Lesson 4: Implement a simulated annealing using ParadisEO

1 Example

The archive `paradiseo_practices_0208.tgz` installed on your computer contains a simulated annealing implemented using ParadisEO-MO (see `simulated_annealing` in the **build/lesson4** directory).

To run it, please go in **build/lesson4** and start the program `simulated_annealing` by giving one of the TSP instances located in **tsp/benchs**.

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

```
>> Loading [../../tsp/benchs/eil101.tsp]
[From] -3347 101 84 20 57 71 92 19 59 10 30 55 27 63 36 26 18 21 46
72 96 35 39 24 29 86 60 40 34 48 67 38 13 0 5 11 16 83 49 50 6 7 87
1 53 90 74 52 58 15 8 95 25 68 61 70 65 45 33 79 23 62 4 37 91 85 78
89 47 69 28 32 66 80 75 94 41 100 44 73 22 9 76 64 97 31 88 51 93 43
2 3 14 56 99 12 82 81 42 17 54 98 77
[To] -697 101 84 90 99 36 97
92 60 15 85 37 43 13 41 42 14 56 86 1 40 21 73 72 20 71 74 55 22 66
38 3 24 54 53 23 28 78 80 8 50 32 2 76 67 79 11 75 49 0 68 26 100 52
27 25 39 57 12 93 94 96 91 58 98 95 5 88 51 17 82 59 4 83 16 44 7 45
46 35 48 63 18 47 81 6 87 61 10 62 89 31 9 30 69 29 19 65 70 64 34
33 77
```

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 Study the simulated annealing dedicated components

Study the `simulated_annealing.cpp` file located in the **lesson4** 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 simulated annealing

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

Edit and modify the `simulated_annealing.cpp` file :

- Change the cooling schedule components and parameters.
- Customize the temperature decrease process and try to obtain another good solution.

To compile `simulated_annealing.cpp`,you should use the command `make` from **build/lesson4**.

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