Reductions

1/3 points earned (33%)

You haven't passed yet. You need at least 80% to pass.
Review the material and try again! You have 3 attempts every 8 hours.

Review Related Lesson

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0 / 1
points

1.
(seed = 481253)

Which of the following problems can be linear-time reduced *from* element distinctness: Given an array of N real numbers, are they all distinct? Assume the quadratic decision tree model of computation. Check all that apply.

- [ ] Given an array of N real numbers, rearrange the elements in ascending order.

This should be selected

- [ ] Given N points in the plane, compute the convex hull.

This should be selected

- [ ] Given an array of N real numbers, find a median.

This should not be selected

- [ ] Given an edge-weighted graph, compute the minimum spanning tree.

Un-selected is correct

- [x] Given N points in the plane, compute the minimum spanning tree, where the weight between two points is its Euclidean distance.

Correct

✔ 1 / 1 points

2.
(seed = 50828)

Which problems are known to have the same asymptotic complexity as multiplying two N-by-N matrices? Check all that apply.

- [x] Solving an N-by-N system of linear equations.

Correct

- [x] Inverting an N-by-N matrix.

Correct

- [ ] Sorting each of the N rows of an N-by-N matrix in ascending order.

Un-selected is correct

- [ ] Finding the maximum value in an N-by-N matrix.

Un-selected is correct

- [ ] Adding two N-by-N matrices.

Un-selected is correct

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0 / 1
points

3.
(seed = 484263)

Suppose that 3-SUM has a N^(3/2) lower bound and that 3-SUM linear-time reduces to 3-COLLINEAR. Which of the following can you infer? Check all that apply.

- [ ] If 3-COLLINEAR can be solved in N^(3/2) time, then so can 3-SUM.

This should be selected

- [ ] 3-COLLINEAR can be solved in N^(3/2) time.

This should not be selected

- [ ] 3-SUM can be solved in N^(3/2) time.

Un-selected is correct

- [ ] If 3-SUM cannot be solved in N^(5/3) time, then neither can 3-COLLINEAR.

Correct

- [ ] 3-COLLINEAR cannot be solved in N^(5/4) time.

This should be selected