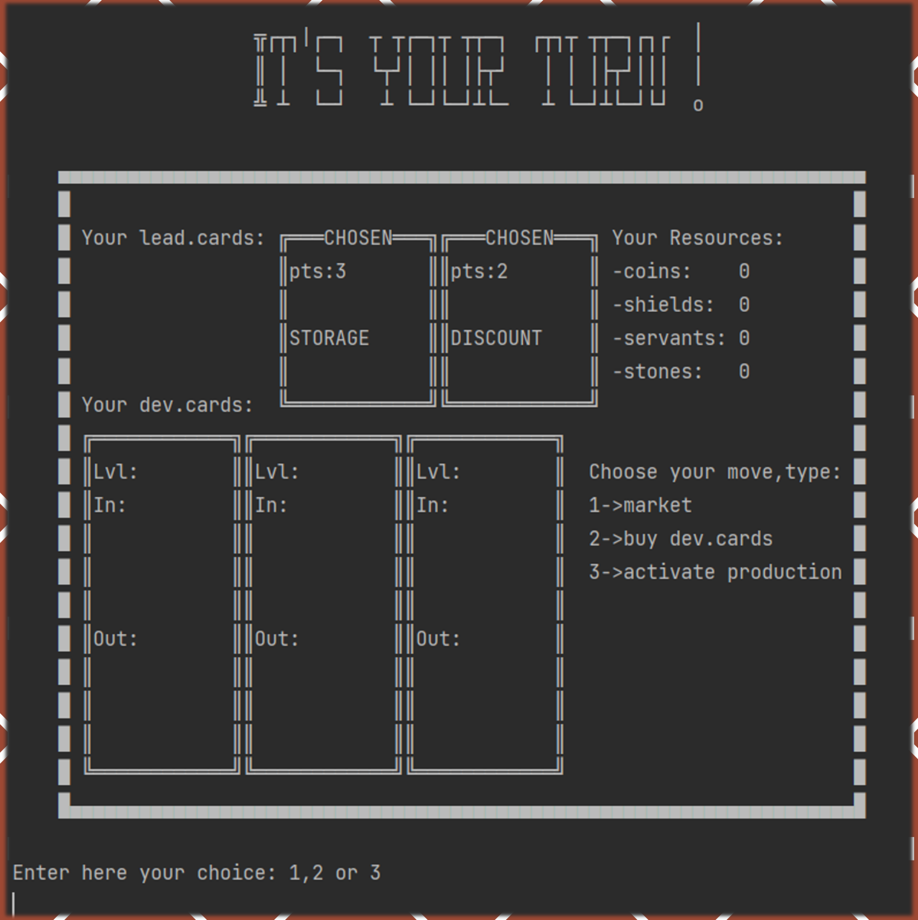

```
IT'S YOUR TURN !

Your lead.cards:  ═CHOSEN═    ═CHOSEN═    Your Resources:
                  pts:3       pts:2       -coins:    0
                                          -shields:  0
                  STORAGE     DISCOUNT    -servants: 0
                                          -stones:   0
Your dev.cards:

 Lvl:        Lvl:        Lvl:          Choose your move,type:
 In:         In:         In:           1->market
                                       2->buy dev.cards
                                       3->activate production

 Out:        Out:        Out:

Enter here your choice: 1,2 or 3
```

Masters of the Renaissance - GC7
It's your turn! Choose your Initial Leader Cards
END TURN
Welcome
Common Board
Your Board
Masters of Renaissance

PROVA FINALE DI INGEGNERIA DEL SOFTWARE

GC07

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CORE DECISIONS

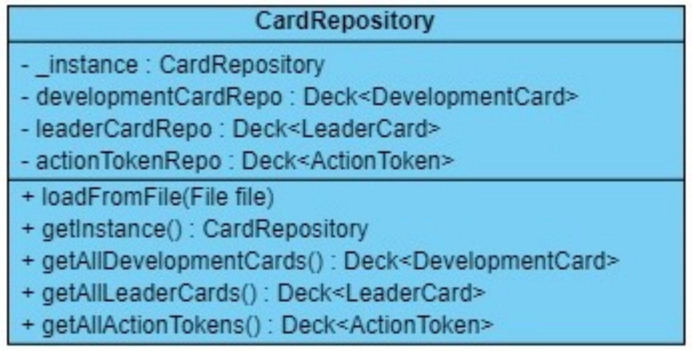
- ASCII Art for Command Line Interface

- **Swing** over JavaFX

- Full Rule Set + 2 Advanced Features (Multiple Game Sessions, Disconnection Resilience)

