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TSP Solver and Generator [1]

Short description:

Generate and solve Travelling Salesman Problems

Homepage:

http://tspsg.info/

Supported platforms:

- Windows
- Linux
- FreeBSD
- Windows Mobile
- Symbian
- BlackBerry 10

UI Languages:

- English
- Українська
- Русский

Technologies:

- C++
- Qt 4
- Qt 5

Description:

TSP Solver and Generator is intended to generate and solve **Travelling Salesman Problem** tasks. It uses *Branch and Bound* method for solving. Its input is a number of cities and a matrix of city-to-city travel costs. The matrix can be populated with random values in a given range (which is useful for generating tasks). The result is an optimal route, its price, step-by-step matrices of solving and a solving graph. The task can be saved in an internal binary format and opened later. The result can be printed or saved as *PDF*[1], *HTML*, or *ODF*.

TSPSG may be useful for teachers to generate test tasks or just for regular users to solve

TSP's. Also, it may be used as an example of using*Branch and Bound* method to solve a particular task.

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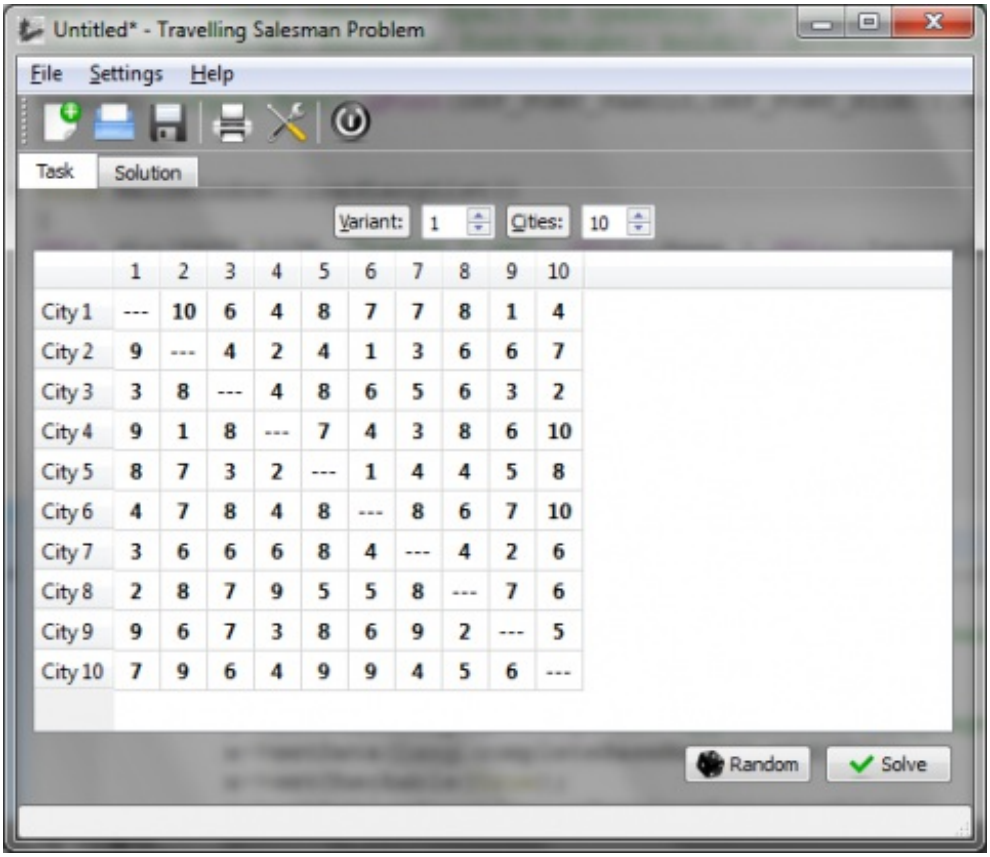
1. Depends on the platform. ↩

My contribution:

