


```

81 No other solutions better than 667
82
83 Optimal solution found (tolerance 1.00e-04)
84 Best objective 6.670000000000e+02, best bound 6.670000000000e+02, gap 0.0000%
85
86 Output optimal solution and the Optimal Obj: 667.0
87
88
89 Obj = 667.0
90
91 Solutions:
92   The total pi = 130.0
93   The total duration time in berth stage = 135.0
94   The total duration time in quay crane scheduling stage = 26.0
95   The total departure time in berth stage= 388.0
96   The total departure time in quay crane scheduling stage = 279.0
97   The total wasted crane work hour according QC0= 12.90386657765775
98   The last departure time in quay crane scheduling stage = 61.0
99
100 The specific solution are as follows:
101 Vessel i: 0: li: 4, pi: 17-21, ai-di: 56-81, taoi-deltai: 56-81, periodi: 25, taoPi_SP-
    deltaPi_SP: 56-61, periodPi: 5, c_i: 6377423, dowork: 6459278, fa_i: 4
102 Vessel i: 1: li: 7, pi: 22-29, ai-di: 0-9, taoi-deltai: 0-9, periodi: 9, taoPi_SP-deltaPi_SP: 0-2
    , periodPi: 2, c_i: 2335732, dowork: 3954660, fa_i: 6
103 Vessel i: 2: li: 7, pi: 21-28, ai-di: 33-57, taoi-deltai: 33-57, periodi: 24, taoPi_SP-
    deltaPi_SP: 33-37, periodPi: 4, c_i: 6133829, dowork: 6327456, fa_i: 5
104 Vessel i: 3: li: 7, pi: 7-14, ai-di: 24-37, taoi-deltai: 24-37, periodi: 13, taoPi_SP-deltaPi_SP
    : 24-26, periodPi: 2, c_i: 3192893, dowork: 4218304, fa_i: 6
105 Vessel i: 4: li: 6, pi: 7-13, ai-di: 42-61, taoi-deltai: 42-61, periodi: 19, taoPi_SP-deltaPi_SP
    : 42-46, periodPi: 4, c_i: 4985448, dowork: 5009236, fa_i: 6
106 Vessel i: 5: li: 6, pi: 28-34, ai-di: 40-59, taoi-deltai: 40-59, periodi: 19, taoPi_SP-
    deltaPi_SP: 40-44, periodPi: 4, c_i: 4752884, dowork: 4877414, fa_i: 3
107 Vessel i: 6: li: 4, pi: 13-17, ai-di: 51-59, taoi-deltai: 51-59, periodi: 8, taoPi_SP-deltaPi_SP
    : 51-54, periodPi: 3, c_i: 1986730, dowork: 2109152, fa_i: 2
108 Vessel i: 7: li: 7, pi: 15-22, ai-di: 7-35, taoi-deltai: 7-25, periodi: 18, taoPi_SP-deltaPi_SP
    : 7-9, periodPi: 2, c_i: 4534126, dowork: 4745592, fa_i: 7
109 TimeSolveModel: 56.000000
110
111 TimeAll: 60.000000
112
113

```