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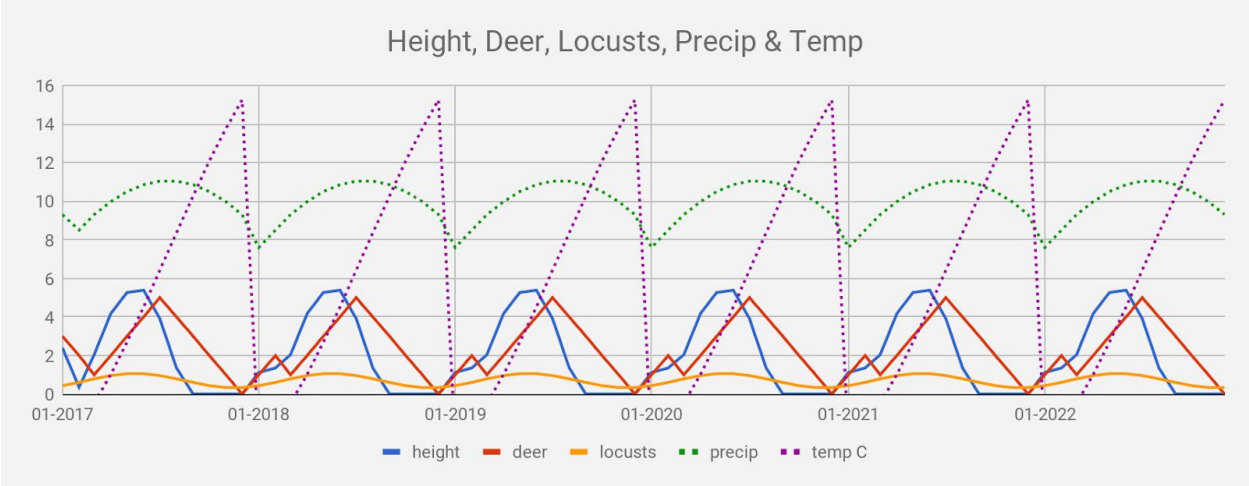
CS 475.400
Assignment: Project #4 - Functional Decomposition

1. I opted for the enemy of crops, the Locust. I didn't want to completely decimate the Height factor, so I capped the Locust range fairly shallow. I inserted the monthly-updated Locust factor as a subtraction from Height during Height's monthly calculation.

2. (table attached to end)

3.



4. First, I want to state that I modified the angular variable under Watcher() function in order to allow a seasonal crop growth. (Without this adjustment, I could not coax grain and deer height to prosper for greater than four months of the year.

I believe that my simulation corresponds with what one would expect for seasonal spring growth, autumn harvest, winter dearth, as a result of successful OpenMP "section" interaction. That is, in compliance with illustrative section chart in our project's instructions, my coding structure allows for pseudo form of multi-instruction-multi-data operation. Such a structure allows for unique, independent thread responsibilities, which, if our simulation were extensively deep, would allow the program to take advantage of multiprocessor architecture. (Related, I *do* wonder if this program would benefit from multi-threaded operation greater than four where the program explicitly deploys four *sections* rather than *tasks* (tasks allowing for runtime thread assignment).)

My own quantity modifier is the inclusion of locusts, which contribute a minor subtraction on the grain's height. This locust modifier appears to yield some tangible impact where the grain height forms a distinct plateau at its peak height. I note that the grain height always plateaus with the corresponding cresting of the locust count. This plateau occurs *before* the crest of the precipitation as well as the peak of the temperature. Further, the deer count's relationship does not indicate any inappropriate relationship to grain height, peaking only after the grain height has touched its peak, descending after grain height's descent is already underway.

