**Unit 3 – Activity 3**

**Coding Non-Constant Velocity Motion**

Using what we learned in Activity 2, we will now try to code a car moving with a non-constant velocity. We will code three cars moving at the same time, each one using one of the three next-x functions we came up with in Activity 2 and compare each of their motions to that of a pace car. Open the starter code found here: <https://tinyurl.com/y6uh4q2u>.

1. Note that only how we calculate the positions of each car will be different, so all three cars will use the same function to increase their velocity. Complete this function, called next-v, on lines 8-10 so that all of the cars will move with a constant velocity of 20 m/s2.
2. Car 1, the black car, will use the next-x function you wrote on the bottom of page 2 of Activity 2. Fill that in for the function next-x1 on lines 18-20. Based on your understanding of Activity 2, how would you expect this car’s position to compare to that of the pace car?
3. Car 2, the blue car, will use the next-x function you wrote on the bottom of page 3 of Activity 2. Fill that in for the function next-x2 on lines 27-29. Based on your understanding of Activity 2, how would you expect this car’s position to compare to that of the pace car?
4. Car 3, the orange car, will use the next-x function you wrote on the bottom of page 4 of Activity 2. Fill that in for the function next-x3 on lines 36-38. Based on your understanding of Activity 2, how would you expect this car’s position to compare to that of the pace car?
5. Once you’ve filled in all of the missing functions run the simulation. Were your expectations about the motion of each car consistent with what you observed? Explain.
6. Based on the results of this simulation, which next-x function best approximates the motion of an object moving with a constant acceleration and why?