MIDDLESEX UNIVERSITY-HENDON

CMT3060 Distributed Internet Programming

Cousework 2

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CMT3060 304 Cards Game

Introduction

304 cards game is one the most played games and one of my favourite games in my home town Jaffna, Sri Lanka. That's why I've chosen this game and developed this with reasonably complex for the allocated time for this coursework. Even though I've finished most of the main functionalities is the game, some are yet to be finished, for instants, re-betting, chat feature.

Developing this game has been more difficult than I expected it to be, as testing the game every time by running four or more clients and a server was highly time consuming. And logics of this particular cards game are bit more complex than other usual card game.

Rules of this game are not clearly mentioned in any books or websites except Wikipedia. I spent much time to find the proper rules of the game from a book so that I can refer the book in my documentation, but I really couldn't find any books or any highly trustable websites. So, I have got the rules of the game from Wikipedia.

I accessed http://en.wikipedia.org/wiki/304_(Card_Game) on 14th of April 2009 and got the rules.

How to play the game?

The cards are dealt by the dealer to all four players in a clockwise manner each getting four cards in the first round. Then the player to the left of the dealer looks at his cards and picks out a trump and places it face down on the table. He then shouts out a score for his team to score, which he trusts he can win with the cards he has. Then a member of the opposing team can pick their own trump, and must pick a score higher than that was named before for his team to score. When a score is agreed the rest of the cards are distributed and the game is started.

The game is played similar to the standard rules followed, where the players answer the suite played. But if they don't have the particular suite, then they can try to guess the trump and pass a face down trump to the player who has closed a trump card. If he guesses it right then he gets the hand or else the game goes on.

Points are scored according to the points shown in the table. After all the hands are completed, if the team has scored the required score they win.

Card Values	
Card	**Points**
J (JACK)	30
9 (NINE)	20
A (ACE)	11
10 (TEN)	10
K (KING)	3
Q (QUEEN)	2
8 (EIGHT)	0
7 (SEVEN)	0

Features

- Up to 100 teams can be played this game simultaneously.
  `In the games array, I've have set Game[] games=new Game[100];`
- Each game has maximum 2^{31}-1 number of plays as the limit of integer in java is 2^{31}-1.
- One player must bet while optional for others and it's with the logic of who wins last gets the change to bet next.
- Scoreboard will show the number of wins, partners name, best bet and best bet by and score of each player.
- When one player of a team closes his/her game window, everyone's window will close with a notification.
- Game uses port 3060 and there are no other popular programs use the port.

Game Logic

Starts with initial 0 score to every player in the team and then as every round finishes the GAME class calculates the total score and sends it to every player in a particular game. And PLAYER class gets the total and assigns to every player. In the same way, when game starts to run GAME class receives the name of every player and assigns it to a string array and it broadcasts the play name to other clients.

All the cards are defined in a separate class called cards and card ranks and suits are defined in a enum.

Eg:

```
public enum Suit{ HEARTS, SPADES, CLUBS, DIAMONDS }
public enum Rank {
    JACK    (30),
    NINE    (20),
    ACE     (11),
    TEN     (10),
    KING    (3),
    QUEEN   (2),
```

```
        EIGHT   (0),
        SEVEN   (0);

        private final int points;

        Rank(int points) {
                this.points=points;
        }
        public int points() { return points; }

    }
```

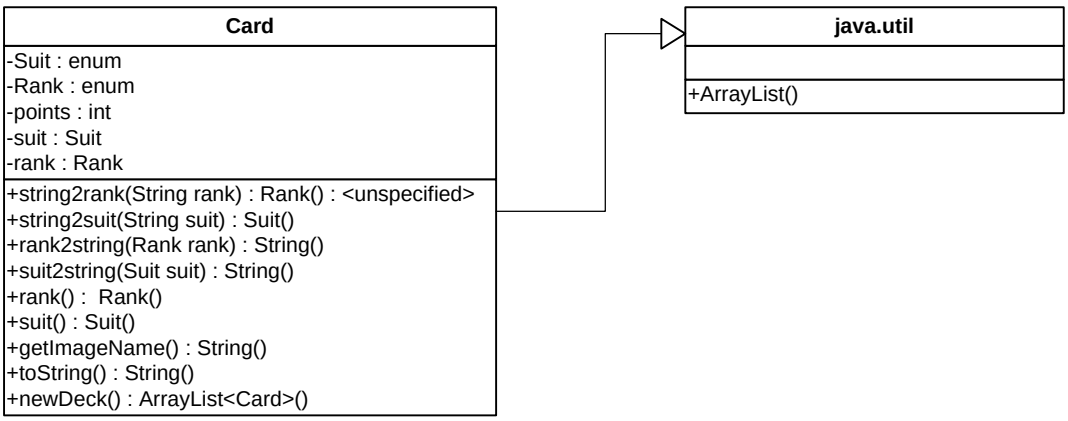
How the game has been developed?

