Recitation 10

P9.8

a) $$\max \sum_{i=1}^{n} w_i y_i + \sum_{j=1}^{n} \sum_{\substack{i=1 \\ i \neq j}}^{n} b_{ij} y_{ij}$$

$w_{i\alpha}$: Number of letter α that word W_i contains.

s.t

$y_{ij} \leq y_i$, $y_{ij} \leq y_j$

① $$\sum_{i=1}^{n} w_{i\alpha} y_i \leq N_\alpha \quad \forall \alpha \in \{a, b, \ldots, z\}$$

$y_i \in \{0, 1\} \quad \forall i = 1 \ldots n$

b) Replace constraints ① by:

$$\sum_{\alpha} \sum_{i=1}^{n} w_{i\alpha} y_i \leq 100$$

P.21

a) $$\min \sum_{j=1}^{N} \left(\sum_{i=1}^{m} w_i x_{ij} \right) J^2$$

b) $$\min \sum_{j=1}^{m} \left(W - \sum_{i=1}^{m} w_i x_{ij} \right) y_j$$

Let $w^* = \min_i \{W_i\}$

s.t

$$y_j \geq \frac{w^* - \left(W - \sum_{i=1}^{m} w_i x_{ij} \right)}{B}, \quad B \gg 0$$

$0 \leq y_j \leq 1$

y_j Integer

d)

Let P be the set of possible patterns

$$\min \sum_{p \in P} y_p$$

s.t

$$\sum_{p \in P} y_p \leq N$$

$$\sum_{p \in P} x_{pi} y_p = N_i$$

y_p is Integer

x_{pi}: Total number of rolls of width W_i in pattern p.