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Complexity Analysis

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For the sort car programming assignment I will take each step of my algorithm and break it down by parts to verify that it has O(n) complexity. Beginning with the initial start of the sort car inventory call it begins by calling quicksort once to initialize it. Quicksort will call a secondary function which is partition and that will take in the car inventory size and then put it into a while loop for analysis. Given that partition is planning on returning a singular result I know that it will become an O(n) complexity. In taking in the car inventory size it will take the whole of car inventory and split it up into multiple parts to properly index the algorithm. Even though it splits and does not look through each index one by one it still has to search through each half or fourth. This type of indexing will reach one result and return it back to the initial call which is how it gets back to a linear scale. In terms of space complexity, quick sorting will have a space complexity of O(log(n)) given that it will call on itself recursively. In a worst case scenario, quicksort comes to a notation of O(n).