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Project2

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

My own-choice quantity is number of "Cougar". The number will increase one if the precipitation is greater than seven inches and deer's number is greater than cougar's number plus one as the image shown below.

```cpp
// Deer's predator
void Cougar()
{
    while (NowYear < 2030)
    {
        // compute a temporary next-value for this quantity
        // based on the current state of the simulation:
        int nextNumCougar = NowNumCougar;
        int carryingCapacity = (int)(NowPrecip);
        if (carryingCapacity > 7 && (NowNumDeer > nextNumCougar+1))
            nextNumCougar++;
        else
            nextNumCougar--;
        // DoneComputing barrier:
        WaitBarrier();

        NowNumCougar = (nextNumCougar < 0) ? 0 : nextNumCougar;
        // DoneAssigning barrier:
```

Since cougar is deer's predator. The number of deers is not only affected by the grain height but also the number of cougars as the image shown below.

```cpp
void Deer()
{
    while (NowYear < 2030)
    {
        // compute a temporary next-value for this quantity
        // based on the current state of the simulation:
        int nextNumDeer = NowNumDeer;
        int carryingCapacity = (int)(NowHeight) - NowNumCougar;
        if (nextNumDeer < carryingCapacity)
            nextNumDeer++;
        else if (nextNumDeer > carryingCapacity)
            nextNumDeer--;

        // DoneComputing barrier:
        WaitBarrier();

        NowNumDeer = (nextNumDeer < 0) ? 0 : nextNumDeer;
```

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	temperature	precipitation	deer	grain	cougar
1	8.6	20.65	4	0	1
2	10.84	31.59	3	6.65	2
3	17.25	29.43	2	6.65	1
4	16.6	35.23	1	1.71	0
5	20.94	29.1	0	0	0
6	26.04	23.03	0	0	0
7	24.79	13.97	0	0	0
8	28.44	11.23	0	0	0
9	19.94	5.27	0	0	0
10	8.7	4.15	0	0.01	0
11	2.32	4.39	0	8.43	0
12	0.79	16.93	1	21.73	0
13	1.01	20.72	2	36.89	0
14	3.59	24.58	3	51.9	1
15	18.22	29.64	4	74.01	2
16	18.58	35.95	5	63.92	3
17	24.66	26.48	6	51.26	4
18	27.82	21.97	7	36.02	5
19	26.22	18.64	8	18.24	6
20	21.11	9.76	7	0	5
21	18.73	5.8	6	0	4
22	11.57	7.04	5	0	3
23	5.29	5.5	4	0	2
24	8.24	18.09	3	5.96	1
25	0.04	26.29	2	15.93	0
26	7.99	24.35	3	27.1	1
27	9.26	34.16	4	39.74	2
28	22.77	30.97	5	42.34	3
29	18.57	23.68	6	29.64	4
30	25.82	17.29	7	14.45	5
31	23.38	18.62	6	0	4
32	27.88	10.57	5	0	3
33	15.84	3.46	4	0	2
34	11.29	5.7	3	0	1
35	7.84	8.71	2	0	0
36	5.17	9.15	1	8.55	0
37	4.13	26.11	2	25.91	0
38	12.49	30.8	3	51.19	1
39	10.28	34.92	4	47.15	2

40	19.99	31.02	5	45.77	3
41	25.5	25.16	6	33.08	4
42	25.62	25.59	7	17.84	5
43	29.95	12.11	6	0.06	6
44	20.4	11	5	0	5
45	16.77	4.96	4	0	4
46	17.75	3.96	3	0	3
47	9.45	10.65	2	0	2
48	4.15	18.14	1	4.59	1
49	3.69	24.92	0	30.06	0
50	9.75	32.73	1	59.98	0
51	12.49	29.61	2	68.72	0
52	23.43	36.77	3	67.29	1
53	19.5	32.43	4	59.67	2
54	27.86	21.03	5	49.53	3
55	27.62	11.61	6	36.83	4
56	26.59	5.05	7	21.59	3
57	17.84	0.28	6	3.81	2
58	9.21	0.79	5	0	1
59	8.33	6.16	4	0	0
60	1.15	17.97	3	0.38	0
61	0.41	17.93	2	12.45	0
62	7.65	31.2	3	23.88	0
63	18.07	36.92	4	37.01	1
64	20.48	31.31	5	26.91	2
65	26.19	27.22	6	14.22	3
66	24	19	5	0	4
67	27.23	11.24	4	0	3
68	19.55	9.36	3	0	2
69	14.27	6.04	2	0	1
70	8.95	5.55	1	0	0
71	2.97	11.58	0	6.04	0
72	-0.15	14.05	1	27.17	0

