**Il problema espresso con vincoli di eguaglianza per metodo del “Big M”**

**min z = - x2 + M x7  
  
Soggetto a  
  
1) x1 + x2 - x3 + x7  = 1   
2) x1 + x2 + x4 = 2   
3) x1 - x2 + x5 = 1   
4) - x1 + x2 + x6 = 1   
        xi >= 0     per i = 1,...,7**

***Metodo del SIMPLESSO***

**Tableau al passo 0:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | ***x1*** | ***x2*** | ***x3*** | ***x4*** | ***x5*** | ***x6*** | ***x7*** | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **r0** | 0 | 0 | -1 | 0 | 0 | 0 | 0 | M | | **r1** | 1 | 1 | 1 | -1 | 0 | 0 | 0 | 1 | | **r2** | 1 | 0 | 0 | 1 | 1 | 0 | 0 | -1 | | **r3** | 0 | 0 | -2 | 1 | 0 | 1 | 0 | -1 | | **r4** | 2 | 0 | 2 | -1 | 0 | 0 | 1 | 1 | | Indici di base: S = { 1, 4, 5, 6 }  Soluzione di base: z = 0  x1 = 1  x2 = 0  x3 = 0  x4 = 1  x5 = 0  x6 = 2  x7 = 0 |

Soluzione migliorabile. L'algoritmo continua ad iterare.  
Pivot in riga **r1** colonna **x2**.

**Tableau al passo 1:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | ***x1*** | ***x2*** | ***x3*** | ***x4*** | ***x5*** | ***x6*** | ***x7*** | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **r0** | 1 | 1 | 0 | -1 | 0 | 0 | 0 | M+1 | | **r1** | 1 | 1 | 1 | -1 | 0 | 0 | 0 | 1 | | **r2** | 1 | 0 | 0 | 1 | 1 | 0 | 0 | -1 | | **r3** | 2 | 2 | 0 | -1 | 0 | 1 | 0 | 1 | | **r4** | 0 | -2 | 0 | 1 | 0 | 0 | 1 | -1 | | Indici di base: S = { 2, 4, 5, 6 }  Soluzione di base: z = -1  x1 = 0  x2 = 1  x3 = 0  x4 = 1  x5 = 2  x6 = 0  x7 = 0 |

Soluzione migliorabile. L'algoritmo continua ad iterare.  
Pivot in riga **r4** colonna **x3**.

**Tableau al passo 2:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | ***x1*** | ***x2*** | ***x3*** | ***x4*** | ***x5*** | ***x6*** | ***x7*** | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **r0** | 1 | -1 | 0 | 0 | 0 | 0 | 1 | M | | **r1** | 1 | -1 | 1 | 0 | 0 | 0 | 1 | 0 | | **r2** | 1 | 2 | 0 | 0 | 1 | 0 | -1 | 0 | | **r3** | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | | **r4** | 0 | -2 | 0 | 1 | 0 | 0 | 1 | -1 | | Indici di base: S = { 2, 4, 5, 3 }  Soluzione di base: z = -1  x1 = 0  x2 = 1  x3 = 0  x4 = 1  x5 = 2  x6 = 0  x7 = 0 |

Soluzione migliorabile. L'algoritmo continua ad iterare.  
Pivot in riga **r2** colonna **x1**.

**Tableau al passo 3:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | ***x1*** | ***x2*** | ***x3*** | ***x4*** | ***x5*** | ***x6*** | ***x7*** | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **r0** | 3/2 | 0 | 0 | 0 | 1/2 | 0 | ½ | M | | **r1** | 3/2 | 0 | 1 | 0 | 1/2 | 0 | ½ | 0 | | **r2** | 1/2 | 1 | 0 | 0 | 1/2 | 0 | -1/2 | 0 | | **r3** | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | | **r4** | 1 | 0 | 0 | 1 | 1 | 0 | 0 | -1 | | Indici di base: S = { 2, 1, 5, 3 }  Soluzione di base: z = -3/2  x1 = 1/2  x2 = 3/2  x3 = 1  x4 = 0  x5 = 2  x6 = 0  x7 = 0 |

Soluzione **ottima**:     z\* = -3/2,     x\* = [ 1/2, 3/2, 1, 0, 2, 0, 0 ]T