PATH PLANNING PROJECT

PREDICTION:

This part is implemented in the code 258-313.

Here we use the sensor fusion data to know where the vehicles to know where the vehicles are (In which lane (d) and the s value).

Using these d value we find are there cars in which lanes and with s values we find are the close to us. We use a Boolean variables to assert that we have vehicles within 30 m in front or to left or right of our lane.

Thus we predict the location of the vehicles.

Behavior:

Found in code 315-250

This is the part we decide what to do with the known position of the vehicles.

Here we use the Boolean variables.

If there is a car ahead of us:

Then Check if no car is on left lane and we are not on left lane:

Then make the left lane shift

Else if no car is on right lane and we are not in right lane:

Then make the right lane shift

Else:

Slow our car down so that we might have a chance of lane shift in the next loop

Else if no car in front of us:

Check we are in center lane:

Speed up as we are in correct position and no car is in front of us

Else:

Check if we are in left and car right Boolean is false or check if we are in right lane and car left Boolean is false:

Then make the shift to center lane.

Trajectory Generation:

Found in code 352-452.

This is the part where we generate the trajectory for the behavior we have decided.

Here we use the previous waypoints and compute the remaining waypoints up to 50.

First we take 2 last reference points of the previous waypoints generation and 3 new points with 30 60 90 meters ahead.

We then create a trajectory using spline for these points.

Now we have a trajectory, to execute this trajectory smoothly we need to have points with it we have to reach from time to time to drive smoothly.

To do that we take 50-previous_points and generate it calculating the total N and each distance for x in those N and pass the x to spline to generate y and considered those as waypoints.

Thus the trajectory is generated.

ALL THE CODE ARE EXPLAINED WITH COMMENTS ON WHAT IS BEING DONE.