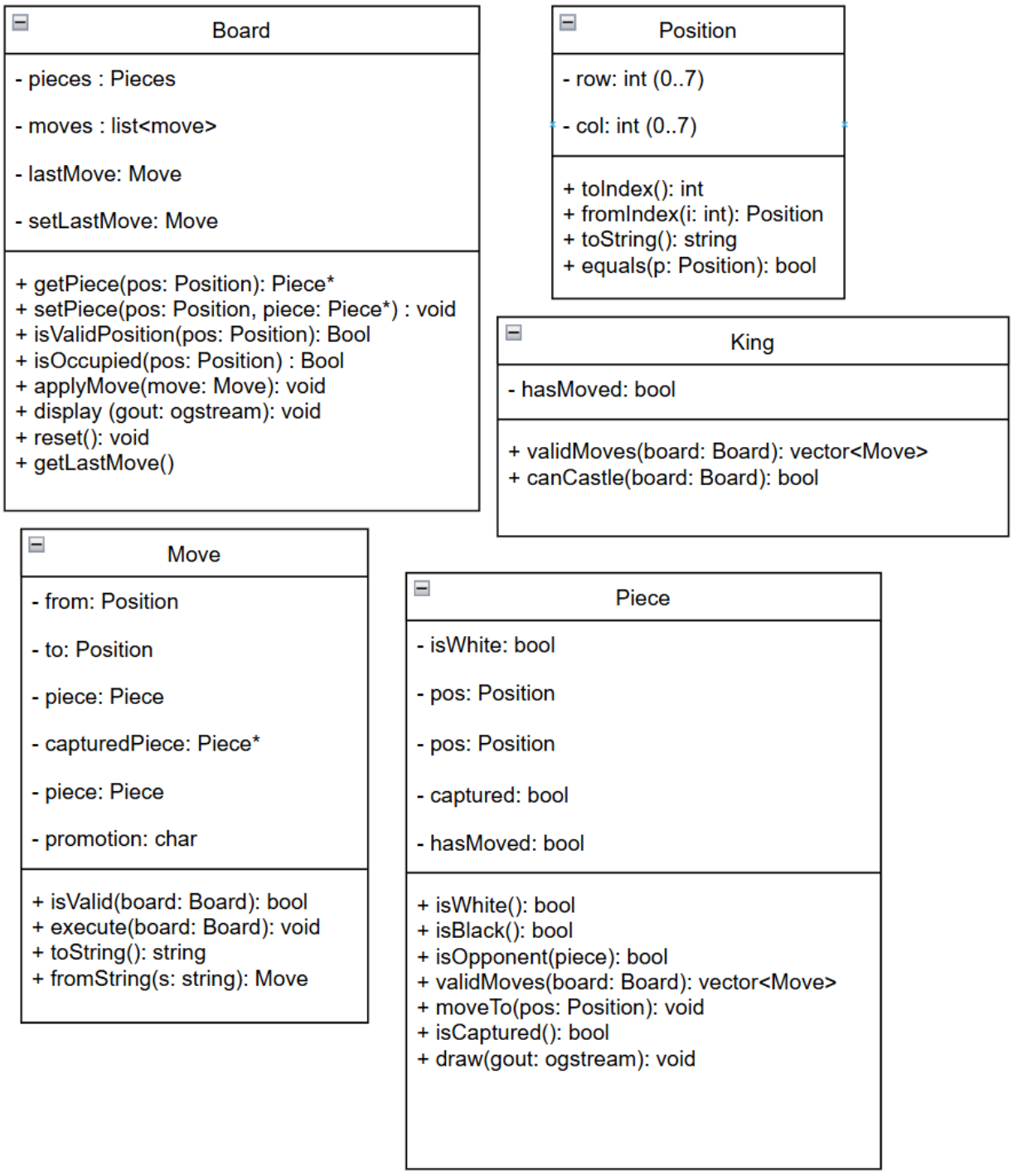
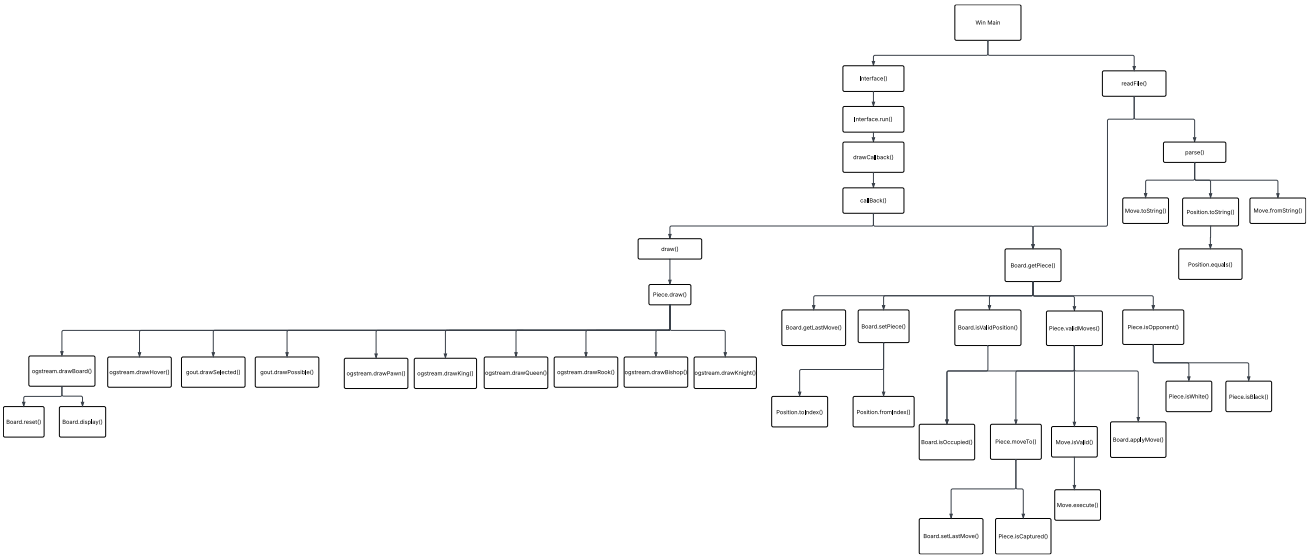
Lab 02 : Chess Design

