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1 #####
2 # File Name: model12_mySimplex.py #
3 # Author: Geonsik Yu, Purdue University, IE Dept #
4 # LP problem (Model 12: Alloy Blending) from: #
5 # https://sites.math.washington.edu/~burke/crs/407/models/m12.html #
6 #####
7 import MySimplex
8
9 ## STEP 1. Set up what we need. -----
10 ## Declare variable names
11 variables = ["x1", "x2", "x3", "x4", "x5"]
12 ## Declare a list of coefficients of each variable in the objective function (same order)
13 obj_coeffs = [19.0, 17.0, 23.0, 21.0, 25.0]
14 ## Declare a list of lowerbounds of each variable
15 lowerbounds = [0.0, 0.0, 0.0, 0.0, 0.0]
16
17 ## Declare constraint names
18 constraint_names = ["Tin(%)", "Zinc(%)", "Lead(%)"]
19 ## Declare a list of RHS constants of each constraints
20 righthand = [40.0, 35.0, 25.0]
21 ## Declare a list of inequality directions of each constraints
22 senses = ['E', 'E', 'E']
23 ## Set coefficients of each variables in each constraints:
24 lin_expr = [[60.0, 25.0, 45.0, 20.0, 50.0],
25             [10.0, 15.0, 45.0, 50.0, 40.0],
26             [30.0, 60.0, 10.0, 30.0, 10.0]]
27
28 ## STEP 2. Generate LP problem object -----
29 ## Generate an LP problem framework
30 problem = MySimplex.SimplexProblem()
31 ## Set objective as minimization
32 problem.setObjectiveDirection( Max=False )
33 ## Set variables and objective function
34 problem.setVariables( Names=variables, ObjCoeffs=obj_coeffs, Lowerbounds=lowerbounds )
35 ## Set constraints
36 for idx in range(len(lin_expr)):
37     problem.addConstraint( Name = constraint_names[idx]
38                           , rowVec = lin_expr[idx]
39                           , ineq_dir = senses[idx]
40                           , RHS = righthand[idx] )
41
42 ## STEP 3. Solve the problem -----
43 problem.setup()
44 Tableau = problem.buildTableau()
45 Tableau = problem.solve(Tableau)

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