GRAIN HEIGHT, DEER, LOCUSTS, PRECIP, TEMP

month-year	height	deer	locusts	precip	temp C	temp F
01-2017	2.395929	3	0.436724	9.303605	-0.4651727778	31.162689
02-2017	0.356011	2	0.60259	8.502423	-1.710120556	28.921783
03-2017	2.043339	1	0.794116	9.303605	-0.4651727778	31.162689
04-2017	4.1752	2	0.959983	9.975877	1.018498889	33.833298
05-2017	5.267446	3	1.055746	10.498812	2.695810556	36.852459
06-2017	5.384469	4	1.055746	10.85652	4.515802778	40.128445
07-2017	3.915588	5	0.959983	11.038133	6.423172222	43.56171
08-2017	1.355951	4	0.794116	11.038133	8.359966111	47.047939
09-2017	0	3	0.60259	10.85652	10.26733611	50.481205
10-2017	0	2	0.436724	10.498811	12.08732833	53.757191
11-2017	0	1	0.340961	9.975877	13.76464222	56.776356
12-2017	0	0	0.340961	9.303605	15.24831111	59.44696
01-2018	1.118135	1	0.436724	7.596674	-2.678517222	27.178669
02-2018	1.356011	2	0.60259	8.502423	-1.710120556	28.921783
03-2018	2.043339	1	0.794116	9.303605	-0.4651727778	31.162689
04-2018	4.1752	2	0.959983	9.975877	1.018498889	33.833298
05-2018	5.267446	3	1.055746	10.498812	2.695810556	36.852459
06-2018	5.384469	4	1.055746	10.85652	4.515802778	40.128445
07-2018	3.915588	5	0.959983	11.038133	6.423172222	43.56171
08-2018	1.355951	4	0.794116	11.038133	8.359966111	47.047939
09-2018	0	3	0.60259	10.85652	10.26733611	50.481205
10-2018	0	2	0.436724	10.498811	12.08732833	53.757191
11-2018	0	1	0.340961	9.975877	13.76464222	56.776356
12-2018	0	0	0.340961	9.303605	15.24831111	59.44696
01-2019	1.118135	1	0.436724	7.596674	-2.678517222	27.178669
02-2019	1.356011	2	0.60259	8.502423	-1.710120556	28.921783
03-2019	2.043339	1	0.794116	9.303605	-0.4651727778	31.162689
04-2019	4.1752	2	0.959983	9.975877	1.018498889	33.833298
05-2019	5.267446	3	1.055746	10.498812	2.695810556	36.852459
06-2019	5.384469	4	1.055746	10.85652	4.515802778	40.128445
07-2019	3.915588	5	0.959983	11.038133	6.423172222	43.56171
08-2019	1.355951	4	0.794116	11.038133	8.359966111	47.047939
09-2019	0	3	0.60259	10.85652	10.26733611	50.481205
10-2019	0	2	0.436724	10.498811	12.08732833	53.757191
11-2019	0	1	0.340961	9.975877	13.76464222	56.776356
12-2019	0	0	0.340961	9.303605	15.24831111	59.44696
01-2020	1.118135	1	0.436724	7.596674	-2.678517222	27.178669
02-2020	1.356011	2	0.60259	8.502423	-1.710120556	28.921783

03-2020	2.043339	1	0.794116	9.303605	-0.4651727778	31.162689
04-2020	4.1752	2	0.959983	9.975877	1.018498889	33.833298
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08-2020	1.355951	4	0.794116	11.038133	8.359966111	47.047939
09-2020	0	3	0.60259	10.85652	10.26733611	50.481205
10-2020	0	2	0.436724	10.498811	12.08732833	53.757191
11-2020	0	1	0.340961	9.975877	13.76464222	56.776356
12-2020	0	0	0.340961	9.303605	15.24831111	59.44696
01-2021	1.118135	1	0.436724	7.596674	-2.678517222	27.178669
02-2021	1.356011	2	0.60259	8.502423	-1.710120556	28.921783
03-2021	2.043339	1	0.794116	9.303605	-0.4651727778	31.162689
04-2021	4.1752	2	0.959983	9.975877	1.018498889	33.833298
05-2021	5.267446	3	1.055746	10.498812	2.695810556	36.852459
06-2021	5.384469	4	1.055746	10.85652	4.515802778	40.128445
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08-2021	1.355951	4	0.794116	11.038133	8.359966111	47.047939
09-2021	0	3	0.60259	10.85652	10.26733611	50.481205
10-2021	0	2	0.436724	10.498811	12.08732833	53.757191
11-2021	0	1	0.340961	9.975877	13.76464222	56.776356
12-2021	0	0	0.340961	9.303605	15.24831111	59.44696
01-2022	1.118135	1	0.436724	7.596674	-2.678517222	27.178669
02-2022	1.356011	2	0.60259	8.502423	-1.710120556	28.921783
03-2022	2.043339	1	0.794116	9.303605	-0.4651727778	31.162689
04-2022	4.1752	2	0.959983	9.975877	1.018498889	33.833298
05-2022	5.267446	3	1.055746	10.498812	2.695810556	36.852459
06-2022	5.384469	4	1.055746	10.85652	4.515802778	40.128445
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11-2022	0	1	0.340961	9.975877	13.76464222	56.776356
12-2022	0	0	0.340961	9.303605	15.24831111	59.44696