

SDVRP Test Instances

Instances may be downloaded from the SDVRP Challenge webpage:

<http://dimacs.rutgers.edu/programs/challenge/vrp/vrpsd/>

The zipped folder available for download contains 95 instances drawn from four different instance sets.

We describe each of them here.

Set 1) SDxx instances: The set of 21 instances whose names begin with SD are due to:

S. Chen, B. Golden, and E. Wasil, "[The Split Delivery Vehicle Routing Problem: Applications, Algorithms, Test Problems, and Computational Results](#)," *Networks* **49** (2007), 318–329.

The instances are named SD1 – SD21. Their size varies from 8 to 288 customers. The vehicle capacity is 100 units. The customer demand is either 60 units or 90 units. In all instances of this set the customers are located in concentric circles around the depot.

Set 2) SxxDy instances: This set of 14 instances is due to:

J.M. Belenguer, M.C. Martinez, and E. Mota, "[A Lower Bound for the Split Delivery Vehicle Routing Problem](#)," *Operations Research* **48** (2000), 801–810.

The node coordinates for these instances correspond to those of three instances—eil51 (50 customers), eil76 (75 customers), and eil101 (100 customers)—in TSPLIB. The vehicle capacity Q for each instance is 160. Each base instance is used to generate six VRPSD instances corresponding to six different demand scenarios.

D1: demand for each customer is randomly generated between 1% and 10% of Q .

D2: demand for each customer is randomly generated between 10% and 30% of Q .

D3: demand for each customer is randomly generated between 10% and 50% of Q .

D4: demand for each customer is randomly generated between 10% and 90% of Q .

D5: demand for each customer is randomly generated between 30% and 70% of Q .

D6: demand for each customer is randomly generated between 70% and 90% of Q .

The file names are in two parts—Sxx followed by Dy, xx will be 51, 76, or 101, based on the TSPLIB instance from which it is derived, and y will be 1-6 depending on the demand scenario. Thus, S51D2 corresponds with the node locations based on TSPLIB instance eil51 and demands between 10% and 30% of vehicle capacity.

Note that only four of six possible demand scenarios are included for eil76 and eil101.

Set 3) P... instances: The 49 instances that begin with "P" are due to:

Claudia Archetti, Maria Grazia Speranza, and Martin W. P. Savelsbergh, "[An Optimization-Based Heuristic for the Split Delivery Vehicle Routing Problem](#)," *Transportation Science* **42**(1): 22-31 (2008).

There are 42 total instances that are derived from 7 different base instances by generating 6 different demand scenarios for each. The base instances have between 50 and 199 customers and vehicle capacities ranging from 140 to 200.

The name of each instance is formed by two parts. The first part is the "base" problem name (p01, p02...). The second part of the file name describes the demand scenario. For the base instance, the second part of the file name is "00", so the base instance of problem p01 is in a file called "p01_00.cri." For non-base instances, the demands are randomly generated according to the same six scenarios described above. In this case, however, they are named using the percentages bounding the demand generation. For example, p01_1030.cri, is problem p01 where demands are generated between 10% and 30% of the capacity of the vehicle. The additional (ie non-base) sets of instances are created with the following lower and upper bound combinations: (10%, 30%), (10%,50%), (10%,90%), (30%,70%) and (70%,90%), as described above.

Set 4) eil instances: The remaining 11 instances are CVRP problems from TSPLIB. They have between 21 and 100 customers and vehicle capacities ranging from 112 to 8000. All instances in this group have filenames that begin with "eil".