

Unit 7 - Week 5

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The due date for submitting this assignment is 11/11/2023. As per our records you have not submitted the assignment.

1) Which of the following statements is/are true about 'Traveling Salesman problem' (TSP)? 1 point

Optimisation

- Ant colony optimisation can generate "good solutions" to TSP using a simulation of an ant colony

☐ All of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
It is an NP-hard problem in combinatorial optimisation
Ant colony optimisation can generate "good solutions" to TSP using a simulation of an ant colony

2) Genetic Algorithms are: 1 point

☐ a class of algorithms that try and build solutions by introducing evolution and selection of the best in a population of candidate solutions

☐ methods, based on the theory of natural selection and evolutionary biology, for solving optimisation problems

☐ methods for genetically modifying ants to do ant colony optimisation

☐ a heuristic search method used in artificial intelligence and computing

No, the answer is incorrect.
Score: 0

Accepted Answers:
a class of algorithms that try and build solutions by introducing evolution and selection of the best in a population of candidate solutions
methods, based on the theory of natural selection and evolutionary biology, for solving optimisation problems
a heuristic search method used in artificial intelligence and computing

3) The Fitness Function in Genetic Algorithms is 1 point

☐ an evaluation mechanism to determine the goodness of the algorithm

☐ a user defined function to decide the goodness of candidate solutions/designs

☐ a method of measuring the fitness value of each candidate solution towards solving the problem

☐ a least squares approximation for a polynomial

No, the answer is incorrect.
Score: 0

Accepted Answers:
a user defined function to decide the goodness of candidate solutions/designs
a method of measuring the fitness value of each candidate solution towards solving the problem

4) The basic idea behind Genetic Algorithms is to work with a population 1 point

☐ of problem solvers that interact with each other through signs

☐ of candidate solutions to try and create better candidates by mixing genes

☐ of candidate solutions in which each candidate is heuristically refined

☐ of problem solvers each of which does an independent heuristic search

No, the answer is incorrect.
Score: 0

Accepted Answers:
of candidate solutions to try and create better candidates by mixing genes

5) The basic idea behind Ant Colony Optimization algorithms is to work with a population 1 point

☐ of problem solvers that interact with each other through signs

☐ of candidate solutions to try and create better candidates by mixing genes

☐ of candidate solutions in which each candidate is heuristically refined

☐ of problem solvers each of which does an independent heuristic search

No, the answer is incorrect.
Score: 0

Accepted Answers:
of problem solvers that interact with each other through signs
of problem solvers each of which does an independent heuristic search

6) A genetic algorithm (GA) for optimization is *most* likely to succeed given 1 point

☐ a small population of fit and similar individuals

☐ a large population of fit and similar individuals

☐ a small diverse population of fit individuals

☐ a large diverse population of fit individuals

No, the answer is incorrect.
Score: 0

Accepted Answers:
a large diverse population of fit individuals

7) Which of the following is/are True? 1 point

☐ The Path Representation of the TSP candidates does not allow all permutations of the cities as candidate tours, while the Adjacency Representation does

☐ In Adjacency Representation every tour has many different representations

☐ In Path Representation every tour has many different representations

☐ The Adjacency Representation of the TSP candidates does not allow all permutations of the cities as candidate tours, while the Path Representation does

No, the answer is incorrect.
Score: 0

Accepted Answers:
In Path Representation every tour has many different representations
The Adjacency Representation of the TSP candidates does not allow all permutations of the cities as candidate tours, while the Path Representation does

8) An ant in Ant Colony Optimization algorithm for TSP produces a tour by 1 point

☐ a deterministic greedy constructive method

☐ a stochastic greedy constructive method

☐ a deterministic perturbation of the previous tour

☐ a stochastic perturbation of the previous tour

No, the answer is incorrect.
Score: 0

Accepted Answers:
a stochastic greedy constructive method

9) What is the relation between the pheromone deposited by an ant on an edge and the cost of the tour generated by that ant in the ACO algorithm? 1 point

☐ The pheromone deposited on each edge is directly proportional to the cost of the tour consisting that edge

