Classmate

Date 10-3.2020

Page 1

SIMPLEX METHOD - 2

18.4.2020

•	min	cTre	S	n_	variables	(original)
	An	<u> </u>		m	constraints	-
	N	> 0				

- Constraints are modified with additional slack variables to obtain

 Ax = b

 A: mx (m+n)
- basic feasible solution (BFS) by solving
 Br = b B: mrn G verter/corner

26/0

- · iterate j'and I exists from the Basic Variable.

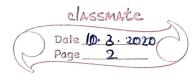
 Cet B.
 - let; be the entering variable and I be the exiting variable.

dj= 1 for i not in the basic variable set.

$$A_{N_{\text{new}}} = A(n + \Theta d)$$

$$= A_{N_{\text{new}}} = b \Rightarrow Ad = 0$$

$$\sum_{c \geq 1} d_{B(c)} A_{B(c)} + A_j = 0$$



SIMPLEX ALGORITHM

· rew = xo Id + 0 d.

- Chew

• dy = 1

dB = -B-1 A

• B = min (= B - Ri)

dico ies (di)

for a given variable j, difference in cost due

to jth variable being basic is:

ct de + c; = c; - ct B'A;

we do for each; and select:

as at for each of area server

 $\overline{C} = [C_1, C_2, ..., C_n]$ where $\overline{C}_j = C_j - \overline{C}_B B'A_j$

· compute the reduced costs &

Cj = Cj - CBB'A;

for all non-basic indices by

they are all non-negative, the corrent

basic feasible solution is optimal, the algorithm terminates; else, choose some july for which cj (o.

apply now operations to product matrix, changing the colomn u to ee.

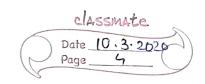
SIMPLEX TABLEU

- c B B b	cT-CBBTA	
B-lp	B ⁻¹ A	

often start with a simple case of B=I

we start with a basis B = [ABCID, ..., ABCID]
as and associated solution n.

for each non-basic variable j'if they are all positive, convent solution is optimal, so exit else choose j such that Cj (0.



compute $v = B^TA$; if no component of v is positive, we have $B^{ac} = \infty$ and optimal cost $= -\infty$. exit.

eighor some computation, vi, is positive then,

Or = min (ABCI) / Ui)

enists and j enters. For a New basis by replacing Aboit by Aj.

EXAMPLE !

min - 21 - 22

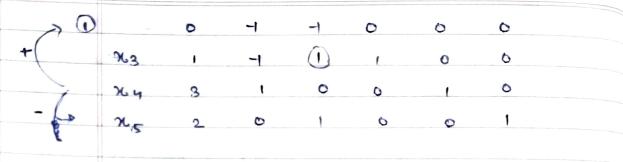
8t. -x1+x2+x3=1

M, + My = 3

n2 + n5 = 2

41. 7,0

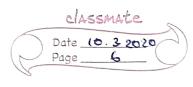
Date 10.3.2020 Page 5



(2) 1 0 1 0 6

3 3 6 1 D 2 -1 11 0

5 0 0 Q Q Ö



EXAMPLE 2

(3)

min -10x1 -12x2 -12x3

st. n1 + 2n2 + 2n3 < 20

2x, + x2 +2x3 < 20

22, + 22, + 23 5 20

n, n, n, no

74 20 1 2 2 1 0 0

7.5 20 2 1 2 0 1 0

20 2 2 1 0 0 1

(2) 100 0 -7 -2 0 5 0

Ny 10 0 15 1 1 -0.5 0

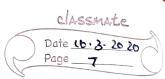
26 0 0 1 -1 0 -1 1

120 0 -4 0 2 4 0

2 0 1 -1 0 -1 1 0

21 0 1 -1 0 -1 1 0

10 0 2.5 0 1 -0.5



3 136 3.6 1.6 • 0 0.4 0.4 -6.6 n3 1 4 Ò 6 -0.6 0.4 0 NI 5 0.5 0 .0.1 ~ 0 · g 0.4 0 4 NZ