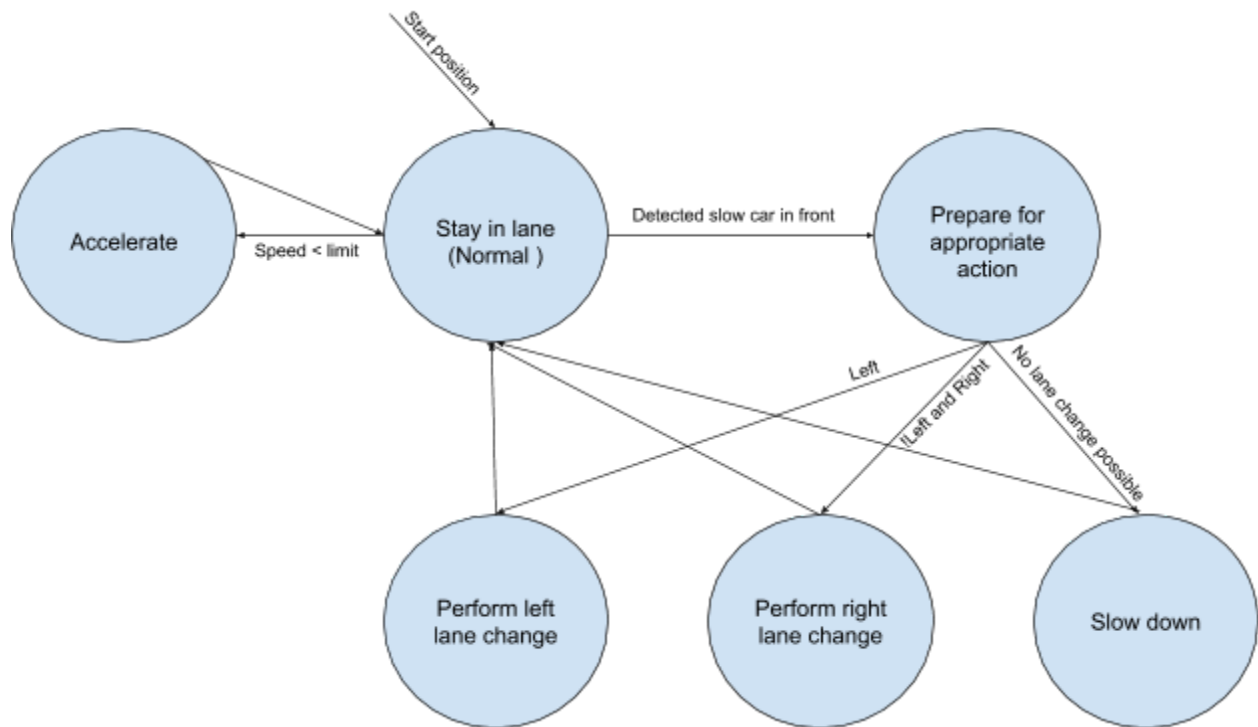


## Path Planning Project:

In this project to navigate the car in the highway situation, the following FSM was created.



The start position is always the Normal state, which makes the car move in the same lane as the car currently resides in. In this project, the starting lane is the middle lane in the simulator. In this state, the car follows its path, and if it has not reached the speed limit, the car will accelerate until the speed limit is reached. If no other car, which is slower than our car, appears in the way, then the same lane is kept by the car with the speed limit of approximately 50 mph. On the other hand, if another slower car appears in the distance closer than 30 meters in front of our car, the car will go to a state for deciding what to do next.

The priorities in this state are changing lane to the left, changing lane to the right, and deceleration respectively. To check whether the car can move to the left, we get the sensor fusion information from all the vehicles in the left lane, if we are not in the leftmost lane, and check if there is a car either approaching or in the distance closer than 20 meters in that lane in front of us. This check prevents collisions in the case that we switch lanes, this condition is called Left in the SFM depicted above. If it is not possible to go to the left lane, because the Left situation didn't hold, then the same check will be performed

for the right lane switch. If no lane change is possible at all, due to crowded lanes, the car will decelerate and slow down.

The check to see if a slower car is in front of us and closer than 3 meters is written in main.cpp lines 272 to 290. A variable called `too_close` will be set that indicates the entry to the state "Prepare for the appropriate action" state in the FSM.

The code for this state is written in main.cpp lines 292 to 345.