Transportation & Logistics

Prescriptive Analytics

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Initialization

- Knapsack problem: greedy solution
- Sort customers by decreasing demand
- For each customer, go through all routes, putting the customer in the first route that fits their demands
- Remaining customers get put in an “unassigned” vehicle
  - Local search should empty this vehicle
  - Penalize objective value heavily if not empty

Initialization

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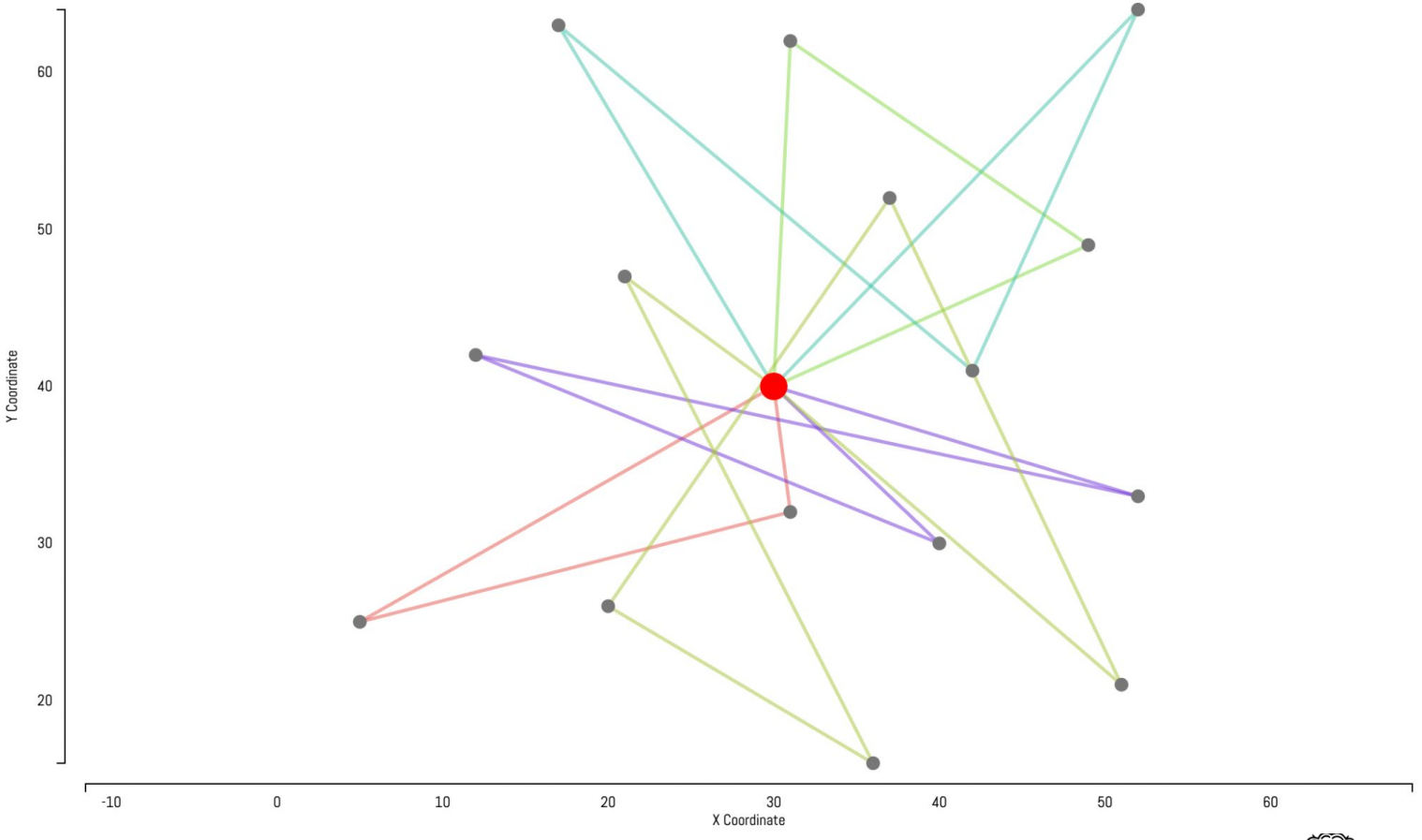

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Neighbor Search

- Portfolio of neighborhoods:
- 2-exchange
- or-exchange
- relocation
- exchange
- crossover

Simulated Annealing

- Control exploration vs. exploitation via temperature **t**
- Start out with high temperature (high exploration) and exponentially decrease temperature over epochs
- In each epoch, run **n** iterations and accept non-improving solution with likelihood (random() < e^(-Δ/t)), while tracking the best solution in the epoch
- Δ = proposed - current
- Run until no improvement over **k** epochs

