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# Quiz 5

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## Quiz 5

5/5 points (graded)

1. We consider the greedy algorithm that always choose to jump to the closest unexplored vertex to solve the TSP. Which of the following statements is true?

☐ The solution found by a greedy algorithm is always optimal.

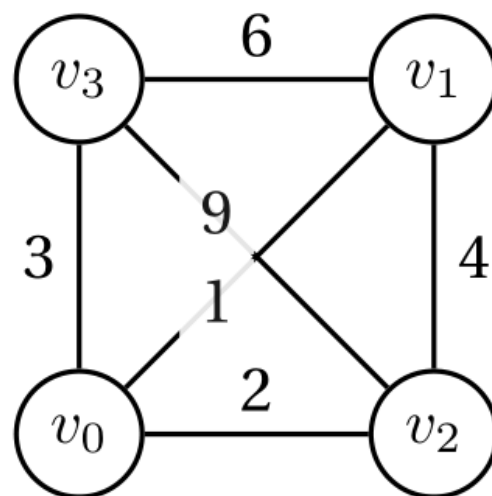
☒ The solution found by a greedy algorithm may or may not be optimal.

☐ The solution found by a greedy algorithm is never optimal.



2. Which of the following is the route obtained for the TSP when applying a greedy algorithm that jumps to the closest vertex

and starts from vertex 0 ?:



☐  $\{0, 2\}, \{2, 3\}, \{1, 3\}$

☐  $\{0, 3\}, \{2, 3\}, \{1, 2\}$

☒  $\{0, 1\}, \{1, 2\}, \{2, 3\}$



3. Consider the problem of finding a longest path in a given weighted graph, starting at vertex  $u$ . To solve it, we can adopt the greedy approach of systematically choosing an unexplored edge  $\{v, v'\}$  of maximum weight from the current vertex we are in,  $v$ , then jumping to the corresponding vertex  $v'$ , until there are no such edges left. Which of the following statements are true?

☐ This greedy algorithm is optimal (it always outputs the longest path).

☒ This greedy algorithm outputs a path starting at  $u$ .

☒ This greedy algorithm always finishes (it cannot iterate endlessly).



4. A Pareto optimal is...

☐ a solution that minimizes both speed and correctness.

☒ an optimal trade-off between speed and correctness.

☐ a solution that maximises correctness, irrespective of speed.

☐ a solution that maximizes both speed and correctness.



5. We consider the use of a backtracking algorithm to solve the TSP. Which of the following statements are true?

☒ On a weighted graph in which all weights are equal, backtracking will be at least as costly as a brute force search.

☐ If interrupted before the end, a solution estimated by backtracking will always be inferior to the true answer.

☒ The order in which vertices are explored has an important influence on overall execution time.



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**i** Answers are displayed within the problem

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