

Project #3
Functional Decomposition

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Choice Quantity:

- I decided to create a randomly generated population of predators. This population has a set number of 10 predators but they only appear if the current deer population exceeds 4 deer. If that happens, the deer population will decrease by two deer from the predators. This should cause a faster decrease in the deer population.

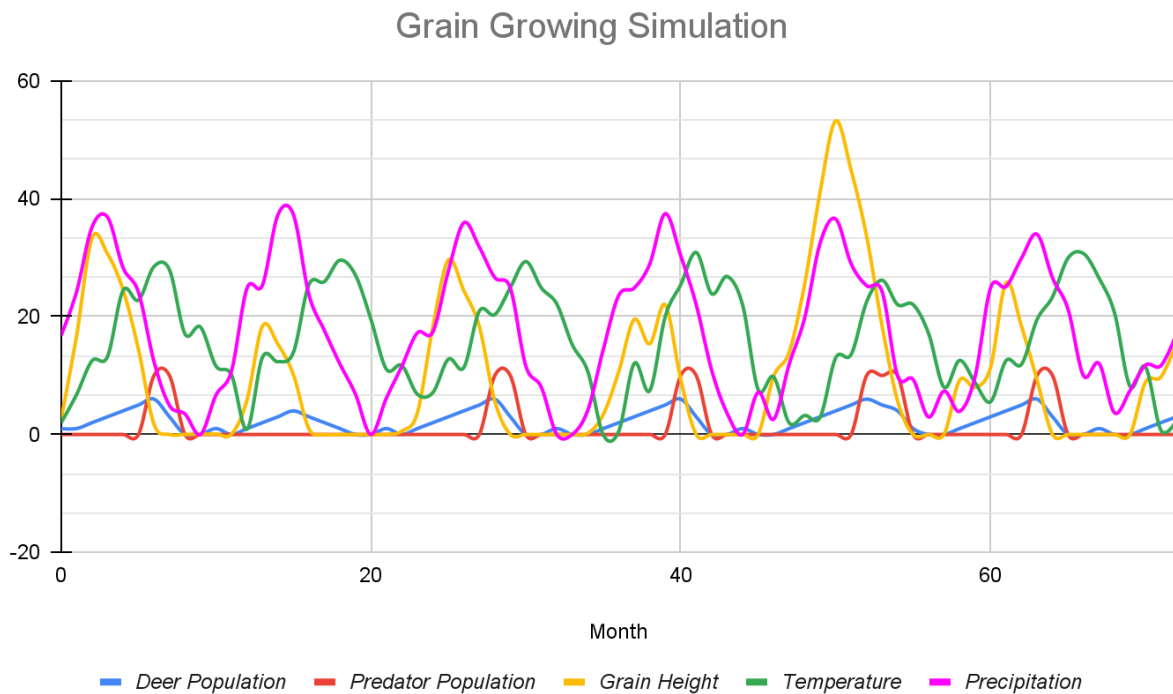
Table:

Month	Deer population	Predator population	Grain height	Temperature	Precipitation
0	1	0	2.54	1.962806	16.781254
1	1	0	16.688398	6.750509	24.16484
2	2	0	33.344801	12.505434	35.196541
3	3	0	30.664381	13.219496	36.896338
4	4	0	24.581147	24.427075	28.340697
5	5	0	14.421201	22.802895	24.118634
6	6	10	1.721614	28.495382	12.368535
7	3	10	0	27.947973	4.910737
8	0	0	0	17.070143	3.482151
9	0	0	0.062036	18.229404	0
10	1	0	0.079856	11.615151	6.668522
11	0	0	0.048055	10.120239	10.754629
12	1	0	5.820979	0.869865	24.779132
13	2	0	18.382517	13.096487	25.339708
14	3	0	15.324319	12.344922	37.285982
15	4	0	10.13478	13.940122	37.317378
16	3	0	0.962665	25.419744	23.747267
17	2	0	0	25.940717	17.639678
18	1	0	0	29.580222	11.970248
19	0	0	0	27.062225	6.87304
20	0	0	0.000001	19.574047	0
21	1	0	0.005057	11.077485	6.169358
22	0	0	0.562758	11.696786	11.586044
23	1	0	3.656816	6.83235	17.241085
24	2	0	18.257597	7.105543	17.393715
25	3	0	29.632009	12.778653	27.723848
26	4	0	24.400223	11.364422	35.923893
27	5	0	18.320696	20.944782	31.805895

28	6	10	5.623862	20.344666	26.62172
29	3	10	0	24.921773	24.849004
30	0	0	0	29.346169	11.634272
31	0	0	0	24.888602	8.028948
32	1	0	0.000019	22.14386	0.00563
33	0	0	0	15.235403	0
34	0	0	0.193317	10.702667	4.105554
35	1	0	3.375531	-0.058481	14.420717
36	2	0	10.667022	0.555767	23.609542
37	3	0	19.52299	12.066462	24.859425
38	4	0	15.38167	7.435048	28.925046
39	5	0	22.004427	20.001759	37.470433
40	6	10	9.311595	25.418193	30.334088
41	3	10	0	30.895949	22.032955
42	0	0	0	23.878161	10.878922
43	0	0	0.00008	26.818725	3.566458
44	1	0	0.000081	21.9104	0
45	0	0	0	7.605451	7.152908
46	0	0	9.87065	9.762484	2.594589
47	1	0	13.954053	1.964982	11.907815
48	2	0	25.540391	3.22504	19.773587
49	3	0	41.202044	2.931213	32.483315
50	4	0	53.21929	12.993416	36.593355
51	5	0	44.822676	13.57928	28.966456
52	6	10	33.623553	22.511664	25.252209
53	5	10	18.384137	26.180467	24.241481
54	4	10	5.684142	22.038918	9.955776
55	1	0	0	22.045292	9.327741
56	0	0	0	17.120353	2.962766
57	0	0	0.057446	8.009396	7.366798
58	1	0	9.205723	12.568279	3.914781
59	2	0	7.983034	8.799301	9.808561
60	3	0	11.386635	5.546496	24.878074
61	4	0	25.735278	12.531893	25.11079
62	5	0	18.321093	11.92134	29.941414
63	6	10	9.239858	19.500419	33.981826
64	3	10	0	23.361927	26.568834
65	0	0	0	29.939287	21.272796
66	0	0	0	30.70396	9.964072

67	1	0	0	26.531698	12.058629
68	0	0	0	20.640759	3.681866
69	0	0	0.002241	8.152858	7.421853
70	1	0	8.873624	11.490536	11.772561
71	2	0	9.765017	0.689706	11.685607
72	3	0	15.501593	2.368079	17.069226

Graph:



Analysis:

- Looking at the graph, I noticed that there are collective spikes in all categories about every 10 months. I would assume this is correlated with the temperature and precipitation because that is what affects the height of the grain which in turn brings more deer. My added variable was predators which is the red line on the graph. The predator's function only really has an effect once the deer population reaches a certain point. If you look at the graph, you can see how the predator population causes a sharper decrease in the amount of deers present. Without the predators, you would see a more symmetrical up and down trend for the deer population.