# Car Park Simulator GUI Testing

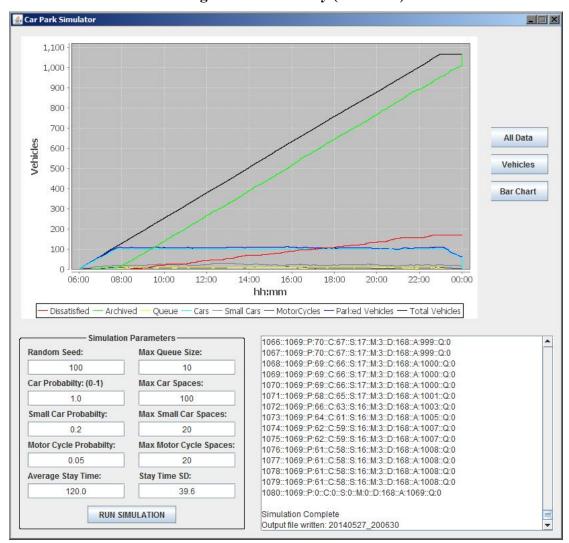
- 1. High Car Probability
- 2. High Small Car Probability and Spaces
- 3. Low Number of Parking Spaces.
- 4. High Number of Parking Spaces
- 5. No Queue.

Default simulation values which have naturally high car probability (100%) 🙆 Car Park Simulator 1.0 0.9 0.8 Nehicles 0.5 All Data Vehicles 0.4 Bar Chart 0.3 0.2 0.1 06:00 08:00 10:00 14:00 16:00 18:00 20:00 22:00 00:00 hh:mm – Dissatisfied — Archived — Queue — Cars — Small Cars — MotorCycles — Parked Vehicles — Total Vehicles - Simulation Parameters -Random Seed: Max Queue Size: 100 10 Car Probabilty: (0-1) Max Car Spaces: 1.0 100 Small Car Probabilty: Max Small Car Spaces: 0.2 20 Motor Cycle Probabilty: Max Motor Cycle Spaces: 0.05 20 Average Stay Time: Stay Time SD: 120.0 39.6 RUN SIMULATION

1. **High Car Probability**alues which have naturally high car probability (100

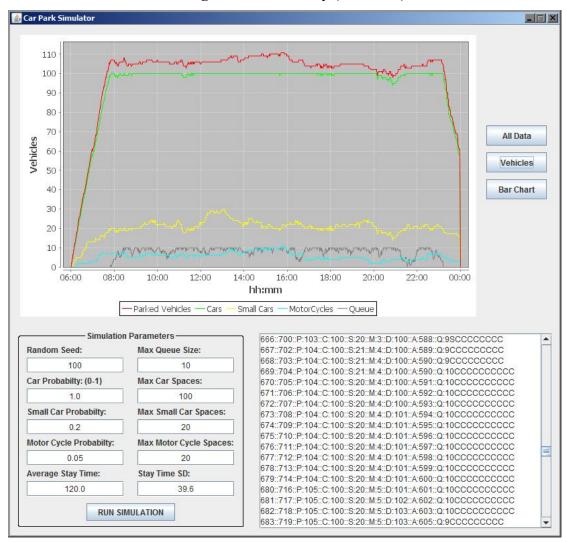
# Expectations:

- Higher number of normal cars than other types of vehicles.
- Queue often containing normal cars.
- Normal car spaces being full.
- Average level of satisfaction/dissatisfaction.



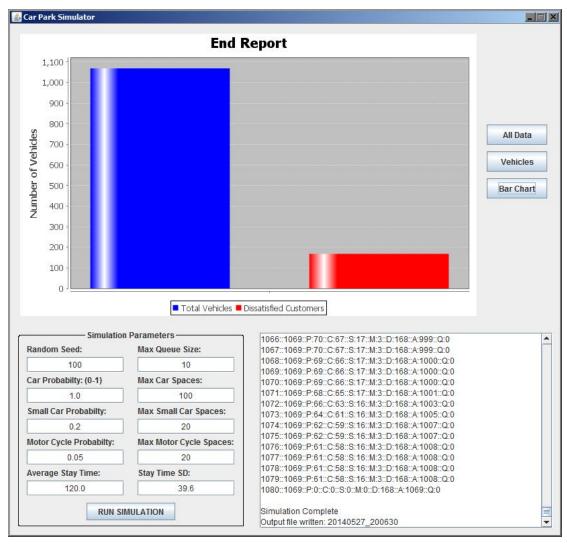
# 1. High Car Probability (Results 1)

- Here we can see the black 'Total Vehicles' line, which increments by 1 every minute. This is due to Car Probability being 1.0 (100%), and generating one every for every time point.
- This also reflects on the number of archived vehicles which is also very high.



