VEHICLE **ROUTING**

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Problem:
inefficient and costly delivery routes, no consideration of flexible variables as loading capacity and material weight

Solution:
AI-based route planning with interactive maps

Benefit and value:
cost efficient route planning taking into account flexible and changing variables such as loading capacity and current weight

Industries:
Transportation & logistics

VEHICLE **ROUTING**

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Given are

customers with pickup orders like waste,
a lorry with a capacity,
a dump site and
a depot.

Wanted

The minimum cost driving sequence.

Nature:

Operational Research (OR) problem

OR ~ Mathematical Optimisation + Economics + Informatics

<u>Extensions</u>

Fleet Resource Scheduling

Location Planning

VEHICLE **ROUTING**

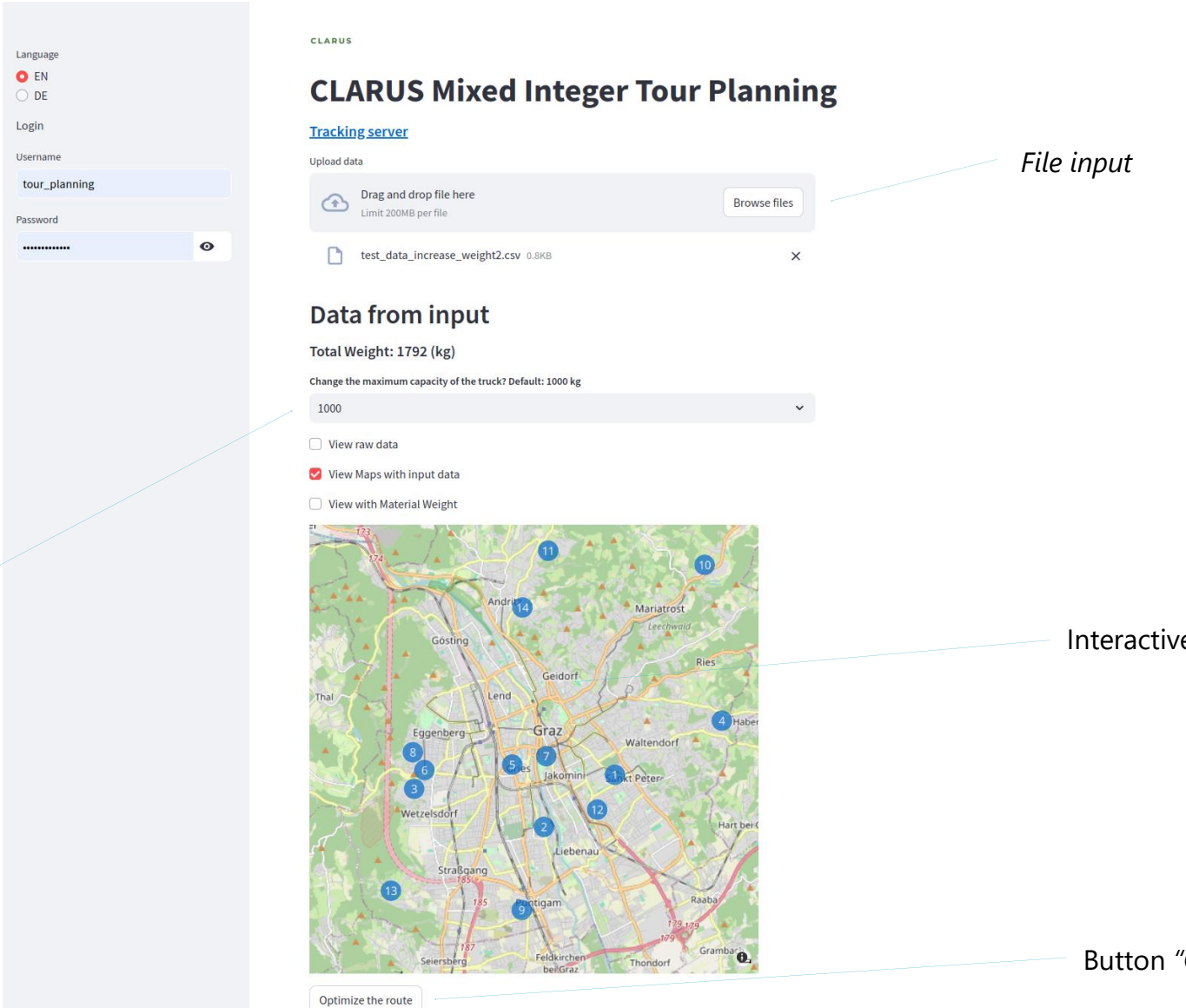
DEMO

Logged in and uploaded data

Change language

User login

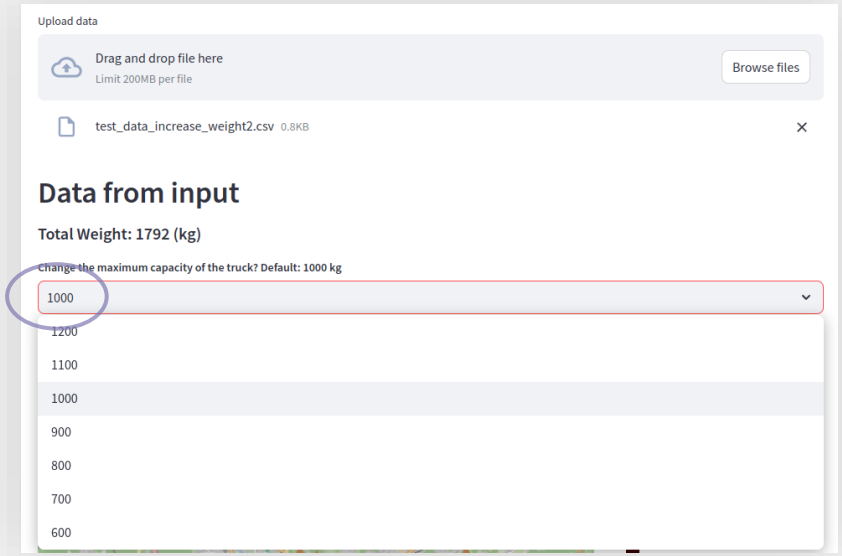
Change *truck capacity*



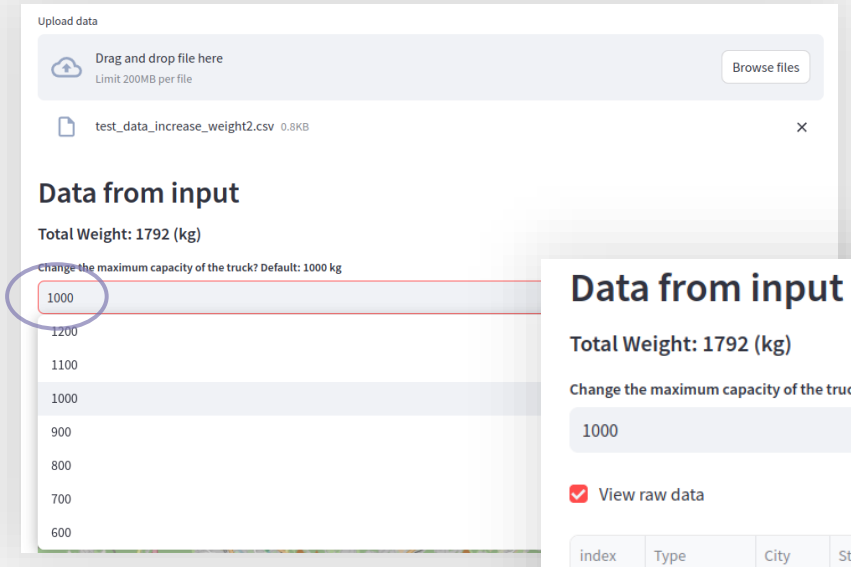
File input

Interactive maps

Button *"Optimize"*



VEHICLE **ROUTING**



Data from input

Total Weight: 1792 (kg)

