The board game Go in Leon

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Abstract

The ancient Chinese board game Go has fascinated computer scientists and mathematicians for its enormous state space. In this project, we propose to implement the rules of Go in Leon and verify certain properties of the game. If time allows, we will try to integrate our game with Scala.js and make some interactive web-based user interface.

1   Plan of attack

Our plan of attack is as follows:

1. Implement the game with a text-based ASCII user interface

2. Verify certain properties, such as:

   - A play cannot make an illegal move according to the rules of the game
   - If a player respects the rules of the game, then no illegal states are reachable
   - There are no runtime errors[1]

3. Synthesize several simple strategies for a computer player.

4. If time allows, we would be excited to compile our Leon program with Scala.js and write an interactive web-based user interface with a library such as *scalajs-react*.

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[1]We are not entirely sure how to accomplish this