CMPE 187 - Conformance Testing

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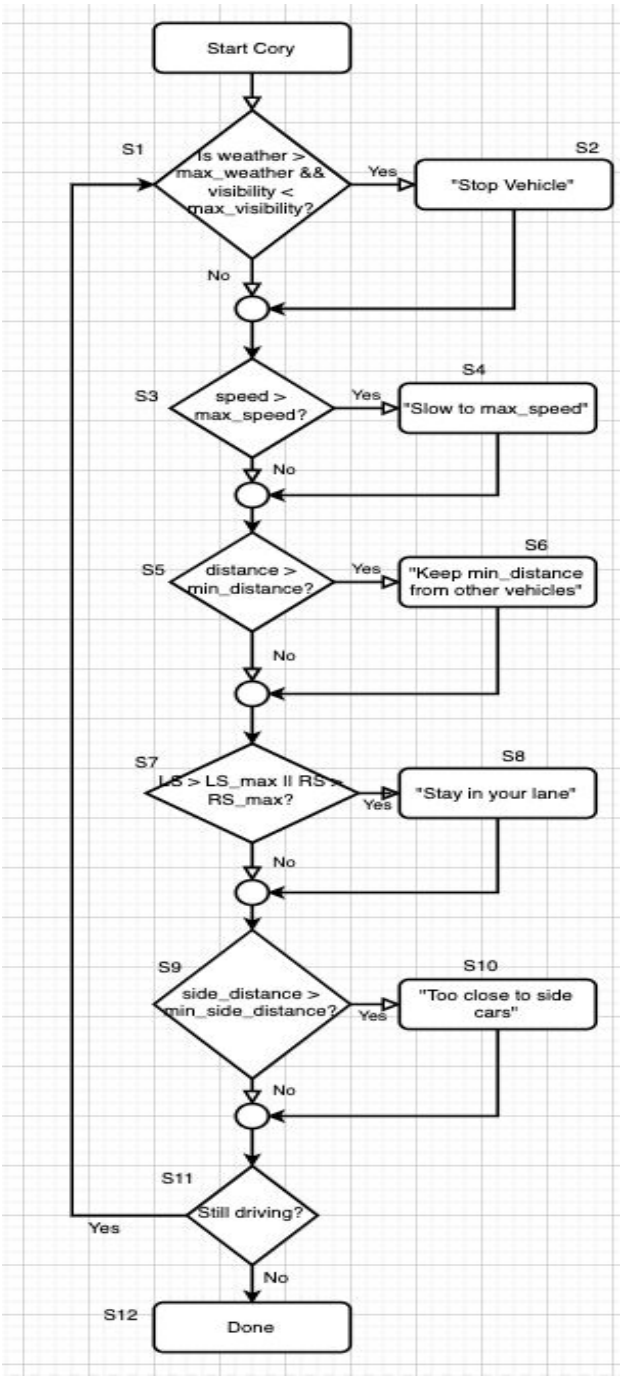
1. Flow Diagram for System

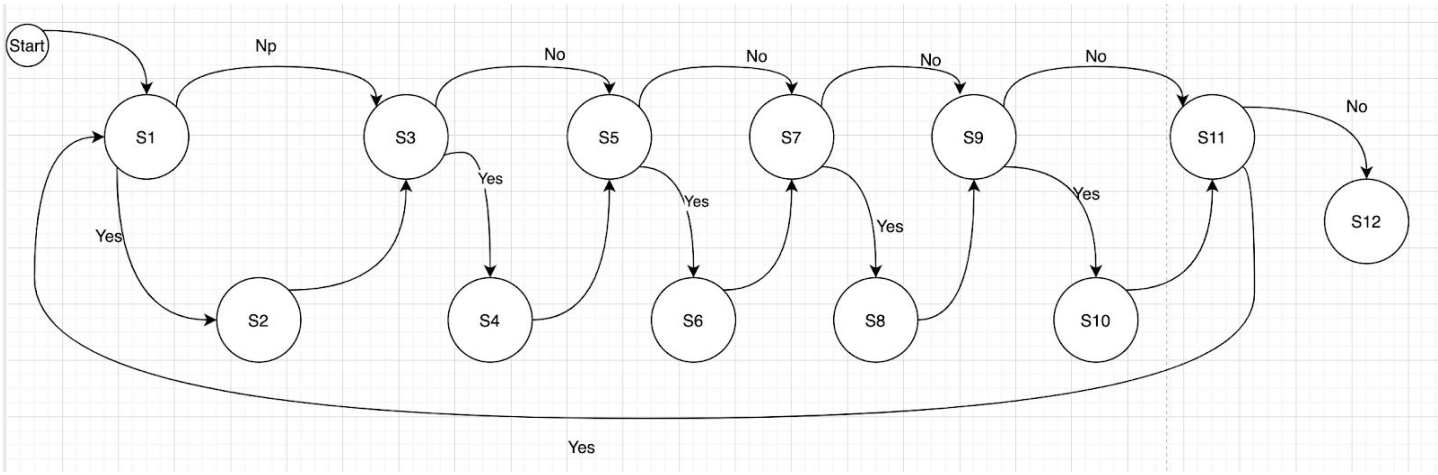


2. Business Rules and Finite State Machine Diagram and Table

Business Rules	
BR1	If Weather is severe and visibility is below safe measure, Then Cory will tell the driver to stop the vehicle. If not, keep going.
BR2	If Driver is driving faster than speed limit, Then Cory will tell the driver to slow down to the speed limit. If not, let the driver keep going.
BR3	If driver is too close to cars in front, Then Cory will tell the driver to maintain a certain distance from the car in front. If not, then keep going.
BR4	If driver is too close to lane boundaries or over, Then Cory will tell the driver to stay in their lane. If not, keep going.
BR5	If the distance between the car parallel to driver's car is less than the minimum distance, Then Cory will tell the driver that they are too close to the car next to them.
BR6	If done driving, Then Cory will say bye. If not, then start from the beginning and check again.

