For Final exam:

Nov. 20/17

Dual-simplex $\bar{\omega}$ change

Linear Prog.

↳ Chapter 9

Knapsack problem - IP with single constraint

$$\text{Max } z = 40x_1 + 80x_2 + 10x_3 + 10x_4 + 4x_5 + 20x_6 + 60x_7$$

$$\text{s.t.} \quad 40x_1 + 50x_2 + 30x_3 + 10x_4 + 10x_5 + 40x_6 + 30x_7 \leq 100$$

Item	c_i/a_i	Ranking
1	$40/40 = 1$	T3
2	$80/50 = 8/5$	2
3	$10/30 = 1/3$	5
4	$10/10 = 1$	T3
5	$4/10 = 4/10$	4
6	$20/40 = 1/2$	6
7	$60/30 = 2$	1

Implicit Enumeration

Solve 0-1 IPs

each variable must equal a 0 or 1

$$\text{Max } z = -7x_1 - 3x_2 - 2x_3 - x_4 - 2x_5$$

$$\text{s.t.} \quad -4x_1 - 2x_2 + x_3 - 2x_4 - x_5 \leq -3$$

$$-4x_1 - 2x_2 - 4x_3 + x_4 + 2x_5 \leq -7$$

$$x_i = 0 \text{ or } 1 \quad (i = 1, 2, 3, 4, 5)$$

(1) $x_1 = x_2 = x_3 = x_4 = x_5 = 0$ → $x_1 = x_2 = x_4 = x_5 = 1$, $x_3 = 0$ (1°)

$0 \leq -3$ ✗ $\quad 0 \leq -7$ ✗

$-4-2-2-1 = -9$

$-4-2-4 = -10 \leq -7$ (2°)

(2) $x_1 = 1$, $x_2 = x_3 = x_4 = x_5 = 0$

$-4 \leq -3$ ✓ $\quad -4 \not\leq -7$ ✗

↳ using this, branch.

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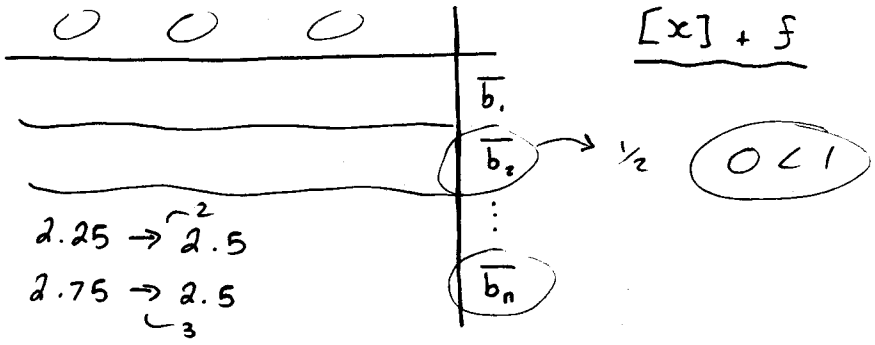
LINEAR PROG.



$$\text{Max } Z = 8x_1 + 5x_2$$

$$\text{s.t.} \quad x_1 + x_2 \leq 6$$

$$9x_1 + 5x_2 \leq 45$$

1 - Change b, Find optimised sol.
Solution changed, point doesn't (?)

2 - branch + bound

3 - enumeration

4 - dual simplex, graphic, the stuff From this class. See table 84.