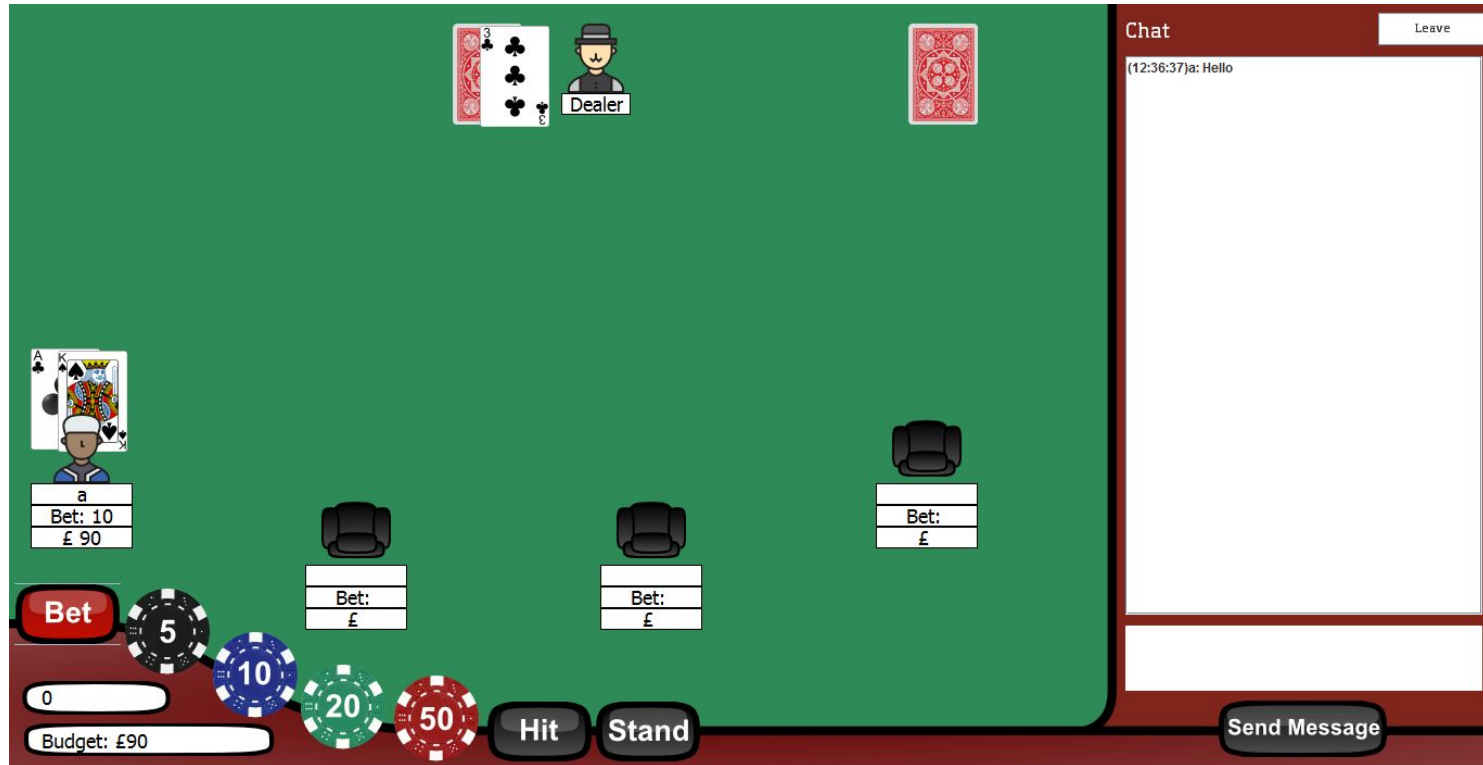# Group Project: Blackjack Online

Team Bordeaux

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Overview

Features

- Create Account

- Login/Logout

- Lobby List of Games

- Private Game room and chat functionality

- Custom frame resizing of components

- Blackjack card game logic

- Concurrent Blackjack game for up to 4 players

System Architecture

- Three tier client server database architecture

- Multithreaded server and client

- Request response communication

- Observable client and GUI screen observers

Database

- Three databases:

  - users
  - users_games
  - game_outcomes

- One to many relationship for game outcomes to user games

- Sign up and login stored in users, gameplay to user_games and game_outcomes

Server

- Overall server that waits for client connection

- Server thread that handles client communication

- Game lobby and game logic (later)

- Database interaction (FunctionsDB)

