Sprint 0: Design Patterns

Team: Java Doctors

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CSC207H5: Software Design

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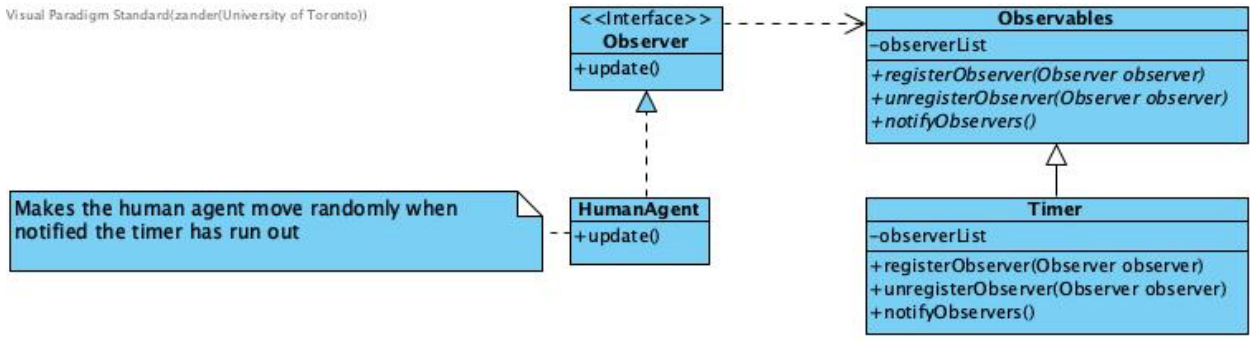
Observer

Usage

The Human player is given an allocated time to make their move; if they do not, the HumanAgent is notified and a move is made for them.

