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Airport Systems Modelling and Simulation Assignment 5

Q1

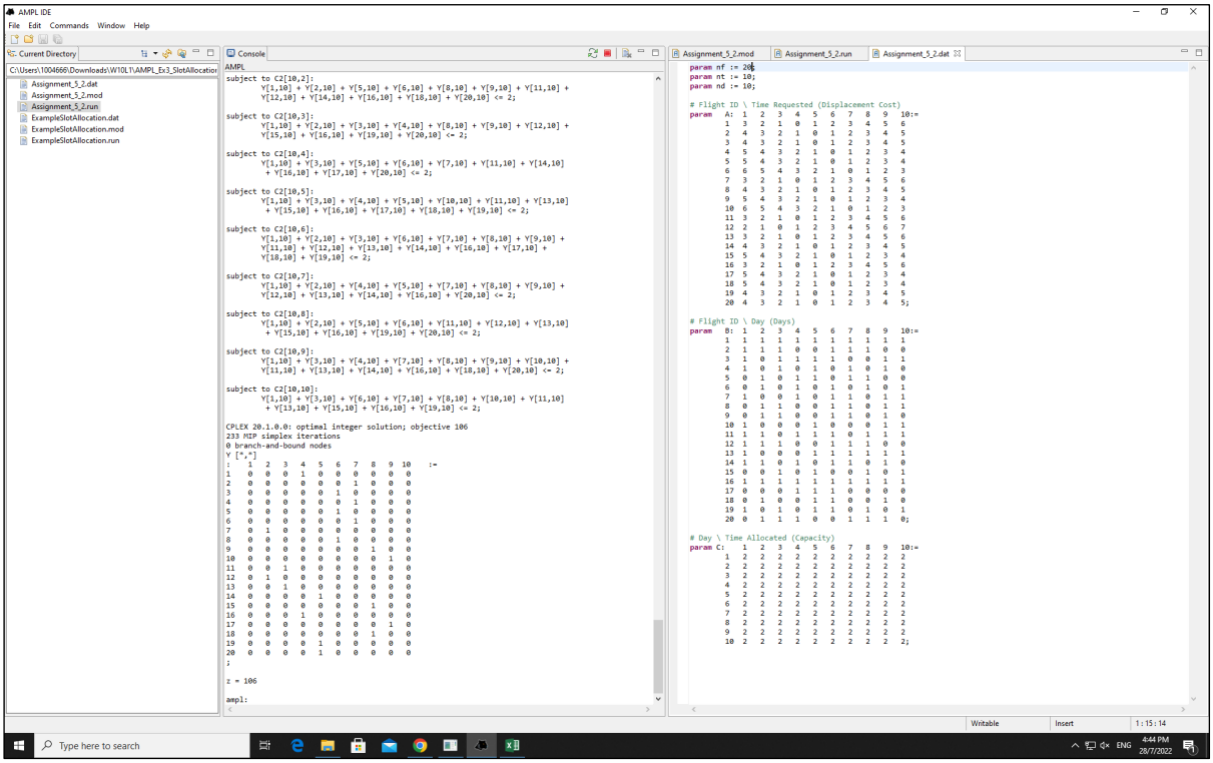
z = 189

Flight ID	Time Allocated										Maximum Displacement	Total Displacement	Allocated ?
	1	2	3	4	5	6	7	8	9	10			
1	0	0	0	1	0	0	0	0	0	0	0	0	1
2	0	0	0	0	0	1	0	0	0	0	1	6	1
3	0	0	0	0	1	0	0	0	0	0	0	0	1
4	0	0	0	0	0	0	0	0	1	0	3	15	1
5	0	0	0	0	0	0	0	1	0	0	2	10	1
6	0	0	0	0	0	0	0	1	0	0	1	5	1
7	0	1	0	0	0	0	0	0	0	0	2	12	1
8	0	0	0	0	0	1	0	0	0	0	1	6	1
9	0	0	0	0	0	0	0	0	1	0	3	15	1
10	0	0	0	0	0	0	0	0	0	1	3	12	1
11	0	0	1	0	0	0	0	0	0	0	1	8	1
12	0	0	1	0	0	0	0	0	0	0	0	0	1
13	0	0	0	0	1	0	0	0	0	0	1	7	1
14	0	1	0	0	0	0	0	0	0	0	3	18	1
15	0	0	0	0	0	0	0	0	0	1	4	16	1
16	0	0	0	1	0	0	0	0	0	0	0	0	1
17	1	0	0	0	0	0	0	0	0	0	5	15	1
18	1	0	0	0	0	0	0	0	0	0	5	20	1
19	0	0	0	0	0	0	1	0	0	0	2	12	1
20	0	0	0	0	0	0	1	0	0	0	2	12	1
												189	

