1920aGroup3 – ParkingLot1

Requirements Document for Parking-Lot Project

Version 4.0 (PURPOSE):

The purpose of the Parking-Lot project is to allow vehicles to enter and exit the parking lot while supporting all complex situations.

The parking-lot is considering every possible situation such as VIP vehicles entering the parking lot, full parking-lot, multiple vehicles want to enter the parking lot.

VIP vehicles enter through a specific gate (the left one) and they are gained priority to enter the parking lot. However, the entrance to the parking lot also depends on the pedestrian traffic lights.

The parking-lot includes two complex situations:

1) General parking-lot maintenance - the whole parking-lot gets reset.
2) Spot maintenance – a specific parking spot is under maintenance. No car is allowed to park in the spot.

Main Assumptions:

1. At the beginning of a simulation the parking lot is empty.
2. Once enable maintenance is set, it is consistent over all run-time.
3. Vehicles of any type are allowed to enter the parking lot while there is space.
4. Eventually, every vehicle which wants to enter the parking lot will enter and not disappear.
5. On current state, if a car wants to exit, no car will exit on next state.
6. Vehicles may enter the parking lot only when the gate is open.
7. Pedestrian don't wait to cross the cross-walk forever.
8. Cars in the parking lot shouldn't collide.
9. Parking-lot environment's variables are reset after parking-lot maintenance is activated.

<u>Main Guarantees:</u>

1. At the beginning the gates are closed.

2. If a gate is open, it will be closed on next state.

3. We support FIFO principle for cars parking. (The meaning of FIFO in our project regards the gate – which means the first car that will reach the gate will be the first one to enter the parking lot)

4. If a vehicle wants to enter the parking lot and there is space, the entrance gate will open.

5. If a vehicle wants to leave the parking lot, the exit gate will open.

6. If a parking spot is under maintenance, it means that the spot isn't available for vehicles.

7. A parking spot can be under maintenance only if there isn't a car in it and there wasn't a car in it on the previous state.

8. If Vip and regular vehicles want to enter – the priority will be given to the Vip vehicle, it also depends on the pedestrian lights

9. We allow several cars driving in the parking lot in the same time.

10. If a pedestrian is waiting to cross the cross-walk, he will eventually get a green light.

11. When pedestrian gets green lights, the relevant gates won't open. Since if they do the cars will run over the pedestrians.

12. If parking lot is full, all entrance gates are closed.

13. Whenever a car parks in a specific spot, it's light turns red. Otherwise, the spot light is green - cars can enter the parking spot unless the spot is under maintenance.

14. Only one spot can be under maintenance in each state.

15. When a car enters the parking-lot, the minimal spot available is chosen.

16. If enable maintenance isn't set, parking lot will not be under maintenance all over run-time.

17. If enable maintenance is set, parking lot will not be under maintenance until we reach the specified parameter.

18. Parking-lot system's variables are reset after parking-lot maintenance is activated.

Requirements:

ID	Priority (H/M/L)	Description
1	H	Parking cars mechanism
1.1	L	Safe parking mechanism – no collision between cars
1.2	H	Fair car parking mechanism (FIFO)
1.2.1	H	Every vehicle wishing to park will park eventually in the parking lot.
2	H	VIP cars parking mechanism
2.1	H	VIP cars get parking spot priority.
3.	M	Maintenance spot mechanism
4.	H	Parking lot maintenance mechanism
5.	H	Pedestrian mechanism
6	H	GUI
6.1	H	Design
6.1.1	M	Parking lot design
6.2	M	UX
6.2.1	M	Environment Control Panel
6.2.2	H	Action Screen
6.3	H	Connection with the controller API
6.4	H	Clearing parking lot before playing
6.5	H	GUI System mechanism
6.6	H	GUI core
6.7	H	Spectra assumptions and guarantees
6.8	H	Motion mechanism
6.9	H	Controller's states and environment synchronization

Scenarios:

Scenario #	Nickname	Description
0	Schreiber	One car enters and exits the parking lot.
1	Seshek	It's rush hour and the parking lot is full with regular cars.
2	Café Neto	Regular vehicle and VIP vehicle want to enter the parking lot at the same time. (Note: it also depends on the pedestrian lights)
3	Sherman	Pedestrian cross both cross-walks while cars want to enter the parking lot.
4	Shenkar	Vehicles enters the parking lot and suddenly a fire bursts.