Algorithm 1 Genetic Algorithm (GA)

Input: Objective function $f(\mathbf{x})$, population size P, crossover rate c_r, mutation rate m_r, maximum number of iterations $MaxIter$.
Output: Best solution $\mathbf{x}_{best}$.
Initialize population $\mathcal{P}$.
Evaluate initial population $\mathcal{P}$.
for $iter = 1$ **to** $MaxIter$ **do**
    Selection operation: Select individuals from $\mathcal{P}$ to form a new population $\mathcal{M}$.
    Crossover operation: Perform crossover on individuals in $\mathcal{M}$ to produce offspring $\mathcal{C}$.
    Mutation operation: Perform mutation on individuals in $\mathcal{C}$ to produce new offspring $\mathcal{N}$.
    Evaluate $\mathcal{N}$.
    Select the best individuals: Choose the best P individuals from $\mathcal{P} \cup \mathcal{N}$ to form a new population $\mathcal{P}$.
end for
return $\mathbf{x}_{best}$