Assignment 8

Due on 2021-03-17, 23:59 EST.

As per our records you have not identified the assignment.

1. The true claims of IFEM are the following:
   - The general fitness function is used.
   - An enhanced adaptive tournament method
   - A non-linear scaling
   - (b) crowding distance
   - (d) no true ranking
   Answer: (a) True, (b) False, (c) True, (d) True

2. Your current fitness function strategy is to use the following:
   - Be an enhanced adaptive tournament method
   - Be an enhanced non-linear scaling
   Answer: (a) True, (b) False, (c) True, (d) True

3. Considering $N$ is the number of objectives and $Q = N - 1$ where $N$ is the population size and $Q$ is the archive size, the computational complexity of the method you have implemented for fitness assignment strategy of IFEM is:
   - $O(Q^2)$
   - $O(Q^3)$
   - $O(Q^4)$
   Answer: (a) True, (b) False, (c) True, (d) True

4. Consider the Pareto front function $f_1(x) = 0.5x + 0.5y$, $f_2(x) = 0.5x - 0.5y$ and $f_3(x) = 0.5x^2 - 0.5y^2$. Now, let both the objectives are of min-max type. Measurement of these objectives will require $O(N)$, $O(N^2)$, or $O(N^3)$.
   - $O(N)$
   - $O(N^2)$
   - $O(N^3)$
   Answer: (a) True, (b) False, (c) True, (d) True

5. Importance of the function $f_i(x)$ is
   - $f_{1(x)}$
   - $f_{2(x)}$
   - $f_{3(x)}$
   Answer: (a) True, (b) False, (c) True, (d) True

6. Consider the following
   - $f_1(x) = 0.5x + 0.5y$, $f_2(x) = 0.5x - 0.5y$ and $f_3(x) = 0.5x^2 - 0.5y^2$. Now, let both the objectives are of min-max type.
   - (a) The objective function is $f_1(x)$.
   - (b) The objective function is $f_2(x)$.
   - (c) The objective function is $f_3(x)$.
   Answer: (a) True, (b) False, (c) True, (d) True

7. Consider the function $f(x, y) = x^2 + y^2$.
   - $f_{1(x)}$
   - $f_{2(x)}$
   - $f_{3(x)}$
   Answer: (a) True, (b) False, (c) True, (d) True

8. Using exponentially decreasing of the guess-to-true optimization problem, set a better than set 0.
   - $O(1)$
   - $O(N)$
   - $O(N^2)$
   Answer: (a) True, (b) False, (c) True, (d) True

9. Compute the objective function $f_1(x)$ for the following values of $f_2(x)$:
   - $f_1(x) = 0.5x + 0.5y$, $f_2(x) = 0.5x - 0.5y$ and $f_3(x) = 0.5x^2 - 0.5y^2$.
   - $f_1(x) = 0.5x + 0.5y$, $f_2(x) = 0.5x - 0.5y$ and $f_3(x) = 0.5x^2 - 0.5y^2$.
   - $f_1(x) = 0.5x + 0.5y$, $f_2(x) = 0.5x - 0.5y$ and $f_3(x) = 0.5x^2 - 0.5y^2$.
   Answer: (a) True, (b) False, (c) True, (d) True