Engineering Optimization Homework

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1 Nature of OR

Maximize $Z = 2x_1 + 5x_2$
subject to

- $10x_1 + 30x_2 \leq 30$
- $95x_1 - 30x_2 \leq 75$

and
x_1, x_2 are binary

Answer :

$x_1 = 0$:
Maximize $Z = 5x_2$
subject to

$$x_2 \leq 1$$
$$30x_2 \geq -75$$

$(x_1, x_2) = (0, 1)$ with $Z = 5$

$x_1 = 1$:
Maximize $Z = 2 + 5x_2$
subject to

$$30x_2 \leq 20$$

$$30x_2 \geq 20$$

$(x_1, x_2) = (1, \frac{2}{3})$ with $Z = 5\frac{1}{3}$

$x_2 = 0$:

Maximize $Z = 2x_1$

subject to

$$x_1 \leq 3$$

$$95x_1 \leq 75$$

$(x_1, x_2) = (\frac{15}{19}, 0)$ with $Z = 1\frac{11}{19}$

$x_2 = 1$:

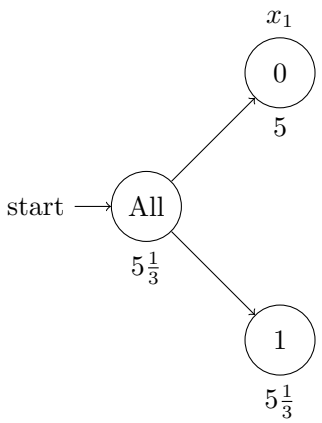
Maximize $Z = 2x_1 + 1$

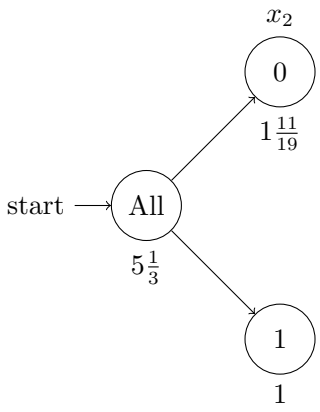
subject to

$$x_1 \leq 0$$

$$95x_1 \leq 105$$

$(x_1, x_2) = (0, 1)$ with $Z = 1$




x_2
0
$1\frac{11}{19}$
start
All
$5\frac{1}{3}$
1
1