# **CS 575**

# **Project #3**

# **Functional Decomposition**

# **Submitted By: Aman Pandita**

# **ONID:** [**panditaa@oregonstate.edu**](mailto:panditaa@oregonstate.edu)

# **OsuID: 934-456-235**

1. **What your own-choice quantity was and how it fits into the simulation.**

I took the deer parasite as my simulation agent. These parasites grow in number when there is a increase in the number of deers and decrease when there is reduction in the number of deers. I wanted to make this simulation as realistic as it can.

1. **A table showing values for temperature, precipitation, number of deer, height of the grain, and** **your own-choice quantity as a function of month number.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| NowYear | NowMonth | NowTemp | NowPrecip | NowNumDeer | NowHeight | DeerParasite |
| 2022 | 0 | -17.7778 | 0 | 9 | 0 | 5 |
| 2022 | 1 | -3.40706 | 29.0594 | 8 | 0 | 6 |
| 2022 | 2 | 10.8421 | 25.967 | 7 | 0 | 7 |
| 2022 | 3 | 15.8029 | 31.328 | 6 | 0 | 7 |
| 2022 | 4 | 17.0551 | 31.094 | 5 | 0 | 6 |
| 2022 | 5 | 22.6451 | 17.501 | 4 | 0 | 5 |
| 2022 | 6 | 17.9658 | 11.8952 | 3 | 0 | 4 |
| 2022 | 7 | 15.0069 | 2.79151 | 2 | 0 | 3 |
| 2022 | 8 | 13.3624 | 0 | 1 | 0 | 2 |
| 2022 | 9 | 10.2948 | 0 | 0 | 1.19617 | 1 |
| 2022 | 10 | -0.536864 | 9.18078 | 1 | 7.24523 | 0 |
| 2022 | 11 | 3.2568 | 7.75224 | 2 | 17.9544 | 1 |
| 2023 | 12 | 2.84843 | 16.6934 | 3 | 32.0505 | 2 |
| 2023 | 13 | 7.28243 | 30.5709 | 4 | 43.2578 | 3 |
| 2023 | 14 | 5.61657 | 34.8226 | 5 | 55.1144 | 4 |
| 2023 | 15 | 17.6411 | 33.6168 | 6 | 48.8292 | 5 |
| 2023 | 16 | 22.4393 | 29.7045 | 7 | 41.2098 | 6 |
| 2023 | 17 | 21.2373 | 23.9927 | 8 | 32.322 | 7 |
| 2023 | 18 | 15.8361 | 7.01421 | 9 | 22.3416 | 8 |
| 2023 | 19 | 22.2335 | 4.55651 | 8 | 10.9119 | 9 |
| 2023 | 20 | 13.9781 | 0 | 7 | 1.14523 | 8 |
| 2023 | 21 | 11.6061 | 1.2248 | 6 | 0 | 7 |
| 2023 | 22 | 3.57864 | 5.6702 | 5 | 3.22773 | 6 |
| 2023 | 23 | 0.711952 | 16.2062 | 4 | 8.22763 | 5 |
| 2024 | 24 | 0.616199 | 16.8254 | 3 | 14.4251 | 4 |
| 2024 | 25 | 4.90082 | 28.5357 | 4 | 30.4932 | 3 |
| 2024 | 26 | 12.301 | 34.0233 | 5 | 27.8641 | 4 |
| 2024 | 27 | 15.8044 | 30.5795 | 6 | 21.8119 | 5 |
| 2024 | 28 | 17.6309 | 27.8307 | 7 | 14.2639 | 6 |
| 2024 | 29 | 20.1305 | 23.7244 | 6 | 5.38088 | 7 |
| 2024 | 30 | 19.445 | 8.51047 | 5 | 0 | 6 |
| 2024 | 31 | 23.1764 | 4.26414 | 4 | 0 | 5 |
| 2024 | 32 | 10.1229 | 0 | 3 | 0 | 4 |
| 2024 | 33 | 5.22886 | 1.49184 | 2 | 4.40275 | 3 |
| 2024 | 34 | 1.33035 | 9.24909 | 1 | 11.7682 | 2 |
| 2024 | 35 | -2.56736 | 11.3057 | 2 | 13.5348 | 1 |
