

## Algorithms and Uncertainty

Winter Term 2023/24

Tutorial Session - Week 4

### Exercise 1:

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

**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  $\frac{3}{2}$ .