MINOA Research Challenge: Questions/Answers

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Contents

1 Recharge during outline compatibilities

1.1 Question

Dear Challenge Organizers,
we have a question about the outline compatibility: consider an out-line compatible arc between trips i and j, and consider that trip i ends at terminal A and trip j starts at terminal B. It is clear that we have to go from A to the depot (pull-in trip), stop at the depot for at least the minimum required time, and then go from the depot to B (pull-out trip).

Is it correct that we do not have to consider the possibility of stopping at A nor at B?

This would imply that after trip i we immediately move to the depot, and then we leave the depot at the latest possible time to perform trip j. If this is correct, then, in an outline arc, the recharge can only occur at the depot, i.e., the recharge cannot be done at terminal A or B. In principle it could be beneficial to recharge at A or B, but it complicates the problem, so we would like to know if this possibility has to be taken into account or not.

Thank you in advance for your time,

Team

1.2 Answer

Dear Team,
thank you for your question which led us to reflect on a case we hadn't thought of.

> Is it correct that we do not have to consider the possibility of stopping at A nor at B?

You are allowed to stop at A or B for recharging, between a trip and a pull in/out trip. But if you don't recharge, then you are NOT allowed to stop (with stopping time >0) at terminals between a trip and a pull in/out trip. In that case, in fact, the stop will be meaningless since it brings no advantage neither to the transport company nor to the service users.

We take this opportunity to stress the fact that the minimum stopping time, denoted by $\delta^h_{n,\min}$ regards only in-line compatibility and this does not refer to the stopping time between a trip and a pull in/out trip, while the maximum stopping time $\delta^h_{n,\max}$ is always in force.
On the other hand, if you are recharging between a trip and a pull-in/out trip, the recharge time τ_r must be between the minimum recharge time $t_{min,v}$ and the maximum recharge time $t_{R,v}(a^c_{res}/a^{tot}_v)$ (see item 3 in section 3.2.2 in [1, 2]).
If you are NOT recharging between a trip and a pull-in/out trip, as we already said, the stopping time has to be equal to zero.

To recap, given a break of duration τ between a trip and a pull-in/out trip at node n (*A* or *B*) and a recharge inside the break, the recharge time τ_r has to respect the following conditions

$$\begin{cases} \tau_r = \tau \\ \tau_r = 0 \end{cases} \quad or \quad t_{\min,v} \le \tau_r \le \min\{t_{R,v}(a^c_{res}/a^{tot}_v), \delta^h_{n,\max}\}.$$

The problem description documents [1, 2, 3] and the validator will be updated as a consequence of this answer, as soon as possible.

Let us know if our reply is not clear.
Best regards,
The Challenge Organizers

2   Inconsistency in instance format

2.1   Question

Dear Challenge Organizers,
I would like to report that there is a small problem with the new batch of instances:

one of the keys in the JSON files was called `"breakingTimes"` in the old instances (like `Small_Input_P`) now is called `"stoppingTimes"` (see `1line_input_P`).

Team

2.2   Answer

Dear Team,
thanks for your report.

The correct key in the JSON files is `"breakingTimes"` as stated in Section 2.2 in [4]. We will correct the new instances as soon as possible.

Best regards,
The Challenge Organizers

3   Headways instance Medium_Input_P.json

3.1   Question

In the instance Medium_Input_P.json one of the "maxHeadway" for "lineName": "line2" and "directionType": "inBound" reports a value equal to 12600.

Is this value correct? It looks out of place since all other values are about 1000.

3.2   Answer

Dear Team,
thanks for your report,
Yes, you are right the correct value is 1260.

Sorry for the inconvenience,
Best regards,
The Challenge Organizers

4   Missing pullOut arc in 3Lines_3tw and 3Lines_6tw

4.1   Question

Dear Challenge Organizers,
In instance 3Lines_3tw node 3 has only one deadheadArc. The pullOut arc is missing. Moreover, there are multiple definitions of the pullOut arc for node 1. The same is replicated in instance 3Lines_6tw.

4.2   Answer

Dear Team thanks for the report!
There was a typo error inside both instances. We have just updated them and node3 has now both pullIn and pullOut arcs. Moreover the multiple definition of the pullOut arc for node1 has been erased. You can download the new instances using your credentials at [5].
Best regards, The Challenge Organizers

References

[1] *MINOA Research Challenge: Description problem - Professional.* https://minoa-itn.fau.de/?page_id=968.

[2] *MINOA Research Challenge: Description problem - Senior.* https://minoa-itn.fau.de/?page_id=968.

[3] *MINOA Research Challenge: Description problem - Junior.* https://minoa-itn.fau.de/?page_id=968.

[4] *MINOA Research Challenge: Input-Output description format.* https://minoa-itn.fau.de/?page_id=968.

[5] *MINOA Research Challenge: Challenge instances download.* https://minoa-itn.fau.de/?page_id=945.