Change the maximum capacity of the truck? Default: 1000 kg

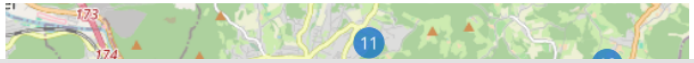
1000

☑ View raw data

index	Type	City	Street name	Latitude	Longitude	Material [kg]
1	Start & End	Graz	Inffeldgasse 13	47.059580	15.463290	0
2	Drop Off	Graz	Sturzgasse 16	47.046350	15.436890	0
3	Pick up	Graz	Krottendorfer Straße / Lissäckerstraße	47.056010	15.388530	170
4	Pick up	Graz	Wilhelm-Gösser-Gasse 31	47.073320	15.503170	180
5	Pick up	Graz	Custozzagasse 7	47.062160	15.425070	155
6	Pick up	Graz	Burenstraße / Burgenlandstraße	47.060770	15.392350	194
7	Pick up	Graz	Grazbachgasse / Pestalozzistraße	47.064320	15.437720	111
8	Pick up	Graz	Baiernstraße 93	47.065300	15.388020	132
9	Pick up	Graz	Piccardigasse 22	47.025230	15.428610	149
10	Pick up	Graz	Föllinger Straße 13	47.112850	15.496770	199
11	Pick up	Graz	Pfanghofweg 45	47.116430	15.438470	117
12	Pick up	Graz	Harmsdorfgasse / Weinholdstraße	47.050740	15.456740	123
13	Pick up	Graz	Mantscha-Wald-Weg 27	47.030130	15.379880	112
14	Pick up	Graz	Ziegelstraße 11s	47.102040	15.428850	150

☑ View Maps with input data

☐ View with Material Weight



VEHICLE **ROUTING**

Upload data

Drag and drop file here
Limit 200MB per file
Browse files

test_data_increase_weight2.csv 0.8KB

Data from input

Total Weight: 1792 (kg)

Change the maximum capacity of the truck? Default: 1000 kg

1000

1200
1100
1000
900
800
700
600

Data from input

Total Weight: 1792 (kg)

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1000

☑ View raw data

index	Type	City	Street name	Latitude	Longitude	Materia
1	Start & End	Graz	Inffeldgasse 13	47.059580	15.463290	
2	Drop Off	Graz	Sturzgasse 16	47.046350	15.436890	
3	Pick up	Graz	Krottendorfer Straße / Lissäckerstraße	47.056010	15.388530	
4	Pick up	Graz	Wilhelm-Gösser-Gasse 31	47.073320	15.503170	
5	Pick up	Graz	Custozzagasse 7	47.062160	15.425070	
6	Pick up	Graz	Burenstraße / Burgenlandstraße	47.060770	15.392350	
7	Pick up	Graz	Grazbachgasse / Pestalozzistraße	47.064320	15.437720	
8	Pick up	Graz	Baiernstraße 93	47.065300	15.388020	
9	Pick up	Graz	Piccardigasse 22	47.025230	15.428610	
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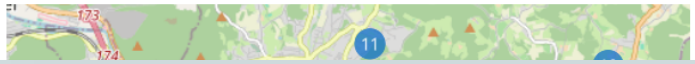
12	Pick up	Graz	Harmsdorfgasse / Weinholdstraße	47.050740	15.456740	
13	Pick up	Graz	Mantscha-Wald-Weg 27	47.030130	15.379880	
14	Pick up	Graz	Ziegelstraße 11s	47.102040	15.428850	

☑ View Maps with input data

☐ View with Material Weight



Data from input

Total Weight: 1792 (kg)

