

Optimization Report-Course IT3020-Topic 24

Pham Quang Trung · Nguyen Huy Hoang · Nguyen Viet Quy Anh

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1 Introduction to important files in this projects

- solution/cp_model.py: The implementation of CP
- solution/mip_model.py: The implementation of MIP
- solution/greedy_alg.py: The greedy approach for this problem
- tests/mixed integer programming/test_for_mip.py: Test generator for MIP model
- tests/constraint programming/test_for_cp.py: Test generator for CP model

2 Testing Result

The result table

Table 1: Testing results for Mixed Integer Programming method

number of tasks	number of worker	number of prerequisite relations	running time(ms)
3	5	1	9660
3	5	2	11132
10	3	4	11964
10	4	3	4631
10	5	4	6702
10	7	3	7641
20	3	10	5961
20	3	10	5215
20	4	6	9306
20	5	7	8990
20	6	11	16502
20	7	13	8956
20	8	11	7021
20	9	12	6335

20	10	15	6876
30	5	20	17384
30	6	17	6335
30	7	11	13657
30	8	20	10455
30	9	16	43844
30	10	16	5651
30	11	19	10316
30	12	15	16405
30	12	18	6885
30	13	11	8438
30	14	21	5223
30	15	16	16666
40	10	17	23277
40	11	19	24994
40	12	22	17775
40	15	17	17115
40	18	22	13062
40	19	21	6240
40	20	12	26079
40	21	16	7732
50	10	1	16041
50	10	2	7542
50	10	3	86079
50	10	4	11481
50	10	5	7689
50	10	6	21686
50	10	7	19212
50	10	8	18483
50	10	9	16129
50	10	10	6671
50	10	40	51706
50	10	41	33761
50	10	42	33493
50	10	43	10416
50	10	44	33989
50	10	45	30448
50	10	46	4535
50	10	50	16746
50	11	12	14040
50	11	13	13826
50	11	14	4030
50	11	15	46978

50	11	16	13387
50	11	17	31924
50	11	18	26967
50	11	19	18695
50	11	20	20150
50	11	25	53610
50	11	30	20026
50	11	35	26352
60	30	20	25158
70	30	15	16649

Table 2: Testing results for Constraint Programming method

number of tasks	number of worker	number of prerequisite relations	running time(ms)
6	3	2	509
7	4	3	576
6	4	2	525
6	5	2	557
6	6	2	495
6	6	3	542
6	6	4	513
6	6	5	525
6	6	6	525
5	3	2	503
5	3	3	506
5	4	2	505
5	4	3	499
5	4	4	546
5	5	2	514
5	5	3	513
5	5	4	541
5	5	5	512
7	3	2	621
7	3	3	741
7	4	2	583
7	4	4	612
7	5	2	705
7	5	3	499
7	5	4	517
7	5	5	547
7	6	2	577
7	6	3	614

7	6	4	530
7	6	5	557
7	6	6	566
7	7	2	573
7	7	3	561
7	7	4	577
7	7	5	572
7	7	6	561
7	7	7	559
7	8	2	540
7	8	3	504
7	8	4	602
7	8	5	591
7	8	6	551
7	8	7	566
9	4	2	996
15	6	8	6234
12	8	9	765
16	10	5	816
13	5	7	1900
17	12	10	3345

3 List of Tasks

Pham Quang Trung 20214935

MIP model(100%)
Greedy Algorithm(100%)
Report(100%)
Data Analysis(50%)

Nguyen Huy Hoang 20214959

CP model(50%)
Data Analysis(50%)

3.1 Nguyen Viet Quy Anh 20214947

CP model(50%)
Slide(100%)