CS5040(LO) Assignment Test Cases

ASSIGNMENT 1

TEST CASE 1

Maximize $2x_1 + 5x_2$

subject to the constraints

$$2x_1 - x_2 \leq 4$$
$$x_1 + 2x_2 \leq 9$$
$$-x_1 + x_2 \leq 3$$
$$x_1, x_2 \geq 0$$

Matrix A		Vector B					Vector C		Initial feasible point	
2	-1	4	9	3	0	0	2	5	2	0
1	2									
-1	1									
-1	0									
0	-1									

TEST CASE 2

Maximize $4x_1 + 5x_2$

subject to the constraints

$$x_1 + x_2 \leq 10$$
$$3x_1 + 7x_2 \leq 42$$
$$x_1, x_2 \geq 0$$

Matrix A		Vector B				Vector C		Initial feasible point	
1	1	10	42	0	0	4	5	10	0
3	7								
-1	0								
0	-1								

TEST CASE 3

Maximize $2x_1 - x_2 + 2x_3$

subject to the constraints

$$2x_1 + x_2 \leq 10$$
$$x_1 + 2x_2 - 2x_3 \leq 20$$
$$x_2 + 2x_3 \leq 5$$
$$x_1, x_2, x_3 \geq 0$$

Matrix A			Vector B						Vector C			Initial feasible point		
2	1	0	10	20	5	0	0	0	2	-1	2	5	0	0
1	2	-2												
0	1	2												
-1	0	0												
0	-1	0												
0	0	-1												

ASSIGNMENT 2

TEST CASE 1

Maximize $2x_1 + x_2$

subject to the constraints

$$x_1 - x_2 \leq 10$$
$$2x_1 - x_2 \leq 40$$
$$x_1, x_2 \geq 0$$

Matrix A		Vector B				Vector C		Initial feasible point	
1	-1	10	40	0	0	2	1	10	0
2	-1								
-1	0								
0	-1								

TEST CASE 2

Maximize $x_1 + 2x_2$

subject to the constraints
$$2x_1 + x_2 \leq 8$$
$$x_1 + x_2 \leq 5$$
$$x_1, x_2 \geq 0$$

Matrix A		Vector B				Vector C		Initial feasible point	
2	1	8	5	0	0	1	2	4	0
1	1								
-1	0								
0	-1								

TEST CASE 3

Maximize $x_1 + 3x_2$

subject to the constraints
$$-x_1 + x_2 \leq 20$$
$$-2x_1 + x_2 \leq 50$$
$$x_1, x_2 \geq 0$$

Matrix A		Vector B				Vector C		Initial feasible point	
-1	1	20	50	0	0	1	3	0	20
-2	1								
-1	0								
0	-1								

ASSIGNMENT 3

TEST CASE 1

Maximize $\qquad 3x_1 + 9x_2$

subject to the constraints $\qquad x_1 + 4x_2 \leq 8$

$$x_1 + 2x_2 \leq 4$$

$$x_1, x_2 \geq 0$$

Matrix A		Vector B				Vector C	
1	4	8	4	0	0	3	9
1	2						
-1	0						
0	-1						

TEST CASE 2

Maximize $\qquad x_1 + 2x_2$

subject to the constraints $\qquad x_1 - 3x_2 \leq 1$

$$-x_1 + 2x_2 \leq 4$$

$$x_1, x_2 \geq 0$$

Matrix A		Vector B				Vector C	
1	-3	1	4	0	0	1	2
-1	2						
-1	0						
0	-1						

TEST CASE 3

Maximize $x_1 + 2x_2$

subject to the constraints
$$x_1 + 3x_2 \leq 15$$
$$2x_1 - x_2 \leq 12$$
$$x_1, x_2 \geq 0$$

Matrix A			Vector B					Vector C	
1	3		15	12	0	0		1	2
2	-1								
-1	0								
0	-1								