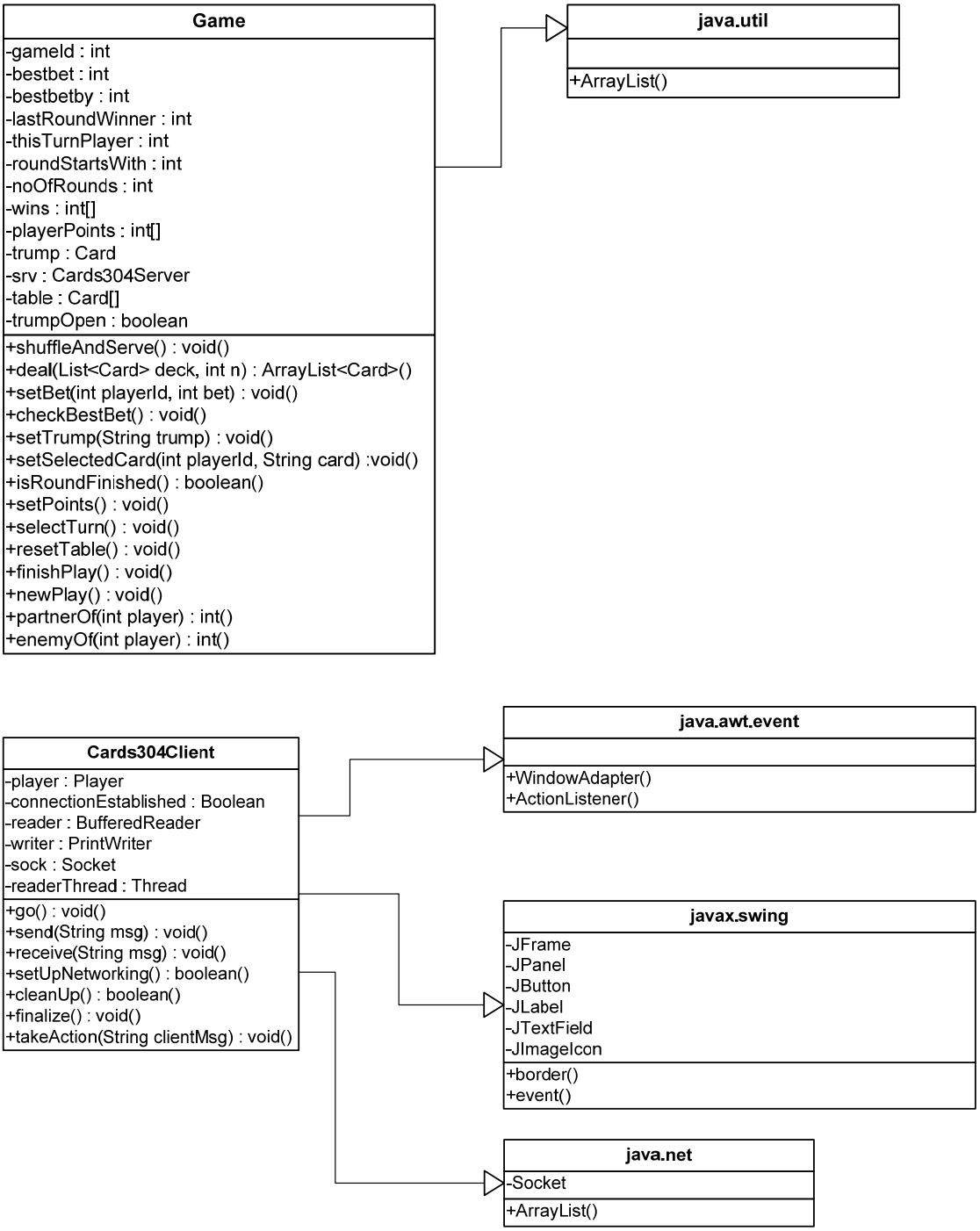
I have developed this game using JAVA and compiled and tested using JDK version jdk1.6.0_10. As I got a disappointing feedback from my lecturer for inefficient use of access specifier, last time, so I've used access specifier as appropriate as possible in this coursework. In this coursework, I have used appropriate mechanism that java provides to develop this game. For instants, usage of enum to have a card deck and use and usage of array when necessary instead of using arraylist all the time.

