

MLL-EGO: Linear Logic as a Lego Game

Olivier.Laurent@ens-lyon.fr

Only rectangular bricks and plates are used. They have different sizes and colors. Some of the bricks have holes:

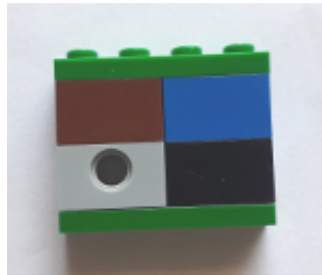


Considered models are all rectangular 2D constructions (5 of them below):



A position in the game is given by multiple packages of Lego models. The initial position is just one package containing one model.

A *splitter* is a particular kind of model having a plate at the top and a plate at the bottom (both having the same color), and whose width is the total width of the model:



A *move* consists in the choice of one package (called the *active* package) and in the application of one on the following three operations in the active package (the other packages are not modified):

1. *Breaking*:

- select a model in the active package,
- break it vertically between two blocks (possibly a block and a plate, or two plates) whose width is the total width of the model,
- put back the two obtained models in the active package.

2. *Blank removal*:

- remove a blank block (or plate) from the active package (it should not be attached to any other block or plate),
- the removed block completely leaves the game (it is not put in another package),
- this move is allowed only if it does not make the active package empty.

3. *Splitter activation*:

- select a splitter in the active package and put it in your hand,
- remove the top and bottom plates (they completely leave the game),
- count how many models you get in your hand (say k), they are called the *splitted models*,
- split the active package into k packages (some of them possibly empty),
- put one of the splitted models into each of the obtained new packages.

The player is playing a move after another until he cannot apply any move. The play is a win if each package contains exactly two blocks (no plates) of the same color (which are not connected together nor to any other block): one with hole(s) and the other one without any hole (no matter the size of the two blocks). Otherwise it is a loose... try again from the initial position!