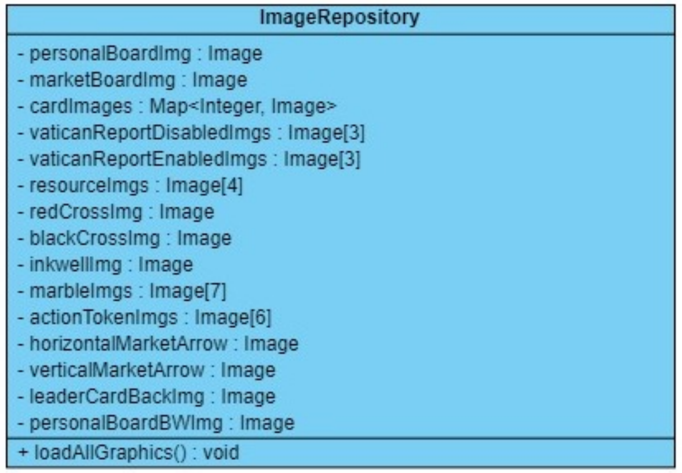
- Thin Client

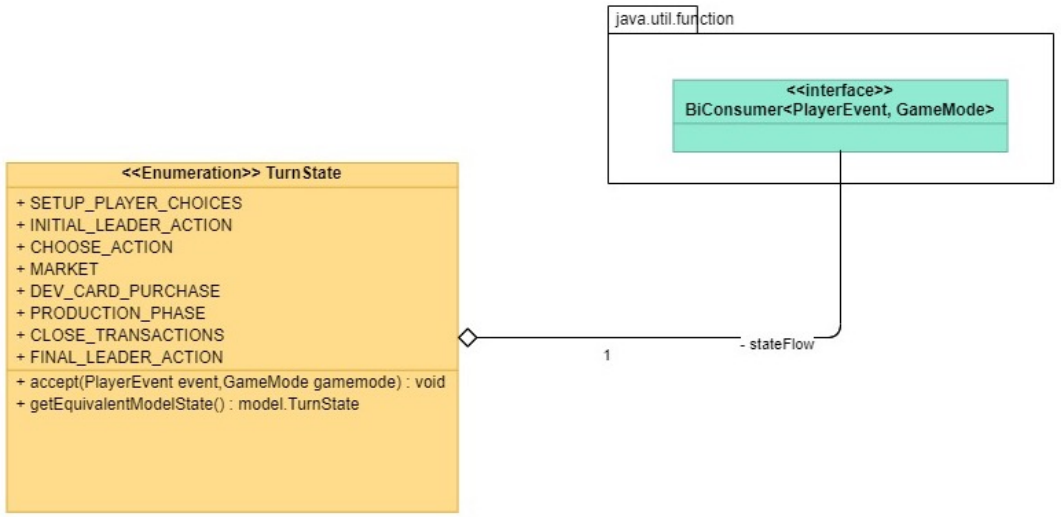
- Client-Server messages and Card Data use JSON serialization (GSON Library)


```
CardRepository
- _instance : CardRepository
- developmentCardRepo : Deck<DevelopmentCard>
- leaderCardRepo : Deck<LeaderCard>
- actionTokenRepo : Deck<ActionToken>
+ loadFromFile(File file)
+ getInstance() : CardRepository
+ getAllDevelopmentCards() : Deck<DevelopmentCard>
+ getAllLeaderCards() : Deck<LeaderCard>
+ getAllActionTokens() : Deck<ActionToken>
```

OTHER DECISIONS

- On Client Side, graphics are loaded once to optimize memory usage and can easily be accessed through a ImageRepository (Singleton


ImageRepository
- personalBoardImg : Image
- marketBoardImg : Image
- cardImages : Map<Integer, Image>
- vaticanReportDisabledImgs : Image[3]
- vaticanReportEnabledImgs : Image[3]
- resourceImgs : Image[4]
- redCrossImg : Image
- blackCrossImg : Image
- inkwellImg : Image
- marbleImgs : Image[7]
- actionTokenImgs : Image[6]
- horizontalMarketArrow : Image
- verticalMarketArrow : Image
- leaderCardBackImg : Image
- personalBoardBWImg : Image
+ loadAllGraphics() : void



