

1 Performance profiling

Using GProf, we will look at the performance in different scenarios. By varying parameters, we try to see which parts of the code they have an influence on, and which parts take up the most time.

For the first 4 parameters

- amount of days
- population size
- immunity rate
- seeding rate

the actual sorting and analyzing of the population takes up most of the time.

1.1 Number of days

By increasing the number of days to be simulated, the total execution time gets longer as well. This should be expected as more days means more times simulating what goes on in a day.

Number of days	Time
50	00:00:04
100	00:00:09
150	00:00:14
200	00:00:18
500	00:00:38

Table 1: Number of days

1.2 Population size

Generating a new population depends on the given size, which was expected. The generation however is very fast.

Population size	Time
10000	00:00:00:421
50000	00:00:00:816
100000	00:00:01:332
200000	00:00:02:249
500000	00:00:04:926

Table 2: Population size

1.3 Immunity rate

Varying the immunity rate does not seem to affect the total execution time.

Immunity rate	Time
0.2	00:00:05:817
0.4	00:00:05:750
0.6	00:00:05:643
0.8	00:00:05:580
0.99	00:00:05:648

Table 3: Immunity rate

1.4 Seeding rate

A bigger seeding rate slightly increases the time of the execution. This happens as more people have to be initially infected.

Seeding rate	Time
0.02	00:00:06:599
0.002	00:00:05:589
0.0002	00:00:05:134
0.00002	00:00:04:865

Table 4: seeding rate

1.5 Contact log mode

The mode of the contact log has a very large impact on the execution time. Logging every contact between people takes a long time.

At day 50 in the simulation, only 20000 people out of 600000 were infected. When logging the susceptible people, you actually log almost 580000 people at each day which is very close to logging all people. This is very fast when the mode is set to Transmissions as you would only log once for each newly infected person.

Contact log mode	Time
All	00:26:48:251
Transmissions	00:00:06:730
Susceptibles	00:27:06:444
None	00:00:05:824

Table 5: Contact log mode