

Project 3

Functional Decomposition

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

- My own-choice of quantity is Rat.
- Rat is a function which increases or decreases the number of rat based on the height of grain by a factor of 2 or 1 respectively.

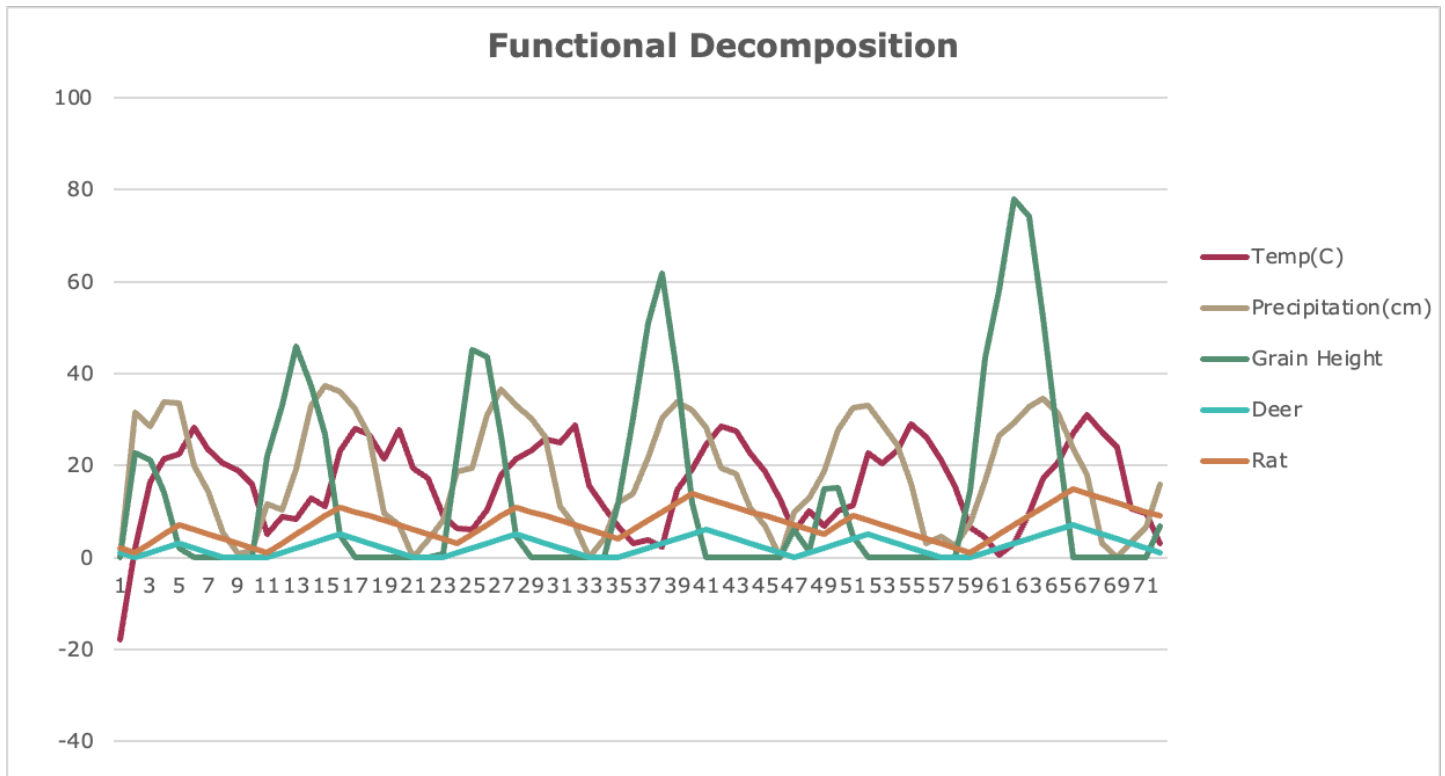
2. A table showing values for temperature, precipitation, number of deer, height of the grain, and your own-choice quantity as a function of month number

