3) N types of food

M types of nutrition

a_{ij} – food type i w/ nutrition type j for $i = 1, \dots, N$ & $j = 1, \dots, M$

c_i – unit price of food type i

b_j – necessary quantity of nutrition type j for a month

obj: min cost to satisfy nutrition

$$\text{total cost} = \sum_{i=1}^{N} a_{ij} c_i$$

$$\text{total nutrition} = \sum_{j=1}^{M} a_{ij} b_j$$

let TN_j = total nutritional value of type j needed in a month

$$\min_{\{a_{ij}\}} \sum_{i=1}^{N} a_{ij} c_i$$

$$\text{s.t.} \sum_{j=1}^{M} a_{ij} b_j = TN_j$$