$P(\hat{\theta}_1, \hat{\theta}_2 \cdots \hat{\theta}_k \mid r_1, r_2 \cdots) \rightsquigarrow \mathbb{P}\left(\begin{array}{l} \hat{\theta}_1 \geq \hat{\theta}_2 \\ \hat{\theta}_1 \geq \hat{\theta}_3 \\ \vdots \\ \hat{\theta}_1 \geq \hat{\theta}_k \end{array} \right)$

$\mathrm{Var}(\hat{\theta}_1) \quad \mathrm{Var}(\hat{\theta}_2)$

$\Leftrightarrow$ a_1 is Opt. act.

$=: \pi(a_1)$

Prob(Error in Selecting Opt. act)

$= \pi(a_1)[1 - \hat{\pi}(a_1)] + \pi(a_2)[1 - \hat{\pi}(a_2)] + \cdots$