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Introduction to Parallel Programming

Project 3

Functional Decomposition

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

   I have used MyAgent function uses a random function to generate an arbitrary value to increase the item generation. It is done alternately for grass and deer growth.

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	Height	NumDeer	Precip	NowTemp	MyAgent
1	12	10	10	5.555556	0
2	12	16	10	5.555556	0.000943
3	0	11	13.48409	14.34568	0.668629
4	0	3	14.65268	17.62729	1.718076
5	5.154064	1	10.69988	24.90659	1.957075
6	2.737943	3	8.589455	24.88341	1.787816
7	3.185637	3	5.93262	27.89915	1.260003
8	0	0	3.000996	24.29089	1.799718
9	0	3	3.119527	17.51757	0.960717
10	2.306299	3	3.088459	12.43592	0.669726
11	0	1	3.500395	8.286271	1.280174
12	16.53074	4	4.582528	5.469036	1.216072
13	23.71344	10	8.502069	6.028305	1.061795
14	0	12	10.0243	8.344065	0.842973
15	0	6	12.9618	11.80553	0.465642
16	0	1	13.83239	17.11792	1.286009
17	2.619978	2	9.721664	24.32105	1.927819
18	5.266811	0	9.394835	25.89218	1.067233
19	0	3	7.125669	26.96526	1.818287
20	4.39739	1	2.836106	22.76914	0.265506
21	1.073473	4	0	19.62722	1.428971
22	0	0	1.035306	13.76109	1.328519
23	4.935735	4	3.915833	8.421338	0.169424
24	8.167397	4	5.281649	3.81066	0.489786
25	15.68363	8	8.442088	5.475629	0.029483
26	6.307468	11	11.69306	6.601543	0.118357
27	0	7	11.06377	14.31469	0.678741

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28	0	2	12.08475	17.44355	1.720203
29	5	2	10.64904	24.97982	1.456392
30	0	4	10.37018	27.23377	1.211766
31	2.189258	2	5.098696	27.78525	0.312777
32	2.09902	4	1.707799	24.23554	1.491205
33	5	0	0.517722	16.90192	1.814096
34	2.073383	3	1.325512	13.94061	0.591597
35	9.454975	1	2.593345	6.068908	1.252481
36	22.64289	5	5.955543	3.903351	0.494251
37	33.57911	8	9.814388	5.28876	1.867569
38	33.90084	13	10.16525	9.28669	0.261539
39	0	12	14.15441	12.33993	1.634885
40	0	7	14.23944	18.69462	0.693594
41	0	2	10.02018	22.94405	0.388767
42	4.046524	1	8.32076	26.38672	0.232612
43	0	0	5.031087	27.45382	1.406197
44	5	3	4.722543	23.9373	0.621644
45	5.241602	0	0.149417	17.9065	1.290339
46	0	2	2.057854	12.37663	1.704819
47	7.427434	3	3.877924	7.471532	0.407915
48	7.503495	8	3.468636	4.641342	0.755261
49	13.58441	5	7.981697	4.650355	1.099257
50	25.24151	10	11.04136	8.486803	1.665496
51	0	12	14.31961	13.2329	0.448382
52	0	6	10.95444	18.23658	1.351142
53	5	0	12.07721	22.33148	1.408206
54	5	0	7.60578	26.10544	0.528758
55	3.187584	3	5.299065	25.53644	0.075017
56	0	0	0.84357	21.8052	1.076779
57	0	1	1.903881	17.28389	1.810191
58	4.730062	3	2.873912	12.49918	1.218031
59	4.171312	4	1.551541	7.698517	0.106131
60	6.767644	4	3.813586	5.173198	0.370591
61	10.07383	8	8.191933	4.564107	1.336447
62	7.025218	10	11.93418	6.153973	0.137097
63	3.35402	6	14.61286	11.08607	1.799845
64	0	2	12.47746	18.87648	0.674758
65	0	2	12.14648	24.71962	1.211593
66	0	3	10.34868	27.54514	1.754245
67	5	2	4.307655	24.70624	1.901498
68	3.217391	3	3.937877	23.736	1.946558

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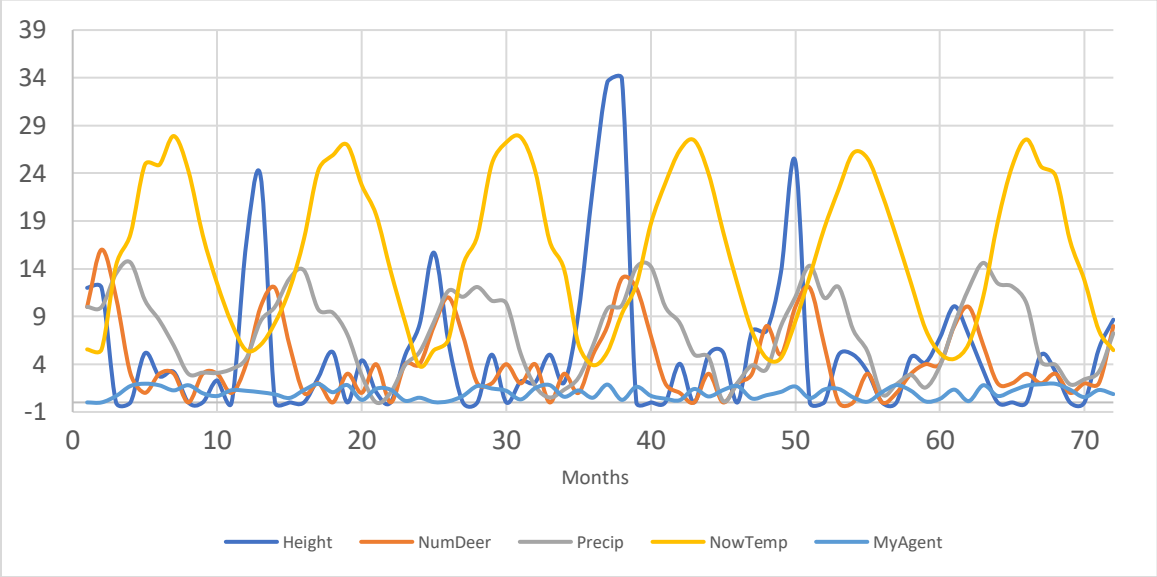
69	0	1	1.893912	16.96894	1.340198
70	0	2	2.42088	12.80181	0.549799
71	5.621455	2	3.211875	7.531552	1.299853
72	8.664659	8	7.250262	5.468989	0.865299

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.

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



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 actually affecting the simulation correctly?

   According to the graph, temperature and Precip are randomly generated independently in a graph. Grass height is calculated using temp factor, precip factor. Deer count is calculated based on how much grass is available. My agent is a randomly generated value that helps in growing the grass and deer population alternatively.

   If the value of grass is less than the deer count, the deer count is reduced and the grown grass is also reduced back to the same as the remaining deers eat the grass to stay alive. If the deers are less and grass is high, the grass value increase and deer count also increases. The MyAgent value is used to increase the value of the grass and deer count alternately.