

## Randomized Play

- usually allow randomized play:
  - Mindy chooses distribution  $\mathbf{P}$  over rows
  - Max chooses distribution  $\mathbf{Q}$  over columns (simultaneously)
- Mindy's (expected) loss

$$\begin{aligned} &= \sum_{i,j} \mathbf{P}(i) \mathbf{M}(i,j) \mathbf{Q}(j) \\ &= \mathbf{P}^\top \mathbf{M} \mathbf{Q} \equiv \mathbf{M}(\mathbf{P}, \mathbf{Q}) \end{aligned}$$

- $i, j$  = “pure” strategies
- $\mathbf{P}, \mathbf{Q}$  = “mixed” strategies
- $m = \#$  rows of  $\mathbf{M}$
- also write  $\mathbf{M}(i, \mathbf{Q})$  and  $\mathbf{M}(\mathbf{P}, j)$  when one side plays pure and other plays mixed