# 1. High Car Probability (Results 2)

- Higher number of normal cars than other types of vehicles, as indicated by the green Cars line. Normal car spaces were at capacity for most of the simulation.
- The log showed mostly normal cars in the queue, and the queue was mostly full for the majority of the duration.



# 1. High Car Probability (Results 3)

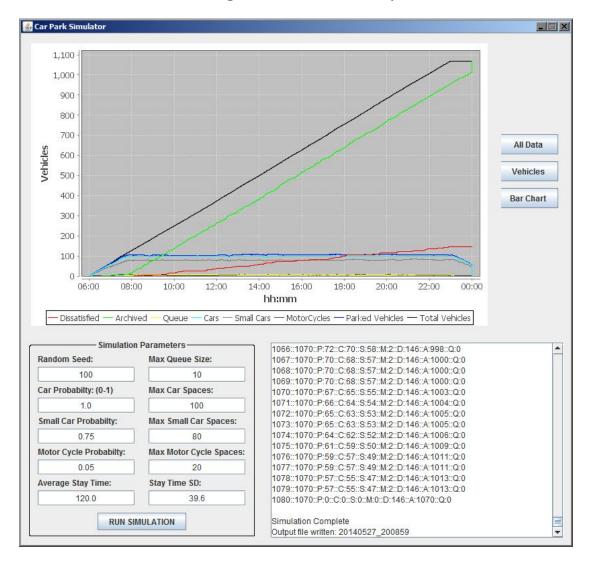
- Here we can see an average level of satisfaction/dissatisfaction. Most vehicles that arrive are parked as expected.

### 🙆 Car Park Simulator 1.0 0.9 0.8 0.7 Nehicles 0.5 All Data 0.4 Bar Chart 0.3 0.2 0.1 08:00 10:00 12:00 06:00 14:00 16:00 18:00 20:00 22:00 00:00 hh:mm — Dissatisfied — Archived — Queue — Cars — Small Cars — MotorCycles — Parked Vehicles — Total Vehicles - Simulation Parameters -Random Seed: Max Queue Size: 100 10 Car Probabilty: (0-1) Max Car Spaces: 1.0 100 Small Car Probabilty: Max Small Car Spaces: 0.75 80 Motor Cycle Probabilty: Max Motor Cycle Spaces: 0.05 20 Average Stay Time: Stay Time SD: 39.6 120.0 RUN SIMULATION

# 2. High Small Car Probability

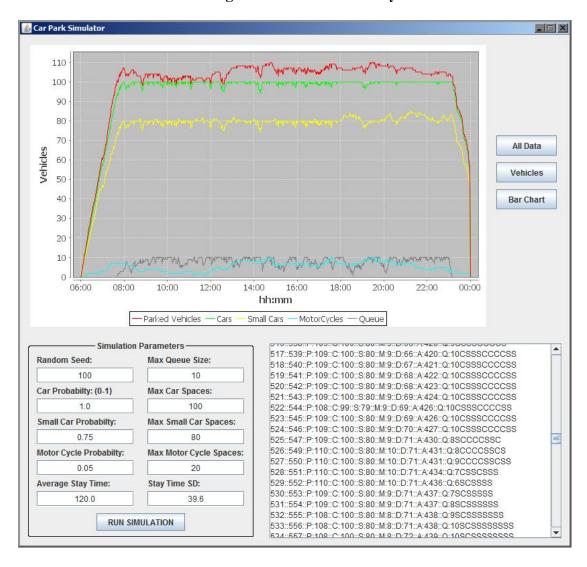
# **Expectations:**

- Higher number of small cars than other types of vehicles.
- Queue often containing small cars.
- Normal car spaces being full.
- Average level of satisfaction/dissatisfaction.



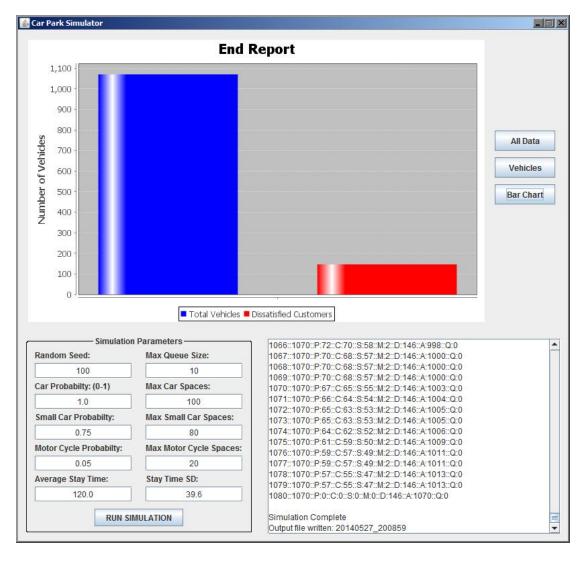
# 2. High Small Car Probability

- Here we can see the black 'Total Vehicles' line, which increments by 1 every minute. This is due to Car Probability being 1.0 (100%), and generating one every for every time point.
- This also reflects on the number of archived vehicles which is also very high.