Scheduled Flights	Time Allocated									
	1	2	3	4	5	6	7	8	9	10
Day 1	0	2	2	2	2	1	1	0	1	1
Day 2	1	1	2	2	0	2	1	2	1	0
Day 3	0	0	1	2	1	2	2	0	2	1
Day 4	1	2	1	2	1	0	1	2	0	0
Day 5	2	0	1	2	2	0	1	1	1	2
Day 6	2	2	2	2	2	2	1	1	1	0
Day 7	0	2	1	2	1	2	1	1	2	0
Day 8	0	0	2	2	1	1	2	2	0	1
Day 9	1	2	1	2	2	1	1	0	2	1
Day 10	0	1	1	2	2	1	1	1	0	2

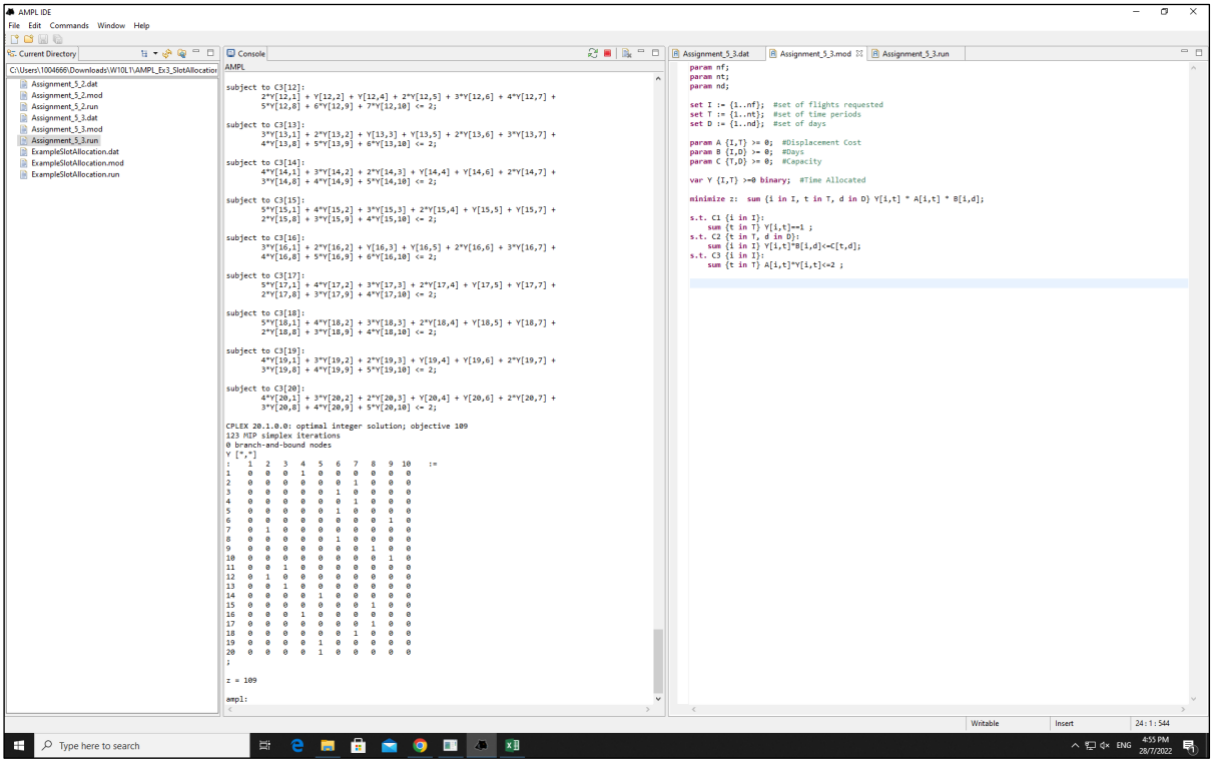
Q2

z = 106



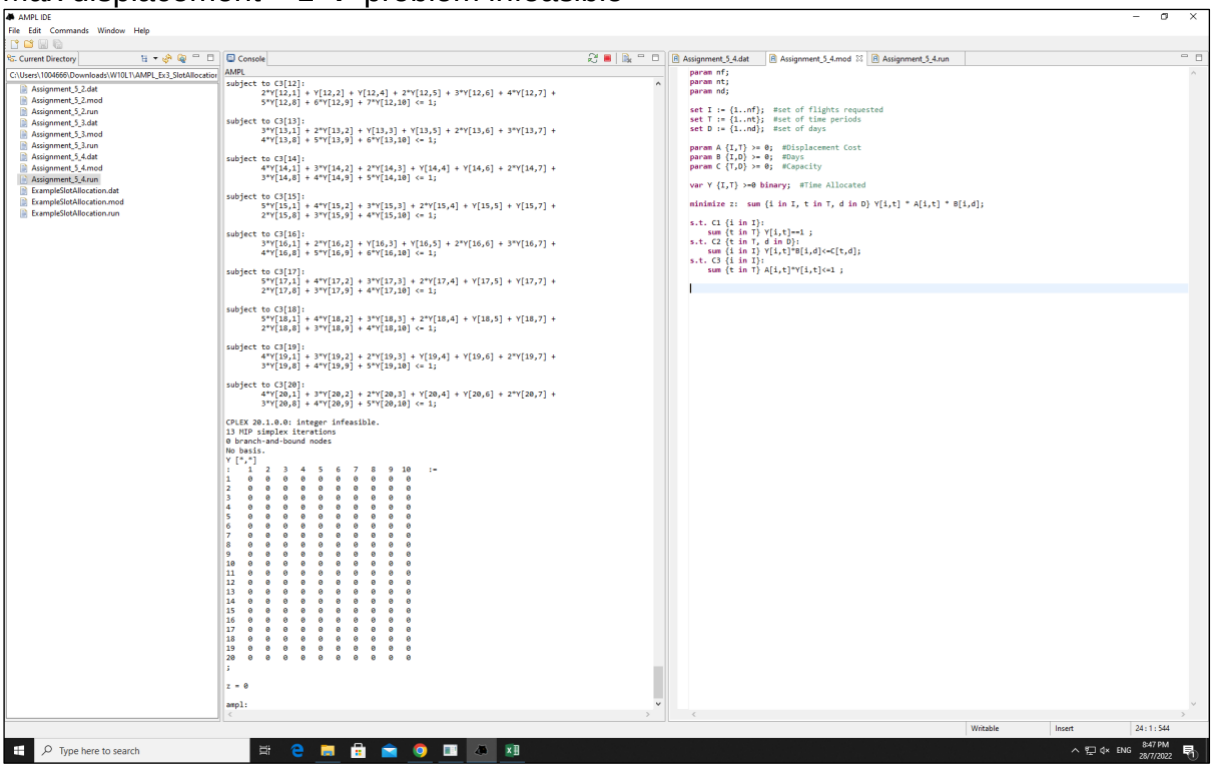
Q3

z = 109



Q4

Max displacement = 1 → problem infeasible



After adding Ri as a variable and included in the objective function and constraints, 3 flights rejected (1, 3, 16) and total slot displacement = 65 (3065 (new obj fx) – 3 flights rejected * 1000).