Centralized agents

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Encoding the problem

We create the class *ExtendedTask* which is the extension of a basic task provided by *Logist*. This new class is used to differentiate the pickup action and the delivery action. It is characterize by a task and by an action (pickup or delivery). We used these *ExtendedTask*s to be able to carry multiple tasks in the same vehicle.

We also implement the class *Solution* which represents a possible solution. A solution is characterized by a map between a vehicle and a list of *ExtendedTask*s that we called *tasksList*. We have therefore one *tasksList* per vehicle.

The notion of time is define by the indices of the task in the *tasksList*.

Constraints

To have a valid solution, we need to satisfy constraints:

1. A specific *ExtendedTask* can be contained in only one *tasksList*.

2. Let take the two *ExtendedTask*s coming from the same task (pickup and delivery part), the index of the pickup part has to be strictly smaller that the index of the delivery part.

3. Let take again the two *ExtendedTask*s coming from the same task, the two *ExtendedTask* have to be in the same *tasksList*.

4. All task must be deliver. The sum of the *ExtendedTask*s from all *tasksList*s had to be equal to the number of initial tasks multiplied by 2.

5. The weights of the carried tasks by a vehicle cannot exceed the capacity of this vehicle.