The system will consist of four components:

Server

The server will contain all the system data as well as the domain logic. It will receive data from the camera system and laser break system. It will perform calculations on this data and update the database with the appropriate values. It will also handle web requests made by mobile applications and return an appropriate web response.

Each parking lot will have:

* A unique identifier, used to differentiate between two parking lots (positive integer)
* A counter representing the number of vehicles in the parking lot (non-negative integer)
* A number representing the maximum capacity of the parking lot (positive integer)

Static data on the server will include:

* A database of common shapes of vehicles. This will be used to better determine whether or not an object passing by an entrance camera is a vehicle or not.

Camera System

The camera system will consist of several cameras mounted at the entrance of parking lots or looking over entire parking lots.

Entrance cameras are responsible for capturing images of vehicles as they enter and exit the parking lot. They will only be triggered when the laser break system

Overhead cameras are responsible for capturing images of the parking lot as a whole. The purpose of these cameras is to get an accurate idea of how many cars are actually in the parking lot, as the counter for each parking lot will become inaccurate over time. These images will be captured in the early morning (2-4AM) where there is the least amount of cars in the parking lot. Using this information, we will know what to reset the counter in each parking lot to.

Laser break system

The laser break system will consist of several laser break devices mounted at the entrance of parking lots. Each entrance will consist of three parallel lasers. Using this system, we will be able to determine