Other Enhancements

- PyPy

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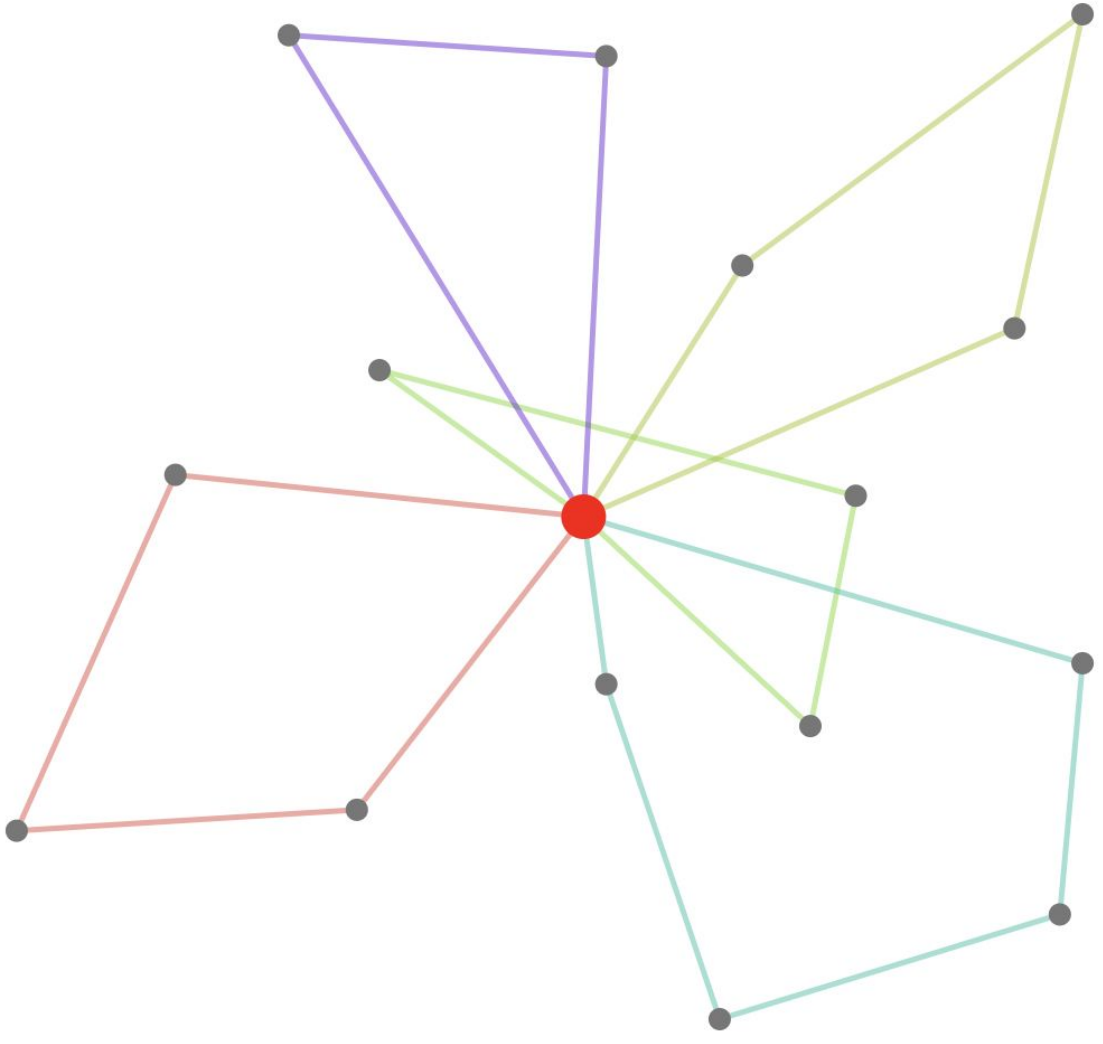
Results (16_5_1.vrp)