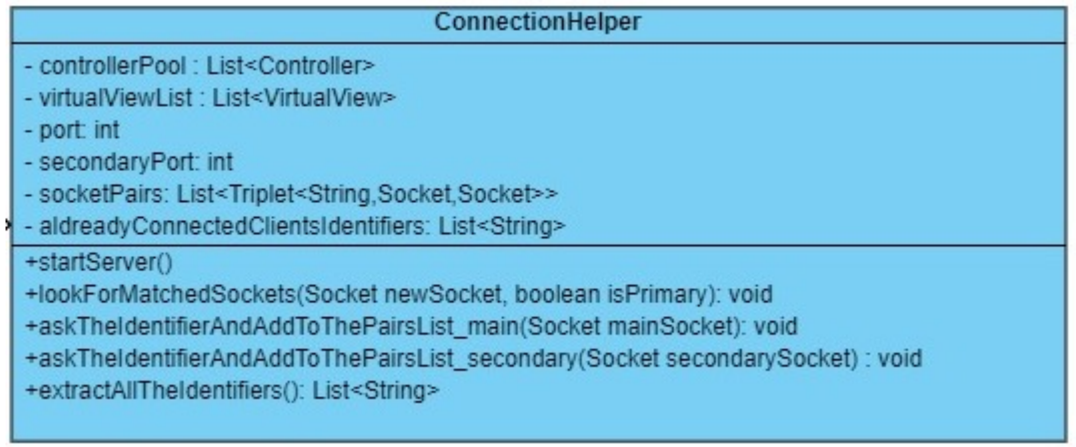
- When the controller receives a PlayerEvent, the message is handled by a BiConsumer encapsulated in each state the player turn may be (TurnState). Each consumer function calls methods from *GameMode*, a controller class containing methods to perform actions on the game session.

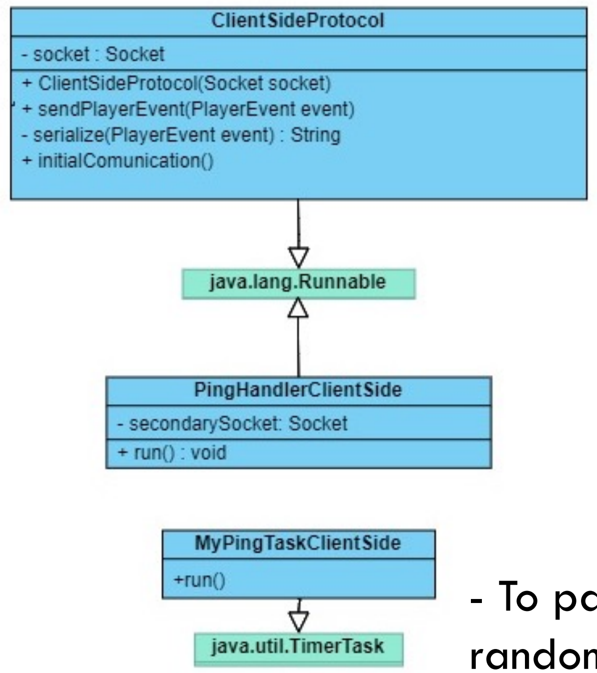
A CRITICAL DECISION

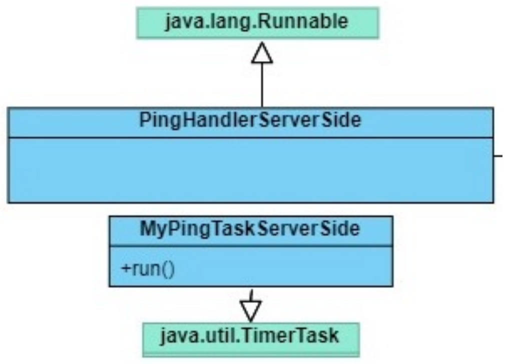
- We decided to implement the FA: Client Reconnection using a **ping mechanism**
- Many reasons led us to this decision:

