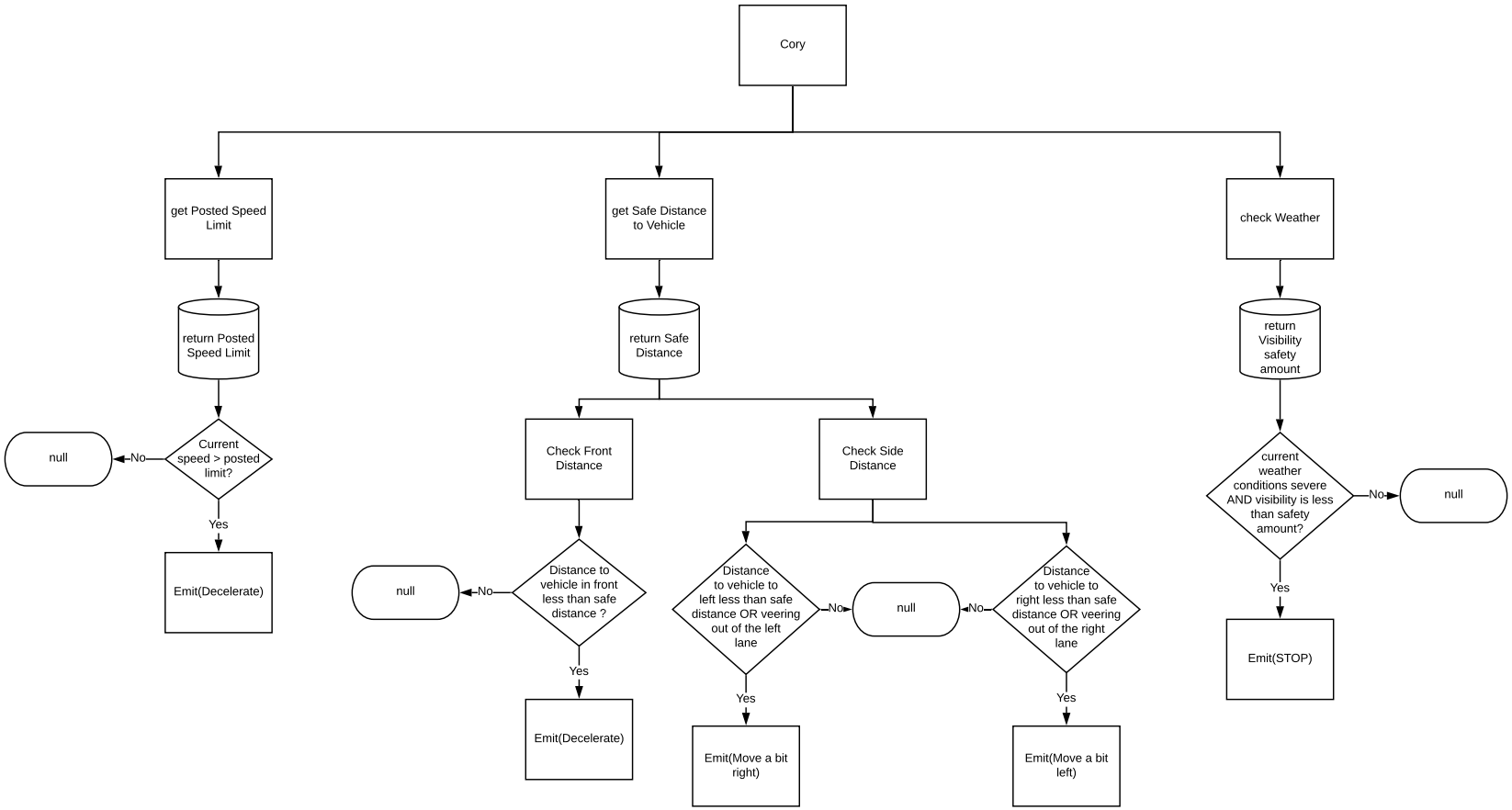

Cory
get Posted Speed Limit
get Safe Distance to Vehicle
check Weather
return Posted Speed Limit
return Safe Distance
return Visibility safety amount
Current speed > posted limit?
No
null
Yes
Emit(Decelerate)
Check Front Distance
Check Side Distance
Distance to vehicle in front less than safe distance ?
No
null
Yes
Emit(Decelerate)
Distance to vehicle to left less than safe distance OR veering out of the left lane
No
null
Yes
Emit(Move a bit right)
Distance to vehicle to right less than safe distance OR veering out of the right lane
Yes
Emit(Move a bit left)
current weather conditions severe AND visibility is less than safety amount?
No
null
Yes
Emit(STOP)

