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1  Algorithm: Multi-start Optimization Algorithm
2
3  Input: n_starts, Nmax, objective_function
4  Output: best_result
5
6  1 /* Initialize tracking variables */
7  2 best_result ← null
8  3 best_objective ← ∞
9
10 4 /* Generate starting points for each parameter */
11 5 Nt_starts ← linspace(100000, 0.8 × Nmax, n_starts)
12 6 τ_starts ← linspace(0.02, 0.07, n_starts)
13 7 k_starts ← linspace(0.05, 0.15, n_starts)
14
15 8 /* Define optimization bounds */
16 9 bounds ← [
17 10     (100000, Nmax),
18 11     (0.02, 0.08),
19 12     (0.05, 0.2),
20 13     (0.05, 0.2),
21 14     (0.05, 0.2)
22 15 ]
23
24 16 /* Perform optimization from multiple starting points */
25 17 for i ← 0 to n_starts-1 do
26 18     /* Construct initial point */
27 19     x0 ← [Nt_starts[i], τ_starts[i], k_starts[i], k_starts[i], k_starts[i]]
28
29 20     /* Minimize objective function */
30 21     result ← minimize(objective_function, x0, bounds,
31 22                       method="SLSQP",
32 23                       maxiter=10000,
33 24                       ftol=1e-9,
34 25                       eps=1e-8)
35
36 26     /* Update best result if better solution found */
37 27     if result.success and result.objective < best_objective then
38 28         best_objective ← result.objective
39 29         best_result ← deepcopy(result)
40 30     end if
41 31 end for
42
43 32 return best_result

```