

Algorithms and Uncertainty

Winter Term 2025/26

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 $\frac{3}{2}$.