PDP And Tabu Search

VRP is an important problem in the fields of transportation, distribution and logistics. Often the context is that of delivering goods located at a central depot to customers who have placed orders for such goods. The pickup and delivery problem with time windows (PDPTW) is a generalization of the VRP which is concerned with the construction of optimal routes to satisfy transportation requests, each requiring both pickup and delivery under capacity, time window and precedence constraints.

Tabu Search: -

It uses a local or neighbourhood search procedure to iteratively move from one potential solution x to an improved solution x' in the neighbourhood of x, until some stopping criterion has been satisfied (generally, an attempt limit or a score threshold).

Tabu search enhances the performance of local search by relaxing its basic rule. First, at each step *worsening* moves can be accepted if no improving move is available (like when the search is stuck at a strict local minimum). In addition, *prohibitions* are introduced to discourage the search from coming back to previously-visited solutions.

https://en.wikipedia.org/wiki/Tabu_search#Basic_description – pseudocode for tabu search

https://github.com/pgRouting/pgrouting/wiki/VRP-Pickup-Delivery-Problem - pseudocode for pdp

VRP and PDP Codes

If there are no other constraints, the optimal solution is to assign just one vehicle to visit all locations, and find the shortest route for that vehicle. This is essentially the same problem as the TSP.

TSP -> VRP ->include capacity constraint -> Include time window -> PDP.

TSP: -https://developers.google.com/optimization/routing/tsp

VRP: - https://developers.google.com/optimization/routing/vrp#example

Capacity constraint: - https://developers.google.com/optimization/routing/cvrp

Time window: -https://developers.google.com/optimization/routing/vrptw

PDP: - https://developers.google.com/optimization/routing/pickup_delivery