

Constance Xu

Homework02

SSW-555

I pledge my honor that I have abided by the Stevens Honor System.

**1. Identify 3 features relevant to the driver-free parking feature.**

Three features that are relevant to the driver-free parking feature are the following: (1) the ability for a car to identify an empty parking space, (2) the ability for the car to identify if said vehicle can fit into the given parking space, and (3) the ability for the car to identify cars surrounding the parking space.

**2. Describe each of the three features as a use case.**

**Identifying an empty parking space**

The person using the system is the driver. The driver should be able to turn on automatic parking and the vehicle will attempt to identify whether there is an empty parking spot nearby.

- **Basic flow:** If there is an empty parking spot in the vicinity of the car, the car will identify this and will proceed to park in that spot.
- **Alternative flow:** If the user believes there is a parking spot nearby but the car does not identify one, then automatic parking is turned off and alerts the user that the vehicle could not find a parking spot.
- **Alternative flow:** Driver turns on automatic parking and while the car is identifying if there is an empty parking space, the user turns it off. This causes automatic parking to turn off.

**Identifying if said vehicle can fit into given parking space**

The person using the system is the driver. They turn on automatic parking. The car has correctly identified an empty parking space and now it will check to see if the car can fit whether it is a parallel parking job or otherwise.

- **Basic flow:** The car has sensors that detect there is enough space between two cars to parallel park. It proceeds with the parallel parking job.
- **Basic flow:** The car has sensors that detect there is only one car and two empty parking spaces behind it. It recognizes it has enough space and proceeds with the parallel parking job.
- **Alternative flow:** The car identifies that it cannot fit into a given parking space so it alerts the user.
- **Alternative flow:** The car mistakenly identifies that it can fit into a space and part way through, it realizes it cannot so it alerts the user.

**Identifying if the vehicle can identify cars surrounding the parking space**

The person using the system is the driver. They turn on automatic parking. The car must identify the surrounding cars so that it can check to see if there is enough space to fit said vehicle.

- **Basic flow:** The car uses the sensors on its side to recognize if there are cars to its left, right, and top to then check if the vehicle can fit into a given parking space.
- **Basic flow:** The car uses its sensors in a parallel parking scenario to recognize if it is trying to park between two cars, behind one car, or in front of one car (or if any car is there at all).
- **Alternative flow:** The car does not recognize that there is a car next to it until it is attempting to park, when there is little space between the other car and itself, it alerts the user that there is not enough space.

### 3. Describe each of the same features as user stories.

**Title: The user's car identifies an empty parking space.**

**Description:** The user turns on automatic parking and the car will identify if there is an empty parking spot whether it is in front of the car, behind the car, or to the side of the car. If there is no parking spot detected, then the car will tell the user and shut off automatic parking.

**Acceptance test:** If I am the user and I turn on automatic parking, the car should tell me if it finds a parking space near to park in.

**Priority:** 1

**Story points:** 8

**Title: The user's car identifies if it can fit in an empty parking space.**

**Description:** The user turns on automatic parking and the car will first identify if there is an empty parking space. If there is an empty parking space, then the car will check to see if there is enough space to park. The car will use sensors that are built on the side of the car to see where the other cars are located.

**Acceptance test:** If the car sees that there is enough space to park, then it will park in the space. If there is not enough space, then the car will not attempt to park in that spot and tell the user that there is not enough space.

**Priority:** 1

**Story points:** 5

**Title: The user's car identifies the cars surrounding a space correctly.**

**Description:** Automatic parking is on and after the car checks to see if there is an empty space, it will identify the cars around it properly. It would mark where the cars are relative to itself and then have a relative measurement so that it can later assess if there is enough space to park in a given spot.

**Acceptance test:** If it correctly identifies where the cars are and it identifies how far away each car is, then it works correctly.

**Priority:** 2

**Story Points:** 13

#### **4. Describe the advantages and disadvantages of use cases and user stories for this task?**

The advantages of a use case in this scenario is being able to lay out the alternative flows (the rainy day scenarios). When it comes to self-parking cars, it is important that they are precise and do not hit other vehicles. By laying out the alternative flows, it lays out more clearly the issues that could occur when trying to park. The use cases offer a little more insight in terms of being able to look ahead and there is more context because of the split between alternative and basic flows. The user stories just do not have the same amount of “completeness” because it is limited to a short number of sentences. The disadvantage of use cases is that it does not flow as much as user stories and user stories are just better at describing scenarios in my mind for this task.