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

1

TSP's. Also, it may be used as an example of using *Branch and Bound* method to solve a particular task.
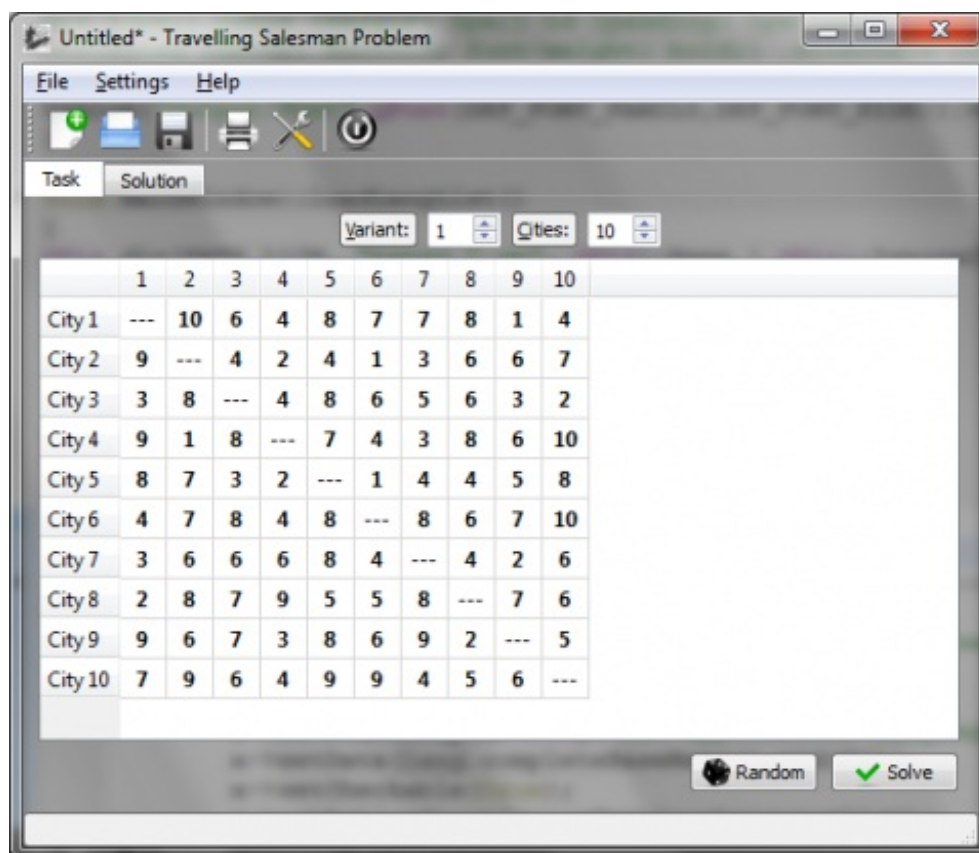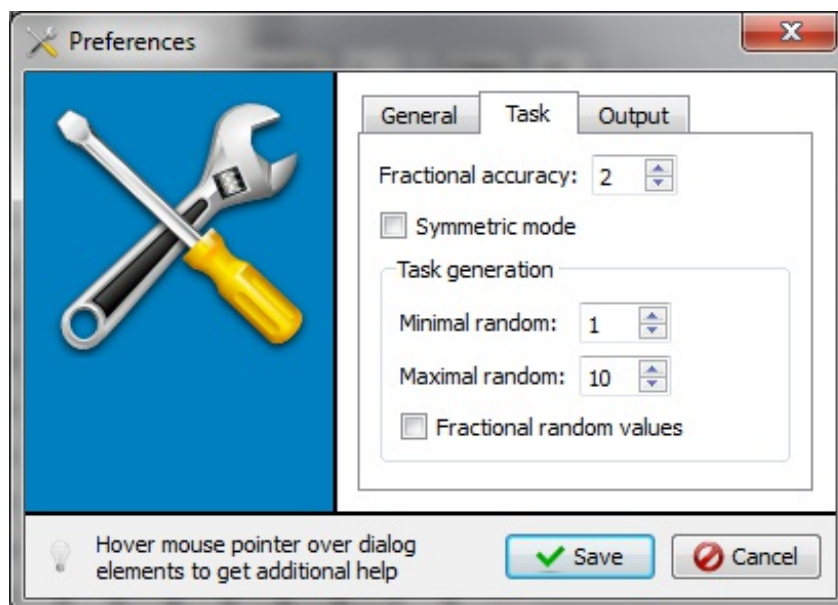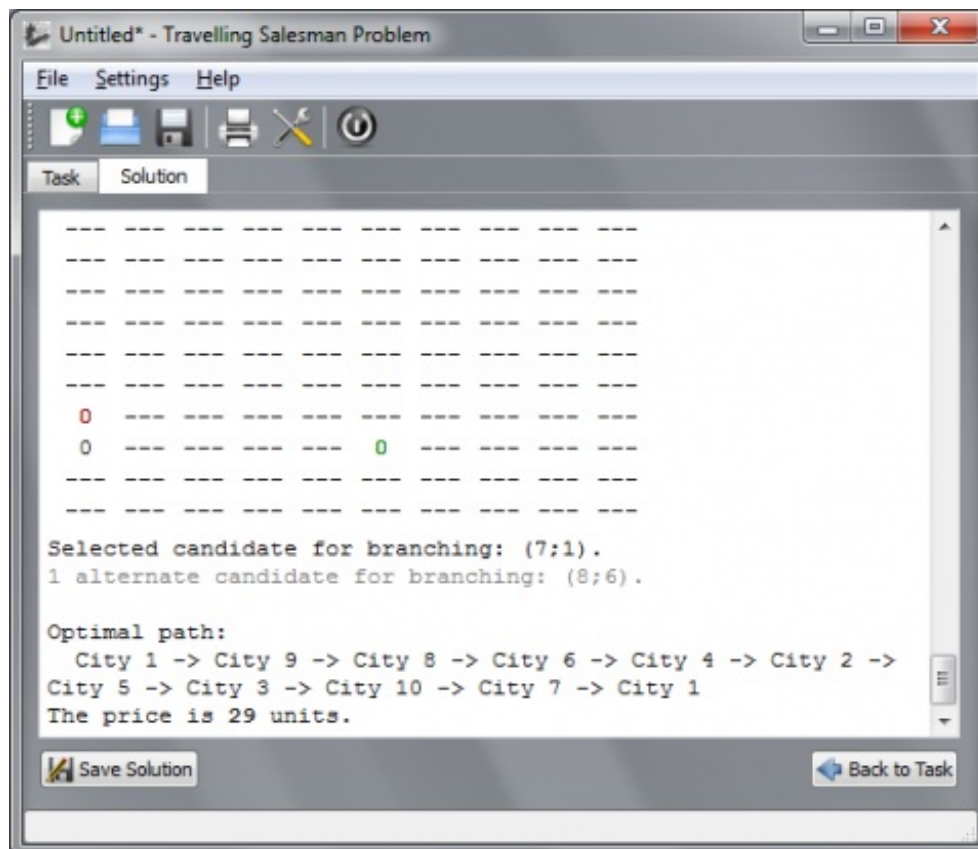
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1. Depends on the platform. ↵
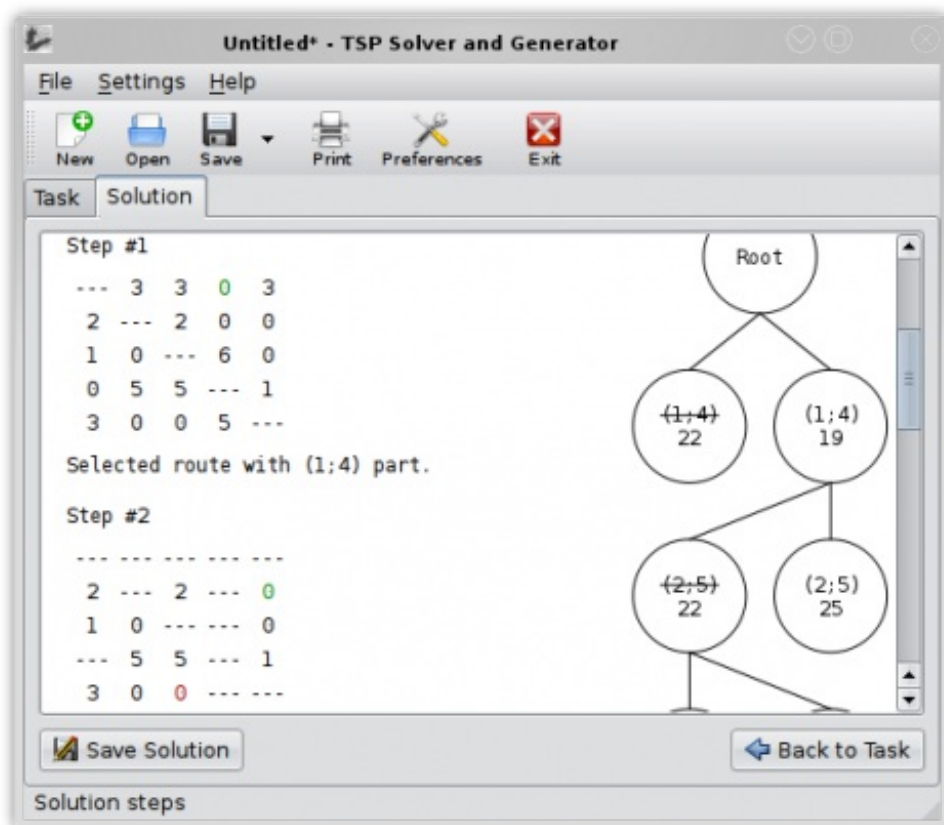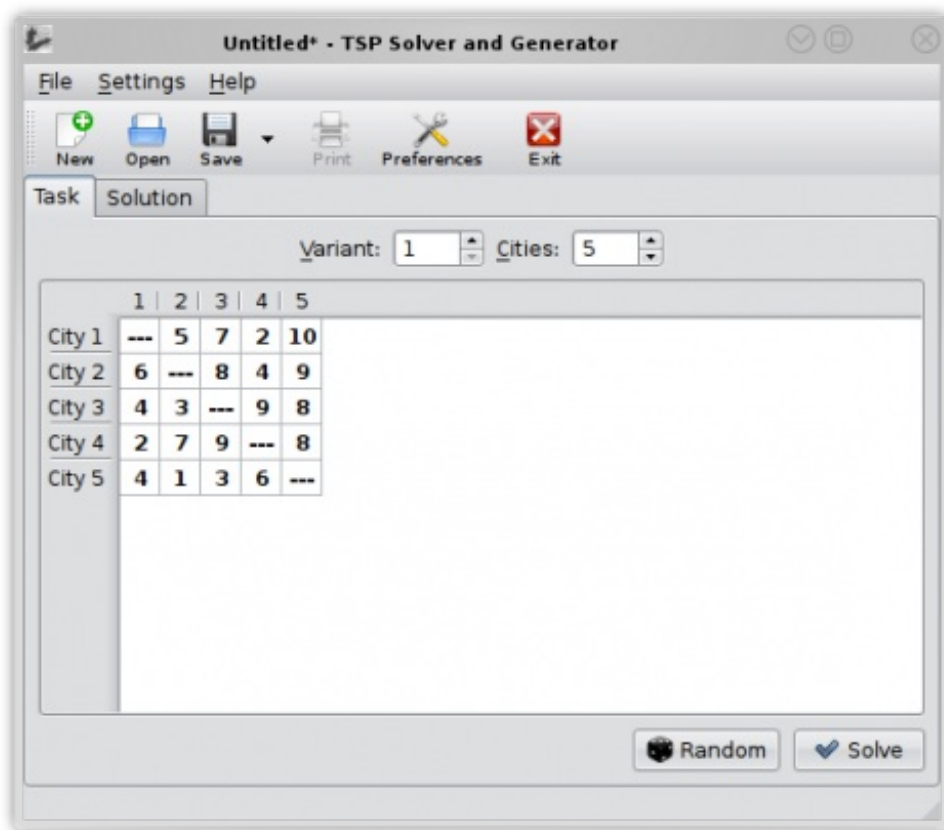
My contribution:

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:

Untitled* - Travelling Salesman Problem

File   Settings   Help

Task   Solution

```
--- --- --- --- --- --- --- --- --- ---
--- --- --- --- --- --- --- --- --- ---
--- --- --- --- --- --- --- --- --- ---
--- --- --- --- --- --- --- --- --- ---
--- --- --- --- --- --- --- --- --- ---
--- --- --- --- --- --- --- --- --- ---
 0  --- --- --- --- --- --- --- --- ---
 0  --- --- --- ---  0  --- --- --- ---
--- --- --- --- --- --- --- --- --- ---
--- --- --- --- --- --- --- --- --- ---
```

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

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   ✕

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 -
 > City 2 -> City 4 -> City 1
```

📝 Save Solution   ◀ Back to Task

⊞ File   ⊞   Menu   ✕

Screenshot 1

File   Settings   Help

Task   Solution

Variant: 1   Cities: 5

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

Generating solution output...

⊘ Cancel

🎲 Random   ✔ Solve

Screenshot 2

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