1. The clients' connection isn't reliable: in some cases they disconnect without notify the server
2. Since the disconnected players skip their turn, by a tactical prospective can be useful to always know who's connected and who's not
3. A simple idea to know when a client is disconnected is to put a timer on player's moves: it's easy to implement but
    - Puts a constraint on users' move time
    - To recognise that a player is truly disconnected a long timeout must pass and all the players have to wait

A CRITICAL DECISION


ConnectionHelper
- controllerPool : List<Controller>
- virtualViewList : List<VirtualView>
- port: int
- secondaryPort: int
- socketPairs: List<Triplet<String,Socket,Socket>>
- aldreadyConnectedClientsIdentifiers: List<String>
+startServer()
+lookForMatchedSockets(Socket newSocket, boolean isPrimary): void
+askTheIdentifierAndAddToThePairsList_main(Socket mainSocket): void
+askTheIdentifierAndAddToThePairsList_secondary(Socket secondarySocket) : void
+extractAllTheIdentifiers(): List<String>





- We then chose to implement a ping mechanism. Handling disconnections properly, especially in the CLI, ended up requiring two sockets: one for the CompressedModel / PlayerEvent messages and one for the continuous *ping* message. With the current implementation, it takes 5 seconds without a ping to disconnect the player.

- To pair the two sockets without ambiguity, a unique identifier for the client is generated randomly and sent upon first connection.

- Thanks to this approach, the thread that receives the message also handles the turn and sends the answer back. This eliminates many syncronization hazards.

CLI & GUI

- **Common Board**

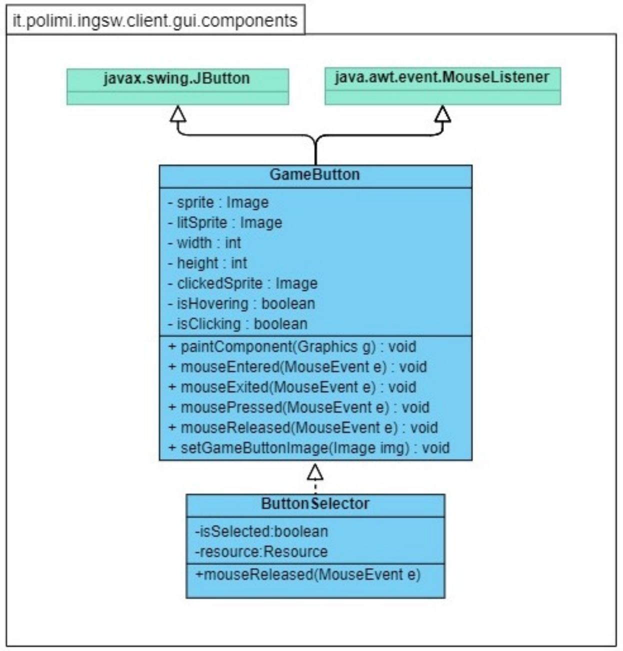
Contains common spaces available to all players: *Market Board* and *Development Card Grid*.

- **Player Board**

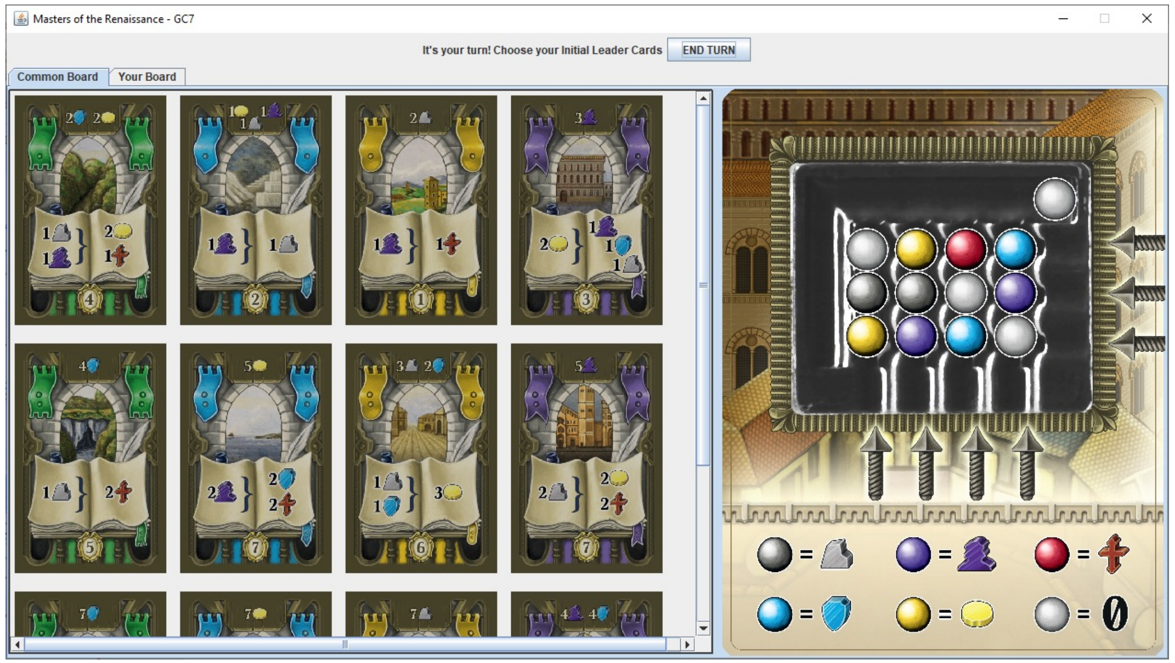
Contains the player specific buttons and views.

