Optimizing Bank Lending Decisions Using Metaheuristics

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01 OBJECTIVE

- To optimize the result using genetic algorithm.
- To optimize the result using Simulated Annealing algorithm.
- Compare the results of both the algorithms.

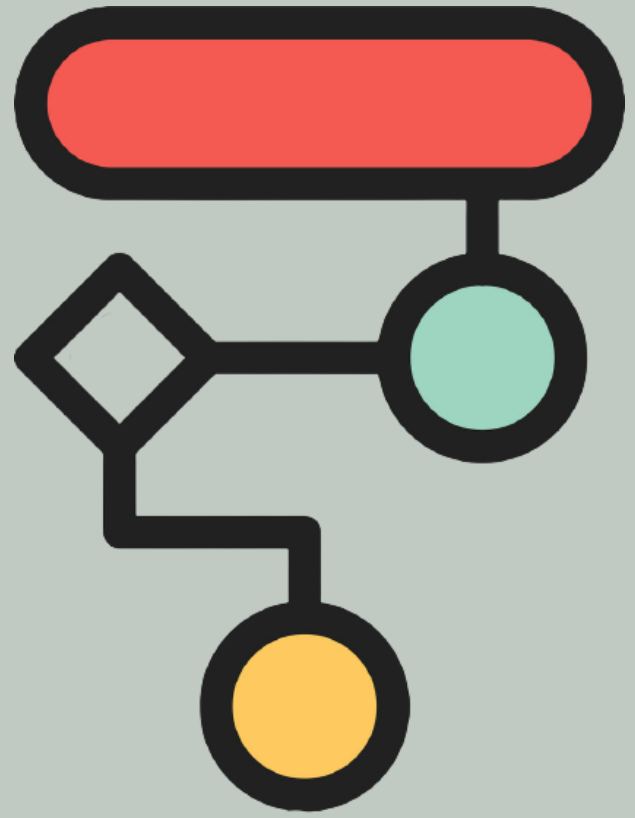
02 Approach

Fitness Function

$$F_x = \nu + \omega - \beta - \sum_{i=0}^{n} \lambda$$

Constraints

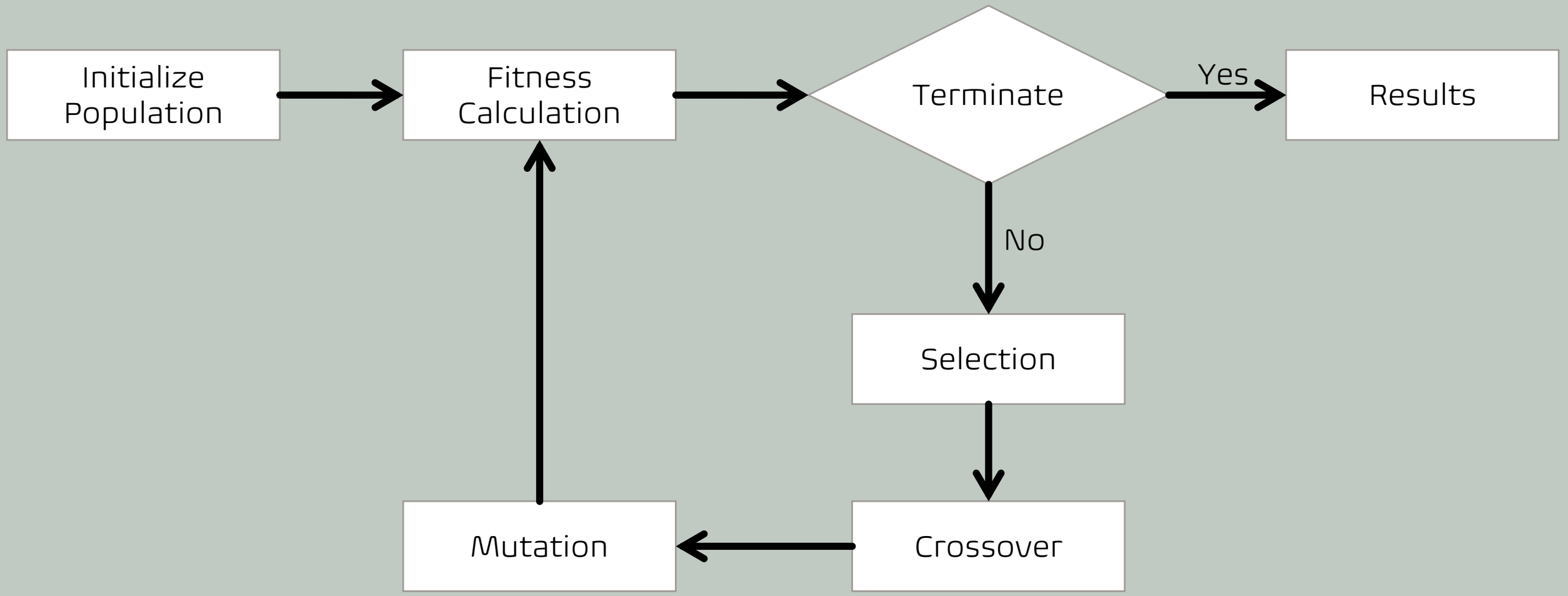
$$\sum_{i=0}^{n} L_i * X_i \leq (1 - K)D$$



