


```

81 Relax-and-lift: 433
82
83 Explored 2820 nodes (117882 simplex iterations) in 74.81 seconds (69.79 work units)
84 Thread count was 8 (of 8 available processors)
85
86 Solution count 3: 783 783 783
87 No other solutions better than 783
88
89 Optimal solution found (tolerance 1.00e-04)
90 Best objective 7.830000000000e+02, best bound 7.830000000000e+02, gap 0.0000%
91
92 Output optimal solution and the Optimal Obj: 783.0
93
94
95 Obj = 783.0
96
97 Solutions:
98   The total pi = 158.0
99   The total duration time in berth stage = 157.0
100  The total duration time in quay crane scheduling stage = 34.0
101  The total departure time in berth stage= 453.0
102  The total departure time in quay crane scheduling stage = 330.0
103  The total wasted crane work hour according QC0= 7.8219341232874635
104  The last departure time in quay crane scheduling stage = 67.0
105
106 The specific solution are as follows:
107 Vessel i: 0:  li: 4,      pi: 18-22,      ai-di: 53-68,      taoi-deltai: 53-68,      periodi: 15,      taoPi_SP-
deltaPi_SP: 53-56,      periodPi: 3,      c_i: 3714886,      dowork: 3954660,      fa_i: 4
108 Vessel i: 1:  li: 4,      pi: 22-26,      ai-di: 39-65,      taoi-deltai: 39-65,      periodi: 26,      taoPi_SP-
deltaPi_SP: 39-44,      periodPi: 5,      c_i: 6679903,      dowork: 6722922,      fa_i: 4
109 Vessel i: 2:  li: 5,      pi: 26-31,      ai-di: 45-67,      taoi-deltai: 45-67,      periodi: 22,      taoPi_SP-
deltaPi_SP: 45-50,      periodPi: 5,      c_i: 5664094,      dowork: 5800168,      fa_i: 3
110 Vessel i: 3:  li: 7,      pi: 7-14,      ai-di: 58-77,      taoi-deltai: 58-77,      periodi: 19,      taoPi_SP-deltaPi_SP
: 58-61,      periodPi: 3,      c_i: 4750315,      dowork: 4877414,      fa_i: 5
111 Vessel i: 4:  li: 4,      pi: 28-32,      ai-di: 11-28,      taoi-deltai: 11-28,      periodi: 17,      taoPi_SP-
deltaPi_SP: 11-16,      periodPi: 5,      c_i: 4376832,      dowork: 4481948,      fa_i: 2
112 Vessel i: 5:  li: 6,      pi: 14-20,      ai-di: 7-34,      taoi-deltai: 7-29,      periodi: 22,      taoPi_SP-deltaPi_SP
: 7-12,      periodPi: 5,      c_i: 5609404,      dowork: 5800168,      fa_i: 3
113 Vessel i: 6:  li: 7,      pi: 7-14,      ai-di: 17-28,      taoi-deltai: 17-26,      periodi: 9,      taoPi_SP-deltaPi_SP:
17-20,      periodPi: 3,      c_i: 2265480,      dowork: 2372796,      fa_i: 2
114 Vessel i: 7:  li: 6,      pi: 22-28,      ai-di: 1-29,      taoi-deltai: 1-19,      periodi: 18,      taoPi_SP-deltaPi_SP
: 1-4,      periodPi: 3,      c_i: 4734427,      dowork: 5668346,      fa_i: 6
115 Vessel i: 8:  li: 4,      pi: 14-18,      ai-di: 65-81,      taoi-deltai: 65-74,      periodi: 9,      taoPi_SP-deltaPi_SP
: 65-67,      periodPi: 2,      c_i: 2193671,      dowork: 2372796,      fa_i: 3
116 TimeSolveModel: 84.000000
117
118 TimeAll: 88.000000
119
120

```