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Quiz 4

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Exam 4

5/5 points (graded)

1. Which of the following statements defines the Traveling Salesman Problem?

- ☐ To find the shortest cycle in a weighted graph from an initial vertex.
- ☒ To find the shortest route going through all vertices of a weighted graph from an initial vertex.
- ☐ To find a minimum spanning tree on a weighted graph from an initial vertex.



2. Consider a situation in which we are interested in the complexity of algorithms that operate on graphs as a function of the order n of these graphs. Check the following problems that can be reduced to finding a shortest path between two vertices u and v in a weighted graph:

- ☐ The TSP.
- ☒ Checking if there is a path between two vertices u and v in a weighted graph.
- ☒ Finding a shortest path between two vertices u and v in an unweighted graph.



3. When solving the TSP using backtracking, which of the following statements are true?

- ☒ The exploration of the current branch is aborted if the length of the partial route is greater than the best route found so far.
- ☒ In the best case, only the first branch has been fully explored.
- ☐ If the last explored branch turns out to be the shortest route, then the execution time for this branch is comparable to that of a bruteforce search.



4. Consider a problem for which we have a solution algorithm with complexity $\mathcal{O}(n^2)$. Select the correct statements:

- ☐ The complexity of the problem is at least to the order of n^2 .
- ☐ There is not an algorithm that can solve the problem with complexity $\mathcal{O}(n)$.
- ☒ The complexity of the problem is $\mathcal{O}(n^2)$.
- ☐ The problem is at least as difficult as the TSP.



5. The complexity of a problem is:

- ☐ The maximum complexity of an algorithm used to solve it.
- ☒ The minimum complexity of an algorithm used to solve it.



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