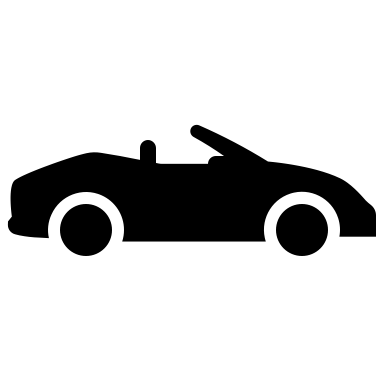
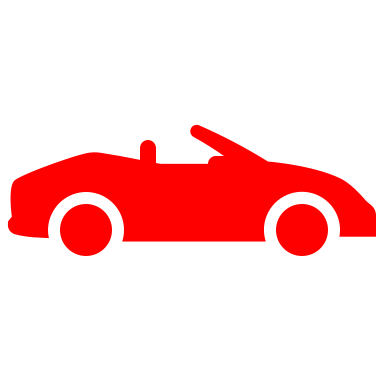
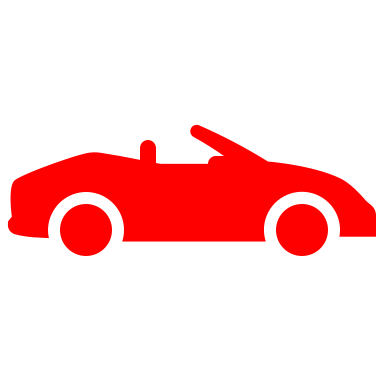
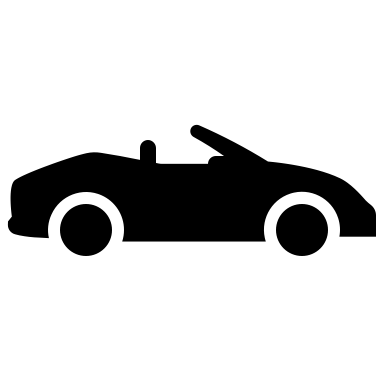
Summary of the goals of our controller:

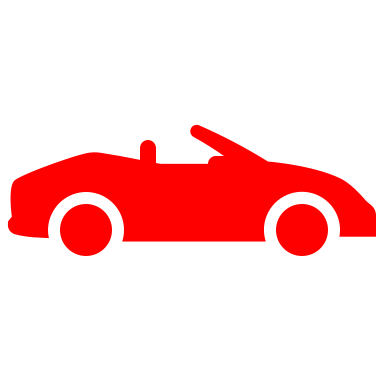
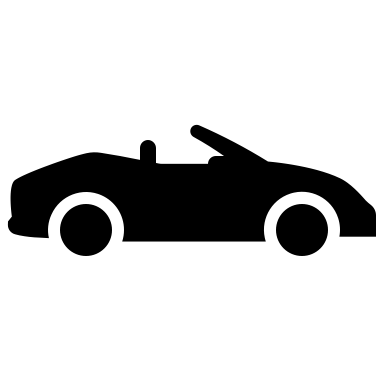
**Case 1.** Lead car is travelling at a higher velocity, TTC is infinite, or lead vehicle does not exist. We plan to insert an acceleration protocol for this Case 1. that will speed up the car to the speed limit when the relative velocity indicates current speed is insufficient.



**Case 2.** Ego Car is approaching lead vehicle with a higher speed, cruise control assist will activate to keep TTC to 4 seconds

**Case 3.** TTC is also in an infinite case. If lead vehicle is detected and Relvel = 0, keep constant acceleration.

**Relvel = 0**

Keep constant acceleration.

Closed Loop SimulationA graph with different colored lines

Description automatically generated

In a closed loop simulation the controller is successful in maintaining safety parameters. The controller accelerates in intervals of ≈ 5 seconds. Strange behavior occurred which we do not fully understand when switching to the sawtooth input, please proceed with caution in testing.