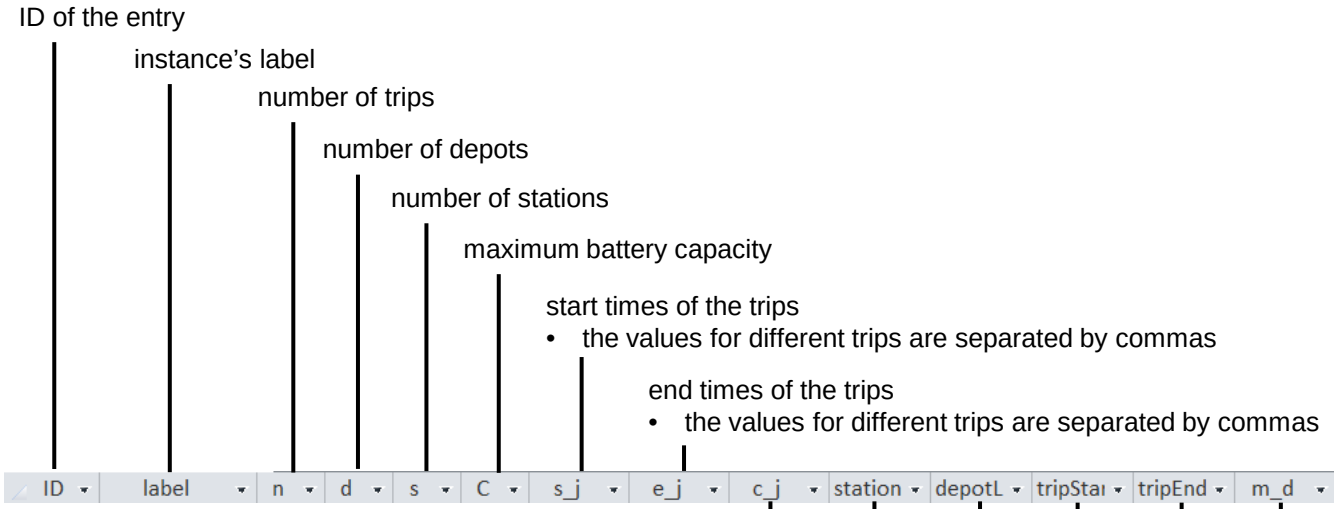
Explanations to the provided database

The database “EVSP-MD-FS_instances_and_results.accdb” belongs to the paper “Multi-depot electric vehicle scheduling in in-plant production logistics considering non-linear charging models”. We suggest reading the paper first before considering the database.

The database contains eleven tables. The tables contain instances generated for the paper and their respective solutions. An overview of the tables is given below. Beyond that, the following pages provide explanations of how to read the different kinds of tables.

Table	**Explanation**
instances_regular	Contains the regular instances.
instances_constrained	Contains the constrained instances.
instances_large	Contains the large instances.
instances_num_of_depot_experiment	Contains instances that were uses to experiment on the number of depots.
results_regular_BCH	Contains the results of the regular instances found by the branch and check approach.
results_regular_CPLEX	Contains the results of the regular instances found by CPLEX solving the MIP.
results_constrained_BCH	Contains the results of the constrained instances found by the branch and check approach.
results_constrained_CPLEX	Contains the results of the constrained instances found by CPLEX solving the MIP.
results_large_BCH	Contains the results of the large instances found by the branch and check approach.
results_num_of_depot_experiment_BCH	Contains the results found by the branch and check approach to the instances that were uses to experiment on the number of depots.
results_battery_capacity_experiment_BCH	Contains the results found by the branch and check approach to the regular instances with altered battery capacities that were uses to experiment on the influence of the battery. This table has an additional column called “battery_capacity” that states the battery capacity that was used when solving the instances as a percentage value of the regular capacity.

Explanations for the “instances_”-tables



maximum number vehicles per depot
- the values for the different depots are separated by commas
- a value of -1 indicates that there is no limit

locations of the trips’ end points
- each location is characterized by four values in rectangular brackets*
- semicolons are used to separate the different locations

locations of the trips’ start points
- each location is characterized by four values in rectangular brackets*
- semicolons are used to separate the different locations

locations of the depots
- each location is characterized by four values in rectangular brackets*
- semicolons are used to separate the different locations

