



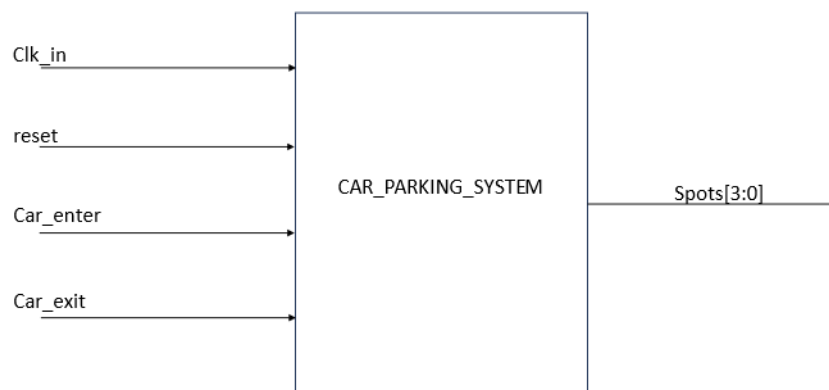
PARKING SYSTEM

INTRODUCTION:

The Parking System is designed to manage and track the number of occupied parking spots in a parking lot. It updates the number of occupied spots based on car entry and exit signals and provides the current occupancy status through output signals.

BLOCK DIAGRAM:

The Parking System must initialize the occupied_spots counter to 0 when the reset signal is high. It should increment the occupied_spots counter by 1 when the car_enter signal is high, provided the counter is less than the maximum number of parking spots (TOTAL_SPOTS). Conversely, it should decrement the occupied_spots counter by 1 when the car_exit signal is high, provided the counter is greater than 0. The system must update the spots output signal to reflect the occupancy status: spots[0] indicates at least 1 spot is occupied, spots[1] for at least 2 spots, spots[2] for at least 3 spots, and spots[3] for at least 4 spots. The clk_in signal will synchronize all updates, and the system should handle a maximum of 8 parking spots, ensuring occupied_spots does not exceed this limit or fall below 0.





Inputs:

- clk_in: The input clock signal.
- reset: Active-high reset signal to initialize or reset the system.
- car_enter: Signal indicating that a car has entered the parking lot.
- car_exit: Signal indicating that a car has exited the parking lot.

Outputs:

- spots [3:0]: A 4-bit signal representing the status of the parking spots.
 - spots[0]: Indicates at least 1 spot is occupied.
 - spots[1]: Indicates at least 2 spots are occupied.
 - spots[2]: Indicates at least 3 spots are occupied.
 - spots[3]: Indicates at least 4 spots are occupied.

conclusion:

This Parking System provides an efficient way to manage and monitor the occupancy of parking spots in a parking lot. With further enhancements, it can be integrated into larger parking management systems to provide comprehensive solutions for automated parking facilities.