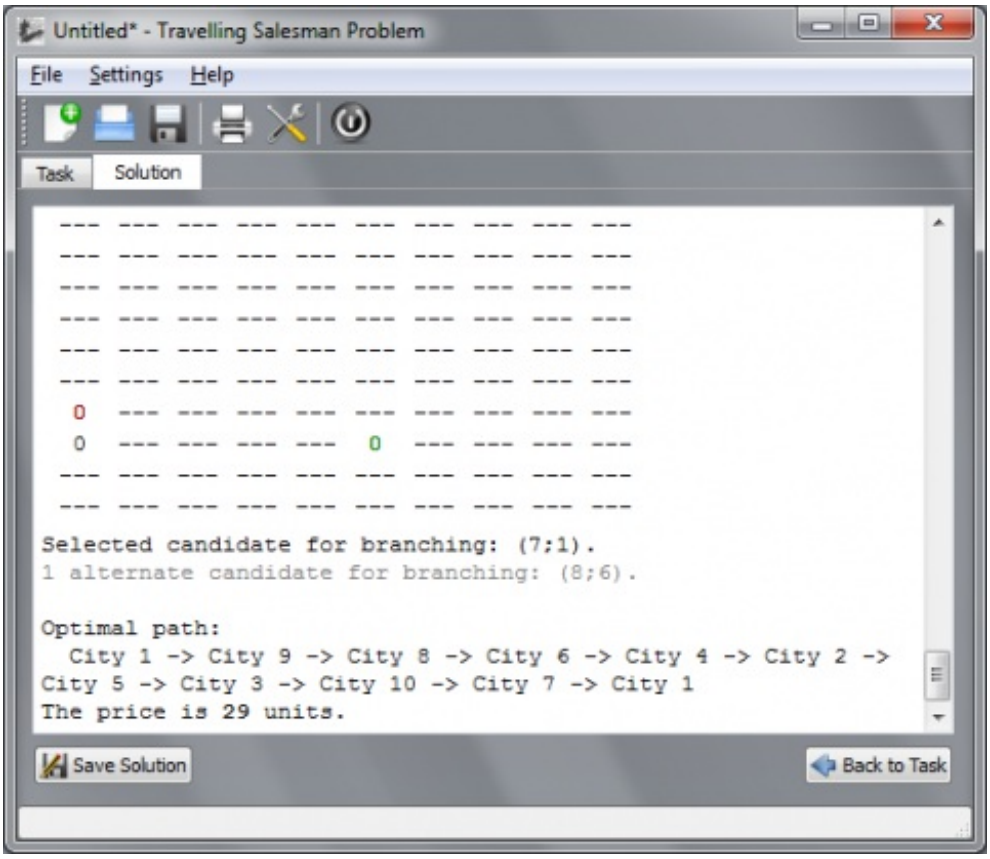
I am the author of this project. The project is currently "on hold" due to the lack of my spare time. But it will be revived, eventually.

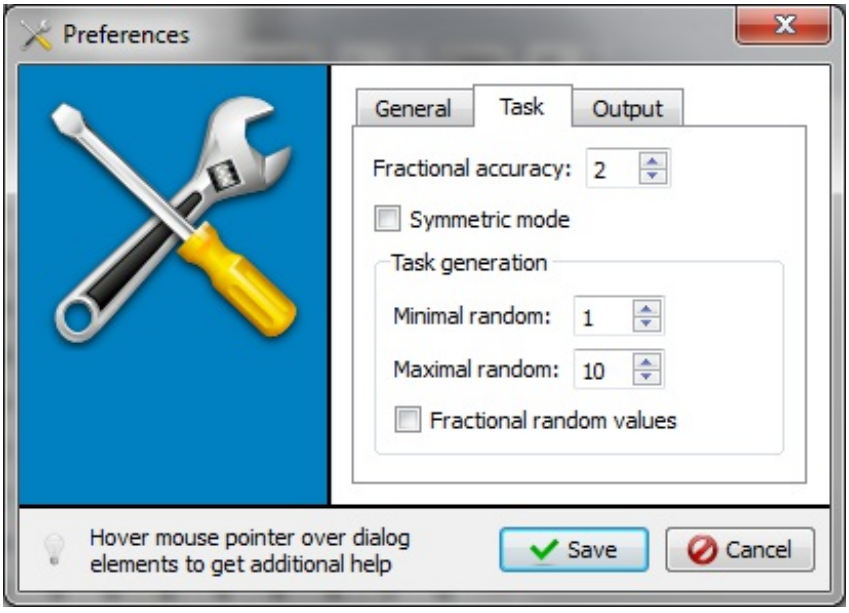
This project was originally born as an Open Source rewrite of my University coursework Branch and bound method of solving Travelling Salesman Problem[2].

