START
+ main()

RunGame
- Player player 0
- Player player 1

+ RunGame()
...
+ startNewGame()
+ gameChoice(Player player0, Player player1)
+ endGame(Player player0, Player player1)

1

1

1

0..n

0..n

0..n

TTT
- Board board
- int rule
- Player player0
- Player player1

+ getBoard(): Board
+ setBoard()
...
+ startGame(TTT newGame)

OAC
- Board board
- int rule
- Player player0
- Player player1

+ getBoard(): Board
+ setBoard()
...
+ startGame(TTT newGame)

Connect4
- Board board
- int rule
- Player player0
- Player player1

+ getBoard(): Board
+ setBoard()
...
+ startGame(TTT newGame)

Message
+ welcome()
+ displayMenu()
...

1

1

Board
- int boardSize
- Cell [][] board
- int row
- int col

...
+ isValid (int row, int col)
+ isFull()
+ isWin(Board board, int rules)

1

1

Cell
- char mark
- boolean filled

+ getMark()
+ getFilled()
...

For my program of the three board games, the Cell and Board objects are working as the base element. Beyond that, a Player class controls the creation of players in one run of the program. Each of the three games (Tic-Tac-Toe, Order and Chaos and Connect-4) has their own class which initializes boards for the game. Each of the game classes has a method to help players to take turns. Beyond that, a RunGame class takes responsibility for the processes BEFORE and AFTER one game, which including two Player objects. Finally, the START class contains a main method which is responsible for run the whole program.

This program can be extended to different board games because (a) the size of the board can be changed by the player easily, (b) the method for checking winning conditions is not bound with any specific game class. Instead, it simply checks whether there is a mark consecutively presenting on the current board. (c) The players' information are stored in the RunGame class, which is not affected by other specific game class. To add more different board games, we simply need to add more game classes like the TTT, OAC and Connect-4 classes, with minor revisions of other classes.

To allow for another turn-based game, the method for checking winning conditions is moved from the Player class to the Board class. Besides, two classes are added as two new games. Because Connect-4 has a slightly different rule for players to place their mark, a new method for this game is also added to the Player class.