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November 18/19, 2026

Algorithms and Uncertainty

Winter Term 2026/27

Tutorial Session - Week 6

Exercise 1:
Suppose that for some job there are 150 candidates in total, which arrive in random order. After interviewing the first 40 candidates, the first candidate is accepted whose value exceeds the highest value among the first 40 candidates. If there is no such candidate, the last candidate is accepted.

(a) Determine the probability that the best candidate shows up last.

(b) Determine the conditional probability that the last candidate is accepted given that this is the best candidate.

(c) Determine the probability that the best candidate shows up last and that this candidate is accepted.

(d) Determine the probability that the last candidate is accepted.

Exercise 2:
Compute and compare the probability of accepting the best candidate of the two following strategies for the Secretary problem with n candidates.

(a) Accept candidate at position $n-1$ if this candidate has a higher value than all previous ones. Otherwise accept the last candidate.

(b) Accept candidate at position $n-2$ if this candidate has a higher value than all previous ones. Otherwise accept the last candidate.