Game Theory 2021
Iterated Prisoner’s Dilemma Tournament

You are invited to take part in the *Iterated Prisoner’s Dilemma Tournament*. You can compete as a team of any size (including size 1). The winning team gets $100 (and this prize is shared equally amongst all winning teams in case of a tie).

**Deadline: Monday, 8 February 2021, 14:00**

You compete by submitting a description of a strategy for playing the iterated variant of the Prisoner’s Dilemma discussed in class (with an unknown number of rounds):

\[
\begin{array}{ccc}
  & C & D \\
C & -10 & 0 \\
D & -25 & -20 \\
\end{array}
\]

You can describe a (deterministic) strategy by specifying your next move (either C or D) for every possible situation. One way of doing this is to use a *finite state machine*. To be a little more precise, we are going to use a *Moore machine* with states \{0, 1, 2, ..., K\}, initial state 0, and (output and input) alphabet \{C, D\}. The *output function* specifies for each state the move you make next. The *transition function* specifies for each state and for each move of your opponent what state you go to next. Below, on the left, you see a graphical representation of the strategy under which you cooperate as long as your opponent does not defect twice in a row, and under which you defect eternally once she does defect twice in a row. On the right you see a textual representation of the same strategy. Each line corresponds to a state (from 0 to 2), listing the action played in that state, the state you move to in case your opponent cooperates, and the state you move to in case she defects.

\[
\begin{array}{ccc}
 0: C & 1: D & 2: C, D \\
C & C & C, 0, 1 \\
D & D & C, 0, 2 \\
\end{array}
\]

Come up with a strategy that differs significantly from the strategies you can easily find out about on the Internet (such as the famous tit-for-tat strategy) and submit it via the game server. Define your strategy using the textual representation explained above. Pay attention to syntax (uppercase C and D, use of commas). You will also be asked for a name for your strategy, for the number of states it uses, and for a short motivation for your strategy.