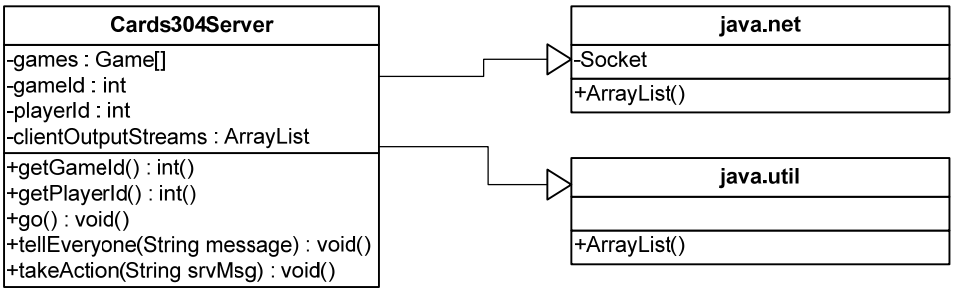
Why I did not use protocol messages interface?

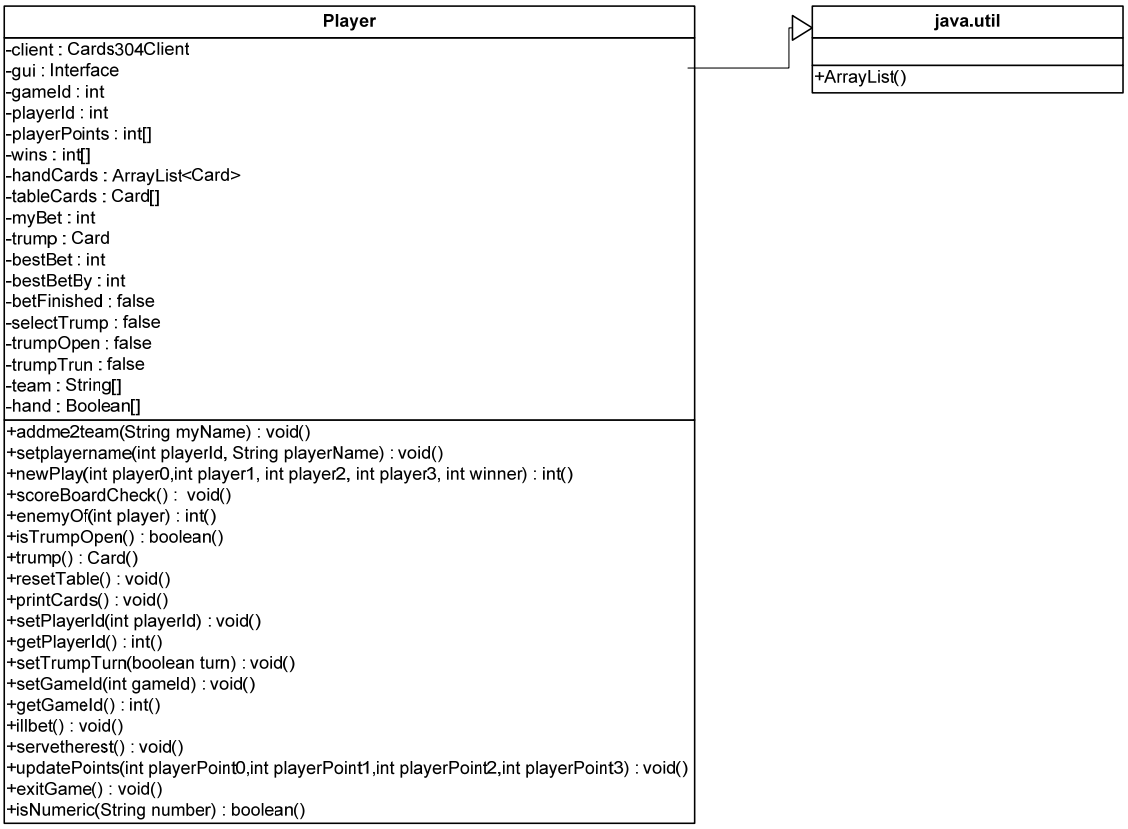
I truly developed a fully featured protocol message interface and, in the half way through, I thought of developing the game for any number of users. So, I had to get rid of protocol messages interface as I had to pass game id with each messages and I didn't have enough time to change the interface, so I'm simply sending all those messages normally.