- Buttons are disabled for other players' boards.
- Other players' leader cards become visible upon activation

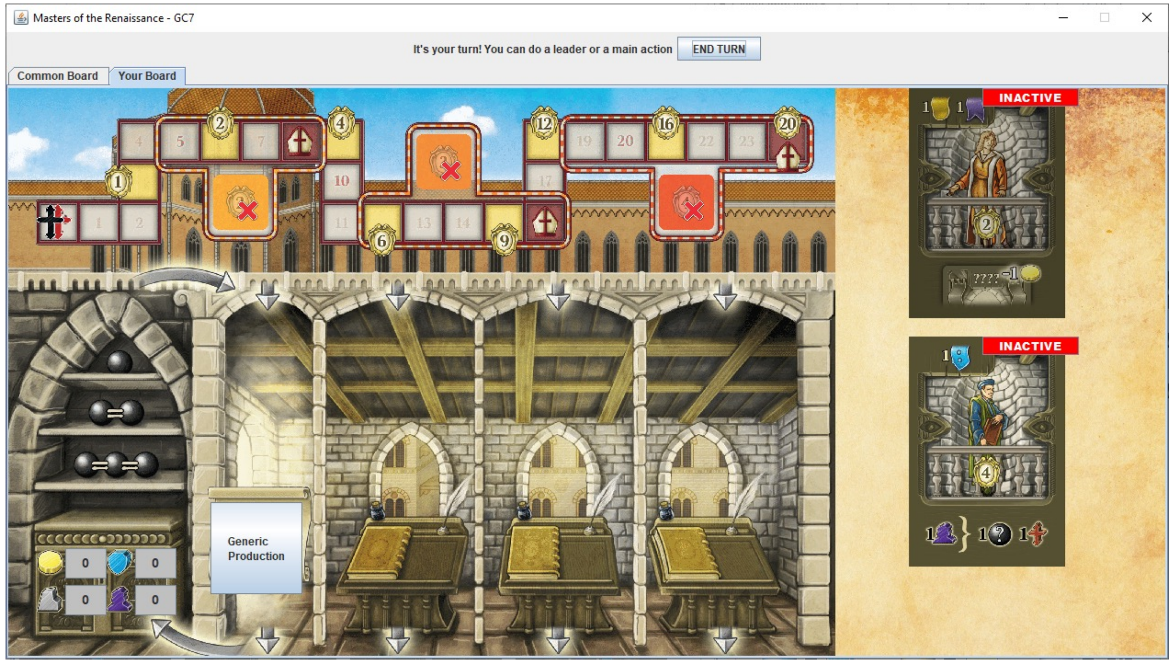
- Selection of cards and market rows / columns is done with *GameButtons*, which have transparent backgrounds and are highlighted when the mouse hovers on them.



