Solution format specification

MPVRP-CC Team

January 25, 2026

> **Note**
>
> This document details the file format used for MPVRP-CC solutions. To be validated, a solution must strictly follow the structure described below.

1 File format

Solutions are stored in text files with the `.dat` extension. The filename must reference the instance being solved (e.g., `Sol_MPVRP_...`).

2 File structure

The file describes the routes vehicle by vehicle. For each vehicle used, the solution contains a block of **2 lines**, separated by an empty line.

2.1 Line 1: visit sequence

```
ID: Garage - Depot [Load] - Station (Deliver) - ... - Garage
```

This line starts with the vehicle ID and describes the path:

- **Garage**: Start and end point (Node ID only).

- **Depot**: Identified by square brackets `[Qty]` indicating quantity loaded.

- **Station**: Identified by parentheses `(Qty)` indicating quantity delivered.

Node IDs refer to their 1-based index in the instance file (e.g., loaded at Depot 1, delivered to Station 2) and are not cumulative across types.

2.2 Line 2: product sequence and costs

```
ID: Prod(Cost) - Prod(Cost) - ...
```

This line indicates which product is transported at each step and the cumulative changeover cost.

> **Important**
>
> The two lines must be perfectly aligned in terms of the number of steps. Each element in the visit sequence corresponds to exactly one element in the product sequence.

3 Valid solution example

```
1: 1 – 1 [1344] – 2 (1344) – 1
1: 0(0.0) – 0(0.0) – 0(0.0)


2: 1 – 1 [8947] – 1 (4278) – 2 (2350) – 3 (2319) – 1
2: 1(0.0) – 1(0.0) – 1(0.0) – 1(0.0) – 1(0.0)
```

In this example:

- **Vehicle 1** starts at garage 1, loads 1344 units at depot 1, delivers 1344 units to station 2, and returns to garage 1. It carries product 0 (cost 0.0).

- **Vehicle 2** starts at garage 1, loads 8947 units at depot 1, delivers to stations 1, 2, and 3, and returns to garage 1. It carries product 1 (cost 0.0).

4 Solution metrics

After all vehicle routes, the file ends with **6 lines** of performance metrics:

```
2
7
55.66
1385.07
Intel Core i7-10700K
0.245
```

4.1 Line 1: number of vehicles used

```
2
```

Number of vehicles with at least one delivery.

4.2   Line 2: number of product changes

```
7                                                            3
```

Total number of product changes across the entire solution.

4.3   Line 3: total transition cost

```
55.66
```

Sum of all product changeover costs for all vehicles.

4.4   Line 4: total distance

```
1385.07
```

Total distance traveled by the fleet (sum of Euclidean distances).

4.5   Line 5: processor

```
Intel Core i7-10700K
```

Model of the processor on which the solution was generated.

4.6   Line 6: resolution time

```
0.245
```

Time elapsed to generate the solution (in seconds).

A valid solution must satisfy all the constraints.