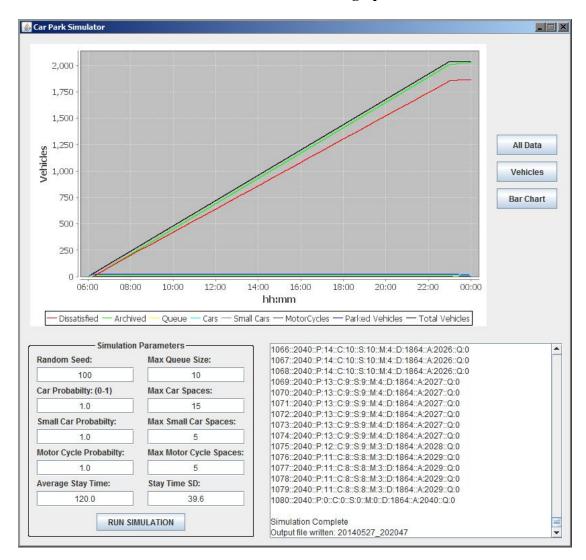
# 2. High Small Car Probability

- We can obviously see that the number of small cars, indicated by the yellow line is high.
- Another notable effect was on the queue, where we saw a lot more small cars occupying it.



# 2. High Small Car Probability

- Here we can see an average level of satisfaction/dissatisfaction. Most vehicles that arrive are parked as expected

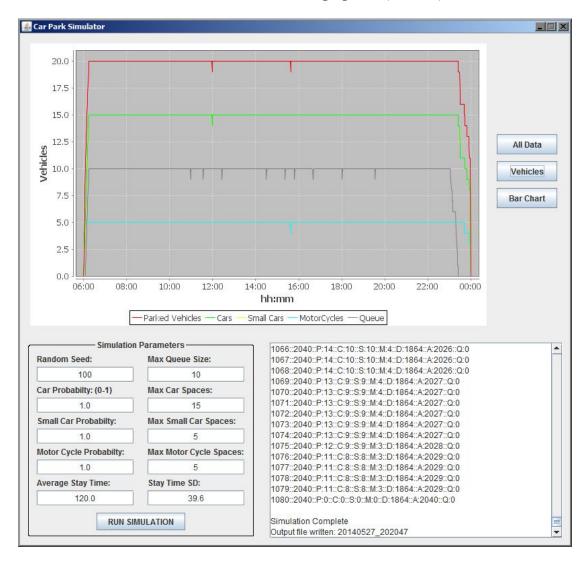


# 3. Low Number of Parking Spaces.

# **Expectations:**

- That there will be a very high number of vehicles 2 for every minute.
- All cars will be small.
- The queue will always be full.
- Very high level of dissatisfaction.

- 2 vehicles created every minute, one small car, one motorcycle.
- Very high level of dissatisfaction based on the red 'Dissatisfied' line.



# 3. Low Number of Parking Spaces (Results)

- As expected all cars are small cars, (small cars and cars overlap, showing only a green bar).
- The number of motorcycles is constantly full.
- As predicted the car park and queue are totally full for the duration of the simulation.



# 3. Low Number of Parking Spaces (Results)

### Results:

- Almost all arriving vehicles are dissatisfied. This is due to the high level of vehicle probability and low number of parking spaces.