it.polimi.ingsw.client.gui.components
javax.swing.JButton
java.awt.event.MouseListener
GameButton
- sprite : Image
- litSprite : Image
- width : int
- height : int
- clickedSprite : Image
- isHovering : boolean
- isClicking : boolean
+ paintComponent(Graphics g) : void
+ mouseEntered(MouseEvent e) : void
+ mouseExited(MouseEvent e) : void
+ mousePressed(MouseEvent e) : void
+ mouseReleased(MouseEvent e) : void
+ setGameButtonImage(Image img) : void
ButtonSelector
-isSelected:boolean
-resource:Resource
+mouseReleased(MouseEvent e)


Masters of the Renaissance - GC7

It's your turn! Choose your Initial Leader Cards


Masters of the Renaissance - GC7

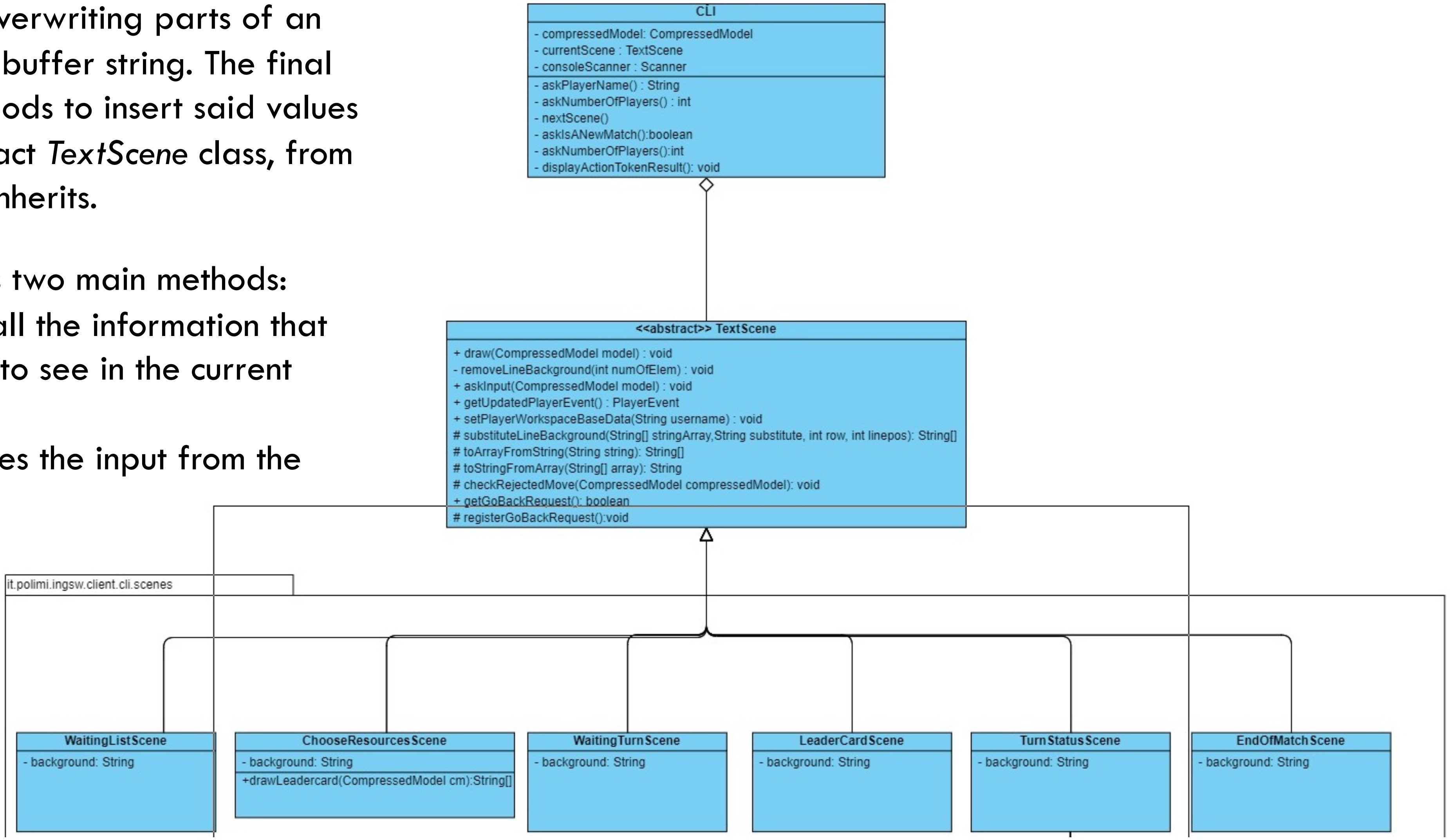
It's your turn! You can do a leader or a main action

CLI & GUI

- Values are inserted by overwriting parts of an ASCII background using a buffer string. The final string is then printed. Methods to insert said values are contained in the abstract *TextScene* class, from which every actual scene inherits.

