# CS 475/575 -- Spring Quarter 2021

## Project #3

## Functional Decomposition


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

   My own-choice is to set a random number which represent the number of deer hunted. In addition, I set the deer-hunted number between 0 and half of NowNumDeer to conserve the population of deer. The deer-hunted number is following the number of NowNumDeer. If the deer group grows, the deer-hunted also grows, vice versa.

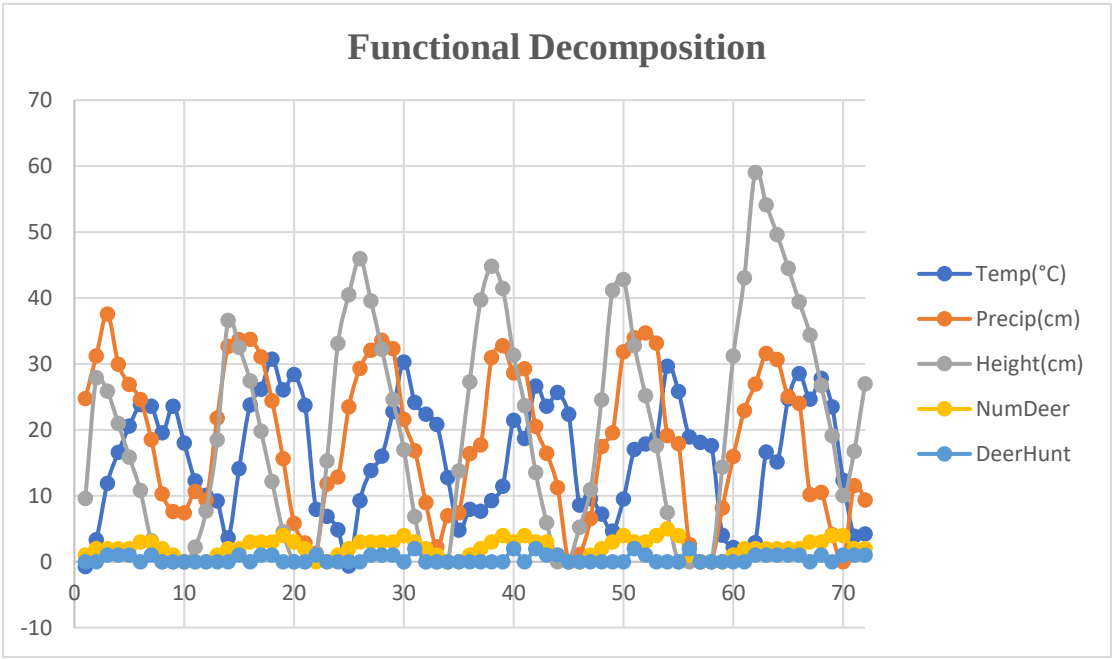
2. A table showing values for temperature, precipitation, number of deer, height of the grain, and your own-choice quantity as a function of month number.

| Month | Temp(°C) | Precip(cm) | Height(cm) | NumDeer | DeerHunt |
|---|---|---|---|---|---|
| 1 | -0.72727 | 24.7675 | 9.60398 | 1 | 0 |
| 2 | 3.33127 | 31.2329 | 27.8963 | 2 | 0 |
| 3 | 11.8782 | 37.5784 | 25.8478 | 2 | 1 |
| 4 | 16.5904 | 29.9708 | 20.9537 | 2 | 1 |
| 5 | 20.5625 | 26.8841 | 15.8787 | 2 | 1 |
| 6 | 23.8196 | 24.6236 | 10.7988 | 3 | 0 |
| 7 | 23.6079 | 18.5527 | 3.17898 | 3 | 1 |
| 8 | 19.5372 | 10.2781 | 0 | 2 | 0 |
| 9 | 23.5705 | 7.61389 | 0 | 1 | 0 |
| 10 | 17.9969 | 7.41675 | 0 | 0 | 0 |
| 11 | 12.2814 | 10.6919 | 2.23483 | 0 | 0 |
| 12 | 10.0815 | 9.35831 | 7.71415 | 0 | 0 |
| 13 | 9.1998 | 21.8172 | 18.4847 | 1 | 0 |
| 14 | 3.65071 | 32.6545 | 36.5882 | 2 | 0 |
| 15 | 14.1152 | 33.7072 | 32.5006 | 2 | 1 |
| 16 | 23.8016 | 33.734 | 27.4207 | 3 | 0 |
| 17 | 26.1699 | 31.0757 | 19.8007 | 3 | 1 |
| 18 | 30.7309 | 24.4024 | 12.1807 | 3 | 1 |
| 19 | 26.0622 | 15.65 | 4.56068 | 4 | 0 |