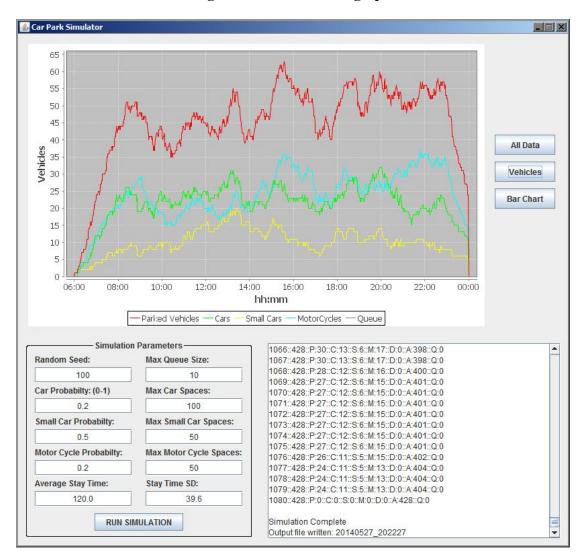
### 📤 Car Park Simulator 425 400 375 350 325 300 275 **All Data** 250 Vehicles 225 Vehicles 200 175 **Bar Chart** 150 125 100 75 50 25 06:00 08:00 10:00 14:00 16:00 18:00 20:00 22:00 00:00 12:00 hh:mm - Dissatisfied - Archived Cars -— Small Cars — MotorCycles — Parked Vehicles — Total Vehicles Oueue Simulation Parameters 1066::428::P:30::C:13::S:6::M:17::D:0::A:398::Q:0 Random Seed: Max Queue Size: 1067::428::P:30::C:13::S:6::M:17::D:0::A:398::Q:0 1068::428::P:28::C:12::S:6::M:16::D:0::A:400::Q:0 100 10 1069::428::P:27::C:12::S:6::M:15::D:0::A:401::Q:0 Car Probabilty: (0-1) Max Car Spaces: 1070::428::P:27::C:12::S:6::M:15::D:0::A:401::Q:0 1071::428::P:27::C:12::S:6::M:15::D:0::A:401::Q:0 0.2 100 1072::428::P:27::C:12::S:6::M:15::D:0::A:401::Q:0 Small Car Probabilty: Max Small Car Spaces: 1073"428"P:27"C:12"S:6"M:15"D:0"A:401"O:0 0.5 50 1074::428::P:27::C:12::S:6::M:15::D:0::A:401::Q:0 1075::428::P:27::C:12::S:6::M:15::D:0::A:401::Q:0 Motor Cycle Probabilty: Max Motor Cycle Spaces: 1076::428::P:26::C:11::S:5::M:15::D:0::A:402::Q:0 1077::428::P:24::C:11::S:5::M:13::D:0::A:404::Q:0 0.2 1078::428::P:24::C:11::S:5::M:13::D:0::A:404::Q:0 Average Stay Time: Stav Time SD: 1079::428::P:24::C:11::S:5::M:13::D:0::A:404::Q:0 120 0 1080::428::P:0::C:0::S:0::M:0::D:0::A:428::Q:0 RUN SIMULATION Simulation Complete Output file written: 20140527\_202227

# 4. High Number of Parking Spaces

### **Expectations:**

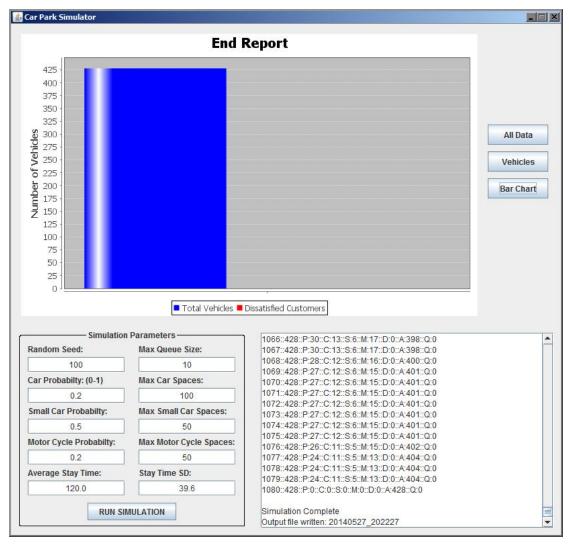
- With a high number of parking spaces, and a lower car probability, it is less likely that our car park will be full. Therefore it is less likely that we will have a full queue and dissatisfied customers.
- No, or very low level of dissatisfaction
- Mostly empty queue.
- Mostly empty car park.
- Same number of small cars vs normal cars.
- Same number of cars vs motorcycles.

- A much smaller number of overall vehicles, as expected.
- No dissatisfied vehicles seen on the graph.
- No queued vehicles seen on the graph.



