The number of trucks as well as the number of buses are given as arguments in the code.

Sets

Truck: j

Items: i

Variables

Capacity of truck j : C_j (continuous, non-negative)

Size of item i: $Size_i$ (continuous, non-negative)

Price of item i: $Price_i$ (continuous, non-negative)

Dual variables

$$y_i = \begin{cases} 1, & \text{Acceptance of the product order } i \\ 0, & \text{The product order is not accepted } i \end{cases}$$

$$x_{ij} = \begin{cases} 1, & \text{Product i is loaded onto the truck j} \\ 0, & \text{Product i is not loaded on the truck j} \end{cases}$$

The total volume of items loaded into the truck must be less than or equal to the storage capacity of that lorry.

Objective function

Total Profit = $\sum y_i \cdot Price_i$

The goal is to maximize Total profit.

Restrictions

$\sum_i Size_i \cdot x_{ij} \leq Capacities_j$ $\forall\, j$ (This restriction applies to every truck)

$\sum_j x_{ij} = y_i$ That is, if the order of product i is not accepted, it should not be loaded on any truck.

Code Results

```
If noted with 1, it means that item_i is transported by
Truck_j
    ('Item0', 'Truck0') 0.0
    ('Item0', 'Truck1') 1.0
    ('Item1', 'Truck0') 1.0
    ('Item1', 'Truck1') 0.0
    ('Item2', 'Truck0') 0.0
    ('Item2', 'Truck1') 0.0
    ('Item3', 'Truck0') 0.0
    ('Item3', 'Truck1') 1.0
    ('Item4', 'Truck0') 0.0
    ('Item4', 'Truck1') 1.0
    ('Item5', 'Truck0') 0.0
    ('Item5', 'Truck1') 1.0
    ('Item6', 'Truck0') 0.0
    ('Item6', 'Truck1') 0.0
    ('Item7', 'Truck0') 1.0
    ('Item7', 'Truck1') 0.0
    ('Item8', 'Truck0') 1.0
    ('Item8', 'Truck1') 0.0
    ('Item9', 'Truck0') 0.0
    ('Item9', 'Truck1') 0.0
Summary of results
The maximum profit is:
797.0
The capacity used in truck i
0 35.0
1 36.0
Orders Assigned in truck 0 are the following:
[1, 7, 8]
Orders Assigned in truck 1 are the following:
[0, 3, 4, 5]

In [130]:
```