Problem Formulation

Maximize $a_1 x_1 + a_2 x_2 + a_3 x_3 + \cdots + a_{n-1} x_{n-1} + a_n x_n$

Constraints

$$\begin{cases} b_{1,1}x_1 + b_{1,2}x_2 + b_{1,3}x_3 + \cdots + b_{1,n-1}x_{n-1} + b_{1,n}x_n \le c_1 \\ b_{2,1}x_1 + b_{2,2}x_2 + b_{2,3}x_3 + \cdots + b_{2,n-1}x_{n-1} + b_{2,n}x_n \le c_2 \\ \qquad\qquad\qquad\qquad \cdots \\ b_{m,1}x_1 + b_{m,2}x_2 + b_{m,3}x_3 + \cdots + b_{m,n-1}x_{n-1} + b_{m,n}x_n \le c_m \\ x_i \ge 0, i = 1,2, \ldots, n. \end{cases}$$

Small-Scale: $n = 100$, $m = 10$
Medium-Scale: $n = 100{,}000$, $m = 50$
Large-Scale: $n = 1000{,}000$, $m = 100$

In each instance file, there are three matrixes A, B and C of size $1 \times n$, $m \times n$ and $m \times 1$, respectively. $A_{1,i} = a_i$, $B_{j,i} = b_{j,i}$ and $C_{j,1} = c_j$ for $1 \le i \le n, 1 \le j \le m$.