Explanation-Based Learning

- Form of ==speed-up learning== or ==analytical learning.==
- Given:
  - a general knowledge base,
  - facts about the specific case
  - a number of solved queries

  determine a simpler rule base that could have solved all of these queries.
- like caching with generalization.

Meta-interpreter: idea

- Carry out two proofs in tandem:
  - one is for the specific query and one for a general query
  - they each use the same general rules
  - when the specific proof uses a specific facts, the general query collects the subgoal in a list.
- Problem: it is difficult to determine and extract "the same rule".

Meta-interpreter: details

- Representation of general rules. We number/name each general rule so it's easy to find "the same rule".

$$2 :: safe\_to\_stack(X, Y) \leftarrow lighter(X, Y).$$

- $ebl(G, H, B0, B1)$ is true if
  - G is an instance of H,
  - $B0$ is a tail of $B1$, and
  - $B1$ is a list of fact relations and built-ins that imply H