**Primal problem**

*Min* -9.299999999999999 y[1,1]² - 14.440000000000001 y[1,2]² - 48.3 x[1,1] - 34.68 x[2,1] - 51.959999999999994 y[1,1] + 6.0e6 z[1,1] - 32.2 x[1,2] - 23.12 x[2,2] - 37.6 y[1,2] + 4.0e6 z[2,1]

*Subject to*

-x[1,1] + x[1,2] = 0.0

-x[2,1] + x[2,2] = 0.0

x[1,1] ∈ [0.0, 5.0]

x[2,1] ∈ [0.0, 10.0]

x[1,2] ∈ [0.0, 5.0]

x[2,2] ∈ [0.0, 10.0]

y[1,1] ∈ [0.0, 7.0]

y[1,2] ∈ [0.0, 6.0]

12.1 y[1,1]² + 52.9 x[1,1] + 69.3 x[2,1] + 2.2 y[1,1] + z[1,1] ≤ 711.6

87.9 y[1,2]² + 65.5 x[1,2] + 37.5 x[2,2] + 64.2 y[1,2] + z[2,1] ≤ 65051.7

z[1,1] ≥ 0.0

z[2,1] ≥ 0.0

x[1,1] integer

x[2,1] integer

x[1,2] integer

x[2,2] integer

**RNMDT relaxation (p = -1)**

*Min* -9.299999999999999 w\_RNMDT[1,1,1] - 48.3 x[1,1] - 34.68 x[2,1] - 51.959999999999994 y[1,1] + 6.0e6 z[1,1] - 14.440000000000001 w\_RNMDT[1,1,2] - 32.2 x[1,2] - 23.12 x[2,2] - 37.6 y[1,2] + 4.0e6 z[2,1]

*Subject to*

y[1,1] - 7 delta\_y\_RNMDT[1,1] - 3.5 z\_RNMDT[1,-1,1] = 0.0

y[1,2] - 6 delta\_y\_RNMDT[1,2] - 3 z\_RNMDT[1,-1,2] = 0.0

-3.5 y\_heat\_RNMDT[1,1,-1,1] + w\_RNMDT[1,1,1] - 7 delta\_w\_RNMDT[1,1,1] = 0.0

-3 y\_heat\_RNMDT[1,1,-1,2] + w\_RNMDT[1,1,2] - 6 delta\_w\_RNMDT[1,1,2] = 0.0

-x[1,1] + x[1,2] = 0.0

-x[2,1] + x[2,2] = 0.0

52.9 x[1,1] + 69.3 x[2,1] + 2.2 y[1,1] + z[1,1] + 12.1 w\_RNMDT[1,1,1] ≤ 711.6

65.5 x[1,2] + 37.5 x[2,2] + 64.2 y[1,2] + z[2,1] + 87.9 w\_RNMDT[1,1,2] ≤ 65051.7

0.5 y[1,1] + 7 delta\_y\_RNMDT[1,1] - delta\_w\_RNMDT[1,1,1] ≤ 3.5

0.5 y[1,2] + 6 delta\_y\_RNMDT[1,2] - delta\_w\_RNMDT[1,1,2] ≤ 3.0

-0.5 y[1,1] + delta\_w\_RNMDT[1,1,1] ≤ 0.0

-0.5 y[1,2] + delta\_w\_RNMDT[1,1,2] ≤ 0.0

-delta\_w\_RNMDT[1,1,1] ≤ 0.0

-delta\_w\_RNMDT[1,1,2] ≤ 0.0

-7 delta\_y\_RNMDT[1,1] + delta\_w\_RNMDT[1,1,1] ≤ 0.0

-6 delta\_y\_RNMDT[1,2] + delta\_w\_RNMDT[1,1,2] ≤ 0.0

-y\_heat\_RNMDT[1,1,-1,1] ≤ 0.0

-y\_heat\_RNMDT[1,1,-1,2] ≤ 0.0

y\_heat\_RNMDT[1,1,-1,1] - 7 z\_RNMDT[1,-1,1] ≤ 0.0

y\_heat\_RNMDT[1,1,-1,2] - 6 z\_RNMDT[1,-1,2] ≤ 0.0

-y[1,1] + y\_heat\_RNMDT[1,1,-1,1] ≤ 0.0

-y[1,2] + y\_heat\_RNMDT[1,1,-1,2] ≤ 0.0

y[1,1] - y\_heat\_RNMDT[1,1,-1,1] + 7 z\_RNMDT[1,-1,1] ≤ 7.0

y[1,2] - y\_heat\_RNMDT[1,1,-1,2] + 6 z\_RNMDT[1,-1,2] ≤ 6.0

delta\_y\_RNMDT[1,1] ∈ [0.0, 0.5]

delta\_y\_RNMDT[1,2] ∈ [0.0, 0.5]

x[1,1] ∈ [0.0, 5.0]

x[2,1] ∈ [0.0, 10.0]

x[1,2] ∈ [0.0, 5.0]

x[2,2] ∈ [0.0, 10.0]

y[1,1] ∈ [0.0, 7.0]

y[1,2] ∈ [0.0, 6.0]

z[1,1] ≥ 0.0

z[2,1] ≥ 0.0

x[1,1] integer

x[2,1] integer

x[1,2] integer

x[2,2] integer

z\_RNMDT[1,-1,1] binary

z\_RNMDT[1,-1,2] binary