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Project 2 Report

For my phenomenon/interaction I chose to incorporate a farmer entity. This farmer performs four main actions. He waters the grass when it falls below 10 inches, which is added to the overall precipitation. He cuts the grass when it is taller than 75 inches. He breeds more rabbits when there are less than two of them and the grass is tall. Lastly, when he has more that 15 rabbits, he sells half of them. In the code I added another barrier after the computations and assignments were made so that farming only occurs after all other data is calculated. This way the farmers actions are a response to the updated environment.



The graph depicts how different elements on this rabbit farm “ecosystem” change over time. Temperature is really the only independent factor. It follows a cosine curve reaching its top temperatures during the summer months (months 6-8, 18-20, which correspond with June, July August) and its lower temperatures in the winter month respectively.

Precipitation is technically also an independent variable. However, my data includes the farmers watering when calculating precipitation. The precipitation level increases by 10 inches anytime the grass is less than 10 inches tall. This is most noticeable at months 1, 10, and 27 where the grass height drops below 10 inches, and the precipitation immediately spikes up 10 inches. Other than those instances, precipitation follows a sine curve where it has more rain in the spring months.

Grass height increases dramatically when temperatures and rain levels are high and rabbit population is relatively low. We can see this condition occur at months 3, 17, 40, and 63. Interestingly it appears that the grass has a pattern of spiking then dropping slightly before reaching its max height. This appears to be mostly due to the dropping precipitation aligning with increasing rabbit populations. This is most noticeable at months 3-10 and 40-47 with months 17-25 being the one outlier to this pattern. The most noticeable action of the farmer is when he cuts the grass. By looking at the data we can see that at months 11, 48, and 64 the grass surpasses 75 inches which causes the farmer to cut the grass down to 10 inches.

Mowing the grass is the main event that causes the rabbit population to start to decrease which is to be expected. The other event is when the population exceeds 15 at months 26 and 48. This triggers the farmer to cut the population in half by means of selling them. We can see that at months 27 and 49 the population drops down to 7. The last action of the farmer is not very noticeable in the graph. The farmer breeds rabbits when there is fewer than two. The only indication of this is that the rabbit population never drops below two and there appears to be small increases at months 56 and 72.