**Question 3**

The codes to solve mission 1 and 2 can be found in main.py

1. To solve this problem, I formulate the problem as a bin packing problem where the trucks are represented as bins. For each day, I compute what is the minimum number of trucks needed. Thus, the minimum number of trucks required by the company will be the max of the daily minimum number of trucks.
2. To solve this problem, I formulate the problem as VRP with time windows (VRPTW) whereby each truck can only operate for 10 hours and each daily order must be fulfilled within these 10 hours. If the VRP can be solved, then all the jobs within the day can be assigned to the trucks and completed within 10 hours. (Note: it may take some time to run and complete the main.py because it takes time to solve each VRPTW instance)
3. There are several considerations when deciding to operate own fleet. We need to calculate the cost i.e. the capital cost of owning a vehicle, drivers’ salary, parking spaces, the service level that is required / reliability especially to ensure timely delivery and making sure the goods are properly handled, operating cost i.e. delivery management/tracking, etc. It would be better to outsource delivery to professional delivery company so as to focus the company’s time and resources on providing world-class furniture as the capital cost of owning fleet of vehicles can be quite high. Here, I assume that there are available, reasonably priced professional furniture delivery companies.
4. I would change my recommendation if there are no available reliable, first-class mover/delivery company which can ensure good quality service. This is because furniture delivery is quite niche and unlike normal goods, need to be properly handled.