Reading Quiz #10

This is a preview of the published version of the quiz

Started: Nov 18 at 8:11p.m.

Quiz Instructions

To prepare for this quiz, please read one of sections 8.5, 8.6 of the Kleinberg + Tardos textbook. The goal of this quiz is to lightly assess a first quick reading of these resources to prepare for class. You should definitely return to this material for a more thorough read to solidify your learning and prepare for assignments and exams.

Answer either question 1 or question 2. The quiz will be graded out of 1 (although canvas does not know about this and will claim it is out of 2).

Question 1 — 1 pts

Select every **true** statement about the reduction from 3SAT to Hamiltonian Circuit.

- [ ] Each variable in the instance of 3SAT is represented in the graph by a pair of paths of length k, where k is the number of clauses.
- [ ] The nodes of the graph that represent the clauses of the 3SAT instance have degree 6.
- [ ] A node in a path representing variable X_i is adjacent to as many clause vertices as there are clauses that contain X_i or its complement.
- [ ] If there is a Hamiltonian Circuit in the graph constructed by the reduction, then it visits all of the nodes representing variable X_i before visiting the nodes representing variable X_{i+1}.
- [ ] Directions along the paths that represent a node correspond to the two possible truth values for that variable.

Question 2 — 1 pts

Select every **true** statement about the 3-Dimensional Matching (3DM) problem and the reduction from 3SAT to 3DM.

- [ ] The 3-Dimensional Matching problem generalizes both the Set Cover problem and the Set Packing problem.
- [ ] The total number of triples in the reduction is 2kn + 3k + (n-1)k triples, where n is the number of variables and k is the number of clauses in the instance of 3SAT.
- [ ] The reduction from 3SAT to 3DM adds three triples for each clause in the instance of 3SAT.
- [ ] A solution to the instance of 3DM constructed by the reduction can use a combination of even and odd triples for variable X_i.
- [ ] The gadget associated with variable X_i in the reduction contains 4 times as many elements as there are clauses in the instance of 3SAT.

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