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Class: CS_575

Project: Project3

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

Ans:

My own choice of quantity is “fox”, The reason behind taking fox is it looks like a dog, and I have a pet dog.



I am fitting fox because the fox occupies the top of the food web in northern cold regions of the world.

In my code, I tried to simulate the wild by decreasing the wild fox population when the deer population is low. If the deer factor is less than 0.5 and the deer population is less than 10 then it is very difficult to sport the deer in the wild so the fox population will decrease.

If the deer factor is more than 0.5 the population of the fox will increase by 3 per month.

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.

Ans:

Months	Temperature (Celsius)	Precipitation	Height (CM)	Deer	Fox
1	-15.6	8.74	0.3	49	2
2	-11.4	13.25	0.3	48	2
3	-3.93	15.32	1.45	47	2
4	4.7	15.32	0.3	46	2
5	12.17	13.25	0.3	45	2
6	16.48	9.66	0.3	44	2
7	16.48	5.52	0.3	43	2
8	12.17	1.94	0.3	42	2
9	4.7	0	0.3	41	2
10	-3.93	0	0.3	40	2
11	-11.4	1.94	0.3	39	2
12	-15.72	5.52	0.3	38	2
13	-15.72	9.66	0.3	37	2
14	-11.4	13.25	0.3	36	2
15	-3.93	15.32	5.1	35	7
16	4.7	15.32	1.28	33	12
17	12.17	13.25	0.3	30	17
18	16.48	9.66	0.3	25	22
19	16.48	5.52	0.3	19	13
20	12.17	1.94	0.3	15	9
21	4.7	0	0.3	12	7
22	-3.93	0	0.3	10	6
23	-11.4	1.94	0.3	8	6
24	-15.72	5.52	0.3	6	6
25	-15.72	9.66	0.3	4	3
26	-11.4	13.25	0.3	3	3
27	-3.93	15.32	15.16	2	1
28	4.7	15.32	21.4	6	1
29	12.17	13.25	19.62	13	1
30	16.48	9.66	15.66	19	6
31	16.48	5.52	9.87	23	11
32	12.17	1.94	2.86	24	16
33	4.7	0	0.3	20	10
34	-3.93	0	0.3	17	15
35	-11.4	1.94	0.3	13	10
36	-15.72	5.52	0.3	10	7

37	-15.72	9.66	0.3	8	7
38	-11.4	13.25	0.3	6	3
39	-3.93	15.32	14.25	5	3
40	4.7	15.32	19.57	8	3
41	12.17	13.25	17.18	14	3
42	16.48	9.66	12.91	19	8
43	16.48	5.52	7.12	22	13
44	12.17	1.94	0.42	23	9
45	4.7	0	0.3	20	14
46	-3.93	0	0.3	16	9
47	-11.4	1.94	0.3	13	7
48	-15.72	5.52	0.3	11	6
49	-15.72	9.66	0.3	9	5
50	-11.4	13.25	0.3	7	5
51	-3.93	15.32	13.94	5	5
52	4.7	15.32	19.26	8	2
53	12.17	13.25	16.88	14	2
54	16.48	9.66	12.61	19	7
55	16.48	5.52	6.82	22	12
56	12.17	1.94	0.3	22	17
57	4.7	0	0.3	17	11
58	-3.93	0	0.3	14	8
59	-11.4	1.94	0.3	12	6
60	-15.72	5.52	0.3	10	5
61	-15.72	9.66	0.3	8	5
62	-11.4	13.25	0.3	6	5
63	-3.93	15.32	14.25	4	2
64	4.7	15.32	19.87	7	2
65	12.17	13.25	17.79	13	2
66	16.48	9.66	13.83	18	7
67	16.48	5.52	8.34	21	12
68	12.17	1.94	1.95	22	8
69	4.7	0	0.3	20	13
70	-3.93	0	0.3	16	9
71	-11.4	1.94	0.3	13	7
72	-15.72	5.52	0.3	11	6

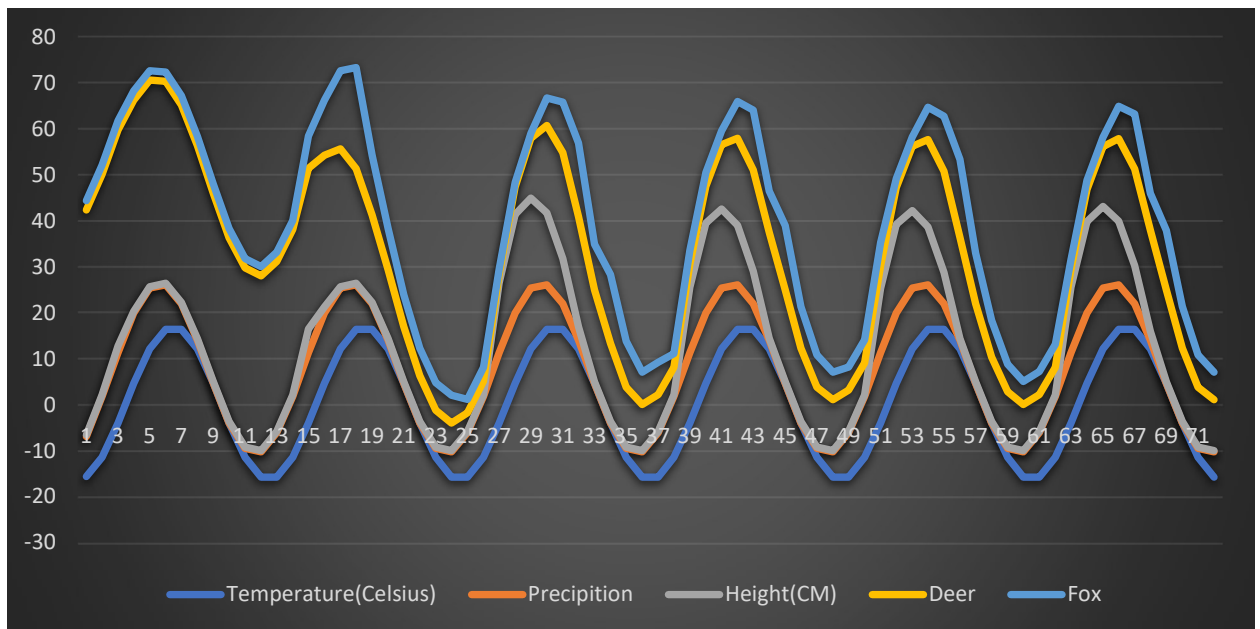
3. A graph showing temperature, precipitation, number of deer, height of the grain, and your own-choice quantity as a function of month number. Note: if you change the units to °C and centimeters, the quantities might fit better on the same set of axes.

$$\text{cm} = \text{inches} * 2.54$$

$$^{\circ}\text{C} = (5./9.)*(^{\circ}\text{F}-32)$$

This will make your heights have larger numbers and your temperatures have smaller numbers.

Ans: In my graph, I converted the Hight in centimeters and temperature in Celsius



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 affecting the simulation correctly?

Ans: I have set the

On the x-axis of my graph, I too the months as we initially took the temperature with respect to the sin carve. So, my temperature flows in the sin waveform.

Initially took the values of the Deer and the Fox values as some constants.

In my code, the temperature, Precipitation, and height of the grains strictly follow the sin graph.

I have introduced the rate on how the values should be changed example Deer eats the grains at a rate of 15 and Fox eats the deer at the 5.

Similarly, the population of foxes is regulated by the deer population because if there are few deer the foxes will starve to death.

I took the temperature in Celsius and high the Centimeters because my temperature become negative in some cases.

I feel my graph shows a valid representation of the food web life flow.