6.5440: Algorithmic Lower Bounds, Fall 2023

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Problem Set 9

Due: Monday, November 13, 2023 at noon

Problem 9.1 [Edge Matching ASP-completeness].

Recall from Problem Set 2 (solutions) that $2 \times n$ *edge matching, forbidding reflections and rotations* is NP-complete.

Prove that this problem is in fact ASP-complete, by giving a parsimonious reduction from an ASP-complete problem.

You must include a drawing or diagram in your submission.

Hint: Use the fact that Numerical 3-Dimensional Matching is ASP-complete, as proved in "Path Puzzles: Discrete Tomography with a Path Constraint is Hard" by Bosboom, Demaine, Demaine, Hesterberg, Kimball, and Kopinsky (2020).