**Business Rules:**
When a user exceeds the posted speed limit Cory alerts the user to decelerate.
When a user gets too close to the vehicle in front of it Cory alerts the user to decelerate
When a user drifts out of their lane Cory alerts the user to move a bit to the right/left to keep the user in their lane.
When a user drifts too close to a vehicle next to it Cory alerts the user to move a bit to the right/left to prevent a collision.
When user corrects error Cory alerts the user that they are driving safely.
If the weather is severe and visibility is lower than a safe measure, Cory alerts the user to stop driving.

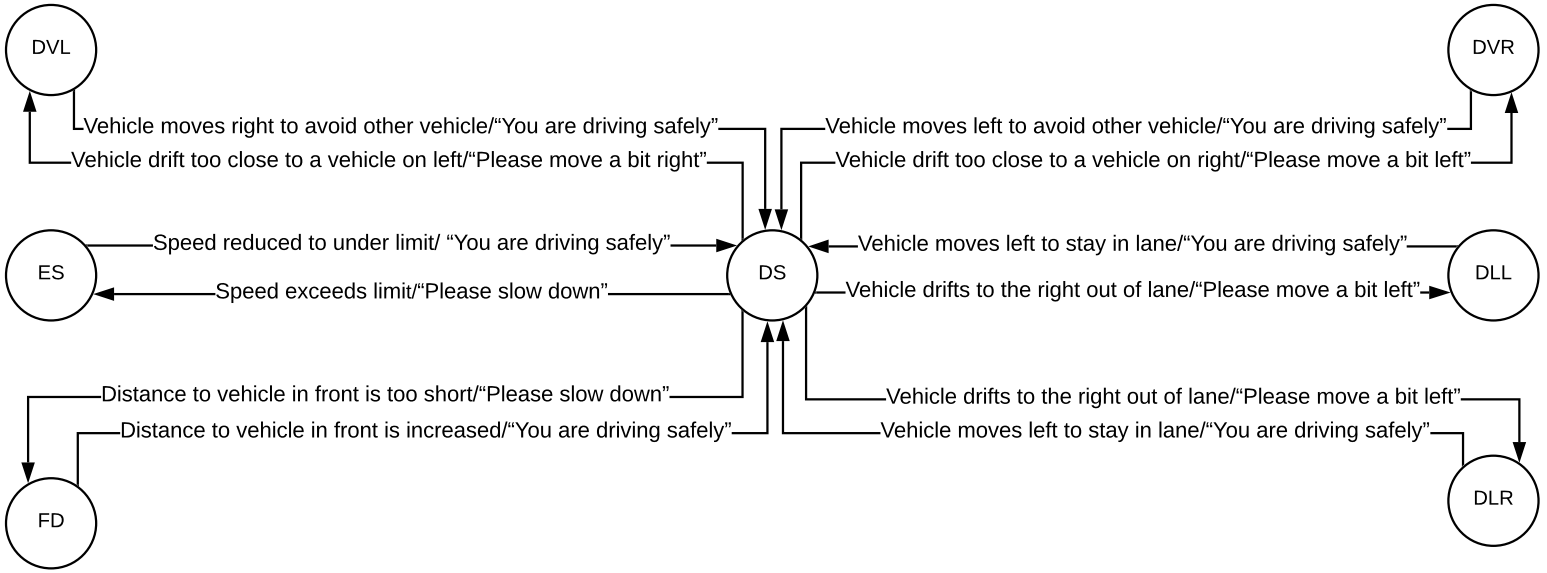
**States:**

| Abbreviation | Expanded Form | Meaning |
|---|---|---|
| DS | Driving Safely | User is driving safely |
| ES | Exceeds speed | User is exceeding posted speed limit |
| FD | Front Distance | User is too close to vehicle in front |
| DLR | Drift lane right | User is drifting right out of lane |
| DLL | Drift lane left | User is drifting left out of lane |
| DVR | Drift vehicle right | User is drifting too close to vehicle on the right |
| DVL | Drift vehicle left | User is drifting too close to vehicle on the left |