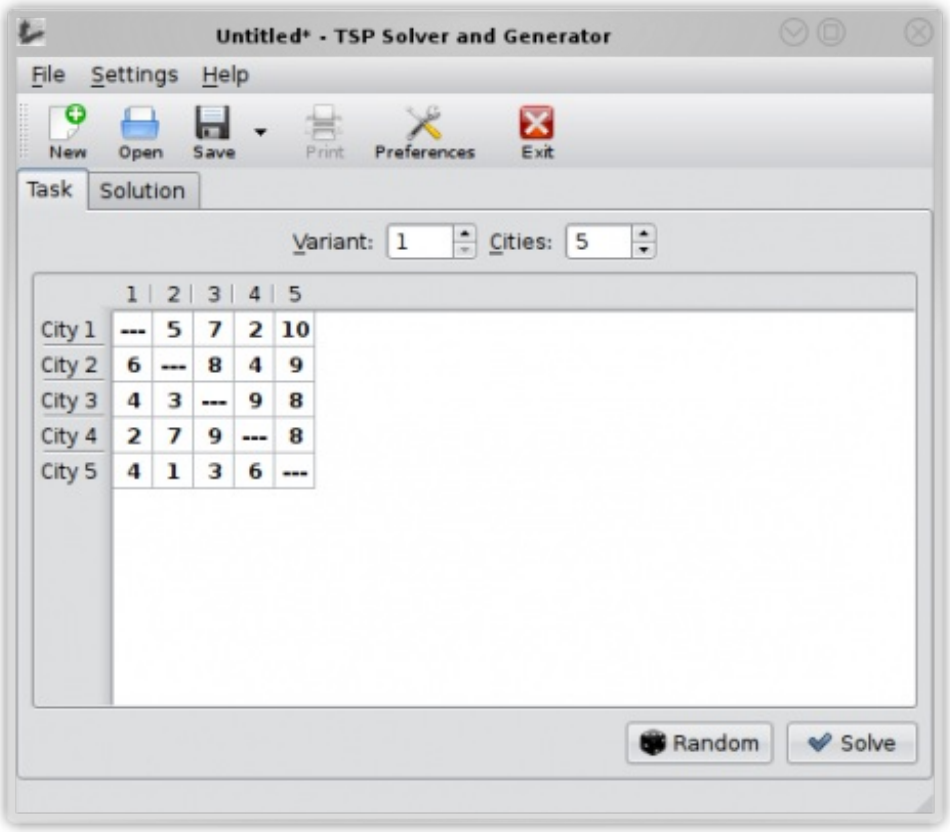
Screenshots:

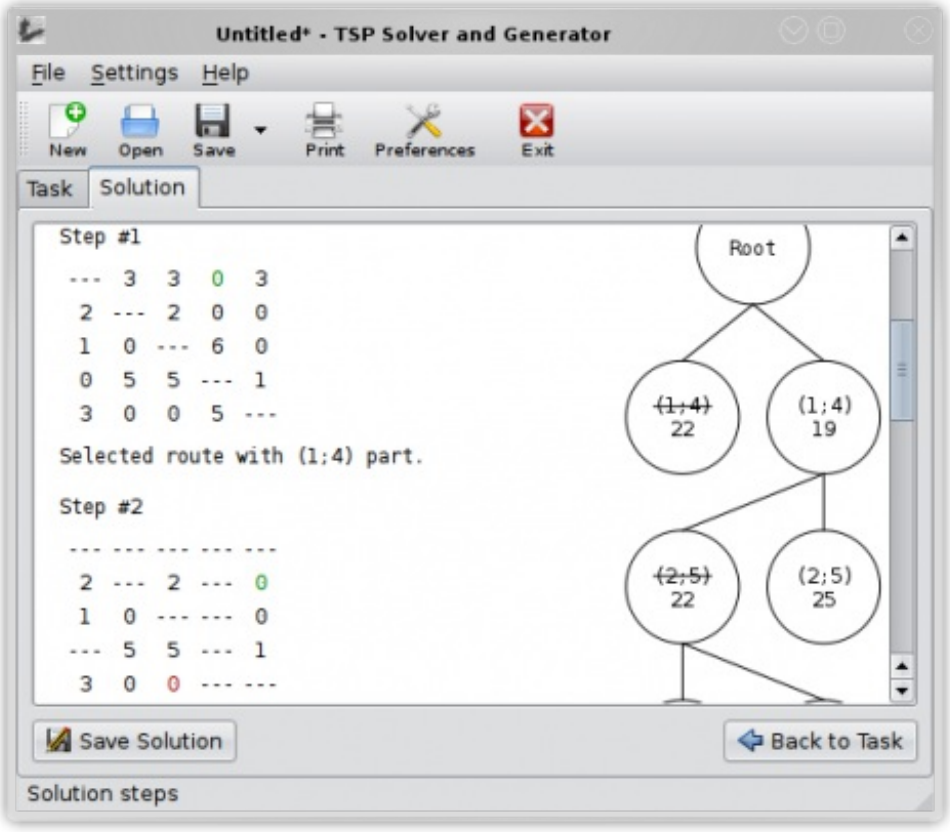


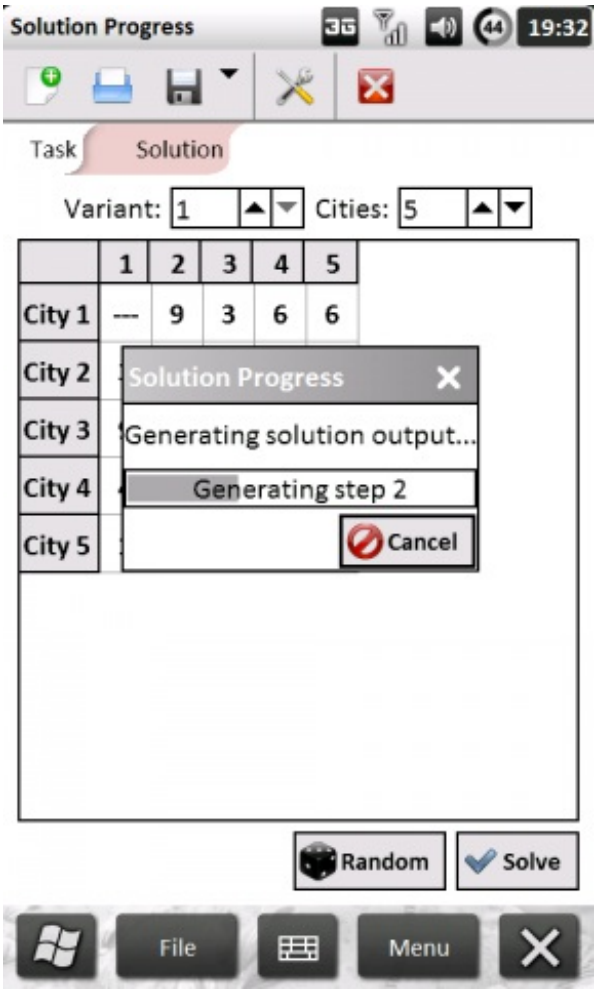
	1	2	3	4	5	6	7	8	9	10
City 1	---	10	6	4	8	7	7	8	1	4
City 2	9	---	4	2	4	1	3	6	6	7
City 3	3	8	---	4	8	6	5	6	3	2
City 4	9	1	8	---	7	4	3	8	6	10
City 5	8	7	3	2	---	1	4	4	5	8
City 6	4	7	8	4	8	---	8	6	7	10
City 7	3	6	6	6	8	4	---	4	2	6
City 8	2	8	7	9	5	5	8	---	7	6
City 9	9	6	7	3	8	6	9	2	---	5
City 10	7	9	6	4	9	9	4	5	6	---

