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Project 4

1. The choice quantity that I picked to add to this simulation is a Fertilizer Scam. The story goes that *allegedly* the CEO of a local fertilizer business regularly dumps excess fertilizer into the fields of the grain deer. He definitely does not do this for an embezzlement scheme. The amount that he dumps depends on both the temperature and the amount of precipitation as he does not like to be too cold or too wet.

On ideal months, he dumps the most, which increases growth in the area by 10%. On better months, excess growth is 5%. On less than ideal months, excess growth is at 1%. And when it is far too cold or and rainy for him he does not come at all and growth is not influenced.

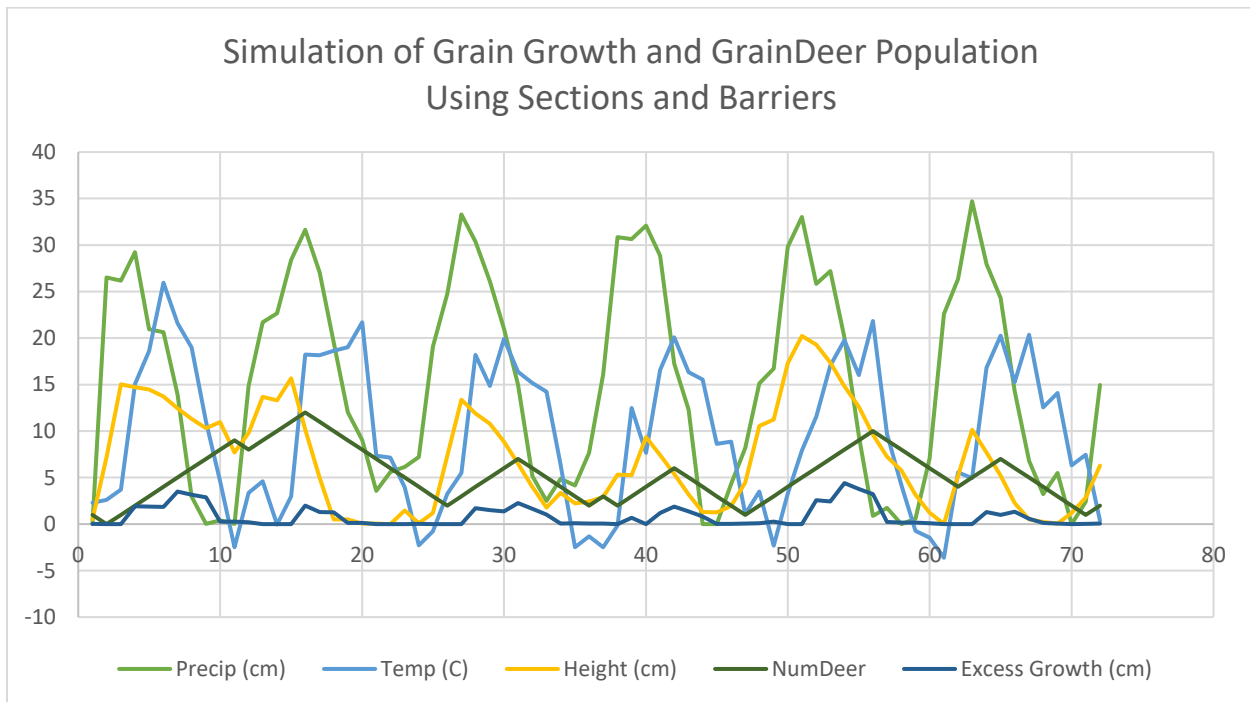
2. Table showing values for temperature, precipitation, number of graindeer, height of the grain, and excess growth due to the fertilizer scam as a function of month number.

