# Deterministic and Stochastic Model for Exam Selection

1. Decision Variables
   $x_i = 1$ if activity $i$ is selected
   $x_i = 0$ otherwise

2. Parameters
   $CFU_i$ = credits of activity $i$
   $T_i$ = total time required for activity $i$
   $G_i$ = grade of exam $i$
   $p_i$ = probability of passing exam $i$
   $CFU\ min$ = minimum required credits
   $T\ max$ = maximum available time

3. Deterministic Model (Baseline)
   Assume all exams are passed $\Rightarrow$ $p_i = 1$

   Objective function: Max total grade of selected exam
   $$Max\ \Sigma(G_i * x_i)$$

   Constraints:
   - $\Sigma(CFU_i * x_i) \geq CFU_{min}$
   - $\Sigma(T_i * x_i) \leq T_{max}$
   - $x_i \in \{0,1\}$

4. Stochastic Model (Expected Value)
   Consider the probability of passing each exam: $0 < p_i \leq 1$

   Objective function: max expected grade
   $$Max\ \Sigma(p_i * G_i * x_i)$$

   Constraints:
   - $\Sigma(CFU_i * x_i) \geq CFU_{min}$
   - $\Sigma(T_i * x_i) \leq T_{max}$
   - $x_i \in \{0,1\}$