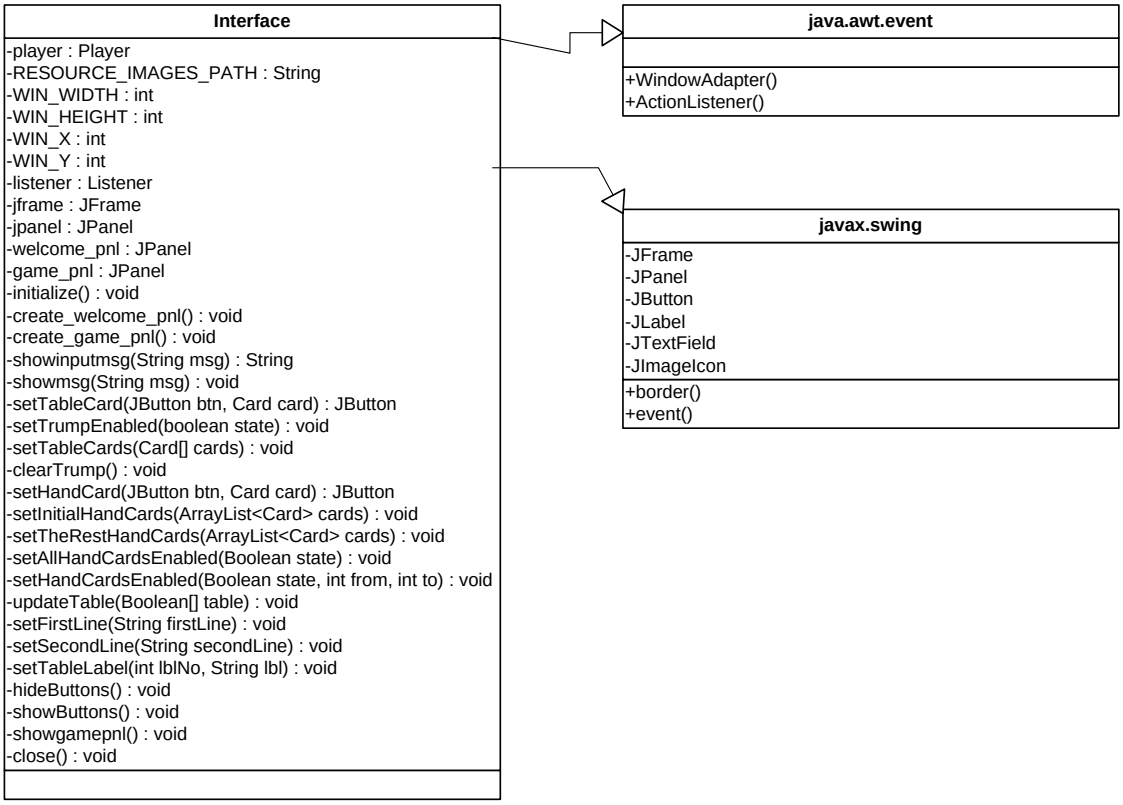
Class Diagram



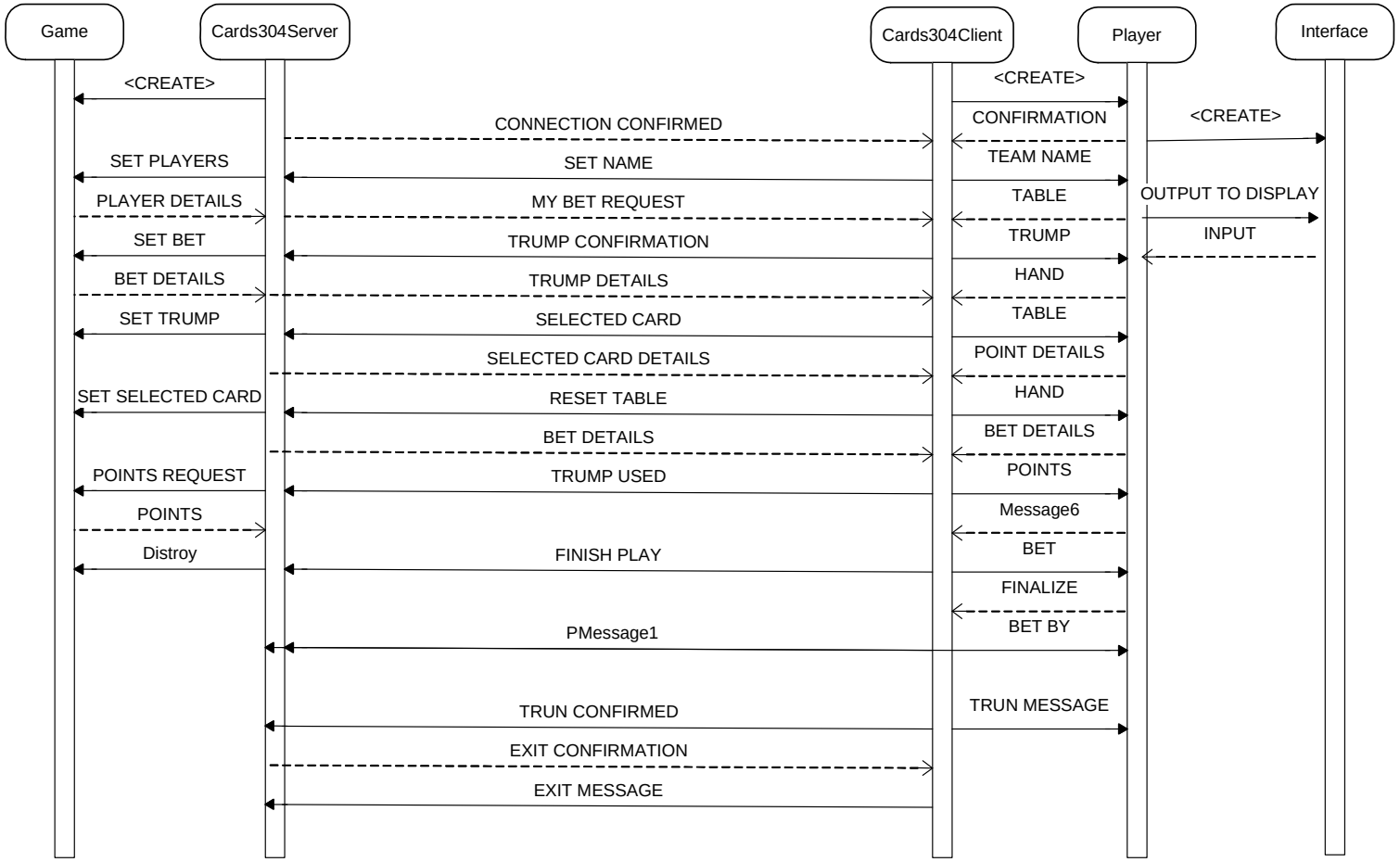

Game
-gameId : int
-bestbet : int
-bestbetby : int
-lastRoundWinner : int
-thisTurnPlayer : int
-roundStartsWith : int
-noOfRounds : int
-wins : int[]
-playerPoints : int[]
-trump : Card
-srv : Cards304Server
-table : Card[]
-trumpOpen : boolean
+shuffleAndServe() : void()
+deal(List<Card> deck, int n) : ArrayList<Card>()
+setBet(int playerId, int bet) : void()
+checkBestBet() : void()
+setTrump(String trump) : void()
+setSelectedCard(int playerId, String card) :void()
+isRoundFinished() : boolean()
+setPoints() : void()
+selectTurn() : void()
+resetTable() : void()
+finishPlay() : void()
+newPlay() : void()
+partnerOf(int player) : int()
+enemyOf(int player) : int()
java.util
+ArrayList()
Cards304Client
-player : Player
-connectionEstablished : Boolean
-reader : BufferedReader
-writer : PrintWriter
-sock : Socket
-readerThread : Thread
+go() : void()
+send(String msg) : void()
+receive(String msg) : void()
+setUpNetworking() : boolean()
+cleanUp() : boolean()
+finalize() : void()
+takeAction(String clientMsg) : void()
java.awt.event
+WindowAdapter()
+ActionListener()
javax.swing
-JFrame
-JPanel
-JButton
-JLabel
-JTextField
-JImageIcon
+border()
+event()
java.net
-Socket
+ArrayList()


Cards304Server
-games : Game[]
-gameId : int
-playerId : int
-clientOutputStreams : ArrayList
+getGameId() : int()
+getPlayerId() : int()
+go() : void()
+tellEveryone(String message) : void()
+takeAction(String srvMsg) : void()
java.net
-Socket
+ArrayList()
java.util
+ArrayList()