UML Diagram

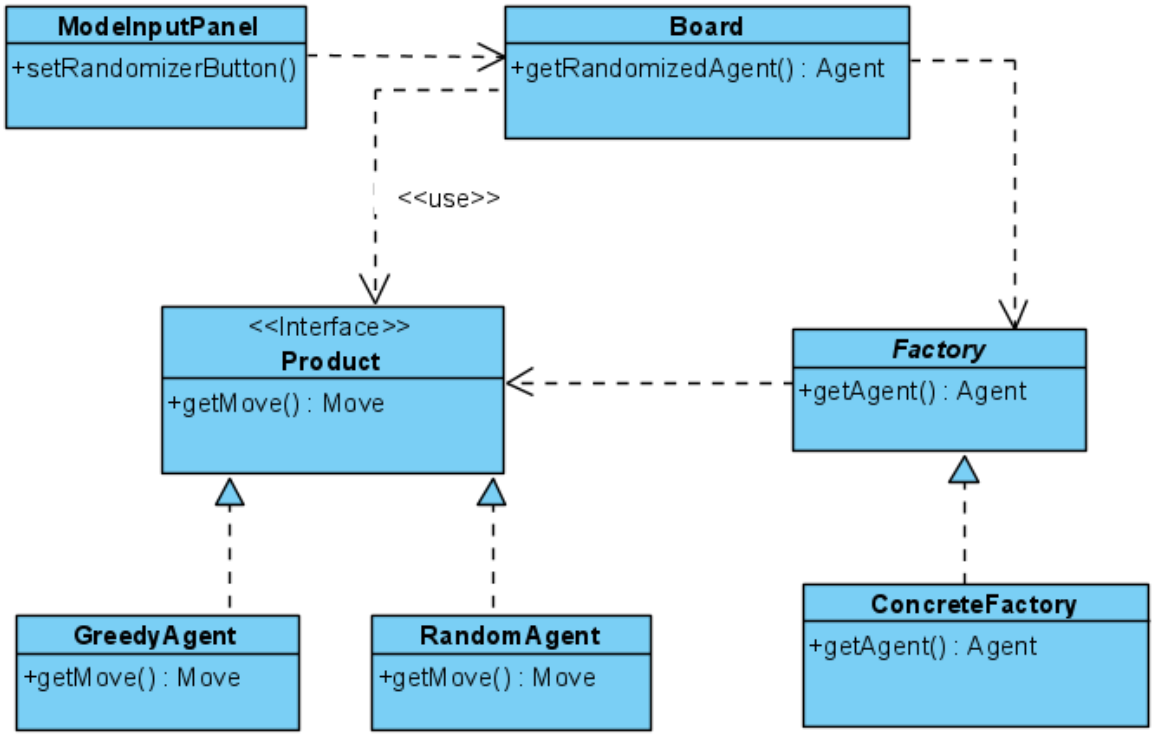


Factory

Usage

Set up the game state when the player selects modes, with the proper agents playing each side. This will also facilitate the implementation of a random mode feature, in which the human player is assigned to a random side opposing a random non-human agent.

UML Diagram

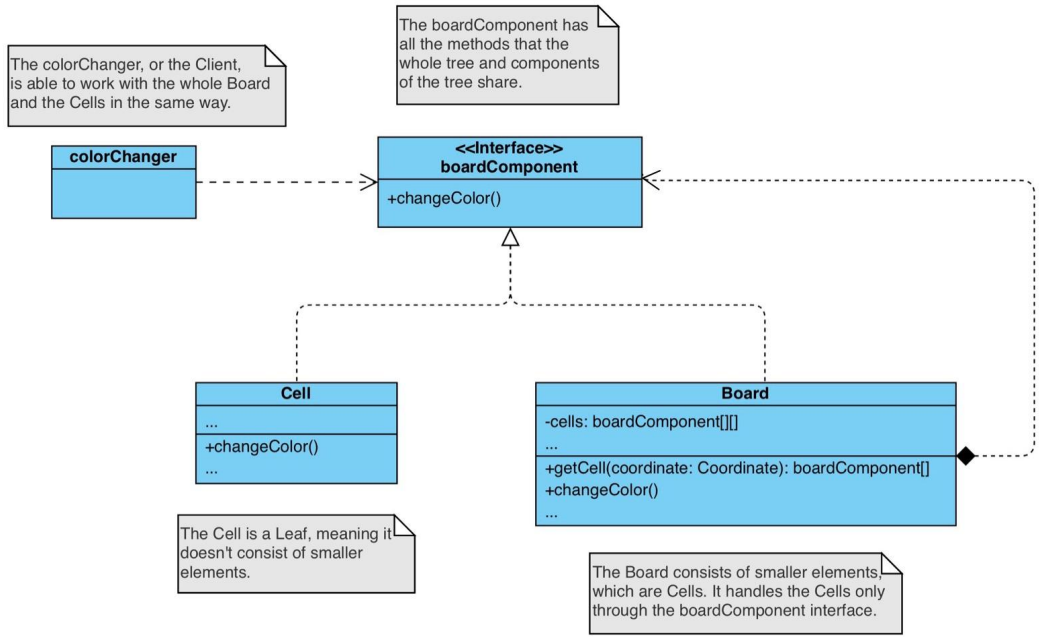


Composite

Usage

After each turn, the board and the cells on the board change color depending on whether it is a Guard or Musketeer turn.

UML Diagram

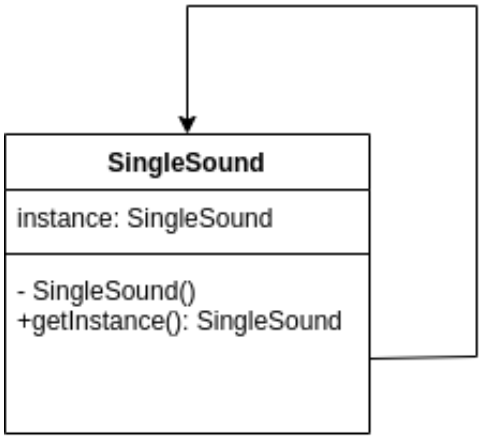


Singleton

Usage

Using this design pattern, users will have a more immersive experience while playing the Three Musketeers. Here, users will hear a sound as their piece moves, which resembles the experience of playing in real life. We will implement this by having a singleton class for sound effects and we will have a method that other classes can call to use the sound effect at a given point in the game.