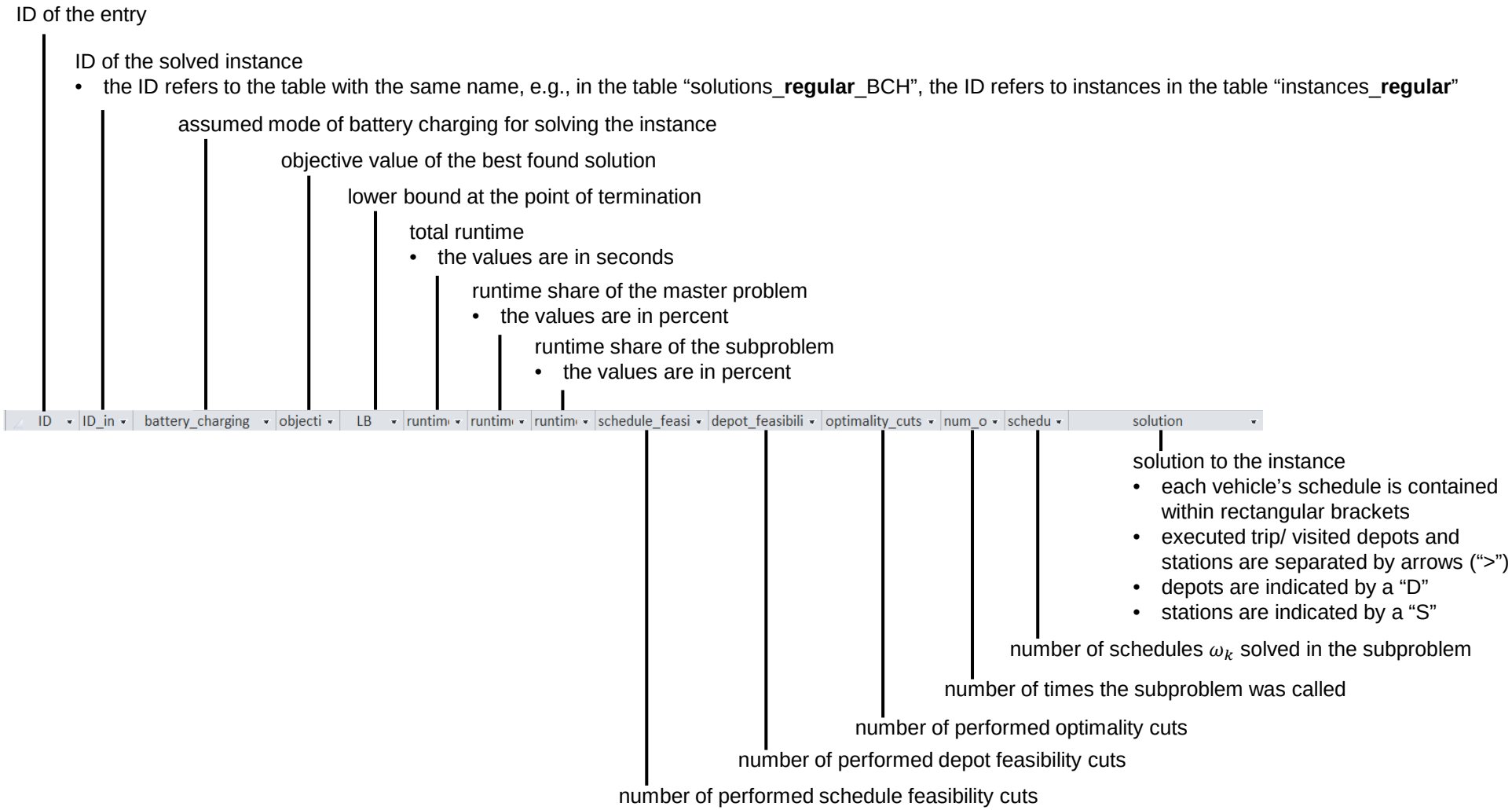
locations of the stations
- each location is characterized by four values in rectangular brackets*
- semicolons are used to separate the different locations

battery requirements for the trips
- the values for different trips are separated by commas

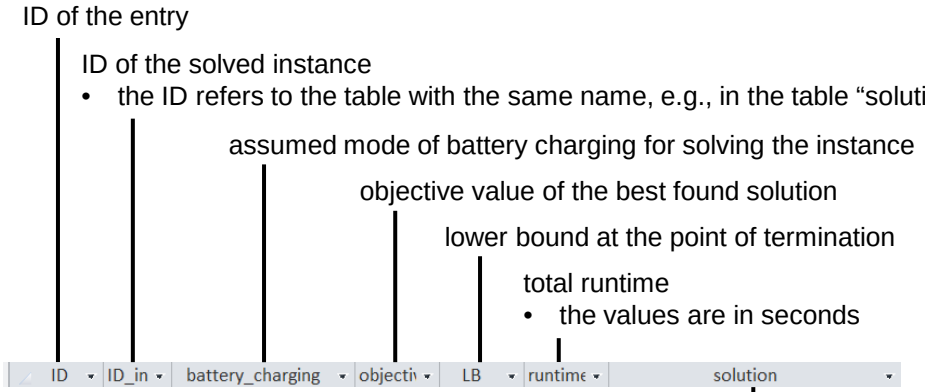
* It is assumed that the locations are located within buildings in a facility. The first two values give the x- and y-coordinate of the entry of the building (where the location is located in) within the facility. The latter two values give the location’s x- and y-coordinate within the building measured from its entry. The distance $dist$ between two locations, $[a_1, b_1, c_1, d_1]$ and $[a_2, b_2, c_2, d_2]$, is calculated as follows:

$$dist = \begin{cases} |c_1 - c_2| + |d_1 - d_2| & \text{if } a_1 = a_2 \wedge b_1 = b_2 \\ |a_1 - a_2| + |b_1 - b_2| + c_1 + d_1 + c_2 + d_2 & \text{else} \end{cases}$$

Explanations for the “results_..._BCH”-tables



Explanations for the “results_..._CPLEX”-tables



solution to the instance
- each vehicle’s schedule is contained within rectangular brackets
- executed trip/ visited depots and stations are separated by arrows (“>”)
- depots are indicated by a “D”
- stations are indicated by a “S”