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Algorithms and Uncertainty

Winter Term 2026/27

Tutorial Session - Week 4

Exercise 1:
Show that no randomized algorithm for the online bipartite matching problem is strictly α-competitive for $\alpha > \frac{3}{4}$.

Hint: You can mainly use the idea from the lecture - in addition, you should consider that a randomized algorithm is allowed to match two vertices with some probability instead of fixing one particular edge.

Exercise 2:
Use Yao's principle to show that any randomized online algorithm for the online vertex cover problem has competitive ratio at least $\frac{3}{2}$.