Bryce Egley

CS475

Project 4 Write Up

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

Answer: I choose to create a predator. There was only 1 predator throughout the simulation. The predator had a 20% or 1/5 chance of hunting down and killing a deer.

This meets the project requirement since it directly effects the number of deer and indirectly effects the grain, since if a deer is killed off then less grain will be eaten.

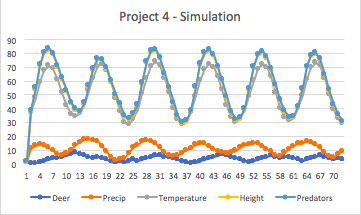
1. A table showing values for temperature, precipitation, number of graindeer, height of the grain, and your own-choice quantity as a function of month number.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Month | Year | Deer | Precip | Temperature | Height | Predators |
| 0 | 2017 | 1 | 0 | 0 | 3.58E-07 | 1 |
| 1 | 2017 | 0 | 11.4407 | 25.8673 | 0.563272 | 1 |
| 2 | 2017 | 0 | 12.9936 | 34.833 | 6.16374 | 1 |
| 3 | 2017 | 1 | 12.9936 | 45.1858 | 11.7533 | 1 |
| 4 | 2017 | 2 | 11.4407 | 54.1516 | 12.3109 | 1 |
| 5 | 2017 | 3 | 8.75099 | 59.3279 | 11.4988 | 1 |
| 6 | 2017 | 4 | 5.64516 | 59.3279 | 10.1567 | 1 |
| 7 | 2017 | 4 | 2.95544 | 54.1516 | 8.81406 | 1 |
| 8 | 2017 | 5 | 1.40252 | 45.1858 | 9.73337 | 1 |
| 9 | 2017 | 6 | 1.40252 | 34.833 | 10.1584 | 1 |
| 10 | 2017 | 7 | 2.95544 | 25.8673 | 7.8193 | 1 |
| 11 | 2017 | 8 | 5.64517 | 20.6909 | 4.47833 | 1 |
| 0 | 2018 | 7 | 8.75099 | 20.6909 | 0.667607 | 1 |
| 1 | 2018 | 6 | 11.4407 | 25.8673 | 0 | 1 |
| 2 | 2018 | 5 | 12.9936 | 34.833 | 2.60046 | 1 |
| 3 | 2018 | 4 | 12.9936 | 45.1858 | 5.69 | 1 |
| 4 | 2018 | 5 | 11.4407 | 54.1516 | 4.74762 | 1 |
| 5 | 2018 | 4 | 8.75099 | 59.3279 | 2.43552 | 1 |
| 6 | 2018 | 3 | 5.64516 | 59.3279 | 0.593399 | 1 |
| 7 | 2018 | 2 | 2.95544 | 54.1516 | 0 | 1 |
| 8 | 2018 | 1 | 1.40252 | 45.1858 | 1.91932 | 1 |
| 9 | 2018 | 2 | 1.40252 | 34.833 | 4.34434 | 1 |
| 10 | 2018 | 1 | 2.95544 | 25.8673 | 4.00524 | 1 |
| 11 | 2018 | 2 | 5.64517 | 20.6909 | 3.66428 | 1 |
| 0 | 2019 | 3 | 8.75099 | 20.6909 | 2.85355 | 1 |
| 1 | 2019 | 2 | 11.4407 | 25.8673 | 2.41682 | 1 |
| 2 | 2019 | 3 | 12.9936 | 34.833 | 7.01729 | 1 |
| 3 | 2019 | 4 | 12.9936 | 45.1858 | 11.1068 | 1 |
| 4 | 2019 | 5 | 11.4407 | 54.1516 | 10.1644 | 1 |
| 5 | 2019 | 6 | 8.75099 | 59.3279 | 7.85234 | 1 |
| 6 | 2019 | 6 | 5.64516 | 59.3279 | 5.01022 | 1 |
| 7 | 2019 | 5 | 2.95544 | 54.1516 | 2.66761 | 1 |
| 8 | 2019 | 5 | 1.40252 | 45.1858 | 3.08692 | 1 |
| 9 | 2019 | 4 | 1.40252 | 34.833 | 3.51194 | 1 |
| 10 | 2019 | 3 | 2.95544 | 25.8673 | 2.17285 | 1 |
