Report

Assignment 3 - Othello

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Functions Used:

1. **listOfPossibleMoves**:
   - **Inputs**: Player, Board, [Position]
   - **Outputs**: [Position]
   - **Use of The Function**: this function provides the list of all the moves which are legal and can be made by the player
   - **How does it work**: this function goes through the list of all positions i.e. from (0, 0) to (0,7), and then checks if that position is a legal move or not, using the pre-defined function. If the position is legal then it appends the position to the list. Else it recursively calls the function

2. **calculateScore**:
   - **Inputs**: Position, Board, Player
   - **Outputs**: Int, Position
   - **Use of The Function**: this function takes in position and gives us an output that shows us how many tiles can we acquire
   - **How does it work**: this function uses a virtual board or a temporary board and plays a position on it and counts how many tiles can be acquired (using the pre-defined function currentScore) and stores it as score and its corresponding position

3. **scoreAll**:
   - **Inputs**: [Position], Board, Player
   - **Outputs**: [(Int, Position)]
   - **Use of The Function**: The purpose of this function is to provide us with a list of positions and the number of tiles we can acquire
   - **How does it work**: It applies the function calculateScore recursively on a list of position and appends it to a list

4. **bestMove**:
   - **Inputs**: (Player, Board, [Position] -> [Position]), Board, Player
   - **Outputs**: Position
   - **Use of The Function**: this function uses the above defined functions to give us the best move out of all the possible moves
   - **How does it work**: this function applies a higher order function (listOfPossibleMoves) and a lambda function (Maximum):
        if the position (0,0), (0,7), (7,0) or (7,7) is in the list of possible moves then it plays that move,
        else it uses the lambda function maximum of the score on the list and return the position

GreedyAI: it uses the function bestMove and listOfPossibleMoves to define the move for the AI, and when the list of possible moves is empty it throws an error.

References:

- Discussed with tutor and classmate (Aditya Iyer).