**CS 475/575 -- Spring Quarter 2017**

**Project #4**

### Functional Decomposition

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For this project, I simulated with the quantities required, and I also added a human influence, which human will kill deer randomly, every month human will go to this area, and kill 0 to 2 deer. Then I got the following table, which have changed to cm and °C, and graph.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| NumDeer | Precip(cm) | Temp(C) | Height(cm) | DeerKilled |
| 1 | 22.225 | -6.283333333 | 0 | 0 |
| 0 | 28.702 | -2.222222222 | 3.4544 | 2 |
| 1 | 35.0266 | 6.322222222 | 19.1516 | 0 |
| 2 | 27.432 | 11.03333333 | 22.8346 | 0 |
| 1 | 24.3332 | 15.00555556 | 20.828 | 2 |
| 2 | 22.0726 | 18.26666667 | 19.6088 | 0 |
| 3 | 16.002 | 18.05 | 17.1196 | 0 |
| 4 | 7.747 | 13.98333333 | 13.9446 | 0 |
| 3 | 5.08 | 18.01666667 | 8.9154 | 2 |
| 4 | 4.8768 | 12.43888889 | 6.4262 | 0 |
| 1 | 8.1534 | 6.727777778 | 12.1666 | 2 |
| 2 | 6.8072 | 4.527777778 | 22.8092 | 0 |
| 3 | 19.2786 | 3.644444444 | 39.0398 | 0 |
| 4 | 30.1244 | -1.905555556 | 40.5384 | 0 |
| 3 | 31.1658 | 8.561111111 | 46.609 | 2 |
| 4 | 31.1912 | 18.24444444 | 42.8498 | 0 |
| 4 | 28.5242 | 20.61666667 | 37.7698 | 1 |
| 5 | 21.8694 | 25.17777778 | 32.6898 | 0 |
| 6 | 13.1064 | 20.50555556 | 26.3398 | 0 |
| 7 | 3.2766 | 22.82222222 | 18.7198 | 0 |
| 8 | 0.3302 | 18.19444444 | 9.8552 | 0 |
| 7 | 0 | 2.4 | 6.223 | 0 |
| 5 | 9.2456 | 1.327777778 | 7.239 | 1 |
| 3 | 10.3124 | -0.722222222 | 6.9088 | 1 |
| 2 | 20.9804 | -6.172222222 | 3.6068 | 0 |
| 1 | 26.7716 | 3.7 | 20.955 | 0 |
| 1 | 29.5656 | 8.272222222 | 32.004 | 1 |
| 2 | 31.0642 | 10.47222222 | 36.6776 | 0 |
| 3 | 29.7942 | 17.21111111 | 34.2392 | 0 |
| 4 | 19.05 | 24.75 | 30.4292 | 0 |
| 5 | 14.3002 | 18.63333333 | 25.3746 | 0 |
| 6 | 6.4262 | 16.83888889 | 19.1008 | 0 |
| 6 | 0 | 15.26666667 | 11.6586 | 1 |
| 5 | 4.4704 | 7.2 | 12.0904 | 0 |
| 4 | 4.8768 | -0.772222222 | 10.1092 | 0 |
| 3 | 13.8684 | 2.411111111 | 19.5072 | 0 |
| 3 | 15.1892 | 2.094444444 | 30.1498 | 1 |
| 4 | 28.4226 | 3.733333333 | 46.0502 | 0 |
| 5 | 30.226 | 5.911111111 | 59.2582 | 0 |
| 5 | 26.0858 | 15.90555556 | 53.1876 | 1 |
| 6 | 26.7208 | 13.12222222 | 48.5902 | 0 |
| 7 | 17.9832 | 21.10555556 | 40.9956 | 0 |
| 8 | 13.9446 | 18.02222222 | 32.131 | 0 |
| 7 | 8.7376 | 20.11666667 | 21.971 | 2 |
| 6 | 0 | 16.81666667 | 13.1318 | 2 |
| 4 | 0 | 3.044444444 | 12.5476 | 1 |
| 5 | 3.9878 | 3.983333333 | 17.3736 | 0 |
| 4 | 14.9352 | 1.65 | 24.3586 | 2 |
| 5 | 17.018 | -0.888888889 | 26.5176 | 0 |
| 4 | 29.3116 | 3.966666667 | 39.878 | 2 |
| 4 | 31.4452 | 11.47222222 | 38.6588 | 1 |
| 4 | 32.1564 | 12.31666667 | 36.1188 | 1 |
| 3 | 30.6324 | 13.24444444 | 32.639 | 2 |
| 4 | 16.5862 | 24.1 | 28.829 | 0 |
| 4 | 15.367 | 20.27222222 | 23.749 | 1 |
| 4 | 0.0508 | 13.36111111 | 19.2278 | 1 |
| 4 | 0 | 12.56666667 | 15.0368 | 1 |
| 4 | 0 | 12.04444444 | 11.0998 | 1 |
| 5 | 5.6134 | -1.516666667 | 9.525 | 0 |
| 2 | 13.4112 | -3.388888889 | 5.4102 | 2 |
| 1 | 20.3708 | -4.844444444 | 4.064 | 2 |
| 2 | 24.384 | -2.666666667 | 6.731 | 0 |
| 3 | 29.0576 | 11.11666667 | 8.89 | 0 |
| 4 | 28.1432 | 9.583333333 | 13.6144 | 0 |
| 4 | 22.479 | 19.13888889 | 8.5598 | 1 |
| 3 | 21.5138 | 22.97222222 | 3.4798 | 0 |
| 2 | 7.6454 | 19.08333333 | 0 | 0 |
| 0 | 7.9756 | 22.27222222 | 0 | 1 |
| 0 | 1.6002 | 17.92222222 | 0.0254 | 0 |
| 1 | 0 | 6.8 | 6.2738 | 0 |
| 2 | 9.017 | -1.672222222 | 8.9916 | 0 |
| 3 | 6.8326 | -1.355555556 | 10.4394 | 0 |

After I adding deer killing quantity, the height affected by temperature and precipitation, when temperature went high, grain will grow higher, precipitation affected in the same way. In addition, there is deer which would eat grain, when deer amount high, grain height will become lower. So, grain, temp and precipitation almost fit cosine curve. Deer should be cosine curve, but because I added human factor, so it not performs like that, and with deer perturbed, grain height have some changes, but not that big.