lic tournament in which political scientists, psychologists, economists, and game theoreticians were invited to submit a computer program to play the iterated prisoner's dilemma. Each computer program had available to it the previous choices made by its opponent, and simply selected either C or D on the basis of these. Each computer program was played against each other for five games, each game consisting of two hundred rounds. The 'winner' of the tournament was the program that did best *overall*, i.e. best when considered against the whole range of programs. The computer programs ranged from 152 lines of program code to just five lines. Here are some examples of the kinds of strategy that were submitted.

ALL-D. This is the 'hawk' strategy, which encodes what a game-theoretic analysis tells us is the 'rational' strategy in the finitely iterated prisoner's dilemma: always defect, no matter what your opponent has done.

RANDOM. This strategy is a control: it ignores what its opponent has done on previous rounds, and selects either C or D at random, with equal probability of either outcome.

TIT-FOR-TAT. This strategy is as follows:

(1) on the first round, cooperate;

(2) on round $t > 1$, do what your opponent did on round $t - 1$.

TIT-FOR-TAT was actually the simplest strategy entered, requiring only five lines of Fortran code.

TESTER. This strategy was intended to exploit computer programs that did not punish defection: as its name suggests, on the first round it tested its opponent by defecting. If the opponent ever retaliated with defection, then it subsequently played TIT-FOR-TAT. If the opponent did not defect, then it played a repeated sequence of cooperating for two rounds, then defecting.

JOSS. Like TESTER, the JOSS strategy was intended to exploit 'weak' opponents. It is essentially TIT-FOR-TAT, but 10% of the time, instead of cooperating, it will defect.

Before proceeding, consider the following two questions.

(1) On the basis of what you know so far, and, in particular, what you know of the game-theoretic results relating to the finitely iterated prisoner's dilemma, which strategy do you think would do best overall?

(2) If you were entering the competition, which strategy would you enter?

After the tournament was played, the result was that the overall winner was TIT-FOR-TAT: the simplest strategy entered. At first sight, this result seems extraordinary. It appears to be empirical proof that the game-theoretic analysis of the iterated prisoner's dilemma is wrong: cooperation *is* the rational thing to do, after all! But the result, while significant, is more subtle (and possibly less encouraging)