- The TextScene class has two main methods:
  1. Draw() : it prints all the information that the player needs to see in the current scene
  2. AskInput(): retrieves the input from the player

- The correct scene is shown based on the *TurnState* received from server.

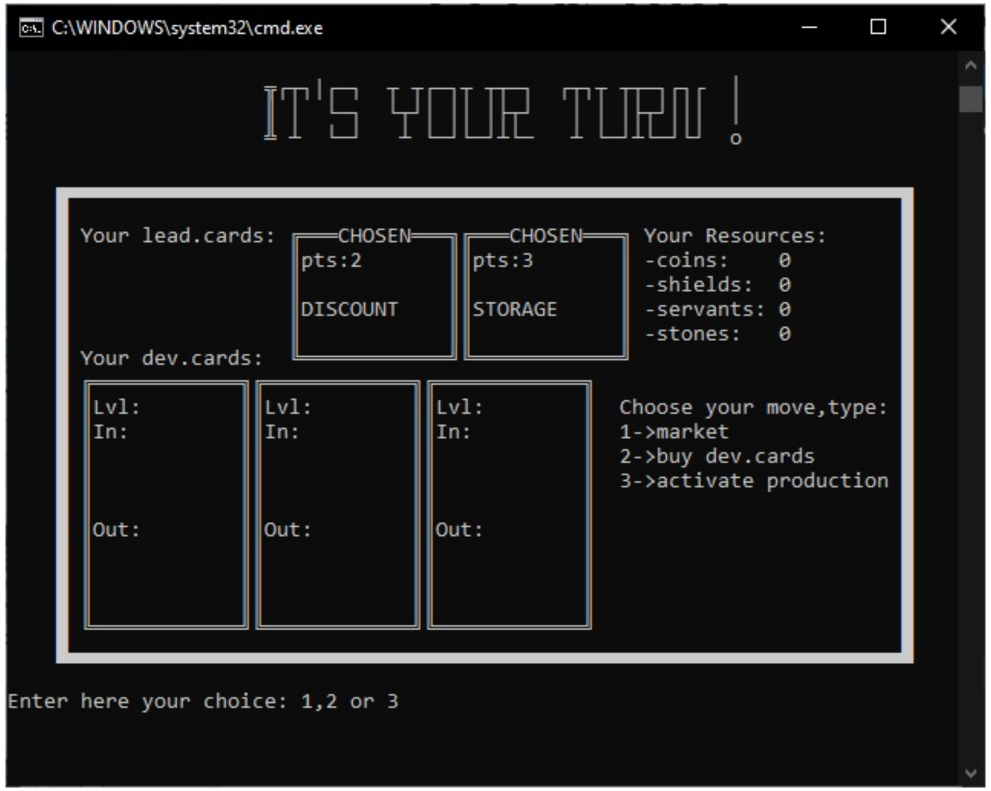

CLI
- compressedModel: CompressedModel
- currentScene : TextScene
- consoleScanner : Scanner
- askPlayerName() : String
- askNumberOfPlayers() : int
- nextScene()
- askIsANewMatch():boolean
- askNumberOfPlayers():int
- displayActionTokenResult(): void
<<abstract>> TextScene
+ draw(CompressedModel model) : void
- removeLineBackground(int numOfElem) : void
+ askInput(CompressedModel model) : void
+ getUpdatedPlayerEvent() : PlayerEvent
+ setPlayerWorkspaceBaseData(String username) : void
# substituteLineBackground(String[] stringArray,String substitute, int row, int linepos): String[]
# toArrayFromString(String string): String[]
# toStringFromArray(String[] array): String
# checkRejectedMove(CompressedModel compressedModel): void
+ getGoBackRequest(): boolean
# registerGoBackRequest():void
it.polimi.ingsw.client.cli.scenes
WaitingListScene
- background: String
ChooseResourcesScene
- background: String
+drawLeadercard(CompressedModel cm):String[]
WaitingTurnScene
- background: String
LeaderCardScene
- background: String
TurnStatusScene
- background: String
EndOfMatchScene
- background: String

