

Algorithmic Game Theory

Summer Term 2025

Tutorial Session - Week 2

Exercise 1:

Consider the following cost-minimization game. Two car drivers approach a junction. Both drivers can either stop at (S) or cross (C) the junction. If a driver decides to stop, she incurs little costs because of the waiting time. If both drivers decide to cross the junction, they will crash - resulting in high costs for both drivers. List all pure and mixed Nash equilibria.

| | C(ross) | S(top) |
|---------|------------|--------|
| C(ross) | 100 100 | 1 0 |
| S(top) | 0 1 | 1 1 |

Exercise 2:

- Specify the payoff matrix for the well-known game rock-paper-scissors¹. Assume that winning has a cost of -1 , losing a cost of 1 , a tie a cost of 0 .
- Mark the best responses with boxes. Do we have a pure Nash equilibrium?
- Compute a mixed Nash equilibrium. Could you have guessed it?

¹https://en.wikipedia.org/wiki/Rock_paper_scissors