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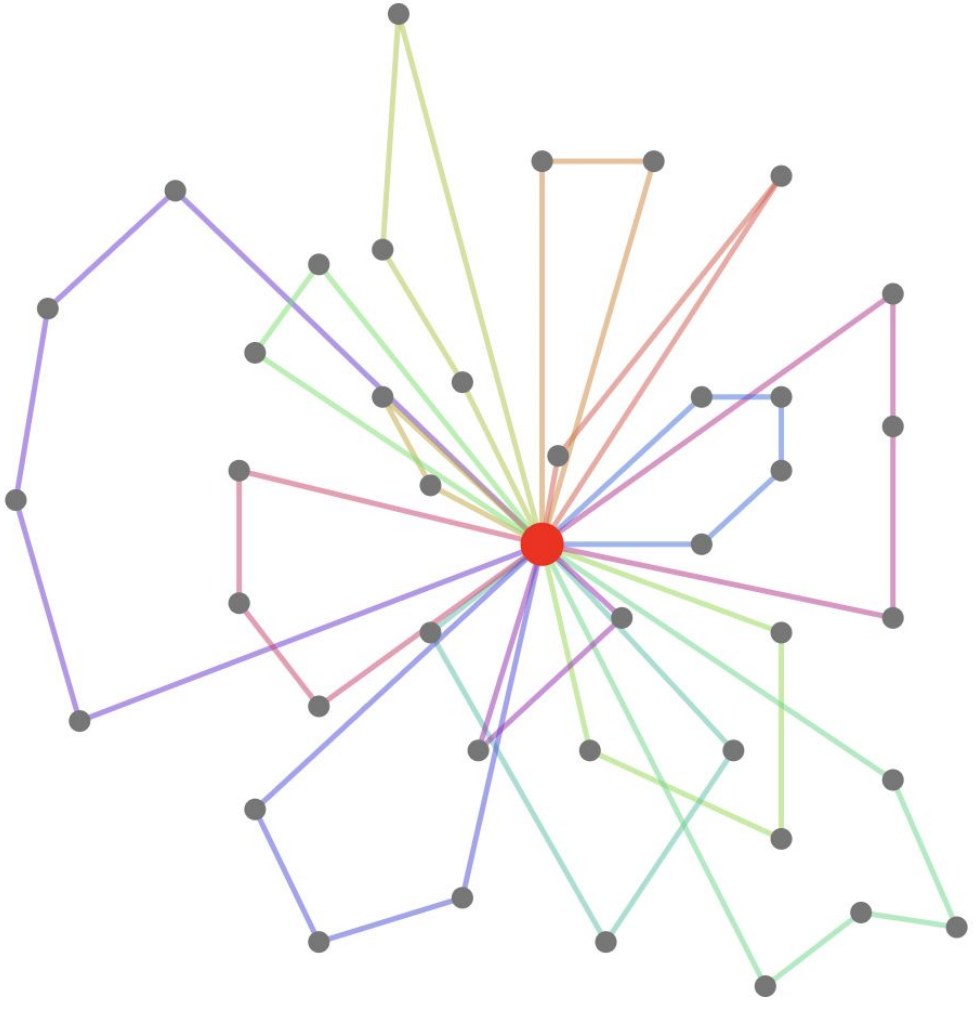
Results (41_14_1.vrp)



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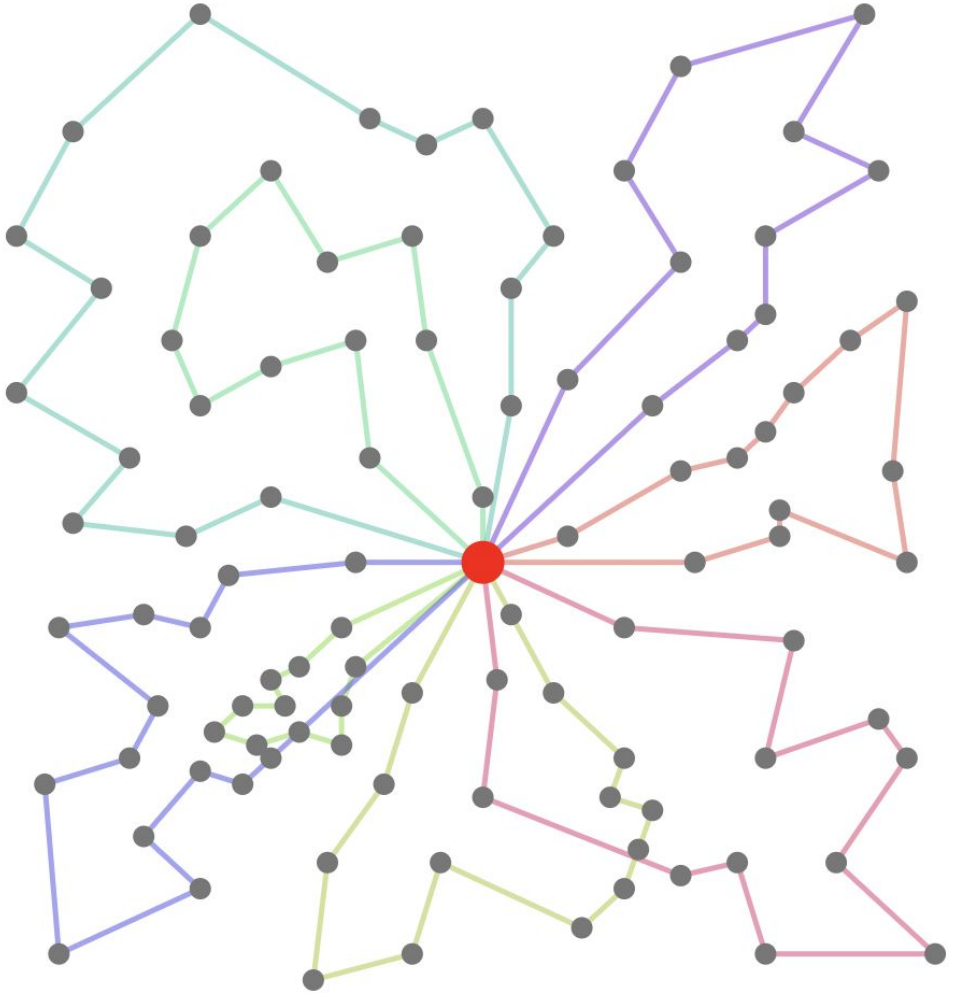
Results (101_8_1.vrp)