**State-Transition Table:**

| Input | Current State | Next State | Output |
|---|---|---|---|
| Speed exceeds limit | DS | ES | “Please slow down” |
| Speed reduced to under limit | ES | DS | “You are driving safely” |

| | | | |
|---|---|---|---|
| Distance to vehicle in front is too short | DS | FD | “Please slow down” |
| Distance to vehicle in front is increased | FTD | DS | “You are driving safely” |
| Vehicle drifts to the right out of lane | DS | DLR | “Please move a bit left” |
| Vehicle moves left to stay in lane | DLR | DS | “You are driving safely” |
| Vehicle drifts to the left out of lane | DS | DLL | “Please move a bit right” |
| Vehicle moves right to stay in lane | DLL | DS | “You are driving safely” |
| Vehicle drift too close to a vehicle on right | DS | DVR | “Please move a bit left” |
| Vehicle moves left to avoid other vehicle | DVR | DS | “You are driving safely” |
| Vehicle drift too close to a vehicle on left | DS | DVL | “Please move a bit right” |
| Vehicle moves right to avoid other vehicle | DLL | DS | “You are driving safely” |


DVL
DVR
Vehicle moves right to avoid other vehicle/“You are driving safely”
Vehicle moves left to avoid other vehicle/“You are driving safely”
Vehicle drift too close to a vehicle on left/“Please move a bit right”
Vehicle drift too close to a vehicle on right/“Please move a bit left”
ES
Speed reduced to under limit/ “You are driving safely”
DS
Vehicle moves left to stay in lane/“You are driving safely”
DLL
Speed exceeds limit/“Please slow down”
Vehicle drifts to the right out of lane/“Please move a bit left”
Distance to vehicle in front is too short/“Please slow down”
Vehicle drifts to the right out of lane/“Please move a bit left”
Distance to vehicle in front is increased/“You are driving safely”
Vehicle moves left to stay in lane/“You are driving safely”
FD
DLR

**Transition Tours:**
<DS: Vehicle drift too close to a vehicle on left>; <DVL: Vehicle moves right to avoid other vehicle
<DS: Speed exceeds limit>; <ES: Speed reduced to under limit>
<DS: Distance to vehicle in front is too short>; <FD: Distance to vehicle in front is increased>
<DS: Vehicle drift too close to a vehicle on right>; <DVR: Vehicle moves left to avoid other vehicles>
<DS: Vehicle drifts to the right out of lane>; <DLL: Vehicle moves left to stay in lane>
<DS: Vehicle drifts to the right out of the lane>; <DLR: Vehicle moves left to stay in lane>

**Test cases:**

| Test Case | Input #1 | Expected Output | Input #2 | Expected Output | Pass/Fail |
|---|---|---|---|---|---|
| Veer left, then correct drift | Vehicle drift too close to vehicle on left | "Please move a bit right" | Vehicle moves right to avoid other vehicle | "You are driving safely" | Pass |
| Vehicle drift too close, but doesn't correct | Vehicle drift too close to vehicle on left | "Please move a bit right" | N/A | N/A | Pass |
| Vehicle stays in center of lane, while safely driving | N/A | N/A | N/A | N/A | Pass |
| Speed exceeds limit and slow down | Exceed speed limit | "Please slow down" | Speed reduced to under speed limit | "You are driving safely" | Pass |
| Speed exceeds limit but does not slow down | Exceed speed limit | "Please slow down" | N/A | N/A | Pass |

**Handling exceptions:**
Handling any exceptions would need to be running any inputs over again. For example, if I am speeding and there's an exception before I'm given instructions to slow down, then an exception would need to re-run a test of the speed, check if I'm speeding, and follow the path correctly. If an exception is then thrown again, I would potentially ask the driver to stop and turn the car off, then on again (e.g. fatal exception).