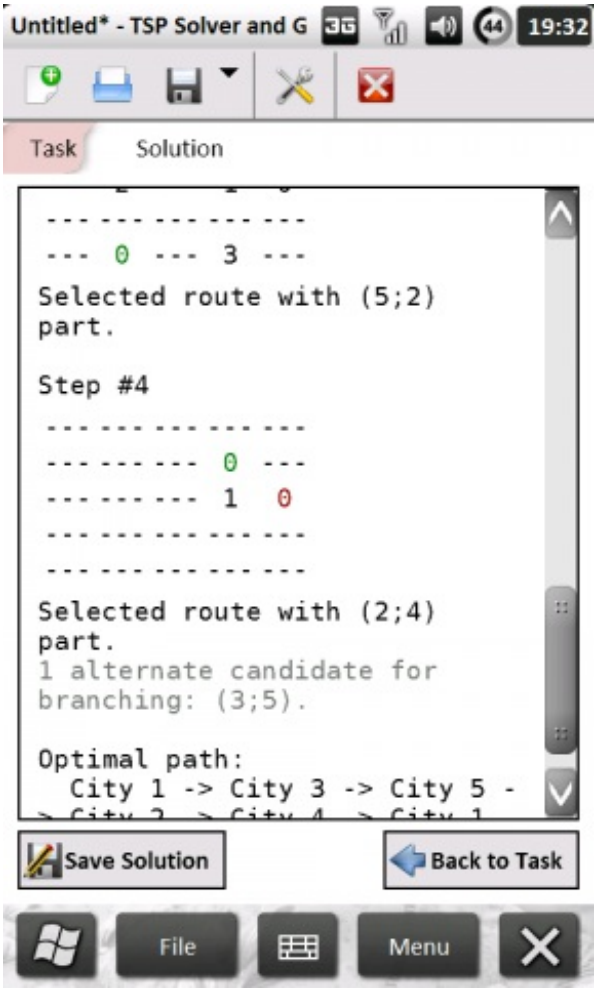

Untitled* - Travelling Salesman Problem
File Settings Help
Task Solution
Selected candidate for branching: (7;1).
1 alternate candidate for branching: (8;6).
Optimal path:
City 1 -> City 9 -> City 8 -> City 6 -> City 4 -> City 2 ->
City 5 -> City 3 -> City 10 -> City 7 -> City 1
The price is 29 units.
Save Solution
Back to Task

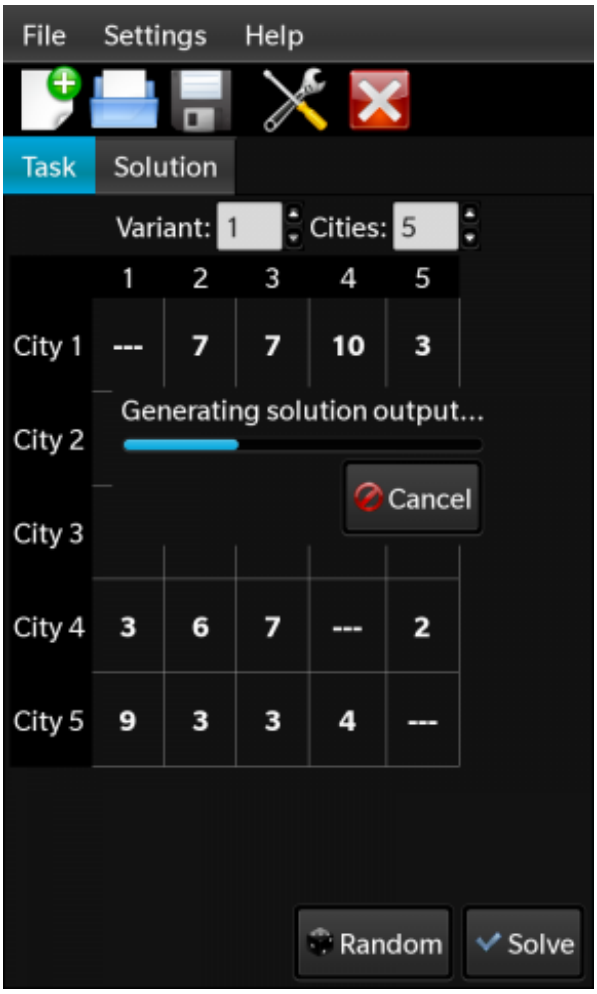

Preferences
General
Task
Output
Fractional accuracy: 2
Symmetric mode
Task generation
Minimal random: 1
Maximal random: 10
Fractional random values
Hover mouse pointer over dialog elements to get additional help
Save
Cancel