Date	Precip (cm)	Temp (C)	Height (cm)	NumDeer	Excess Growth (cm)
1	0	2.3	0.5	1	0.03
2	26.52	2.61	7.17	0	0
3	26.16	3.7	15.02	1	0
4	29.25	15.07	14.72	2	1.91
5	20.95	18.59	14.49	3	1.87
6	20.62	25.95	13.72	4	1.84
7	13.91	21.58	12.45	5	3.49
8	2.95	18.97	11.32	6	3.16
9	0.04	11	10.3	7	2.88
10	0.4	4.6	10.97	8	0.26
11	0.02	-2.48	7.69	9	0.28
12	14.85	3.35	9.78	8	0.2
13	21.69	4.6	13.68	9	0
14	22.67	-0.03	13.32	10	0
15	28.41	2.98	15.67	11	0
16	31.63	18.22	10.19	12	1.99
17	27.06	18.17	4.99	11	1.29
18	19.53	18.64	0.51	10	1.27
19	12.04	19	0.5	9	0.13
20	9.04	21.71	0.05	8	0.13
21	3.56	7.36	0.05	7	0
22	5.6	7.13	0	6	0
23	6.14	3.94	1.47	5	0
24	7.21	-2.27	0.08	4	0.04

25	19.07	-0.77	1.21	3	0
26	24.77	3.27	7.35	2	0
27	33.31	5.49	13.36	3	0
28	30.36	18.18	11.88	4	1.7
29	26.11	14.86	10.78	5	1.51
30	21	19.92	8.88	6	1.37
31	14.99	16.37	6.49	7	2.26
32	5.16	15.17	3.98	6	1.65
33	2.51	14.23	1.79	5	1.01
34	4.86	6.4	3.36	4	0.05
35	4.15	-2.48	2.22	3	0.09
36	7.67	-1.31	2.43	2	0.06
37	16.1	-2.49	2.93	3	0.06
38	30.84	-0.15	5.31	2	0
39	30.63	12.49	5.25	3	0.67
40	32.1	7.65	9.36	4	0
41	28.84	16.57	7.42	5	1.19
42	17.26	20.09	5.39	6	1.89
43	12.32	16.32	3.2	5	1.37
44	0	15.53	1.3	4	0.81
45	0	8.63	1.28	3	0.03
46	4.34	8.86	1.94	2	0.03
47	8.17	1.08	4.45	1	0.05
48	15.14	3.5	10.57	2	0.11
49	16.7	-2.3	11.25	3	0.27
50	29.81	3.29	17.29	4	0
51	33.03	7.92	20.23	5	0
52	25.82	11.55	19.29	6	2.57
53	27.22	17.06	17.35	7	2.45
54	20.06	19.76	14.82	8	4.41
55	9.49	16.03	12.62	9	3.76
56	0.87	21.84	9.61	10	3.21
57	1.75	9.71	7.24	9	0.24
58	0	4.2	5.77	8	0.18
59	0.57	-0.72	3.14	7	0.15
60	7.05	-1.44	1.24	6	0.08
61	22.59	-3.62	0.03	5	0
62	26.33	5.56	5.2	4	0
63	34.71	4.93	10.15	5	0
64	27.96	16.8	7.7	6	1.29
65	24.31	20.25	5.21	7	0.98

66	14.3	15.26	2.25	6	1.32
67	6.82	20.35	0.52	5	0.57
68	3.23	12.54	0.22	4	0.13
69	5.51	14.1	0.05	3	0.06
70	0	6.31	1.21	2	0
71	2.41	7.45	2.84	1	0.03
72	14.96	0.37	6.3	2	0.07

3. The graph for the above data. Notes that applicable data was converted to Celsius or centimeters.



4. There are some clear patterns that emerge within the graph showing that the data is affecting each other very clearly. The most obvious of such is how Precipitation, Height, and Number of graindeer interact. As the precipitation rises you can see that the height of the grain rises as well, and after the height rises, the number of deer rise as well. Similar peaks are shown in temperature. All the variables seem to be interacting well together.

It is also apparent that the fertilizer scam is interacting with the height of the grain, temperature, and precipitation as well. As the CEO does not like it to be too cold or rainy, the dips in excess growth occur when the temperature or rain drop significantly. Likewise, when more “ideal” conditions happen – when it is not too rainy or cold – the excess growth peaks. This is seen roughly around the same time of the peaks of temperature and lower amounts of precipitation.