```
(V,c)
      c(s,P) = \min \sum_{k \in V} \sum_{j \in O} c_{kj} x_{kj} + P \sum_{k \in s} x_{k1} s.t. \sum_{j \in O} x_{kj} - y_k^s = 0, \forall k \in V, \sum_{k \in V} x_{kj} \leq m_s, \forall j \in O, x_{kj} \in \{0,1\}, \forall k \in V, \forall j \in O, y_k^s = 0, \forall k \in V, x_{kj} \leq m_s, \forall j \in O, x_{kj} \in \{0,1\}, \forall k \in V, \forall j \in O, y_k^s = 0, \forall k \in V, x_{kj} \leq m_s, \forall j \in O, x_{kj} \in \{0,1\}, \forall k \in V, \forall j \in O, x_{kj} \in A, x_{kj} \in 
\begin{array}{l} P_{m_s} \\ S_{m_s} \\ M_s \\ M_s \\ V = \\ \{1,2,\ldots,v\} \\ P_t \\ i(i \in V) \\ t_1 < \\ t_2 < \\ \vdots \\ t_v < \\ t_v \\ \omega(P) \\ \omega(P) \\ \omega(P) = \min \end{array}
      \omega(P) = \min\{c(V, m(V, P)) - \alpha(V) : \alpha(s) \le c(s, m(s, P)), \forall s \in S, \alpha \in \mathbb{R}^v\},\
      \hat{\omega}(P) = \min\{c(V, m(V, P)) - \alpha(V) : \alpha(s) \leq c(s, m(s, P)), \forall s \in S \backslash \{V\}, \alpha \in R^v\}.
   \begin{array}{l} \alpha(V) \leq \\ c(V, m(V, P)) \\ [P_L(i, s), P_H(i, s)] \end{array}
       \stackrel{i}{\stackrel{[0,P^*]}{P^*}} 
      c(V, m^*) =
      \min_{m \in M} \{ \sum_{k \in V} C_k(m) + 
      P \cdot m
      c_0(s,i)
         c_0(V,i)
c(V, m^*) = c_0(V, m^*) + P \cdot m^* m^* P^i I_i c_0(V, i) + C_0(V,
   c_0(V, i) + P^i i \leq c_0(V, i - i)
   \begin{array}{c} 1)+\\ P^{i}.\\ (i-\end{array}
      1)
1)

c_0(V, i) + P^i i \le c_0(V, i + 1) + P^i \cdot (i + 1)

1)

P^i

C_0(V, i) - P^i
P^{i}
c_{0}(V, i) - c_{0}(V, i+1) \le P^{i} \le c_{0}(\overline{V}, i-1) - c_{0}(\overline{V}, i-1) = c_{0}(\overline{V}, i-1) - c_{0}(\overline{V}, i-1) = c_{
      1)-
1)-

c_0(V,i)

P^i

[c_0(V,i)-

c_0(V,i+

1), c_0(V,i-
1)-
c_0(V,i)].
t_1 < t_2 < t_2 < t_v < t_0(V,m) = \sum_{j=1}^{\lfloor v/m \rfloor} \sum_{i=1}^m jt_{v-mj-i+m+1}
```