CLI & GUI

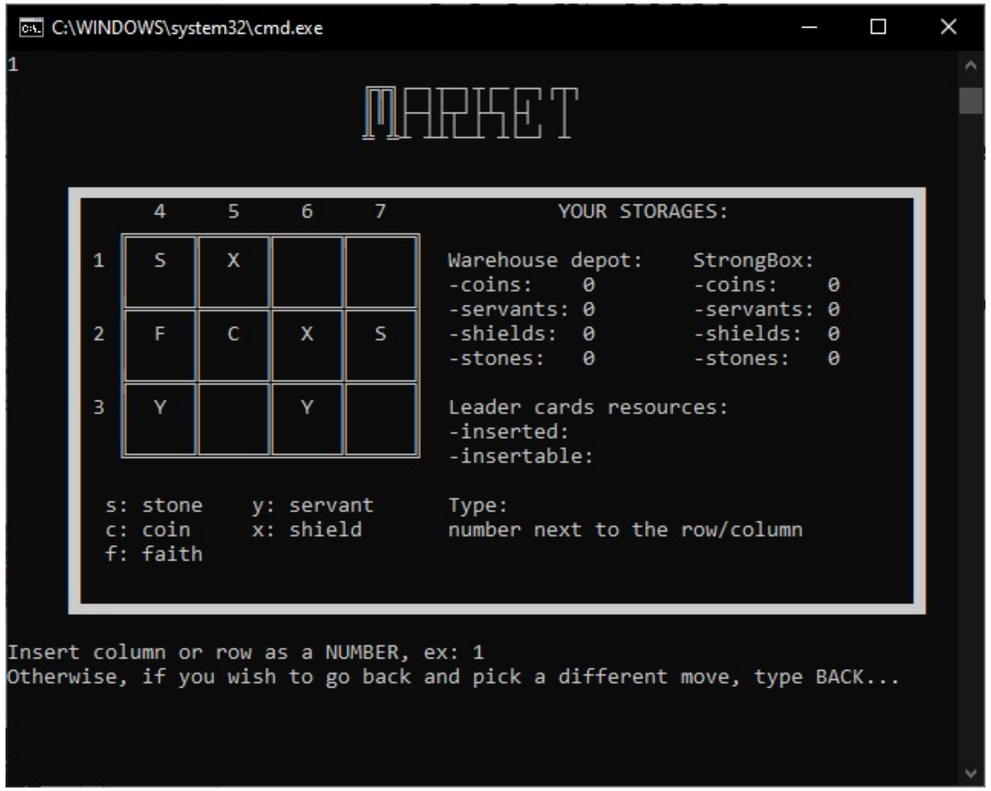
- **CLI - TurnStatusScene**

Here the players can see their Development cards and owned resources.

- They are given the choice to do a *Market Action, Buy a Dev Card* or *Activate Production Powers*



```
C:\WINDOWS\system32\cmd.exe

              IT'S YOUR TURN !

  Your lead.cards:  ══CHOSEN══   ══CHOSEN══   Your Resources:
                    pts:2        pts:3        -coins:    0
                                              -shields:  0
                    DISCOUNT     STORAGE      -servants: 0
                                              -stones:   0
  Your dev.cards:
  Lvl:        Lvl:        Lvl:              Choose your move,type:
  In:         In:         In:               1->market
                                            2->buy dev.cards
                                            3->activate production



  Out:        Out:        Out:



Enter here your choice: 1,2 or 3
```



```
C:\WINDOWS\system32\cmd.exe
1
                    MARKET

        4     5     6     7              YOUR STORAGES:
   1    S     X                   Warehouse depot:    StrongBox:
                                  -coins:    0        -coins:    0
                                  -servants: 0        -servants: 0
   2    F     C     X     S       -shields:  0        -shields:  0
                                  -stones:   0        -stones:   0

   3    Y           Y             Leader cards resources:
                                  -inserted:
                                  -insertable:

    s: stone     y: servant       Type:
    c: coin      x: shield        number next to the row/column
    f: faith


Insert column or row as a NUMBER, ex: 1
Otherwise, if you wish to go back and pick a different move, type BACK...
```