

Integer linear long somning

Gomosy cutting Plane Method
line ILPP

Example-

Solve the LPP

Man Z = 2x + 2x

s.t. 5x+3x < 8

24+2× ≤4

2, x 20 & are integer

Std from-

Marc Z = 2x1 + 2x + 0.x3 + 0.x4

 $5.\pm.$ $5x_1 + 3x_2 + x_3 = 8$

 $x_1 + 2x_2 + x_4 \leq 4$

M, M, My, My ≥0

C; 2 2 0 0

CR 76 6 as as as any Min Rottic.

0 % 8 5 3 1 0 815 ->

0 xy y 1 2 0 1 4/1

zj-cj-2 -2 0 0 ..

2 21 815 1 3/5 45 0 8/3

0 xy 12/5 0 (7/5) -1/5 to 12/7 >

zg-zj 0 -4/s 2/5 0

2 x 4/7 1 0 2/7 -3/7

2 × 11/7 0 1 (-1/2) 5/7

21-4 0 0 27 4/7

-1+6

Page Nail



$$y_{\alpha_1} = y_1 = \frac{y}{7}$$

Then the cutting plane is

$$-\frac{5}{7} - \left(\frac{6}{7} + \frac{5}{7} + \frac$$

$$\frac{5}{7} - \left(\frac{6}{7}x_3 + \frac{5}{7}x_4\right) + 5_1 = 0$$

Tuche this in simplextable & solve again \[\frac{1}{2} \tau - (\frac{1}{2} \times + \frac{1}{2} \sigma 1) \le 0.

Now i will get offenal

Zmore 24. page No -



Man Z= GX

Ax=b

220

xj are integer j=1,2,...,n

A=[B|R] x* [xx | xx] 1-m basic variables
mt1-n bNBV

BXB+ RXX = b

76 = B-1 b - B-1 RXR*

we take xx =0 So x = B-16

But in case of · B-1 b not an Roteger then

x8 = y0 - \(\times \(\times \) \(\times \)

the value of xet is non-integral

Son XB: = yio - E yij xj

yio = dio + fio

integerpant fractional part

gij = dij - tij

0 < fi = 1 XBJ = (dio - \(\frac{2}{5} \) dij xj \ + (fio - \(\frac{2}{5} \) fij xj \\

be all

reger 80 ln

Proteger

Integer soln



fij 20 xj 20

0<f10 51

fio - & fij x ; <0

Cutting plane constraint of Gomony

=) If you have constraint

3 x1 + 2 x =1

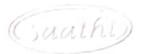
G274+22× 599

0 T

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- X

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Sensitivity Analysia

A coefficient matrix b -> Requirement vector c > coot vector

Change in the objective func. Nariation of requirement vector Elean Change in the coefficient motorix Addition of a variable

Addition of a constraint.

Example >

find the limits of variations of the costs c1, c2, c3, -.-- C6 respectively for the LPP whose optimal table
is given below so that the optimal solution remains
optimal.

CB B · XB b ay az . az ay as a6

-1 oz Xz 5 2/5 1 0 1/10 4/5 0

3 az xz 6 1/5 0 1 3/10 2/5 0

0 a6 x6 8 1 0 0 -1/2 10 1

zj-cj 6/5 0 0 4/5 17/5 0

Ex= Cx+ 8x

max [-(zi-cj) | yx; (o) = Sk = max [-(zj-cj) | yx; >0]

81 = 22 - (2) -> fox A Basic Voriable 84 = 23 - 63 85 = 26 - 6 Date



For non-basic variables

$$j=1,4,5$$

 $E_j \rightarrow C_j + S_j$
 $S_1 \leq Z_1 - C_1 = 6/5$

$$\delta_{4} \leq z_{4} - c_{4} = 4/5$$

 $\delta_{5} \leq z_{5} - c_{5} = 17/5$

Couthi

b-> b+x xB= 6-16 → XB = B-1 (b+ K) ith component is changed Toi = bi+ di d=[di, dz, ..., dm] Tre: = xBit dryix =0 B-1= [y1, y2, -... ym] 文8 = xx* + 是dy dx = xei it yix > 0

Yix

<- xei it yix < 0

Yix: スei = xx + 芸 好が Mon $(-x_{0i})$ $(-x_{0i})$ $(-x_{0i})$ $(-x_{0i})$ $(-x_{0i})$ $(-x_{0i})$ $(-x_{0i})$ $(-x_{0i})$ $(-x_{0i})$ I find the optimal solution of the LPP Max Z= 4x + 3x s.t. 4+ 2 =5 $3x + x \le 3$ $x + 2x \le 10$ m, 2 20 Show how to find the optimal solution of the to by increase. by one writ & by decrease by one writ is be is decreased by two unit. 1) x8 = x8 + B-1 d d= 1

Gaathi

Date

$$B^{-1} = \begin{bmatrix} 3/2 & -1/2 & 0 \\ -1/2 & 1/2 & D \end{bmatrix} - d = \begin{bmatrix} 1 \\ 0 \\ -5/2 & 1/2 \end{bmatrix}$$

xg = xg + β-12

Solve it using dual simplex