

GUIDELINES FOR WRITING PROJECTS

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The following issues came up in the previous assignment of describing the strategies for Poison. Be careful about them in future projects as well.

- (1) Every article needs a title, name of author and date.
- (2) Explain the problem.
- (3) Define all words and mathematical concepts that you need. Not every reader knows the notation that you use (especially if you just made it up like “opposite number”).
- (4) Formulate your main point as a theorem in a few sentences so that it is visible at the first glance. Be precise, but also efficient, for example:

Theorem. *If Poison starts with $3n + 1$ stones for $n \in \mathbb{N}_0$, then player 2 can always win; otherwise ...*

- (5) If you use variables n, x, \dots , write what you can plug in for them. Are they integers, reals, ...? Be careful about quantifiers.

Example: Poison is a game with n stones for any natural number n .

- (6) Give an argument why your theorem is true in full generality.

Examples that your result works for special choices are not a proof. Showing that one player can win the game with 10 stones does not prove that your strategy works for any number of stones.

- (7) If possible, reduce your problem to some easier problem or some case where you already know the solution.

Example: Suppose you already showed that player 2 can always win a game that starts with $3n + 1$ stones (for any $n \in \mathbb{N}_0$). Next you want to explain what happens in a game with $3n + 2$ stones: If player 1 removes 1 stone, then player 2 has $3n + 1$ stones to choose from. You can now refer to your previous argument to explain what will happen.

RUBRIC FOR THE WRITE-UP FOR POISON

Presentation: 1 point each for

- Title, author, date;
- description of the game;
- formulating a theorem using `\begin{theorem} ... \end{theorem}`
- formulating a proof using `\begin{proof} ... \end{proof}`

Mathematical correctness

- 2 points for stating the correct outcomes of the game in all cases;
- 4 points for giving the correct strategies for each case and showing that they lead to victory.