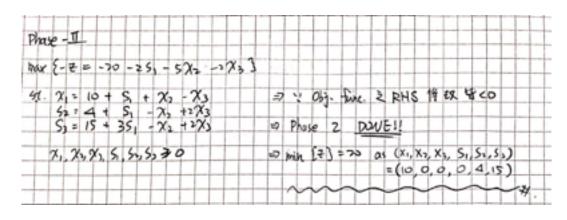
Operation Research

Homework4 B06501011陳霖家

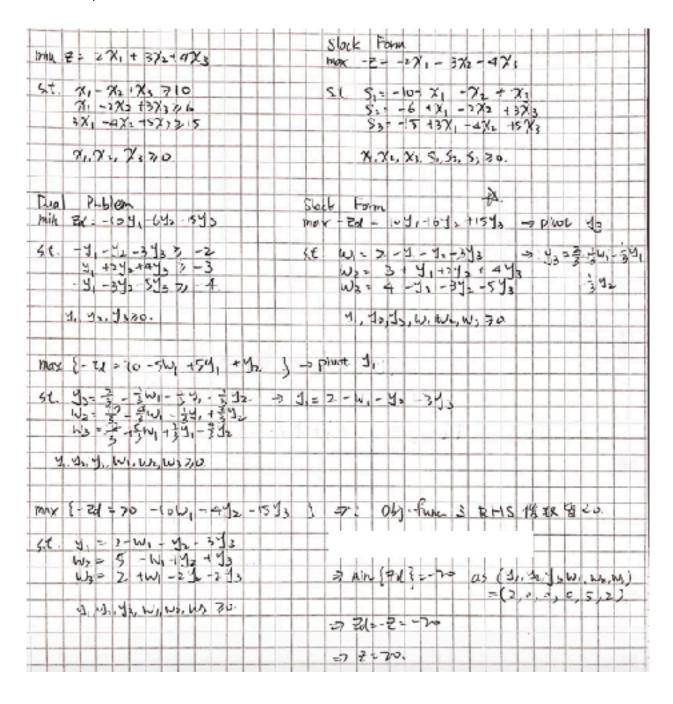
2. 此題不適用 Primal Simplex Method,可以使用 2-Phase Method 或著是 Dual Simplex Method。以下有這兩種方法的手算稿。最後結果證實結果相同。

