ABM Project 3: Alien Invasion

**Why this example?**

* Out of all the options available to us, this one was the most compelling.
* Obviously, this was the only option to pick, however, I put my own flair on it and since the nature of the groundhog example is reacting to an unwanted predator, I thought an alien invasion would be interesting.
* I was also intrigued at the idea of defending the “habitat” and when I switched it up to Aliens instead of groundhogs, I thought it would be cool to add missiles that could try to “shoot” the alien ships down.

**What is it?**

* This project depicts the groundhog exhibit concept with a sci-fi twist as it simulates and alien invasion with civilians scrambling for safety in underground bunkers while soldiers’ man the defenses to try to shoot down the spacecraft.

**How does it work?**

* Several breeds are created to keep track of the different turtles needed to complete the tasks. Aliens spawn after a certain amount of ticks and then after a mouse click, an alarm is metaphorically sounded that alerts the people to the ongoing invasion. This triggers behaviors for each agent set.

**How to use it?**

* Beyond the straightforward buttons, a mouse click is required to “sound the alarm” and trigger the behaviors associated with it. Additional click fire missiles that can potentially destroy and fend off the attack.

**Things to Notice**

* The difference in movement and behaviors of the different human breeds
* The counters that keep track of humans in the bunkers and total population
* The number of aliens remaining if the defense missiles are used

**Things to Try**

* Try eradicating the aliens using the missile defense system before the population is wiped out
* Try toggling the different movement speeds to see if the aliens can wipe out the majority of the civilization including the ones fleeing for the bunkers.

**Extending the Model**

* I wanted to add some better scenery such as drawing roads and maybe some houses to look like a city, but this was just going to be too time consuming at this point. Additionally, the missiles are fired at a specified heading angle. With more time, I could likely tweak them to seek out the alien ships like a “heat seeking missile.”

**NetLogo Features**

* Everything was fairly straightforward, arguably the most difficult part was confining the spawn locations to a certain range.
* Also, it took a bit of work to accurately count the number of turtles that made it to safety and to ensure that the aliens didn’t “abduct” a hidden turtle that was still moving invisibly through the map.

**Credits and References**

* Wilensky, U. (1999). NetLogo. http://ccl.northwestern.edu/netlogo/. Center for Connected Learning and Computer-Based Modeling, Northwestern University, Evanston, IL