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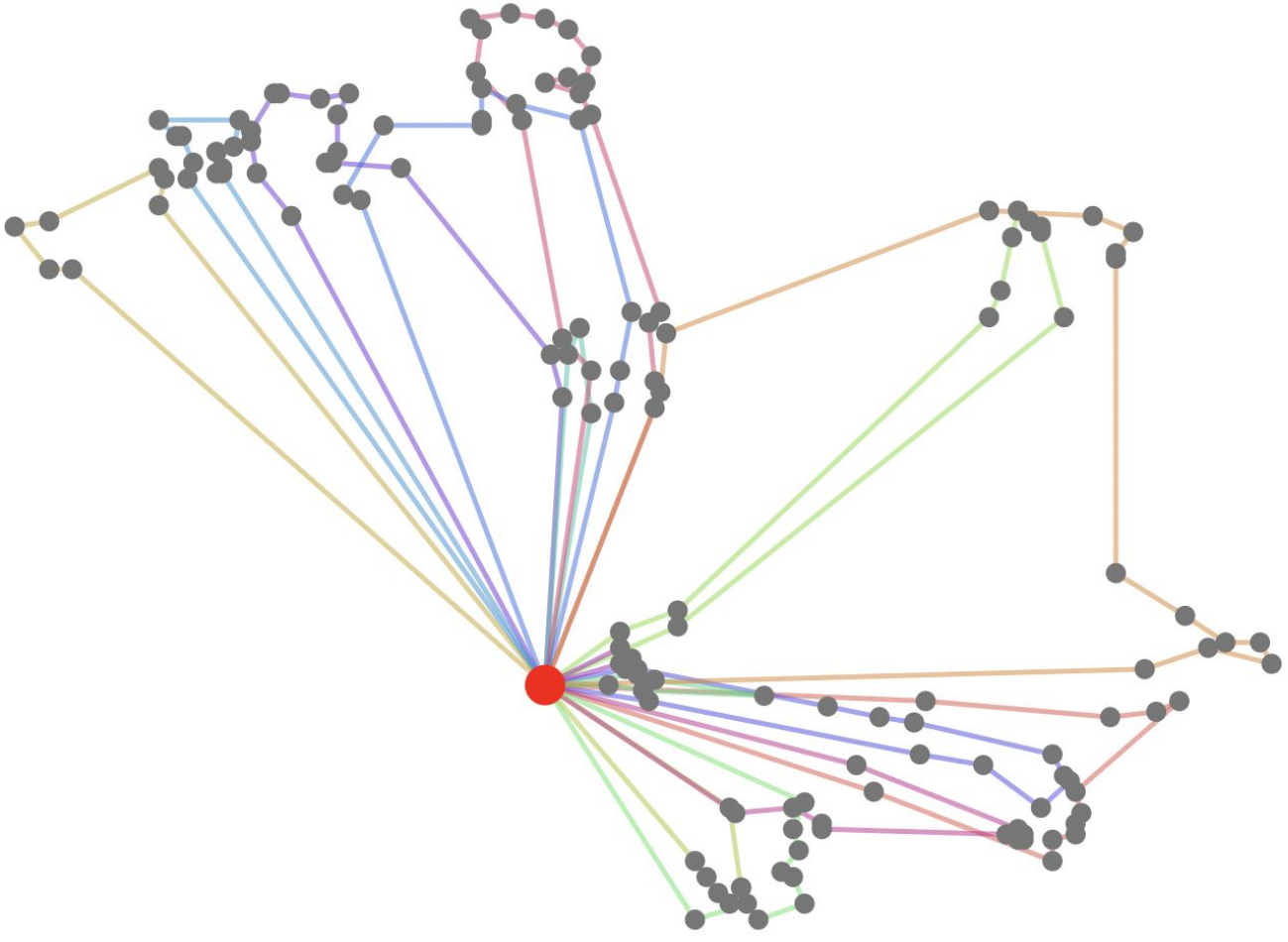
Results (151_15_1.vrp)



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Thank you!

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Time Spent: 30 hrs

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