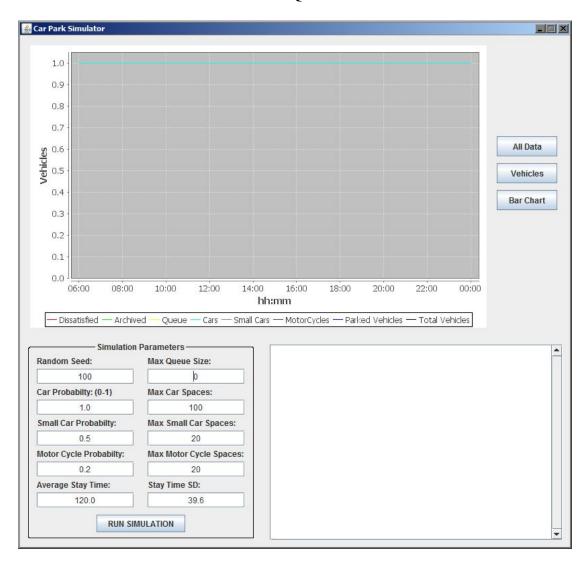
# 4. High Number of Parking Spaces

- Car park never reaches capacity.
- No queued vehicles at all for the duration of the simulation.
- Small Cars and Normal Cars are relatively even.
- Motorcycles and Cars are relatively even.



# 4. High Number of Parking Spaces

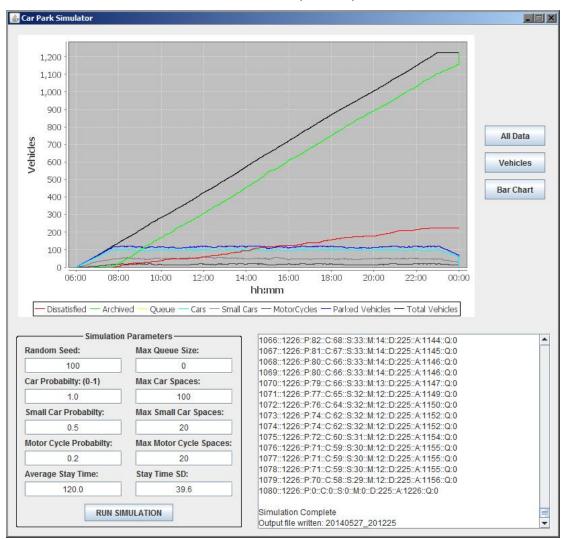
- Absolutely no dissatisfied vehicles as predicted.



# 5. No Queue.

# **Expectations:**

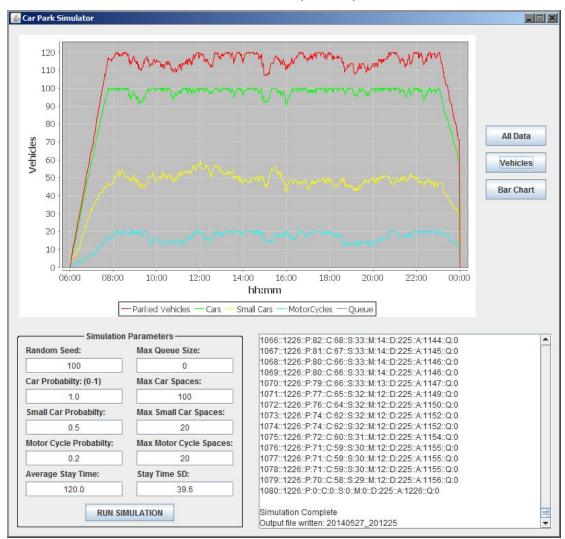
- No vehicles will queue.
- Possibly higher level of dissatisfaction than default simulation due to lack of buffer.



# 5. No Queue (Results)

### Results:

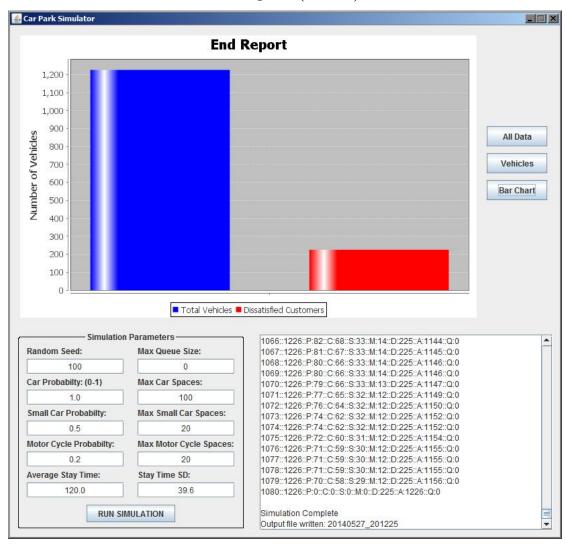
- No vehicles queued in the logs.



# 5. No Queue (Results)

### Results:

- No vehicles queued in the logs.



# 5. No Queue (Results)

- No vehicles queued in the logs.
- Slightly higher level of dissatisfaction.