| 11 | 2019 | 2 | 5.64517 | 20.6909 | 0.831884 | 1 |
| 0 | 2020 | 1 | 8.75099 | 20.6909 | 0.0211568 | 1 |
| 1 | 2020 | 0 | 11.4407 | 25.8673 | 0.584429 | 1 |
| 2 | 2020 | 1 | 12.9936 | 34.833 | 6.18489 | 1 |
| 3 | 2020 | 2 | 12.9936 | 45.1858 | 11.2744 | 1 |
| 4 | 2020 | 3 | 11.4407 | 54.1516 | 11.332 | 1 |
| 5 | 2020 | 4 | 8.75099 | 59.3279 | 10.0199 | 1 |
| 6 | 2020 | 5 | 5.64516 | 59.3279 | 8.17783 | 1 |
| 7 | 2020 | 6 | 2.95544 | 54.1516 | 6.33521 | 1 |
| 8 | 2020 | 7 | 1.40252 | 45.1858 | 6.25453 | 1 |
| 9 | 2020 | 6 | 1.40252 | 34.833 | 5.67955 | 1 |
| 10 | 2020 | 5 | 2.95544 | 25.8673 | 3.34045 | 1 |
| 11 | 2020 | 4 | 5.64517 | 20.6909 | 0.99949 | 1 |
| 0 | 2021 | 3 | 8.75099 | 20.6909 | 0 | 1 |
| 1 | 2021 | 2 | 11.4407 | 25.8673 | 0 | 1 |
| 2 | 2021 | 1 | 12.9936 | 34.833 | 4.60046 | 1 |
| 3 | 2021 | 2 | 12.9936 | 45.1858 | 9.69 | 1 |
| 4 | 2021 | 3 | 11.4407 | 54.1516 | 9.74762 | 1 |
| 5 | 2021 | 4 | 8.75099 | 59.3279 | 8.43552 | 1 |
| 6 | 2021 | 5 | 5.64516 | 59.3279 | 6.5934 | 1 |
| 7 | 2021 | 6 | 2.95544 | 54.1516 | 4.75078 | 1 |
| 8 | 2021 | 5 | 1.40252 | 45.1858 | 4.6701 | 1 |
| 9 | 2021 | 4 | 1.40252 | 34.833 | 5.09512 | 1 |
| 10 | 2021 | 5 | 2.95544 | 25.8673 | 3.75602 | 1 |
| 11 | 2021 | 5 | 5.64517 | 20.6909 | 1.41506 | 1 |
| 0 | 2022 | 4 | 8.75099 | 20.6909 | 0 | 1 |
| 1 | 2022 | 3 | 11.4407 | 25.8673 | 0 | 1 |
| 2 | 2022 | 2 | 12.9936 | 34.833 | 4.10046 | 1 |
| 3 | 2022 | 3 | 12.9936 | 45.1858 | 8.69 | 1 |
| 4 | 2022 | 4 | 11.4407 | 54.1516 | 8.24762 | 1 |
| 5 | 2022 | 5 | 8.75099 | 59.3279 | 6.43552 | 1 |
| 6 | 2022 | 6 | 5.64516 | 59.3279 | 4.0934 | 1 |
| 7 | 2022 | 5 | 2.95544 | 54.1516 | 1.75078 | 1 |
| 8 | 2022 | 4 | 1.40252 | 45.1858 | 2.1701 | 1 |
| 9 | 2022 | 3 | 1.40252 | 34.833 | 3.09512 | 1 |
| 10 | 2022 | 4 | 2.95544 | 25.8673 | 2.25602 | 1 |
| 11 | 2022 | 3 | 5.64517 | 20.6909 | 0.415062 | 1 |

1. A graph showing temperature, precipitation, number of graindeer, 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.

cm = inches \* 2.54   
°C = (5./9.)\*(°F-32)

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



1. 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?

Answer: The simulation graph shows a clear curve where temperature, precipitation, height, and number of deers all follow which makes sense since this would represent the seasons. The predators I created will be eating the deers with 1/5 chance so any month where the number of deers drops very low would probably be a result of the predator I created.