

Design-Patterns End Assignment Proposal

Group End Assignment Team:

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Problem Definition

For the course "Design Patterns" in the third year of the study Information Management, the group has been tasked with building an application that utilizes at least four different forms of patterns which is coded in an OOP oriented language.

Checkers

The main idea behind the product is to build the checkers game within the java programming language. Checkers is a game in which a chess board is filled with twelve checkers per player arranged diagonally.

Each turn the player can move one of their checkers diagonally towards the opponent, however they cannot go backwards besides for the king piece. To capture the opponent's pieces, the player must "jump" the opponent, which requires one to leap over a piece onto the empty space behind it, capturing the piece.

The player wins when the opponent either has lost all their pieces or cannot move any of their pieces anymore.

Features

- The ability to play checkers against another player on the same computer
- The ability to move all pieces according to the rules
- The ability to play an A.I. (Computer) opponent
- A simple GUI that allows the user to see the checkers board and the pieces
- The ability to win/lose the game of checkers

Patterns

Object Pool

The state pattern will be utilized to change the turn of the game, so when the player has done a turn, the opponent is also allowed to do a turn. The states would be used to let the other player move his pieces or allow the A.I. to make their turn. This allows the game to keep going back and forth between players successfully.

The Decorator Pattern

The decorator pattern is utilized to turn regular pieces into king pieces, allowing them to move backwards and as far as they can in a single direction. This allows for easy change of state for the pieces, and scalability for the future if other states for the pieces are added.

The Factory Pattern

The factory pattern is utilized to create the pieces on start-up, while also creating the players when the game is started which are put into a list of players. This allows us to efficiently create the board and all objects' checkers require without too much issue.

The Observer Pattern

Observers possible moves with 2 arrays(Close Node)(Next nodes)