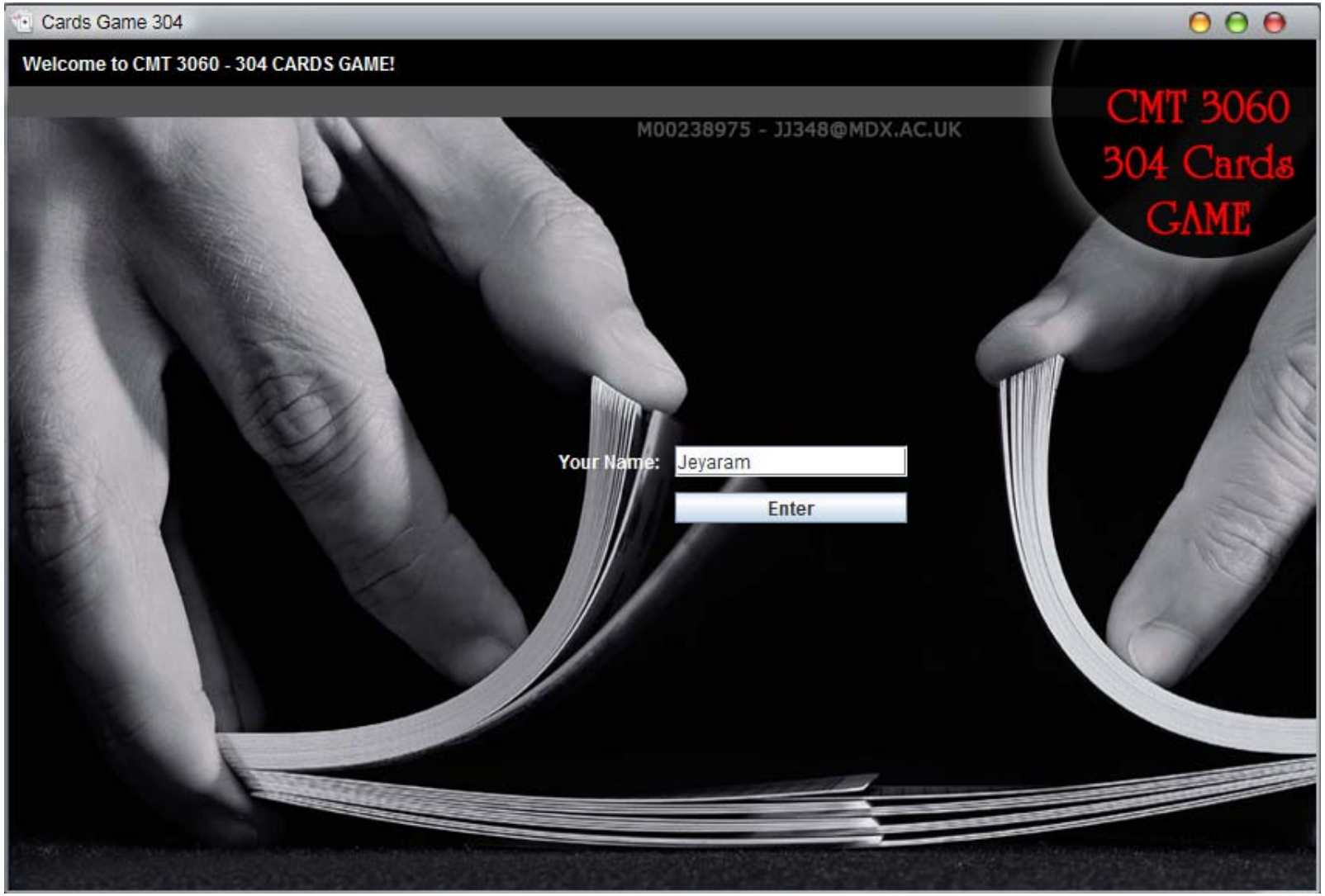

Player
-client : Cards304Client
-gui : Interface
-gameId : int
-playerId : int
-playerPoints : int[]
-wins : int[]
-handCards : ArrayList<Card>
-tableCards : Card[]
-myBet : int
-trump : Card
-bestBet : int
-bestBetBy : int
-betFinished : false
-selectTrump : false
-trumpOpen : false
-trumpTrun : false
-team : String[]
-hand : Boolean[]
+addme2team(String myName) : void()
+setplayername(int playerId, String playerName) : void()
+newPlay(int player0,int player1, int player2, int player3, int winner) : int()
+scoreBoardCheck() : void()
+enemyOf(int player) : int()
+isTrumpOpen() : boolean()
+trump() : Card()
+resetTable() : void()
+printCards() : void()
+setPlayerId(int playerId) : void()
+getPlayerId() : int()
+setTrumpTurn(boolean turn) : void()
+setGameId(int gameId) : void()
+getGameId() : int()
+illbet() : void()
+servetherest() : void()
+updatePoints(int playerPoint0,int playerPoint1,int playerPoint2,int playerPoint3) : void()
+exitGame() : void()
+isNumeric(String number) : boolean()
java.util
+ArrayList()