UML Diagram

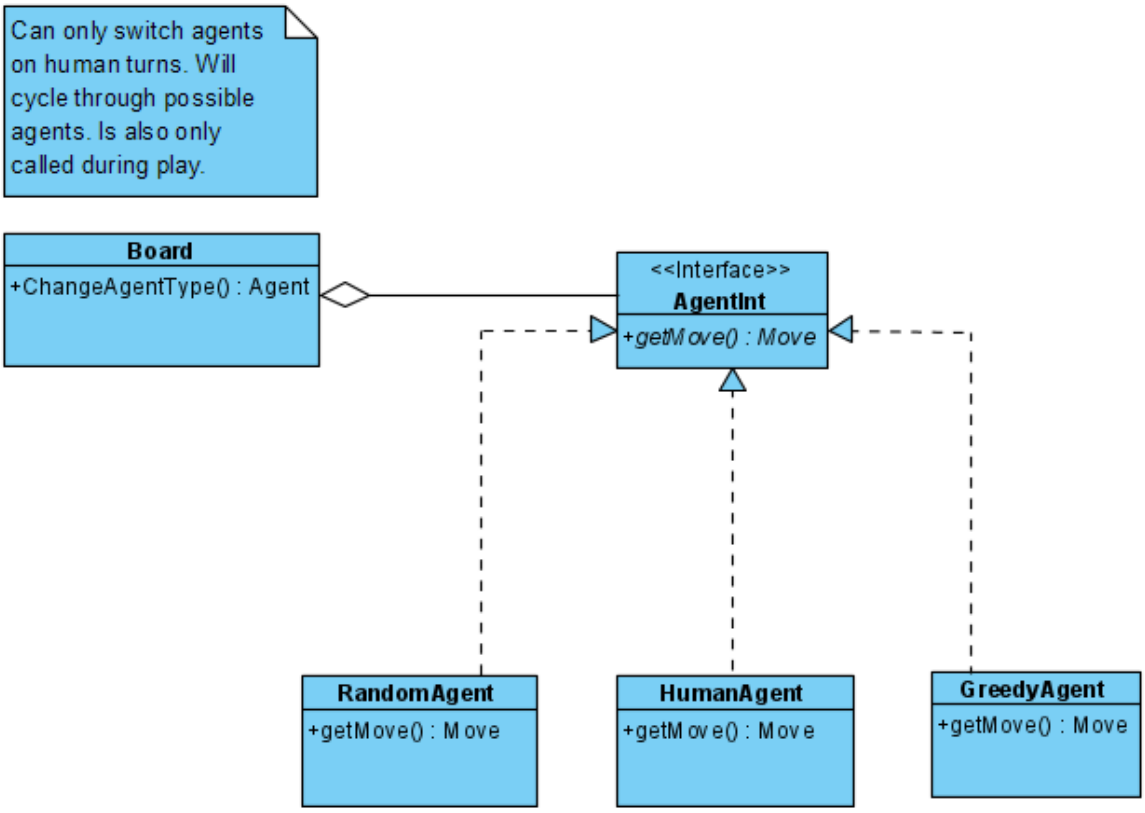


Strategy

Usage

The strategy pattern will be used to allow the human player to switch the game mode mid-game. A “switch” button will be implemented in the GUI, which can only be pressed during human turns and will not end the turn. There must always be at least one human player.

UML Diagram



Memento

Usage

To create a memento of the game state before undoing a move so that the game state can be stored and then reconstructed when the user redoes a move. The board will be the originator, a new BoardMemento class will store the game state, and the main game class ThreeMusketeers can be the caretaker. This solves the problem of game states being lost forever when a move is undone, allowing the implementation of a redo feature.

UML Diagram