Assignment 0

**Model One:**

The first model I chose to explore is the “Traffic Basic” model. One thing I learned immediately based on the “Things to Notice” section of the model information is that the concepts and logic behind the model is typically examined and understood when creating the model. I also learned that based on the previous examination of the concepts and logic, variables are extracted and used in the model. These variables are then made adjustable for exploration and observation purposes. Exploring the model I can clearly see a wave affect in which initially max speed and in speed were high(0.93 and 0.19 respectively), as the model progressed the max and min speed decreased and stayed at a steady rate for the remaining model run time. We can also see in the graphic that once the cars speed up again, they loop back and hit the jam again which was pushed back based on sequence.

Graphical user interface, application

Description automatically generated

On the extended model it prompted to adjust the variables to reduce the occurrence of jams and have the jam move forward rather than backwards. By adjusting the deceleration to 0 and keeping acceleration to a value of 0.005, I was able to achieve a slight initial jam that moved forward and evened into a stead stream with no jams.

Graphical user interface

Description automatically generated

**Model Two:**

The second model I chose to explore was the “Virus” model. Like the first model, the concepts are explored and understood to create variables that influence the model based on the real-life concept. Concepts of infections initially behave, and their variable behaviour is examined. One note would be the comparison between an initial explosion of infections vs a slow build of infections. The initial explosion being shorter lived than the slow build up, with the exclusion of a high reproduction rating. The factors that play a role in an infections life span include the number of potential hosts, the infectious rating, the recover chance, and the duration of the infection. With the default numbers, we can see a pattern of pretty consistent spikes, as immunity percentage goes down, the infected percentage begins to rise and vice versa.

Graphical user interface

Description automatically generated

**Model Three:**

The third model I chose to try out was the “Ant Lines” model. This model explores the exploration line a leader ant lays down and how following ants adhere to this line. I learned that the line isn’t followed exactly. Following ants alter their path to reduce time, a line of best fit if you would. This line is also affected by how close the ants follow the leader and how many ants are following. The sooner the followers leave, or the close they follow the tighter knit the two lines will seem. If there are less ants, the lines will also be tighter. Vice versa, if they wait a bit longer to leave, they line becomes less tight knit and more averaged out, and the more ants that follow, whether closely or not, the more averaged the follow line becomes.

Below we can see a close follow time with a lot of ants.

Chart

Description automatically generated

Below we can see a close follow time with a small number of ants.

Chart

Description automatically generated with low confidence

Below we can see a long follow time with a lot of ants

A picture containing graphical user interface

Description automatically generated

Below we can see a long follow time with a little bit of ants.

Graphical user interface

Description automatically generated with medium confidence

**Extended Model:**

I chose to extend the ant lines model and add some following ant behaviour. I began by adding a follower-wiggle-angle slider. This will provide a value to the wiggle function called by the followers in the code. I then update the followers following behaviours to include wiggles.

Chart

Description automatically generatedGraphical user interface, text, application, email

Description automatically generated

Th behaviour is optimally seen when you increase the follow wiggle angle and the leader wiggle angle are on either side of the extremes.

Graphical user interface

Description automatically generatedGraphical user interface

Description automatically generated

The resulting outcome is a less efficient following model in terms of line smoothing, however expressed a more realistic pattern.