2-Phase Method

Mr. a	Shaded Form
Min 9 = 27, 45 7, 447,	1996 -12 = -9/X, -6/X, -4/X2
Ct 4, - 22 1 X3 5 to	5t - X1 + X3 - X3 & - LD
24 -> X + 1 X 3 3 6	- (x, +p2) - +3(x) 5 +6
42, -4X, -5X, 75	-32, 442, -32, 45
C3. 373 4.3	1 10 15 C* 102 E 15
χ ₁ , χ ₁ , χ ₂ ≥ο	71. X1. X3. 30
Slock Form	Use 2-Pluse method.
Max + + + -17, - 573 - 473	mix {+ 163 , mix -F = -11, -52, - < 23
S.t. S. 10 + 41-22+23	S.t. S. = +10 + 76 + 76 - 26 +763
Sb= -6 + 2/1 -12/2 13/2	S. = -6 . X X2X. +2X.
S31 - 3 +3X, -4X2 +3X3	$ S_k = +15 + 12 \times 13 \times 1 - 4 \times 1 \times 13 \times 1 - 9$
	16 = 15 (53 - 8)
7, 11, 12, 5, 5, 5, 5, 30	76, 76, 78, S, S, S, S, So. +ex, -5x
My 5-13- S. + 371-472 45733 -	227
	7 75-7
hov {-==-2x1-3x2-4x,}	
28 0 C C STV 1201 ADV.	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
St. S. S + S. 174 + 176 + 475	-> x, - \frac{2}{3} - \frac{1}{2} \frac{1}{3} - \frac{1}{2} \frac{1}{3} - \frac{1}{3} - \frac{1}{3} \frac{1}{3} - \frac{1}{3} \frac{1}{3} - \frac{1}{3} \frac{1}{3} - \fra
50 × 7 + 50 - 12 x + 120 + 120	
52. S. C. + S17/4 17/8 -47/3 53 - J. +53 -57/4 -17/3 -17/3 76 - 17 -163 -57/6 +47/3 -77/3	
5, 1 +5; -5X -5X; +1X; 2, = 13 +63 -5X; +4X; -5X;	
50 × 7 + 50 - 12 x + 120 + 120	
5, 1 9 +5; -2% -2% -2% -2%; 7, -13 +63 -3%; +47; -5%; 2, 2, 3, 7, 5, 5, 5, 5, 7, 8	
5, 1 +5; -5X -5X; +1X; 2, = 13 +63 -5X; +4X; -5X;	
5, 1 45; -2% -2% -2% -2%; 7, - 13 +63 -3%; +47; -5%; 7, 6, 7, 7, 5, 5, 5, 7 2 2 . hax {-9 -25, +25; +27; -75;	
5, 1 9 +5; -2% -2% -2% -2%; 7, -13 +63 -3%; +47; -5%; 2, 2, 3, 7, 5, 5, 5, 5, 7, 8	
5, 7 = 5; -2X - 25, -2X; 2, = 13 + 53 - 32; + 42; - 32; 2, 2, 2, 2, 3, 5, 5; 3 = 2. box {-9 - 25, +25; -27; -25; box {-8 - 25, +3; -5; -62; }) - Phot Sa
5. 7 +5; -5X -75, -5X 7. + 5 +5; -5X +47, -5X; 2. 2. X, X, X, S,) = puot S ₃
5. 7 +5; -5X -75, -5X 7. + 15 +53 -5X +47, -5X 2. 2. X, X, X, S,) = puot S ₃
53 - 7 - 55 - 2X - 25 - 2X - 23 - 2X - 2X - 2X - 2X - 2X - 2X) -> pwot Sa
5. 7 +5; -5X -75, -5X 7. + 15 +53 -5X +47, -5X 2. 2. X, X, X, S,) = puot S ₃
5, 7 = 5; -2X - 7; -1X; 7, = 13 + 53 - 3X; + 47; - 5X; 2, 2, 3, 3, 5; 5; 5; 7 = 5; box {-2 - 25, +25; +2 X; -23; box {-2 - 5 + 5 - 5; -6 X; } 41. X, 58 25 + 25; +2 X; -2 X; Y, 12 - 25; -2 5; -2 5; -2 X; Y, 12 - 25; -2 5; -2 X; 5, 5, 5, 7; X; 7; X; 7;) = puot S ₃
53 - 7 - 55 - 2X - 2X - 2X - 2X 26 - 13 + 53 - 324 + 423 - 323 26 20 20 20 3 5 5 5 5 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	- 1/X3 - 1/X3
5, 7 = 5; -2X - 7; -2X; 7, = 5 + 63 - 53; + 47; -52; 7, 2X, X, 5, 5, 5, 5, 7 = 7. Max { - 2 - 25, + 25, + 27, - 25; Max { - 2 - 5 + 2 - 5; -6 X - 1} 61.	- 1/X 3 - 2 S 5 = S + 3 S 1 - 2 X 3 - X 3 + 2 X 3 -
5, 7 = 5; -2X - 7; -2X; 7, = 5 + 63 - 53; + 47; -52; 7, 2X, X, 5, 5, 5, 5, 7 = 7. Max { - 2 - 25, + 25, + 27, - 25; Max { - 2 - 5 + 2 - 5; -6 X - 1} 61.	- 1/X 3 - 2 S 5 = S + 3 S 1 - 2 X 3 - X 3 + 2 X 3 -
5, 7 = 5; -2X - 75, -2X; 7, = 15 + 53 - 33, +47, -5X; 7, 2 X, X, X, 5, 5, 5, 5, 70. hax {-9 -25, +25, +27, -23, hax {-8 - 5 + 5 + 25, +2 X, -23, 1, 2, 3, 5, -25, -25, -2 X, -3X; 7, 5, 5, 7, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2,	- 1/X 3 - 2 S 5 = S + 3 S 1 - 2 X 3 - X 3 + 2 X 3 -
53 9 453 - 2X - 2X - 2X - 2X2 26 2 5 453 - 2X4 + 422 - 2X2 26 2 X - X - X - X - X - X - X - X - X - X	- 1/X 3 - 2 S 5 = S + 3 S 1 - 2 X 3 - X 3 + 2 X 3 -



Dual - Simplex Method



計算結束後我有用 pivot 檢驗 Dual Simplex Method 的正確性,選擇檢驗 Dual Simplex Method 的原因是因為 2-Phase Method 的步驟較為繁瑣,比較不適合用電腦檢驗。

Bonus

我有設計一個自動計算 Simplex Method 的程式在 simplex method.py 檔中,這個程式只能解最基礎的 Simplex Method,意即 LP 化為 Slack Form 時在 RHS 的常數必須皆大於0,不然不能計算。此程式也不行計算 Dual Simplex Method,因為 Dual Simplex Method 在選擇 pivot 的思維跟 Simplex Method 有所不同,Dual Simplex Method 的選擇較為嚴格,因此不能通用。而其最後的輸出結果為計算到最後的矩陣跟 BV List。