Input	Current State	Next State	Output
Weather > max_weather && visibility > max_visibility	S1	S2	"Stop Vehicle"
Weather <	S1	S3	N/A

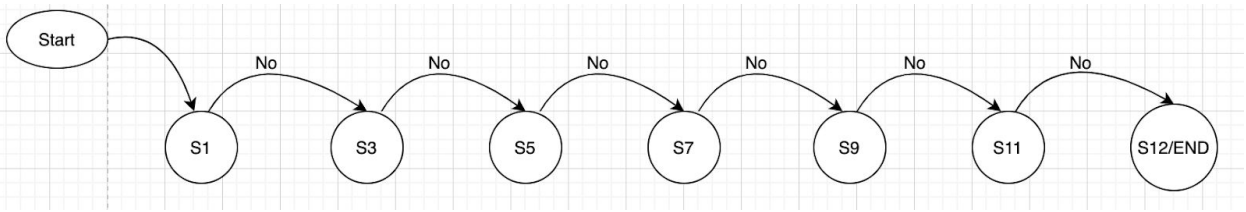
max_weather && visibility < max_visibility			
N/A	S2	S3	N/A
Speed <= max_speed	S3	S5	N/A
Speed >= max_speed	S3	S4	“Slow to max_speed”
N/A	S4	S5	N/A
Distance >= min_distance	S5	S6	“keep min_distance from car in front”
Distance <= min_distance	S5	S7	N/A
N/A	S6	S7	N/A
LS > LS_max || RS > RS_max	S7	S8	“Stay in your lane”
LS < LS_max || RS < RS_max	S7	S9	N/A
N/A	S8	S9	N/A
Side > min_side	S9	S10	“Too close to side cars”
Side < min_side	S9	S11	N/A
N/A	S10	S11	N/A
Done Driving	S11	S12	“Bye”
Not Done Driving	S11	S1	N/A



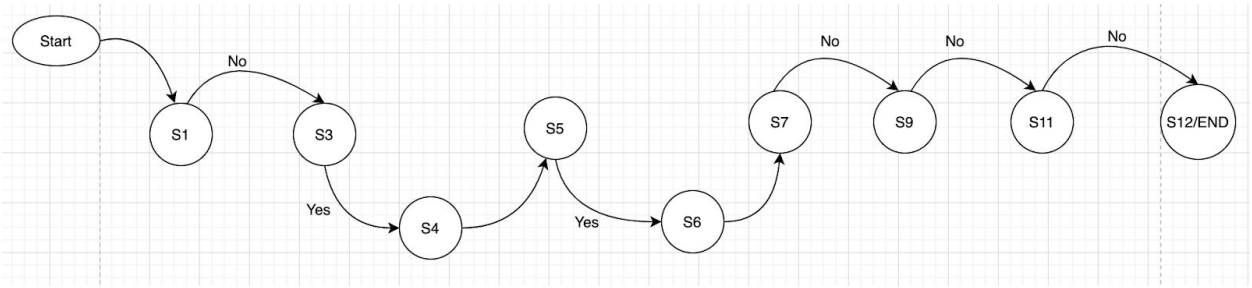
3. Transition Tour & Test Sequences

    a. Transition Tour for FSM (2 sample cases provided)

        i. Case 1 - Car is following all the rules. So, none of the sequence conditions are hit, smooth transition till the end:



        ii. Case 2 - Car is travelling at illegal speed (violating rule S3) and distance is too close to other vehicles (violating S5); however, it is following the rest of the rules:



b. Test Sequences

Test Sequences	S1 >	S2 >	S3 >	S4 >	S5 >	S6 >	S7 >	S8 >	S9 >	S10 >	S11 >	S12 / END
1	NO	N/A	NO	N/A	YES	Applied	NO	N/A	NO	N/A	NO	Complete
2	YES	Applied	NO	N/A	NO	N/A	NO	N/A	YES	Applied	NO	Complete
3	NO	N/A	YES	Applied	NO	N/A	NO	N/A	NO	N/A	YES	Go back to S1
4	NO	N/A	NO	N/A	YES	Applied	NO	N/A	NO	N/A	NO	Complete
5	NO	N/A	NO	N/A	NO	N/A	YES	Applied	NO	N/A	YES	Go back to S1
6	NO	N/A	NO	N/A	NO	N/A	NO	N/A	YES	Applied	YES	Go back to S1
7	YES	Applied	YES	Applied	YES	Applied	YES	Applied	YES	Applied	YES	Go back to S1
8	NO	N/A	NO	N/A	NO	N/A	NO	N/A	NO	N/A	NO	Complete