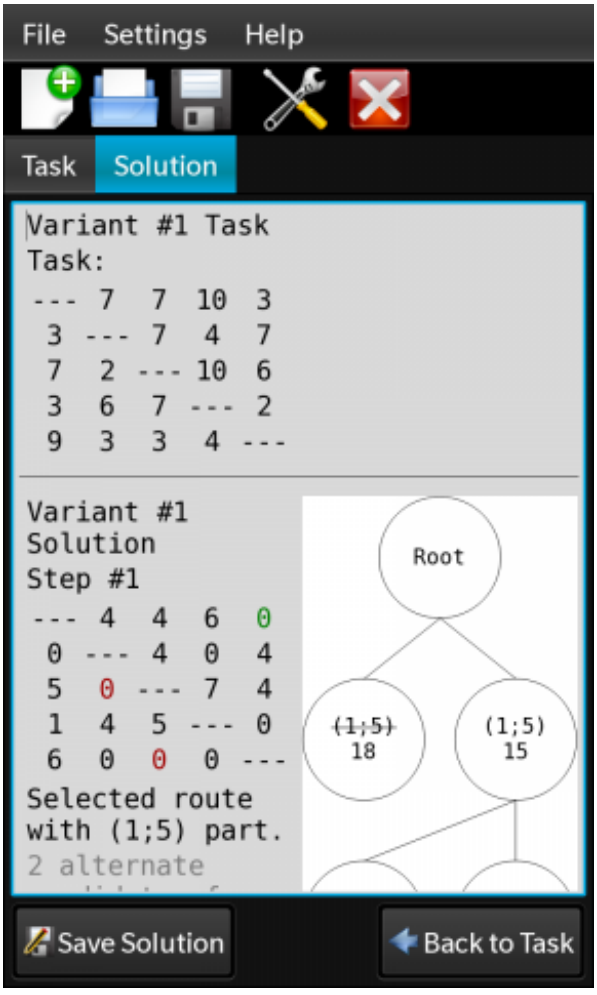

Untitled* - TSP Solver and Generator
File Settings Help
New Open Save Print Preferences Exit
Task Solution
Variant: 1 Cities: 5
1 2 3 4 5
City 1 --- 5 7 2 10
City 2 6 --- 8 4 9
City 3 4 3 --- 9 8
City 4 2 7 9 --- 8
City 5 4 1 3 6 ---
Random Solve


Untitled* - TSP Solver and Generator
File Settings Help
New Open Save Print Preferences Exit
Task Solution
Step #1
--- 3 3 0 3
2 --- 2 0 0
1 0 --- 6 0
0 5 5 --- 1
3 0 0 5 ---
Selected route with (1;4) part.
Step #2
--- --- --- --- ---
2 --- 2 --- 0
1 0 --- --- 0
--- 5 5 --- 1
3 0 0 --- ---
Root
(1;4) 22
(1;4) 19
(2;5) 22
(2;5) 25
Save Solution
Back to Task
Solution steps


Solution Progress
19:32
Task
Solution
Variant: 1
Cities: 5
1 2 3 4 5
City 1 --- 9 3 6 6
City 2
City 3
City 4
City 5
Solution Progress
Generating solution output...
Generating step 2
Cancel
Random
Solve
File
Menu


Untitled* - TSP Solver and G
19:32
Task
Solution
--- 0 --- 3 ---
Selected route with (5;2)
part.
Step #4
--- 0 ---
--- 1 0
Selected route with (2;4)
part.
1 alternate candidate for
branching: (3;5).
Optimal path:
City 1 -> City 3 -> City 5 -
Save Solution
Back to Task
File
Menu


File
Settings
Help
Task
Solution
Variant: 1
Cities: 5
1 2 3 4 5
City 1 --- 7 7 10 3
City 2
Generating solution output...
Cancel
City 3
City 4 3 6 7 --- 2
City 5 9 3 3 4 ---
Random
Solve


File
Settings
Help
Task
Solution
Variant #1 Task
Task:
--- 7 7 10 3
3 --- 7 4 7
7 2 --- 10 6
3 6 7 --- 2
9 3 3 4 ---
Variant #1
Solution
Step #1
--- 4 4 6 0
0 --- 4 0 4
5 0 --- 7 4
1 4 5 --- 0
6 0 0 0 ---
Selected route
with (1;5) part.
2 alternate
Root
(1;5)
18
(1;5)
15
Save Solution
Back to Task

Tags:

- Open Source
- Qt
- TSPSG

Short URL: https://olse.me/HyJ

Source URL (modified on 05.06.2016 - 23:14): https://oleksii.name/en/projects/tspsg

Links
[1] https://oleksii.name/en/projects/tspsg
[2] https://oleksii.name/en/projects/archived/zkommodrd