Solution Representation

1	1	0	1	0	0	0	1	0	1

03 Genetic Algorithm



03 Genetic Algorithm

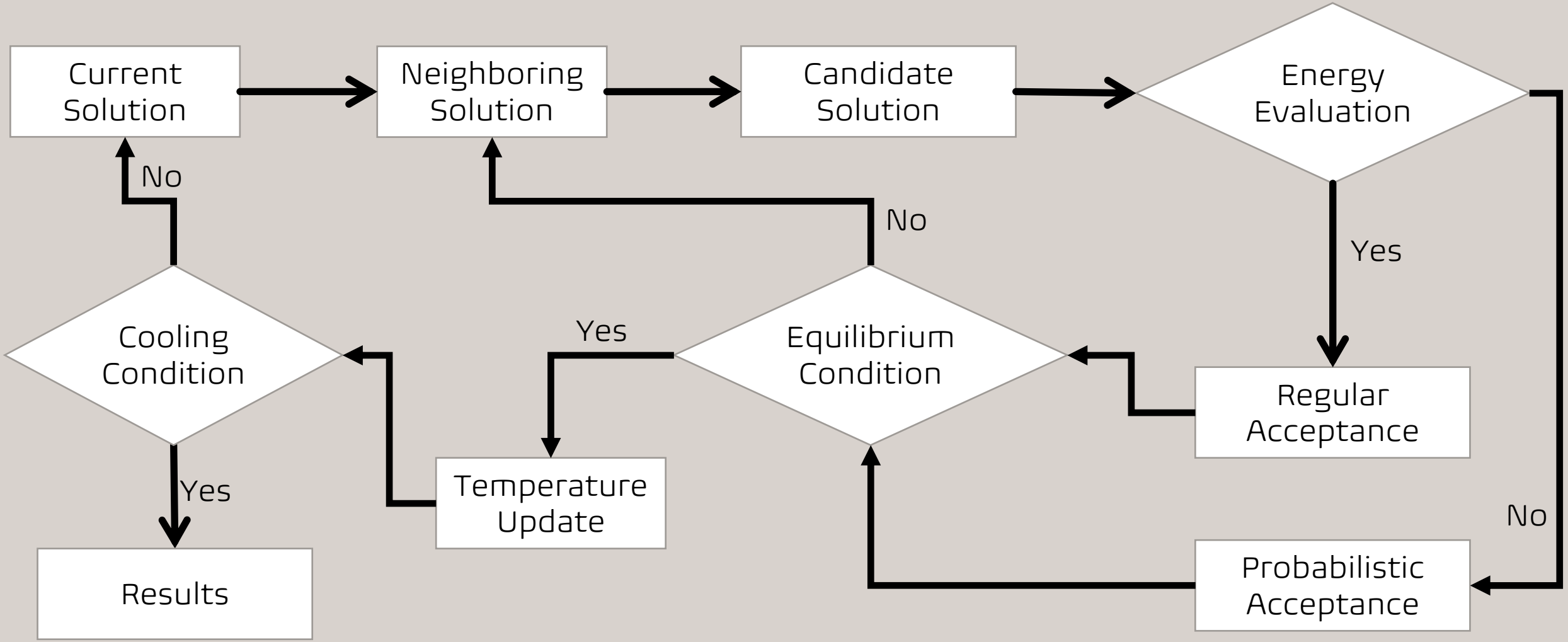
Parameters .

Parameters	Value
Population Size	60
Number of iterations	60
Selection Method	Roulette Wheel
Crossover Probability	0.8
Mutation Probability	0.006
customer transaction rate	0.01

Results

	Value
Optimal Solution	(1, 0, 1, 1, 0, 1, 0, 0, 1, 1)
Optimal Value	3.981999

04 Simulated annealing



04 Simulated annealing

Parameters .

