Part 1 Tutorial

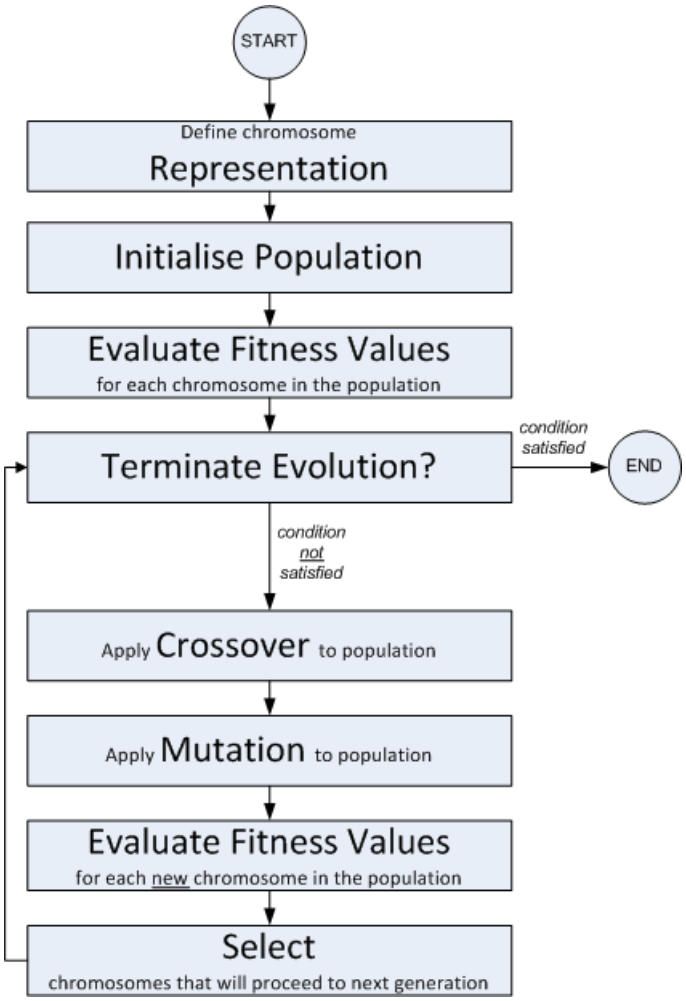
1. Why are genetic algorithms considered to be bio-inspired?

Genetic algorithms are based on natural selection. Natural selection is the process that drives biological evolution.

2. What are genetic algorithms (GA) user for? Give an example of what you might use a GA for?

Optimization: Solving intractable NP-Hard problems including travelling salesman problem and timetable scheduling. Computational Biology: Simulate biological processes to provide inspirations for biologist.

3. Describe the main steps in a GA. Show the steps in a flowchart.



4. What are the purposes of the following in a GA?

- Evaluation or fitness function Measure the quality of each candidate solution.
- Mutation operation Exploring new solutions.
- Selection operation Pick up better solutions among all the candidate solutions.
- Crossover operation (Hopefully) combine good traits of quality solutions.

5. Suppose you have to find the maximum turning point of a function y = f(x). You are given that the x-value of the point lies in the interval [x1, x2] and the y-value of the point lies in the interval [y1, y2]. Design a GA that can solve it. In your design, include the type of chromosome and selection method etc. that would be appropriate and suggest values for settings where required.