CS 475 Parallel Programming: Functional Decomposition

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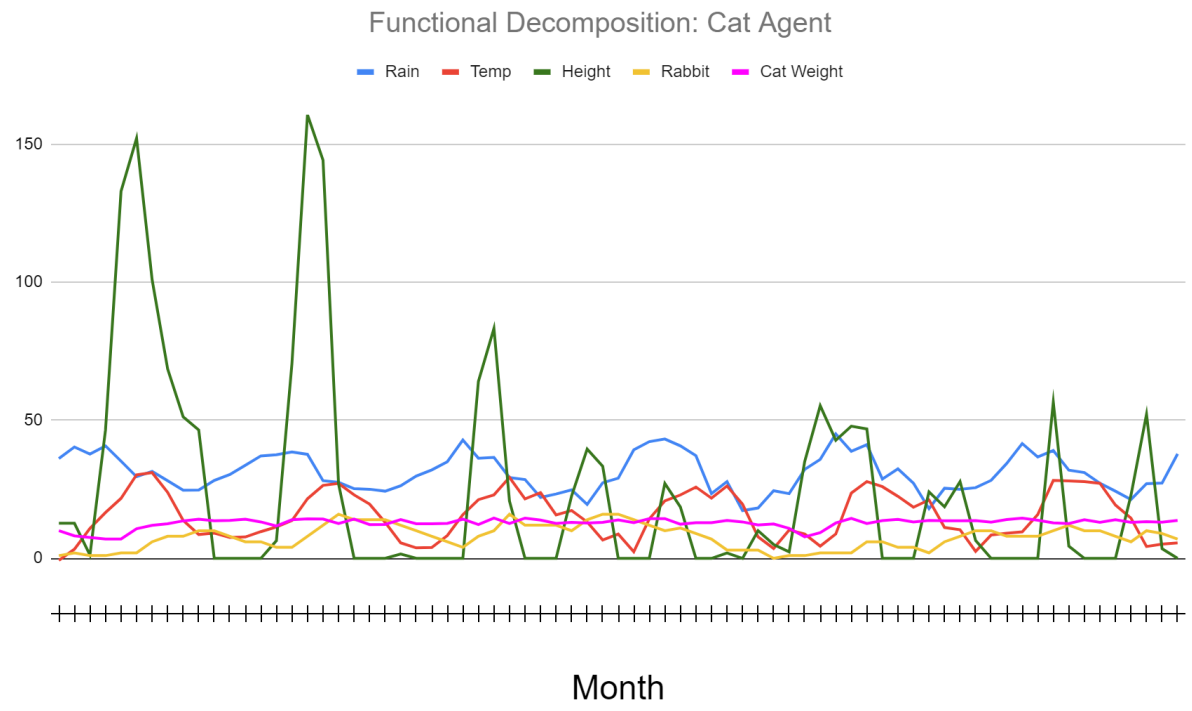
For this assignment, we are required to add an agent of our choice to the Rabbits and Rye Grass Simulation. I chose to add a Russian Blue Cat into the equation (the breed because it also starts with the letter R like Rabbits and Rye Grass). The cat is tracked via is weight, through someone who takes the cat to the vet once a month to keep it healthy. If the cat is unhealthy and overweight, it will be too slow to catch rabbits, but it will eat grass to soothe its stomach and lose weight, the rabbits will also breed more to counter act the predator in the area. If the cat is healthy and there are rabbits around, the cat will eat a rabbit and lower the population and gain weight. If the cat is healthy but the rabbit population is sparse, the cat will go hungry and lose more weight than through eating grass.

Table of Values: Functional Decomp - Cat Agent

Rain	Temp	Height	Rabbit	Cat Weight
36.15	-0.73	12.7	1	10
40.34	3.33	12.7	2	8.17
37.76	10.84	1.17	1	7.56
40.74	16.6	46.5	1	7
35.21	21.74	132.94	2	7
29.57	30.28	152.15	2	10.75
31.51	31.05	100.97	6	11.97
28.1	23.92	68.63	8	12.52
24.67	13.75	51.24	8	13.58
24.76	8.63	46.48	10	14.17
28.21	9.14	0	10	13.59
30.37	7.58	0	8	13.74
33.73	7.75	0	6	14.17
37.11	9.68	0	6	13.19
37.51	11.39	6.4	4	11.74

38.56	13.71	70.58	4	13.99
37.67	21.58	160.7	8	14.32
28.13	26.43	144.23	12	14.26
27.53	27.13	26.96	16	12.61
25.26	22.98	0	14	14.22
25.03	19.63	0	14	12.24
24.34	13.02	0	14	12.31
26.29	5.6	1.57	12	14.05
29.82	3.8	0	10	12.56
32.04	3.95	0	8	12.54
35	8.28	0	6	12.66
42.87	15.83	0	4	14.2
36.29	21.26	64.08	8	12.25
36.55	22.99	83.28	10	14.6
29.25	29.32	20.76	16	12.63
28.55	21.55	0	12	14.59
22.09	23.79	0	12	13.86
23.31	15.72	0	12	12.65
24.82	17.34	22.64	10	13.02
19.56	13.18	39.58	14	12.76
27.39	6.66	33.33	16	13.05
29.03	8.81	0	16	13.92
39.33	2.39	0	14	12.94
42.28	14.3	0	12	14.36
43.24	20.84	27.14	10	14.41
40.74	22.96	18.6	11	12.38
37.17	25.83	0	9	12.92
23.45	21.79	0	7	12.92
27.8	26.21	1.94	3	13.72
17.32	19.64	0	3	13.2
18.24	7.78	10.05	3	12.09
24.49	3.59	5.03	0	12.48
23.45	10.27	2.32	1	10.87
32.21	8.81	35.09	1	7.81
35.86	4.41	55.3	2	9.33

45.06	8.82	42.78	2	12.81
38.79	23.66	47.87	2	14.51
41.18	27.83	46.87	6	12.64
28.72	25.97	0	6	13.68
32.41	22.47	0	4	14.1
27.24	18.53	0	4	13.19
18	21.18	24.08	2	13.74
25.4	11.18	18.67	6	13.59
25.03	10.34	27.81	8	13.59
25.6	2.55	6.51	10	13.69
28.25	8.46	0	10	13.12
34.36	9.1	0	8	14.07
41.59	9.61	0	8	14.54
36.73	15.87	0	8	13.79
39.08	28.23	56.6	10	12.87
31.94	28.03	4.44	12	12.59
31.08	27.8	0	10	13.98
27.19	27.19	0	10	13.08
24.33	19.31	0	8	13.98
21.33	14.55	22.9	6	13.03
27.06	4.3	52.17	10	13.28
27.26	5.15	3.51	9	13.1
37.86	5.58	0	7	13.75



The graph patterns mostly conform to the test data Prof. Bailey showed in the demo, however the Rye Grass seems to have taken a bigger hit which surprised me. I expected the Rabbits to bottom out, however they remained mostly unchanged, the extra rabbits when the cat is too fat definitely helped them out here and hurt the grass. The cat's weight is also surprisingly stable, it doesn't fluctuate much except for when the Rabbits are low during the cold months though there is a small section where the Rabbits are fairly low all year, the viscous hunter keeps well fed it seems. Overall the cat clearly did have an effect on the Rye Grass through the Rabbits being changed, however despite the cat killing the Grass's predator, the Grass never grew out of control and stayed on the downward trend.