Assignment - Optimization Methods and Algorithms

FAQ

1. **Does the number of task for each type of user refer to a single time period?**
   NO. The number of task (n) is time-independent. Each time a variable X is increased by one in the period t and for the cell j, n tasks are satisfied.

2. **Considering a path of the user that moves from cell i to cell j through the cell q, can the user do tasks in cell q?**
   NO. Variables X count the number of users that move from a starting cell to an ending cell to do a fixed number of tasks in the destination cell. Every cells touched during the path are not considered.

3. **Have instances for the assignment a feasible solution?**
   YES. All instances provided to you have a feasible solution.

4. **Which IDE is recommended?**
   There are not recommended IDE. We used CLion (Jet Brain) to write the code included in the zip file on the web portal. Other IDEs for C++ may be Visual Studio, Xcode, eclipse.
   Jet brain provides a student version and covers several languages: C++, Java, Python, …

5. **Are 5 seconds for a single instance?**
   Yes. You can use up to 5 seconds to find a solution for a single instance.
   Reading and writing operation are not considered in the 5 seconds. Any other operations like sorting must be included.

6. **Can people do some tasks in the origin cell?**
   NO. X_{ii} for each type of person and each period is always zero. A person in cell i can do tasks in all cells j != i.

7. **What is the format of the input file?**
   Considering the input file Co_30_1_NT_0.txt

30 1 3 Number of cells Number of periods Type of people

1 2 3 Identification of type of people

0 0 1.4 5.88 3.33 5.53 10.66 2.94 4.41 7.72 4.31 13.67 6.93 10.02 22.92 12.25 26.75 8.71 30.84 30.33 23.89 15.18 20.83 10.19 17.5 31.32 28.53 27.89 38.61 24.66 36.49 21.08 4.26 3.31 4.12 4.19 2.18 6.14 13.5 12.51 4.9 12.07 16.34 13.63 16.17 13.71 17.02 7.87 17.74 17.33 19.58 15.19 12.37 21.55 9.24 10 36.37 17.39 13.98 46.24 15.15 42.5 … Matrix Cij for type 0 and period 0

32 14 0 0 20 0 0 0 0 42 21 46 0 33 61 0 4 42 60 20 0 0 0 0 0 0 0 56 12 59
Number of tasks to do in each cell

0 0
0 0 32 7 0 42 34 26 8 0 0 0 44 0 0 19 0 0 0 0 15 42 16 11 21 19 48 0 0 0
Number of people of type 0 in each cell in period 0

1 0
0 0 20 19 0 24 17 10 39 0 0 0 20 0 0 23 0 0 0 0 36 30 46 1 30 34 20 0 0 0
Number of people of type 1 in each cell in period 0

2 0
0 0 42 20 0 22 6 32 37 0 0 0 42 0 0 43 0 0 0 0 17 30 6 19 44 3 48 0 0 0
Number of people of type 2 in each cell in period 0

8. **What are the elements of the cost ?**
   The cost is composed by two elemtes
   - One based on the distance between cells
   - One uniformly distributed between 2 and 10 multiplied by 1 or by a coefficient dependent on type of people