☐ The pheromone deposited on each edge is inversely proportional to the cost of the tour consisting that edge

☐ The pheromone deposited on each edge is constant

☐ The pheromone deposited on each edge depends upon the length of that edge

No, the answer is incorrect.
Score: 0

Accepted Answers:
The pheromone deposited on each edge is inversely proportional to the cost of the tour consisting that edge

10) Given the parent tours: P1 = (2,7,8,4,6,3,1,5) and P2 = (1,4,7,8,6,2,3,5) in path representation, what can you say about the offspring tours generated 1 point
er applying single point crossover after 5 cities?

☐ The offspring tours are valid and better than the parent tours

☐ The offspring tours are valid but worse than the parent tours

☐ Only one of the offspring is a valid tour

☐ Neither of the two offspring is a valid tour

No, the answer is incorrect.
Score: 0

Accepted Answers:
Neither of the two offspring is a valid tour

11) What is the adjacency representation for the tour (1→3→2→5→4→6→7→8)? Answer should be comma separated list of cities, for example, 1 point
2,3,4

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) 3,5,2,6,4,7,8,1
(Type: String) 3, 5, 2, 6, 4, 7, 8, 1

12) Given the following tour in adjacency representation: (4,3,6,2,7,5,8,1) what is its path representation? Answer should be comma separated list of cities, for 1 point
example, 1,2,3,4

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) 1,4,2,3,6,5,7,8
(Type: String) 1, 4, 2, 3, 6, 5, 7, 8

13) Given the reference vector R=(A,B,C,D,E,F,G,H), what is the ordinal representation for the tour (A,D,C,G,H,B,E,F)? Answer should be comma separated list of 1 point
cities, for example, 1,2,3,4

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) 1,3,2,4,4,1,1,1
(Type: String) 1, 3, 2, 4, 4, 1, 1, 1

14) Given the reference vector R=(A,B,C,D,E,F,G,H) and a tour in ordinal representation: (1,3,1,1,2,1,1,1), what is the tour? Answer should be comma separated 1 point
t of cities, for example, A,B,C,D

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) A,D,B,C,F,E,G,H
(Type: String) A, D, B, C, F, E, G, H

15) What are the offspring tours generated by Partially Mapped Crossover (PMX) between P1 and P2 given above when the cuts are made after the 3rd and 6th 1 point
cities? If the two answer tours are (1,2,3,4) AND (2,3,1,4) then enter 1234,2314 as answer

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) 18746325,37486215
(Type: String) 18746325, 37486215
(Type: String) 37486215,18746325
(Type: String) 37486215, 18746325

16) What are the offspring tours generated by Ordered Crossover (OX) between P1 and P2 given above when the cuts are made after the 3rd and 6th cities? If 1 point
a two answer tours are (1,2,3,4) AND (2,3,1,4) then enter 1234,2314 as answer

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) 46317825,86274315
(Type: String) 86274315,46317825
(Type: String) 86274315, 46317825
(Type: String) 46317825, 86274315

17) While doing the Cycle Crossover with the two parents P1 and P2 identify the first cycle in P1 (starting with 2). Your answer must be a comma separated list 1 point
th no blanks

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) 2,3,1
(Type: String) 2,1,3
(Type: String) 2, 3, 1
(Type: String) 2, 1, 3

18) While doing the Cycle Crossover with the two parents P1 and P2 identify the second cycle in P1 (starting with 7). Your answer must be a comma separated 1 point
t with no blanks

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) 7,8,4
(Type: String) 7, 8, 4
(Type: String) 7,4,8
(Type: String) 7, 4, 8

19) Starting with the city '2' construct the first child C1 generated by the Cycle Crossover from P1 and P2. Your answer must be a comma separated list with no 1 point
anks

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) 2,4,7,8,6,3,1,5
(Type: String) 2, 4, 7, 8, 6, 3, 1, 5

20) Construct the second child C2 generated by the Cycle Crossover from P1 and P2. Your answer must be a comma separated list with no blanks 1 point