3. A graph showing temperature, precipitation, number of deer, height of the grain, and your own-choice quantity as a function of month number.
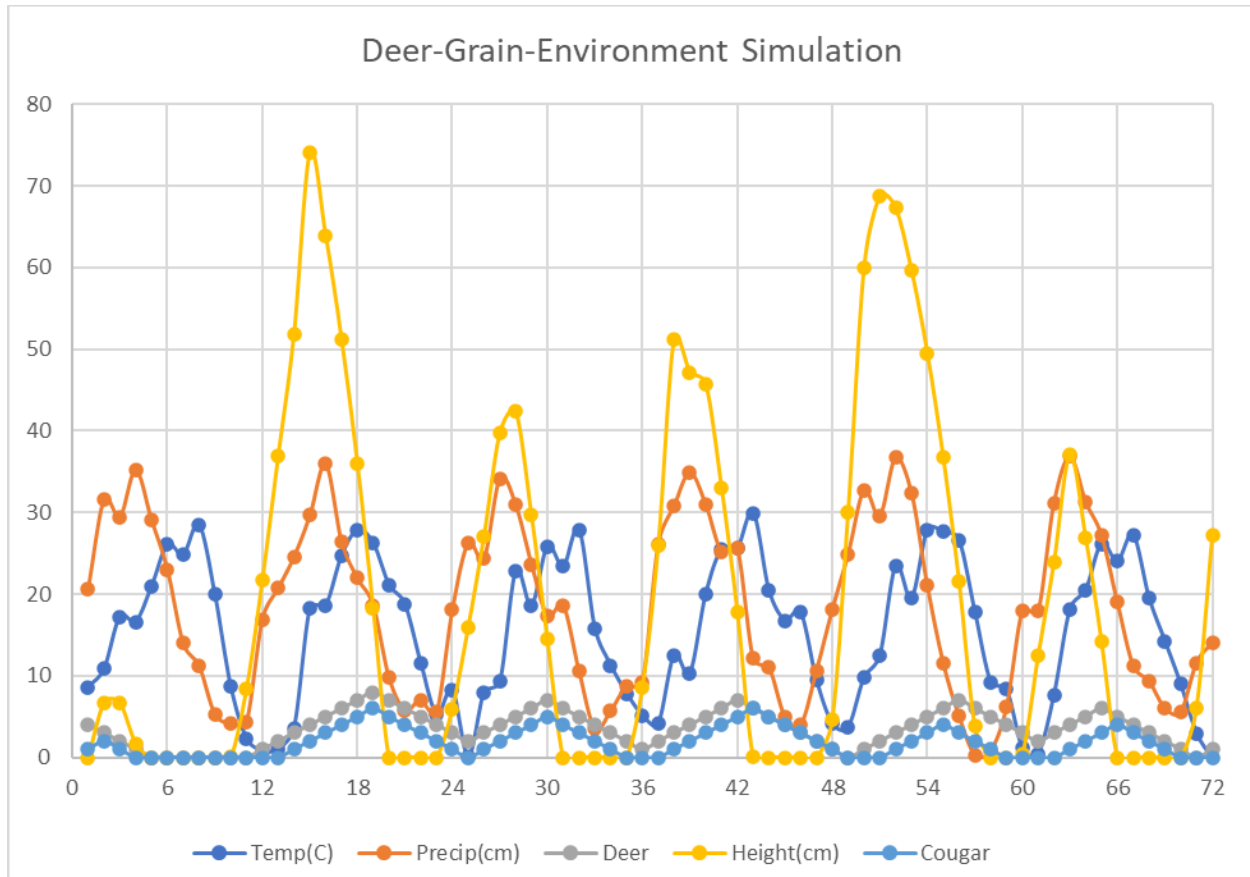
4. A commentary about the patterns in the graph and why they turned out that way.

The number of cougars in the simulation has a clear impact in the graph. When the number of deer and the height of the precipitation increase, there is a lag before we observe a rise in the cougar population. This rise in predators comes as a direct response to the increased availability of prey and the amount drinking water, vice versa. In addition, the number of deers depends on amount of the grain and the predators as well. All things considered, the deer are primarily affected by food availability and predation pressure, with potential indirect influence from environmental conditions such as precipitation.