| | | | | | |
|---|---|---|---|---|---|
| 20 | 28.3773 | 5.82643 | 0 | 3 | 0 |
| 21 | 23.751 | 2.85973 | 0 | 2 | 0 |
| 22 | 7.95756 | 1.32616 | 1.16139 | 0 | 1 |
| 23 | 6.88591 | 11.7891 | 15.3029 | 0 | 0 |
| 24 | 4.83406 | 12.8585 | 33.1291 | 1 | 0 |
| 25 | -0.6174 | 23.515 | 40.5008 | 2 | 0 |
| 26 | 9.25533 | 29.3228 | 45.9658 | 3 | 0 |
| 27 | 13.8267 | 32.1024 | 39.5767 | 3 | 1 |
| 28 | 16.0298 | 33.5984 | 32.2229 | 3 | 1 |
| 29 | 22.7672 | 32.3251 | 24.6033 | 3 | 1 |
| 30 | 30.3056 | 21.5953 | 16.9833 | 4 | 0 |
| 31 | 24.1908 | 16.8283 | 6.82334 | 3 | 2 |
| 32 | 22.394 | 8.97042 | 0 | 2 | 0 |
| 33 | 20.8237 | 2.26159 | 0 | 1 | 0 |
| 34 | 12.758 | 7.00487 | 0 | 0 | 0 |
| 35 | 4.78464 | 7.42595 | 13.803 | 0 | 0 |
| 36 | 7.96938 | 16.4154 | 27.2895 | 1 | 0 |
| 37 | 7.64882 | 17.7211 | 39.7085 | 2 | 0 |
| 38 | 9.28775 | 30.9523 | 44.8202 | 3 | 0 |
| 39 | 11.4665 | 32.7768 | 41.4523 | 4 | 0 |
| 40 | 21.4605 | 28.6374 | 31.2942 | 3 | 2 |
| 41 | 18.6786 | 29.2554 | 23.7056 | 4 | 0 |
| 42 | 26.6616 | 20.5178 | 13.5456 | 3 | 2 |
| 43 | 23.5779 | 16.4746 | 5.92579 | 3 | 1 |
| 44 | 25.6696 | 11.2673 | 0 | 1 | 1 |
| 45 | 22.3695 | 0 | 0 | 0 | 0 |
| 46 | 8.59927 | 1.09897 | 5.23174 | 0 | 0 |
| 47 | 9.53648 | 6.53994 | 10.9174 | 1 | 0 |
| 48 | 7.20622 | 17.4807 | 24.5781 | 2 | 0 |
| 49 | 4.6666 | 19.5548 | 41.1443 | 3 | 0 |
| 50 | 9.52392 | 31.8521 | 42.814 | 4 | 0 |
| 51 | 17.03 | 33.981 | 32.7745 | 3 | 2 |
| 52 | 17.8717 | 34.703 | 25.2125 | 3 | 1 |
| 53 | 18.798 | 33.1675 | 17.6188 | 4 | 0 |
| 54 | 29.6544 | 19.1325 | 7.45881 | 5 | 0 |
| 55 | 25.8285 | 17.897 | 0 | 4 | 0 |
| 56 | 18.9179 | 2.60021 | 0 | 1 | 2 |

| | | | | | |
|---|---|---|---|---|---|
| 57 | 18.1235 | 0 | 0 | 0 | 0 |
| 58 | 17.6007 | 0 | 0.03085 | 0 | 0 |
| 59 | 4.04126 | 8.14776 | 14.3669 | 0 | 0 |
| 60 | 2.16561 | 15.9502 | 31.1895 | 1 | 0 |
| 61 | 0.71309 | 22.918 | 43.0712 | 2 | 0 |
| 62 | 2.88829 | 26.9243 | 59.0502 | 2 | 1 |
| 63 | 16.6697 | 31.6024 | 54.14 | 2 | 1 |
| 64 | 15.1387 | 30.6953 | 49.5982 | 2 | 1 |
| 65 | 24.6937 | 25.0306 | 44.5182 | 2 | 1 |
| 66 | 28.5299 | 24.0429 | 39.4382 | 2 | 1 |
| 67 | 24.6392 | 10.183 | 34.3583 | 3 | 0 |
| 68 | 27.8266 | 10.5208 | 26.7383 | 3 | 1 |
| 69 | 23.4793 | 4.13506 | 19.1184 | 4 | 0 |
| 70 | 12.3571 | 0 | 10.0644 | 4 | 1 |
| 71 | 3.88091 | 11.5671 | 16.7234 | 2 | 1 |
| 72 | 4.19732 | 9.37445 | 26.9662 | 2 | 1 |

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.



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?

   I found that there existed a cyclical change in temperature and precipitation per year. It directly influenced the yield of grain (*Grey line*) and the number of deer (*Yellow line*). Furthermore, the deer-hunted number (*Light blue line*) was also related to it. Based on the graph, we can derive that their relationship is positively correlated. While the number of deer rose (*Yellow line*), then deer-hunted number (*Light blue line*) also increased because it means that the probability of deer being hunted increases.