Revised Simplex Method: Numerical Examples

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Numerical Example:1
Solve the following LPP by Revised Simplex Method.

$$\max : Z = 3X_1 + X_2$$

Subject to

$$X_1 + X_2 \leq 10$$

$$X_1 + 2X_2 \leq 11$$

$$X_1 + 4X_2 \leq 16$$

$$X_1, X_2 \geq 0$$

Numerical Example:2

$$\max : Z = X_1 + 4X_2$$

Subject to

$$X_1 + X_2 \leq 10$$

$$X_1 + 2X_2 \leq 11$$

$$X_1 + 4X_2 \leq 16$$

$$X_1, X_2 \geq 0$$

Numerical Example:3

$$\max : Z = X_1 + 4X_2$$

Subject to

$$X_1 + X_2 \leq 100$$

$$X_1 + 2X_2 \leq 120$$

$$X_1 + 4X_2 \leq 160$$

$$X_1, X_2 \geq 0$$

Can you find an alternate optimal solution of the given LPP ?

Numerical Example: 4

$$\max : Z = X_1 + 6X_2$$

Subject to

$$X_1 + X_2 \leq 10$$

$$X_1 + 2X_2 \leq 12$$

$$X_1 + 4X_2 \leq 16$$

$$X_1 + 6X_2 \leq 20$$

$$X_1, X_2 \geq 0$$

Can you find an alternate optimal solution of the given LPP ?

Numerical Example: 5

$$\max : Z = X_1 + 10X_2$$

Subject to

$$X_1 + X_2 \leq 10$$

$$X_1 + 2X_2 \leq 12$$

$$X_1 + 4X_2 \leq 16$$

$$X_1 + 6X_2 \leq 20$$

$$X_1, X_2 \geq 0$$

Numerical Example: 6

$$\max : Z = 6X_1 + 6X_2 + 8X_3$$

Subject to

$$X_1 + X_2 + X_3 \leq 12$$

$$3X_1 + 3X_2 + 4X_3 \leq 36$$

$$X_1, X_2, X_3 \geq 0$$

Can you find an alternate optimal solution of the given LPP ?

Numerical Example: 7

$$\max : Z = 2X_1 + 3X_2 + 2X_3 + X_4 + X_5$$

Subject to

$$3X_1 - 3X_2 + 4X_3 + 2X_4 - X_5 \leq 10$$

$$X_1 + X_2 + X_3 + X_4 + X_5 \leq 20$$

$$X_1, X_2, X_3, X_4, X_5 \geq 0$$

1. Find an Optimal solution of the LPP . Check X=(0,10,10,0,0).

Numerical Example: 8

$$\min : Z = 2X_1 + 3X_2 + 2X_3 + X_4 + X_5$$

Subject to

$$3X_1 - 3X_2 + 4X_3 + 2X_4 - X_5 = 10$$

$$X_1 + X_2 + X_3 + X_4 + X_5 = 20$$

$$X_1, X_2, X_3, X_4, X_5 \geq 0$$

Numerical Example: 9

$$\max : Z = 6X_1 + 6X_2 + 8X_3$$

Subject to

$$X_1 + X_2 + X_3 \leq 12$$

$$3X_1 + 2X_2 + 4X_3 \leq 40$$

$$X_1, X_2, X_3 \geq 0$$

Numerical Example: 10

$$\max : Z = 6X_1 + 9X_2 + 6X_3$$

Subject to

$$X_1 + X_2 + X_3 \leq 20$$

$$3X_1 + 3X_2 + 4X_3 \leq 48$$

$$X_1, X_2, X_3 \geq 0$$

Numerical Example: 11

$$\max : Z = X_1 + X_2 + X_3 + 3X_4$$

Subject to

$$X_1 - X_2 + X_3 + 5X_4 \leq 5$$

$$2X_1 + 3X_2 - 2X_3 + 4X_4 \leq 6$$

$$X_1, X_2, X_3, X_4 \geq 0$$

Numerical Example: 12

$$\min : Z = X_1 + X_2 + X_3 + 3X_4$$

Subject to

$$X_1 - X_2 + X_3 + 5X_4 = 10$$

$$2X_1 + 3X_2 - 2X_3 + 4X_4 = 12$$

$$X_1, X_2, X_3, X_4 \geq 0$$

Numerical Example: 13
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$$\max : Z = X_1 + 2X_2 + X_3$$

Subject to

$$4X_1 + X_2 + X_3 \leq 6$$

$$2X_1 + X_2 - X_3 \leq 2$$

$$X_1, X_2, X_3 \geq 0$$

Numerical Example: 14

$$\min : Z = X_1 + 2X_2 + X_3$$

Subject to

$$4X_1 + X_2 + X_3 = 18$$

$$2X_1 + X_2 - X_3 = 6$$

$$X_1, X_2, X_3 \geq 0$$

Numerical Example: 15

$$\max : Z = X_1 + 3X_2 + 4X_3$$

Subject to

$$2X_1 + X_2 + X_3 \leq 9$$

$$X_1 + 4X_2 + 3X_3 \leq 12$$

$$X_1, X_2, X_3 \geq 0$$