Model Description

These are the most important step we should do to generate a trajectory.

- Check all lanes if they are empty in the next 30 m in front of the car and 6m behind the car and record the behind car speed if it exceeded Carla speed.
- Decide to keep lane , decelerate , accelerate or change lane depending on lanes status and other cars speed.
- Create a list of widely spaced (x,y) way points, evenly spaced at 30m , 60m , 90m in front of the car (in s) and in the middle of the lane (in d) besides current point and last one.
- Convert This Frenet space to XY space w.r.t. the car.
- Use spline to convert these 5 points to a feasible polynomial
- For a target point in front of the car (30m in front), output 50 trajectory points using this polynomial taking in consideration the last way-points and current cmd_vel.
- Converting back the trajectory points to be absolute in road map instead of car-frame.

What can be done in the final project:

- Adding prediction module will be a great add-up to the planner.
- Adding a cost function for lanes instead of if conditions.