Month	Year	Temp(C)	Precipitation (cm)	Grain Height	Deer	Rat
0	2022	-17.78	0	0	1	2
1	2022	2.15	31.6	22.8	0	1
2	2022	16.4	28.51	21.14	1	3
3	2022	21.36	33.87	14.14	2	5
4	2022	22.61	33.63	2.14	3	7
5	2022	28.2	20.04	0	2	6
6	2022	23.52	14.44	0	1	5
7	2022	20.56	5.33	0	0	4
8	2022	18.92	0.8	0	0	3
9	2022	15.85	1.53	0	0	2
10	2022	5.02	11.72	21.91	0	1
11	2022	8.81	10.29	33.15	1	3
0	2023	8.4	19.23	46.01	2	5
1	2023	12.84	33.11	37.26	3	7
2	2023	11.17	37.36	26.73	4	9
3	2023	23.2	36.16	4.73	5	11
4	2023	27.99	32.24	0	4	10
5	2023	26.79	26.53	0	3	9
6	2023	21.39	9.55	0	2	8
7	2023	27.79	7.1	0	1	7

8	2023	19.53	0	0	0	6
9	2023	17.16	3.76	0	0	5
10	2023	9.13	8.21	0.86	0	4
11	2023	6.27	18.75	22.2	1	3
0	2024	6.17	19.37	45.23	2	5
1	2024	10.46	31.08	43.55	3	7
2	2024	17.86	36.56	26.64	4	9
3	2024	21.36	33.12	4.64	5	11
4	2024	23.19	30.37	0	4	10
5	2024	25.69	26.26	0	3	9
6	2024	25	11.05	0	2	8
7	2024	28.73	6.8	0	1	7
8	2024	15.68	0	0	0	6
9	2024	10.78	4.03	0	0	5
10	2024	6.89	11.79	11.65	0	4
11	2024	2.99	13.85	30.22	1	6
0	2025	3.75	21.85	51.02	2	8
1	2025	2.26	30.35	61.88	3	10
2	2025	14.74	33.92	39.89	4	12
3	2025	19.27	32.18	11.91	5	14
4	2025	24.56	28.16	0	6	13
5	2025	28.44	19.53	0	5	12
6	2025	27.49	18.2	0	4	11
7	2025	22.77	10.77	0	3	10
8	2025	18.77	6.73	0	2	9
9	2025	12.54	0	0	1	8
10	2025	5.6	10	6.2	0	7
11	2025	10.25	12.9	1.43	1	6
0	2026	6.97	18.63	14.93	2	5
1	2026	10.09	27.76	15.28	3	7
2	2026	11.51	32.57	4.68	4	9
3	2026	22.75	33.03	0	5	8

4	2026	20.5	28.98	0	4	7
5	2026	23.32	24.6	0	3	6
6	2026	29.11	16.06	0	2	5
7	2026	26.24	3	0	1	4
8	2026	21.31	4.51	0	0	3
9	2026	15.3	2.67	0	0	2
10	2026	6.49	7.28	14.38	0	1
11	2026	4.22	16.61	43.38	1	3
0	2027	0.6	26.44	58.01	2	5
1	2027	2.97	29.26	77.87	3	7
2	2027	9.66	32.84	74.18	4	9
3	2027	17.11	34.64	52.35	5	11
4	2027	20.7	31.2	25.36	6	13
5	2027	27.02	23.79	0	7	15
6	2027	30.95	17.99	0	6	14
7	2027	27.35	2.97	0	5	13
8	2027	23.91	0	0	4	12
9	2027	10.54	3.26	0	3	11
10	2027	9.54	6.54	0	2	10
11	2027	3.08	16.01	6.76	1	9

3. A graph showing temperature, precipitation, number of deer, height of the grain, and your own-choice quantity as a function of month number



4. 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?

As seen in the graph, the temperature and precipitation values are generated randomly in the graph. The height of grain depends on the temperature and precipitation rates. The count of deer is also dependent on the height of grain. The graph, temperature and Precip are randomly generated independently in a graph. Grass height is calculated using temp factor, precip factor. Deer count is calculated based on how much grass is available. My agent is a randomly generated value that helps in growing the grass and deer population alternatively.

