

# A Language for Board Games

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## 1 Background

Many board games have a similar basic structure: The game starts in one certain condition, followed by a number of rounds. In each round a certain number of players make certain allowed moves, and you keep on until some condition of winning or losing is met.

## 2 Project description

This project is about developing a language to describe (an appropriate class of) board games, and to ensure that programs written in this language can be run (eg by interpretation or compilation).

A simple example: If someone has implemented a chess program then it should be possible for two (human) players to play chess by running the program. The two users will have access some kind of interface to interact with (maybe a graphic presentation of the chessboard, and the interaction may take place via a network), and the program should keep track of the rules of the game.

In addition to the language and its implementation, the project should produce some example games (either existing games or new ones), to demonstrate that the language and its implementation work.

It may be appropriate to let the language be a so-called *embedded language*, i.e. essentially a library for some existing programming language.

It is possible to imagine several kinds of "board game language". An extreme case would be to just use a common programming language. Here however, the idea is to provide more support to the people who implement the games. The language does not necessarily have to be able to describe every board game; the project team must make its own decision on how general the language should be.

Several extensions of the project are conceivable:

- Can one implement automatic analyzes that verify that game has certain desirable properties (eg "all players can win the game")?
- Can the language be designed so that you can only implement games with certain desirable properties?

- Can you implement computer players who can play all games that can be implemented in the language?

### **3 Target groups**

DV, D, IT.

### **4 Special prerequisites**

It can probably be an advantage if a couple of students in the group read advanced functional programming (where you get to learn about embedding domain-specific languages). The course Programming Languages is also relevant.

### **5 Proposal Author**

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### **6 Supervisor**

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