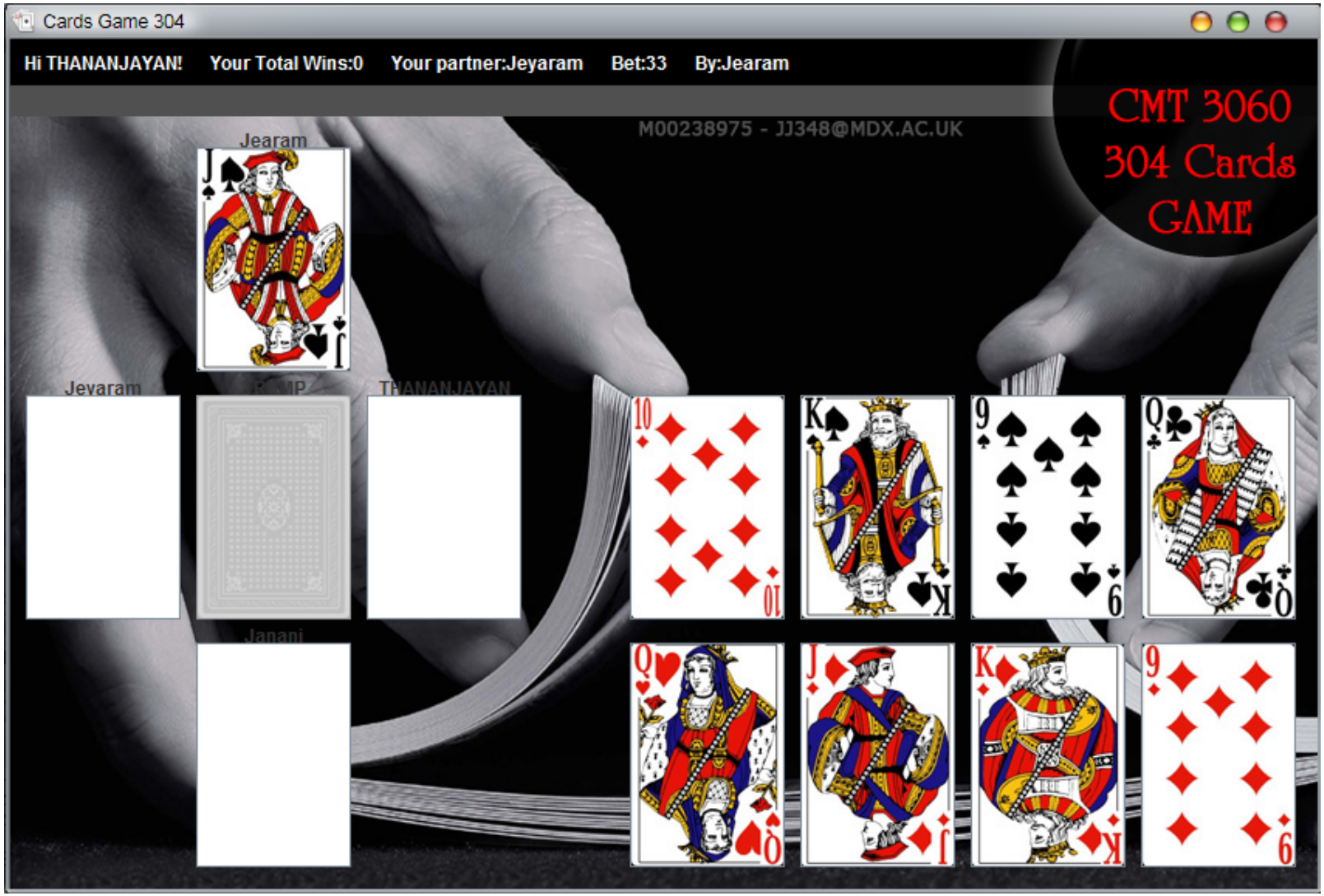

Interface
-player : Player
-RESOURCE_IMAGES_PATH : String
-WIN_WIDTH : int
-WIN_HEIGHT : int
-WIN_X : int
-WIN_Y : int
-listener : Listener
-jframe : JFrame
-jpanel : JPanel
-welcome_pnl : JPanel
-game_pnl : JPanel
-initialize() : void
-create_welcome_pnl() : void
-create_game_pnl() : void
-showinputmsg(String msg) : String
-showmsg(String msg) : void
-setTableCard(JButton btn, Card card) : JButton
-setTrumpEnabled(boolean state) : void
-setTableCards(Card[] cards) : void
-clearTrump() : void
-setHandCard(JButton btn, Card card) : JButton
-setInitialHandCards(ArrayList<Card> cards) : void
-setTheRestHandCards(ArrayList<Card> cards) : void
-setAllHandCardsEnabled(Boolean state) : void
-setHandCardsEnabled(Boolean state, int from, int to) : void
-updateTable(Boolean[] table) : void
-setFirstLine(String firstLine) : void
-setSecondLine(String secondLine) : void
-setTableLabel(int lblNo, String lbl) : void
-hideButtons() : void
-showButtons() : void
-showgamepnl() : void
-close() : void
java.awt.event
+WindowAdapter()
+ActionListener()
javax.swing
-JFrame
-JPanel
-JButton
-JLabel
-JTextField
-JImageIcon
+border()
+event()

Sequence Diagram



Screenshots




Cards Game 304
Hi THANANJAYAN!
Your Total Wins:0
Your partner:Jeyaram
Bet:33
By:Jearam
M00238975 - JJ348@MDX.AC.UK
CMT 3060
304 Cards
GAME
Jearam
Jeyaram
THANANJAYAN
Janani