Project #2
Functional Decomposition

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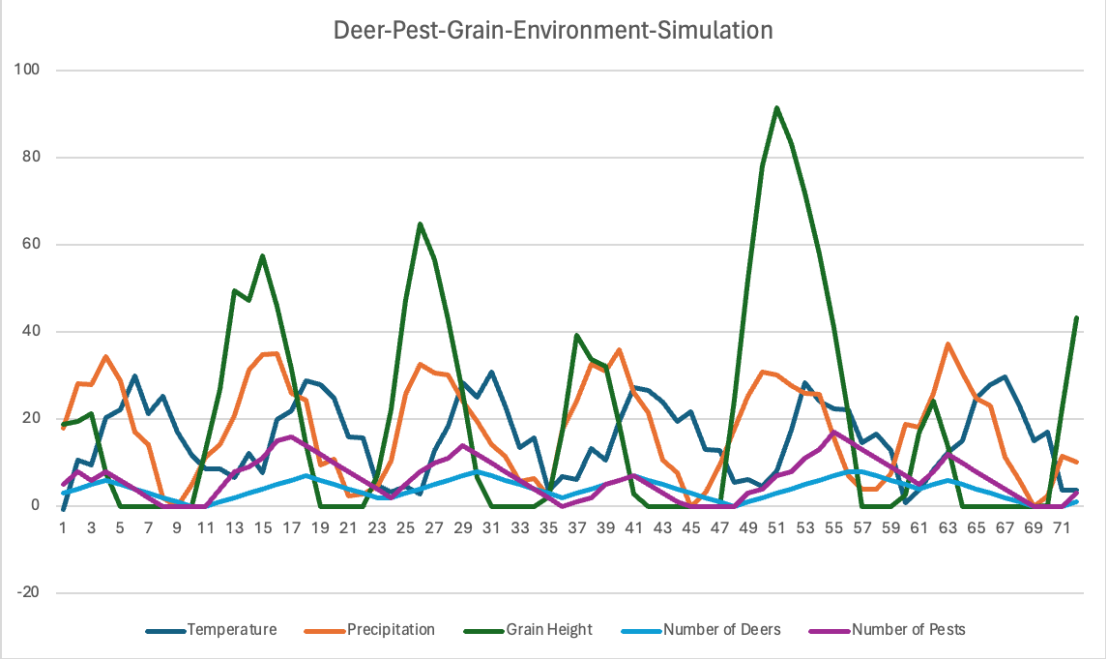
1. **What your own-choice quantity was and how it fits into the simulation**

   In this simulation, we're focusing on pests. These critters play a big role in the ecosystem by munching on the available grain. As they're big fans of grains, their numbers go up when there's plenty of grain to eat, but they decline when grain is scarce. Each pest chows down a set amount of grain, which can either reduce or increase the overall grain supply, and that, in turn, affects the population of other creatures like deer.

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.**

Temperature	Precipitation	Grain Height	Number of Deers	Number of Pests
-0.732422	17.9808	18.7301	3	5
10.5389	28.1362	19.5187	4	8
9.55711	27.8987	21.2847	5	6
20.4187	34.3224	7.82964	6	8
22.1179	28.7536	0	5	6
29.9655	16.9957	0	4	4
21.3265	14.1374	0	3	2
25.314	2.00191	0	2	0
17.1359	0	0	1	0
11.763	4.9569	0.27208	0	0
8.68745	11.3769	12.8126	0	0
8.66934	14.1092	26.8418	1	4
6.53326	20.871	49.4276	2	8
12.2579	31.2202	47.3325	3	9
7.65162	34.8993	57.56	4	11
19.9051	35.1058	46.0144	5	15
21.9161	25.9862	31.411	6	16
28.7621	24.2985	14.139	7	14
27.9716	9.49409	0	6	12
24.8749	10.9123	0	5	10
15.9059	2.41323	0	4	8
15.6408	2.83305	0	3	6
4.7852	4.71674	7.2641	2	4
3.25932	10.4473	22.2703	2	2
4.67324	25.7646	47.3584	3	5
2.8162	32.6676	64.8758	4	8
12.8608	30.6621	56.6418	5	10
18.3644	30.1247	42.7271	6	11
28.3875	24.2256	26.0901	7	14
25.0008	19.4596	6.53211	8	12
30.886	14.1378	0	7	10
23.0173	11.484	0	6	8
13.4323	5.71627	0	5	6
15.6821	6.38991	0	4	4
3.53621	2.08491	2.11061	3	2
6.917	17.577	16.9768	2	0
6.26242	24.1244	39.2126	3	1
13.2483	32.5042	33.7533	4	2
10.5278	30.987	32.0946	5	5
19.4437	36.0159	18.777	6	6
27.2069	26.2126	2.77504	7	7
26.7026	21.3984	0	6	5
23.9238	10.5674	0	5	3
19.5647	7.73171	0	4	1
21.7914	0	0	3	0
13.0626	3.04385	0	2	0
12.7584	9.52634	0	1	0
5.42953	17.8055	24.4706	0	0
6.21026	25.1995	52.0201	1	3
4.50716	30.7378	78.2586	2	4
8.13524	30.2105	91.5836	3	7
17.479	27.6938	83.1976	4	8
28.2778	25.9138	72.0216	5	11
24.2607	25.6562	57.9247	6	13
22.4029	15.6781	41.0344	7	17
22.1648	7.00106	21.0961	8	15
14.515	3.94511	0	8	13
16.5195	3.97479	0	7	11
12.7589	7.57414	0	6	9
0.91362	18.746	2.61856	5	7
3.80934	18.0853	16.7195	4	5
8.41991	26.0379	24.1784	5	8
12.2801	37.1854	13.8243	6	12
15.0953	30.6643	0	5	10
24.8486	24.7637	0	4	8
27.9687	22.9602	0	3	6
29.6555	11.2737	0	2	4
23.1504	5.87913	0	1	2
15.1341	0	0	0	0
17.1428	2.3125	0.0718197	0	0
3.72127	11.5502	22.3322	0	0
3.82652	10.0885	43.2649	1	3

3. **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.**



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?**

   The graph patterns in the Deer-Grain-Pests simulation shed light on how the ecosystem functions. We can see clear cycles of population changes among deer, pests, and grain height. These patterns match what we'd expect based on how the simulation is set up.

   For instance, when the grain height goes up, there's a noticeable increase in the number of pests. This is backed up by the fact that after the pest population peaks, we often see dips in grain height, indicating that pests are eating the grain. This suggests that pests are interacting with the grain just as we programmed them to in the simulation.

   The behavior of the deer population also lines up with our expectations. When there's lots of grain, shown by high grain height peaks, the deer population goes up. This makes sense because more food means more deer. On the flip side, when grain height drops, so does the deer population, showing that deer rely heavily on the availability of their main food source.

   Another interesting observation is the relatively low deer population throughout the simulation. This seems to be because of the competition for grain with pests. Even when grain is plentiful, the deer population doesn't boom like we might expect. This suggests

that the presence of pests, munching on the grain, limits how much food is available for the deer. So, the evidence in the graph supports the idea that the inclusion of pests is indeed affecting the simulation in the way we intended.