Parameters	Value
Tmax	1000
Tmin	0
Nk	50
Crossover Probability	0.8
Mutation Probability	0.006
customer transaction rate	0.01

Results

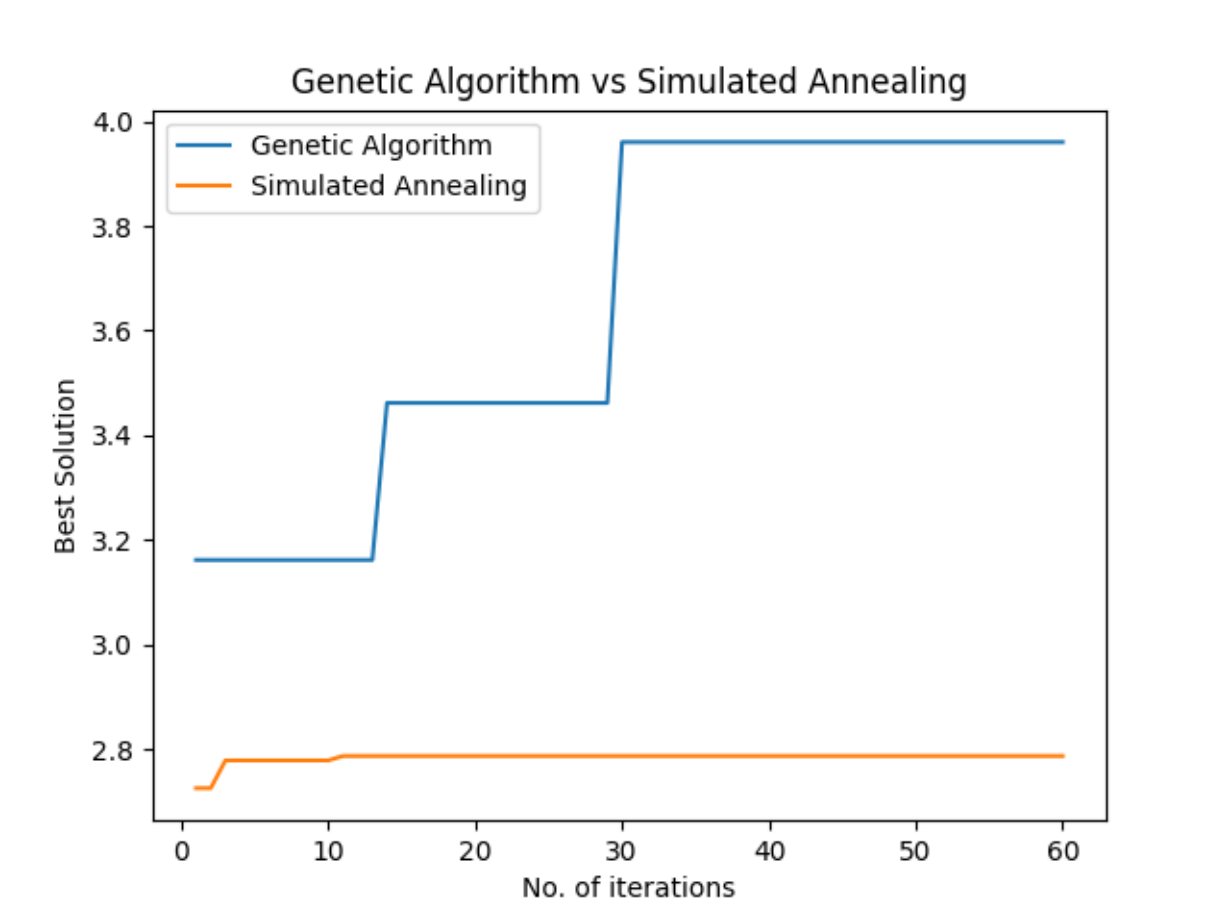
	Value
Optimal Solution	(0, 0, 0, 1, 1, 0, 0, 1, 0, 0)
Optimal Value	2.7872

Comparison of Results

Algorithm	Genetic Algorithm	Simulated annealing
Optimal Solution	(1, 0, 1, 1, 0, 1, 0, 0, 1, 1)	(0, 0, 0, 1, 1, 0, 0, 1, 0, 0)
Optimal Value	3.981999	2.7872

Genetic Algorithm performed much better than Simulated Annealing Algorithm

Comparison of Results



Thank You