Example: B&B for BIPs

Solve:

Max $Z = 9x_1 + 5x_2 + 6x_3 + 4x_4$

Subject to:

- $6x_1 + 3x_2 + 5x_3 + 2x_4 \leq 10$
- $x_3 + x_4 \leq 1$
- $-x_1 + x_3 \leq 0$
- $-x_2 + x_4 \leq 0$
- $x_i \leq 1, x_i \geq 0, x_i$ **integer**

• Initialize

Queue: {}

Incumbent: none

Best cost Z^*: - inf

Example: B&B for BIPs

{}

Solve:

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• Dequeue {}

Queue: {} ~~{}~~

Incumbent: none

Best cost Z^*: - inf

Example: B&B for BIPs

Solve:

Max $Z = 9x_1 + 5x_2 + 6x_3 + 4x_4$

Subject to:

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- $x_3 + x_4 \leq 1$
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- $x_i \leq 1, x_i \geq 0,$ ~~x_i integer~~

$Z = 16.5, x = <0.8333,1,0,1>$

- Bound $\{\}$
    1. Constrain x_i by $\{\}$
    2. Relax to LP
    3. Solve LP

Queue:

Incumbent: none

Best cost Z^*: - inf

Example: B&B for BIPs

 {}

Solve:

Max $Z = 9x_1 + 5x_2 + 6x_3 + 4x_4$

Subject to:

- $6x_1 + 3x_2 + 5x_3 + 2x_4 \leq 10$
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- $x_i \leq 1, x_i \geq 0, x_i \text{ integer}$

$Z = 16.5, x = <0.8333, 1, 0, 1>$

- Try to fathom:
  1. infeasible?
  2. worse than incumbent?
  3. integer solution?

Queue:

Incumbent: none

Best cost Z^*: - inf