the attached histograms below.
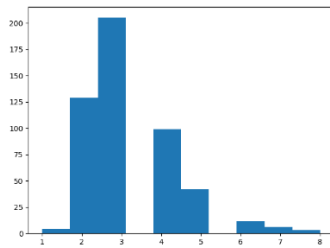
ttl41 =
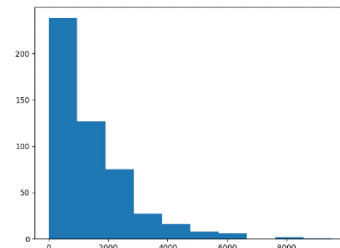
save_world_many_times(my _world, 500, 0.7, 0.1)   #

Dataset 1 (4.1)
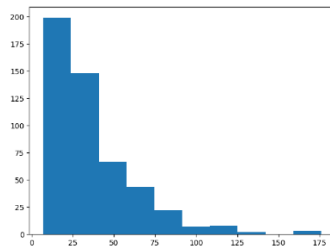
ttl42 =

save_world_many_times(my _world, 500, 0.9, 0.3)   #

Dataset 2 (4.2)

ttl43 =

save_world_many_times(my _world, 500, 0.8, 0.2)

5. In order to achieve a maximum of 24 months, results for the correct setting of p_regain were best fitted between 0.6 and 0.7.