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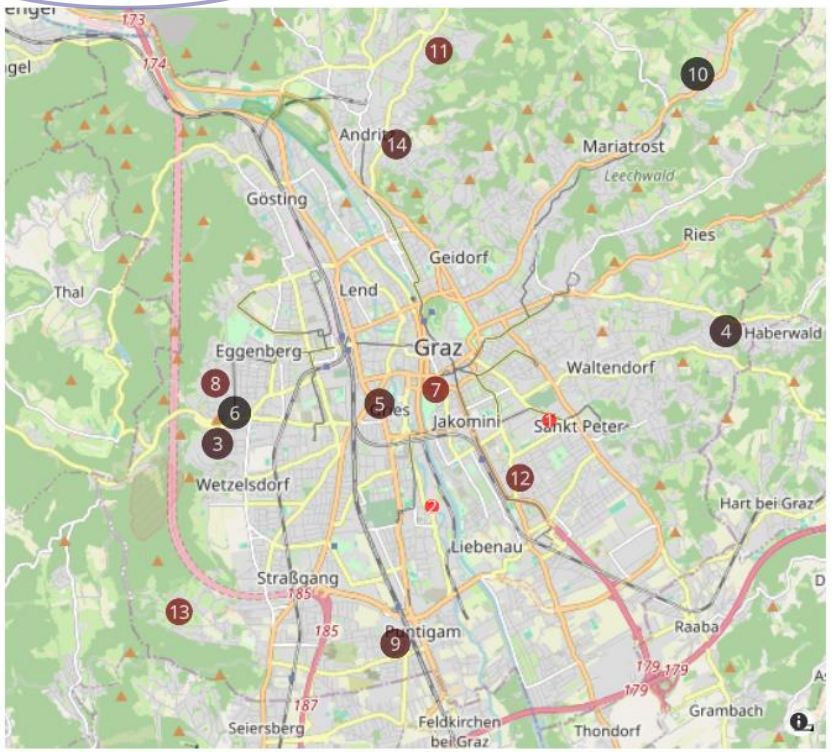
☐ View raw data

