

Lesson 2: Implement a Hill-Climbing using ParadisEO

1 Example

The archive `paradiseo_practices_0208.tgz` installed on your computer contains a Hill-Climbing implemented using ParadisEO-MO (see `hill_climbing` in the `build/lesson2` directory).

To run it, please go in `build/lesson2` and start the program `hill_climbing` by giving one of the TSP instances located in `tsp/benches`.

When entering `./hill_climbing ../../tsp/benches/berlin52.tsp`, you should end up with the following outputs:

```
>> Loading [../../tsp/benches/eil101.tsp]
[From] -3435 101 36 55 54 65 50 80 14 27 46 15 93 58 78 47 99 64 68
49 72 81 82 76 41 16 66 30 29 83 95 71 38 35 19 5 63 26 43 96 79 52
59 69 7 56 37 3 32 28 9 13 1 91 31 73 11 40 62 17 24 45 88 6 85 22
18 20 44 94 12 33 60 89 74 42 97 21 100 57 77 92 98 51 2 25 75 10 86
8 23 67 70 34 90 87 48 53 0 39 4 84 61
[To] -708 101 36 97 91 58 95
98 92 84 99 90 43 13 37 85 15 60 16 83 4 59 82 44 7 45 35 48 63 10
18 46 47 81 17 51 26 27 25 39 57 52 100 88 5 93 94 12 1 56 86 96 41
42 14 40 21 73 71 72 20 3 55 74 22 66 38 24 54 53 23 28 78 2 76 67
79 11 75 68 0 49 32 80 77 33 50 8 34 70 64 65 19 29 69 31 89 62 9 30
87 6 61
```

The printed-out results show for the initial best solution and the final one :

- the length of the route
- the number of cities
- the route itself (notice that the city index starts from 0).

2 Tabu search

Study the `hill_climbing.cpp` file located in the `lesson2` directory using :

- the ParadisEO-MO API documentation available at :
<http://paradiseo.gforge.inria.fr/addon/paradiseo-mo/doc/index.html>
- the source files located in the `tsp/src/` directory

3 Customize the Hill CLimbing

Make a backup (copy) of the `cpp` file `tabuhill_climbing.cpp`. You can now modify the original `hill_climbing.cpp` and use the existing makefiles to compile it.

Edit and modify the `hill_climbing.cpp` file :

- Try to tune a few parameters (random seed and the move selector) and observe the changes on the final solution.

To compile `hill_climbing.cpp`, you should use the command `make` from `build/lesson2`.

Finally, test your modifications on several TSP instances (`berlin52`, `eil101` ...) and compare the results you get.