CS271-Optimization Techniques
Simplex

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MATLAB:

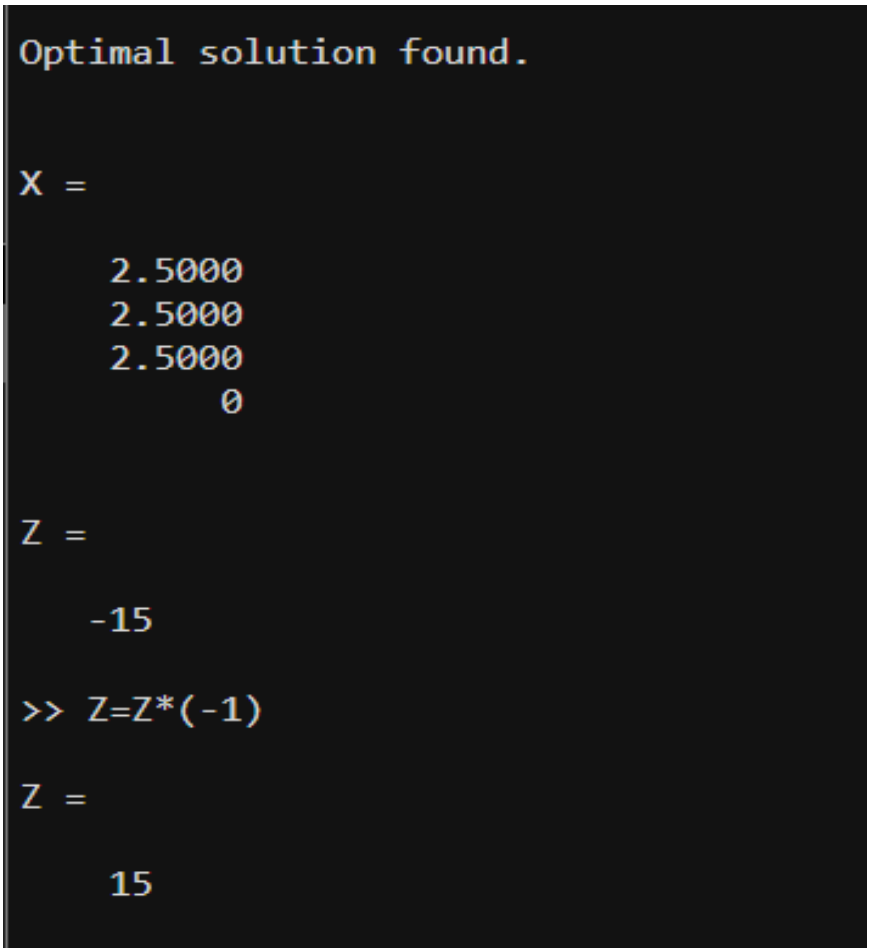
Code for MATLAB:

```
   f=[-1 -2 -3 +1]
f =
  -1   -2   -3    1
   A=[1 2 3 0; 2 1 5 0; 1 2 1 1]
A =
   1    2    3    0
   2    1    5    0
   1    2    1    1
   B=[15 20 10]
B =
  15   20   10
   Aeq=A
Aeq =
   1    2    3    0
   2    1    5    0
   1    2    1    1
   Beq=B
Beq =
  15   20   10
   lb=[0 0 0 0]
lb =
   0    0    0    0
   ub=[]
ub =
   []
```

```
[X, Z]=linprog(f,A,B,Aeq,Beq,lb,ub)

Optimal solution found.
X =
   2.5000
   2.5000
   2.5000
        0
Z =
  -15
   Z=Z*(-1)
Z =
   15
```

Output for MATLAB :-



TORA :-

Input Table

INPUT GRID - LINEAR PROGRAMMING

	x1	x2	x3	x4	Enter <, >, or =	R.H.S.
Var. Name						
Maximize	1.00	2.00	3.00	-1.00		
Constr 1	1.00	2.00	3.00	0.00	=	15.00
Constr 2	2.00	1.00	5.00	0.00	=	20.00
Constr 3	1.00	2.00	1.00	1.00	=	10.00
Lower Bound	0.00	0.00	0.00	0.00		
Upper Bound	infinity	infinity	infinity	infinity		
Unrestr'd (y/n)?	n	n	n	n		

LINEAR PROGRAM – ORIGINAL DATA

	x1	x2	x3	x4		
Maximize	1.00	2.00	3.00	-1.00		
Subject to						
(1)	1.00	2.00	3.00	0.00	=	15.00
(2)	2.00	1.00	5.00	0.00	=	20.00
(3)	1.00	2.00	1.00	1.00	=	10.00
Lower Bound	0.00	0.00	0.00	0.00		
Upper Bound	infinity	infinity	infinity	infinity		
Unrestr'd (y/n)?	n	n	n	n		

OUTPUT for TORA:

LINEAR PROGRAMMING OUTPUT SUMMARY

Final Iteration No.: 7
Objective Value = 15

Variable	Value	Obj Coeff	Obj Val Contrib
x1:	2.50	1.00	2.50
x2:	2.50	2.00	5.00
x3:	2.50	3.00	7.50
x4:	0.00	-1.00	0.00

Constraint	RHS	Slack-/Surplus+
1 (=)	15.00	0.00
2 (=)	20.00	0.00
3 (=)	10.00	0.00

Sensitivity Analysis

Variable	Current Obj Coeff	Min Obj Coeff	Max Obj Coeff	Reduced Cost
x1:	1.00	0.14	infinity	0.00
x2:	2.00	-4.00	infinity	0.00
x3:	3.00	-infinity	5.00	0.00
x4:	-1.00	-infinity	0.00	1.00

Constraint	Current RHS	Min RHS	Max RHS	Dual Price
1 (=)	15.00	10.00	16.67	1.00
2 (=)	20.00	16.25	27.50	0.00
3 (=)	10.00	7.86	15.00	0.00