Class Diagrams



Structure Chart



Pseudocode

```
FUNCTION checkPawnPromotion(pawn: Piece, board: Board):

   IF pawn.isWhite() AND pawn.position.row == 7:
      board.setPiece(pawn.position) SET TO Queen(true, pawn.position)

   ELSE IF pawn.isBlack() AND pawn.position.row == 0:
      board.setPiece(pawn.position) SET TO Queen(true, pawn.position)
```

```
FUNCTION checkEnPassant(pawn, board):
    SET moves TO <0>
    SET lastMove TO board.getLastMove()

    IF lastMove == null:
        RETURN moves

    SET fromRow TO lastMove.from.row
    SET toRow   TO lastMove.to.row
    SET toCol   TO lastMove.to.col

    IF pawn.color == WHITE:
        IF fromRow == 6 AND toRow == 4:
            IF pawn.position.row == 4:
                IF ABSOLUTE VALUE(pawn.position.col - toCol) == 1:
                    SET target TO Position(toCol, 5)
                    SET moves.add(Move(pawn.position, target, capture
TO lastMove.to))

    ELSE IF pawn.color == BLACK:
        IF fromRow == 1 AND toRow == 3:
            IF pawn.position.row == 3:
                IF ABSOLUTE VALUE(pawn.position.col - toCol) == 1:
                    SET target TO Position(toCol, 2)
                    SET moves.add(Move(pawn.position, target, capture
TO lastMove.to))

    RETURN moves
END FUNCTION
```

```
FUNCTION checkCastling(king, board):
    SET moves TO <0>

    IF king.hasMoved == true:
        RETURN moves

    SET row TO king.position.row
    SET col TO king.position.col

    SET rookKPos TO Position(7, row)
    SET rookK TO board.getPiece(rookKPos)
    IF rookK != null AND rookK.type == ROOK AND rookK.color == king.color AND
rookK.hasMoved == false:
        IF board.isEmpty(Position(5, row)) AND board.isEmpty(Position(6, row)):
            SET kingTarget TO Position(6, row)
            SET rookTarget TO Position(5, row)
            CALL moves.add(
                Move( king.position, kingTarget,
                      castleRookFrom TO rookKPos,
                      castleRookTo   TO rookTarget )
            )

    SET rookQPos TO Position(0, row)
    SET rookQ TO board.getPiece(rookQPos)
    IF rookQ != null AND rookQ.type == ROOK AND rookQ.color == king.color AND
rookQ.hasMoved == false:
        IF board.isEmpty(Position(1, row)) AND board.isEmpty(Position(2, row)) AND
board.isEmpty(Position(3, row)):
            SET kingTarget TO Position(2, row)
            SET rookTarget TO Position(3, row)
            CALL moves.add(
                Move( king.position, kingTarget,
                      castleRookFrom TO rookQPos,
                      castleRookTo   TO rookTarget )
            )

    RETURN moves
END FUNCTION
```