☑ View Maps with input data

☑ View with Material Weight



VEHICLE **ROUTING**

RESULTS

Cost function

Execution time

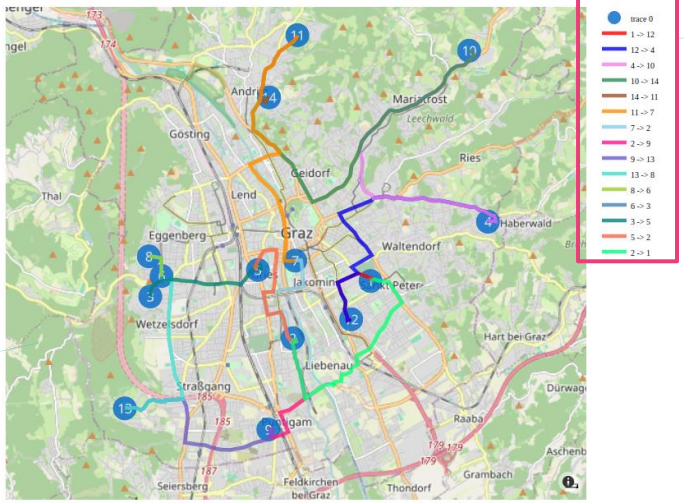
Interactive maps

The route

Result in table format

Value of the objective function 187,07 €

Program duration: 5 s



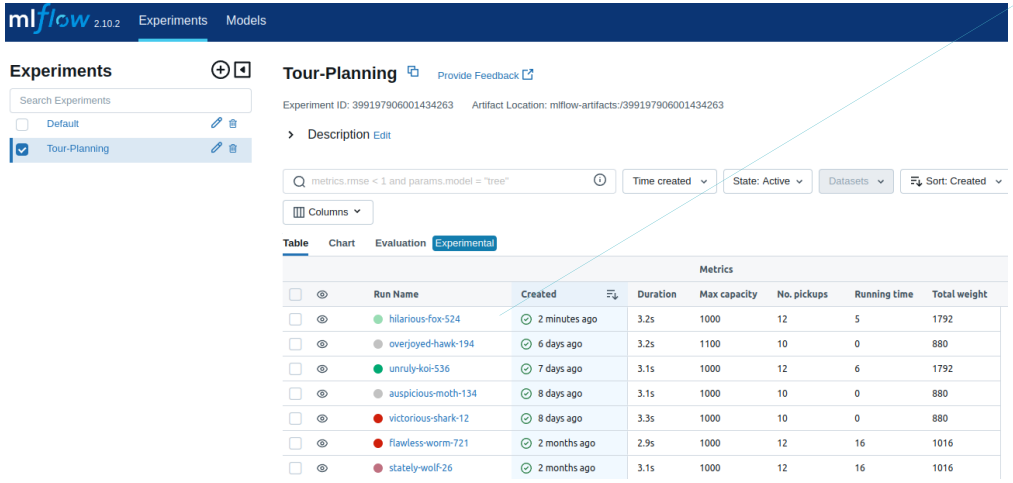
Route

#	time	weight (kg)	start	end	notes
1	07:00:00	0	1	12	
2	07:13:09	123	12	4	
3	07:44:19	303	4	10	
4	08:14:21	502	10	14	
5	08:43:23	652	14	11	
6	08:56:25	769	11	7	
7	09:23:24	880	7	2	Drop Off
8	10:16:21	0	2	9	
9	10:34:52	149	9	13	
10	10:57:07	261	13	8	
11	11:21:42	393	8	6	
12	11:30:08	587	6	3	
13	11:38:02	757	3	5	
14	11:54:44	912	5	2	Drop Off
15	12:48:44	0	2	1	

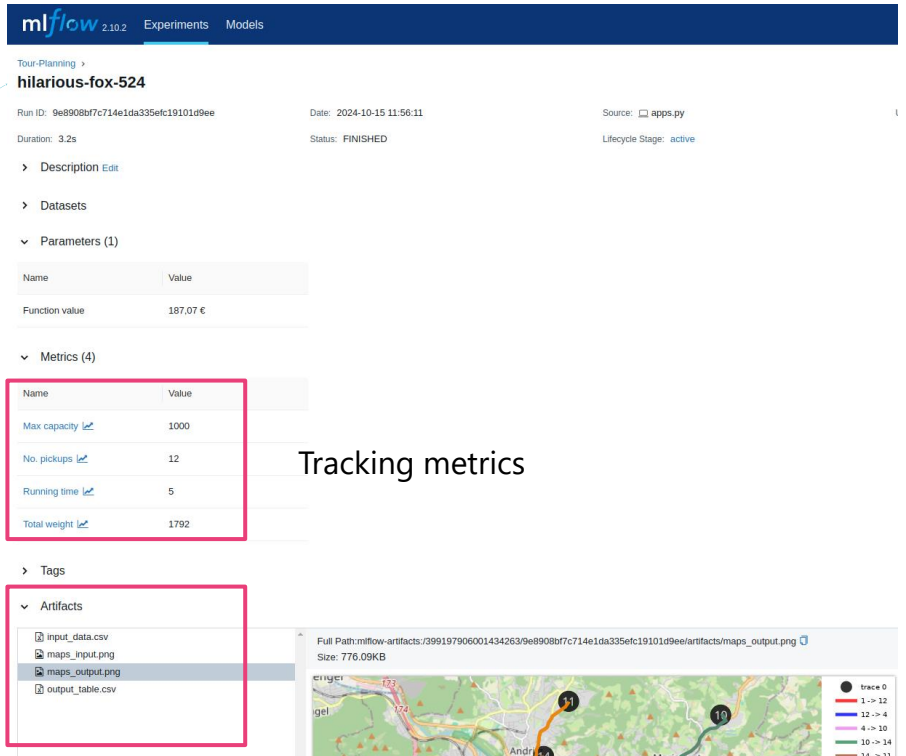
Sending the experiment to the tracking server. Please wait...

Done saving to the tracking server Tracking server

TRACKING SERVER



Run details



Tracking metrics

Tracking input & output Files

KNOW Center

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