| 2025 | 36 | -1.80107 | 19.3146 | 3 | 16.4164 | 2 |
| 2025 | 37 | -3.29719 | 27.8069 | 4 | 15.4951 | 3 |
| 2025 | 38 | 9.18822 | 31.384 | 5 | 19.687 | 4 |
| 2025 | 39 | 13.714 | 29.6377 | 6 | 14.5582 | 5 |
| 2025 | 40 | 19.0036 | 25.618 | 5 | 6.95932 | 6 |
| 2025 | 41 | 22.8858 | 16.9884 | 4 | 0.609618 | 5 |
| 2025 | 42 | 21.9329 | 15.6637 | 3 | 0 | 4 |
| 2025 | 43 | 17.2117 | 8.23251 | 2 | 0 | 3 |
| 2025 | 44 | 13.2191 | 4.19292 | 1 | 0 | 2 |
| 2025 | 45 | 6.983 | 0 | 0 | 4.79668 | 1 |
| 2025 | 46 | 0.0460095 | 7.45642 | 1 | 11.3878 | 0 |
| 2025 | 47 | 4.69132 | 10.3645 | 2 | 24.4031 | 1 |
| 2026 | 48 | 1.41833 | 16.0898 | 3 | 35.0675 | 2 |
| 2026 | 49 | 4.53565 | 25.2186 | 4 | 51.571 | 3 |
| 2026 | 50 | 5.95744 | 30.0322 | 5 | 64.7412 | 4 |
| 2026 | 51 | 17.1907 | 30.4906 | 6 | 58.4923 | 5 |
| 2026 | 52 | 14.9426 | 26.4386 | 7 | 51.443 | 6 |
| 2026 | 53 | 17.7639 | 22.0614 | 8 | 42.6167 | 7 |
| 2026 | 54 | 23.5538 | 13.5193 | 9 | 32.4568 | 8 |
| 2026 | 55 | 20.6825 | 0.460438 | 10 | 21.0283 | 9 |
| 2026 | 56 | 15.7559 | 1.97222 | 9 | 8.46571 | 10 |
| 2026 | 57 | 9.74448 | 0.132361 | 8 | 0.0757597 | 9 |
| 2026 | 58 | 0.930019 | 4.73977 | 7 | 0 | 8 |
| 2026 | 59 | -1.33873 | 14.0655 | 6 | 0 | 7 |
| 2027 | 60 | -4.95745 | 23.8977 | 5 | 0 | 6 |
| 2027 | 61 | -2.59047 | 26.7154 | 4 | 0 | 5 |
| 2027 | 62 | 4.10349 | 30.3023 | 3 | 14.4234 | 4 |
| 2027 | 63 | 11.5562 | 32.0992 | 4 | 14.2951 | 3 |
| 2027 | 64 | 15.1466 | 28.6553 | 5 | 9.70388 | 4 |
| 2027 | 65 | 21.4606 | 21.2485 | 4 | 3.35554 | 5 |
| 2027 | 66 | 25.3953 | 15.4525 | 3 | 0 | 4 |
| 2027 | 67 | 21.7949 | 0.426731 | 2 | 0 | 3 |
| 2027 | 68 | 18.3588 | 0 | 1 | 0 | 2 |
| 2027 | 69 | 4.9804 | 0.719311 | 0 | 6.56135 | 1 |
| 2027 | 70 | 3.98093 | 3.99994 | 1 | 16.4838 | 0 |
| 2027 | 71 | -2.47098 | 13.4748 | 2 | 18.6753 | 1 |

1. **A graph showing temperature, precipitation, number of deer, height of the grain, and your own-choice quantity as a function of month number. Note: if you change the units to °C and** **centimeters, the quantities might fit better on the same set of axes.**
2. **A commentary about the patterns in the graph and why they turned out that way. What** **evidence in the curves proves that your own quantity is actually affecting the simulation** **correctly?**

From the graph we can see how the “deer parasite” is directly proportional to the population of deers at a particular amount of time. And talking about the population of deers, the grain height reduces as there are a greater number of deers in the area and increases as there is less number of deers. This successfully simulated our results.