Client

- Acts as model in mvc architecture and connection point to server

- Contains All state information for client

- Provide methods for sending requests to server
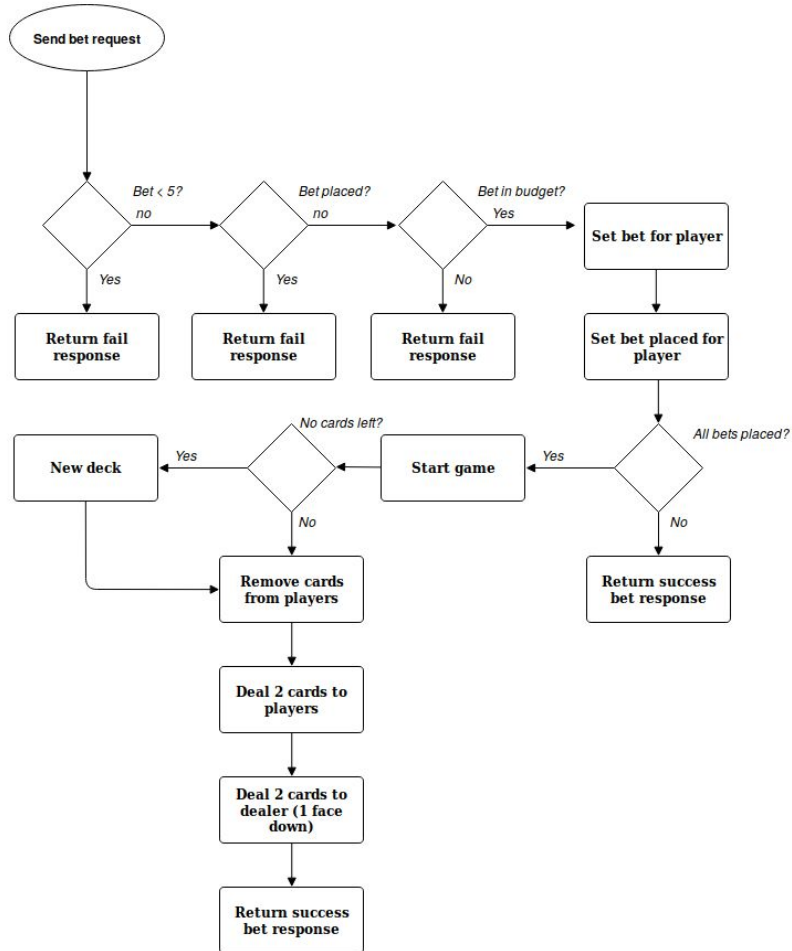
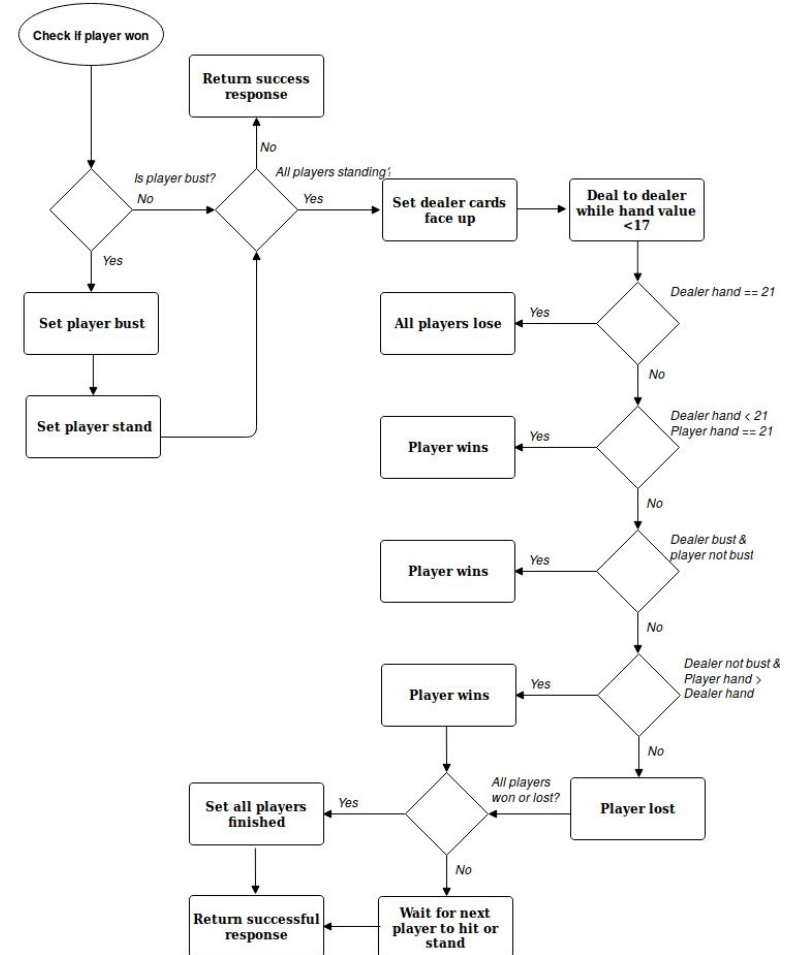- Includes three threads for updating

Game Logic

- Simplified blackjack card game handled server side

- Players can place a bet amount

- Players can choose to "Hit" or "Stand"

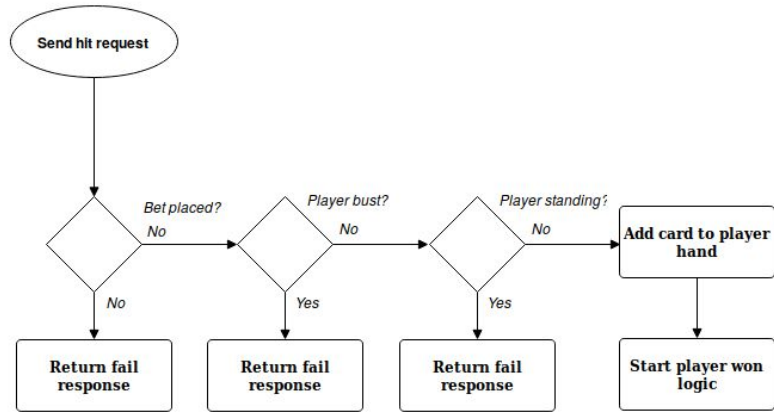- Game requests

- Check if player has won

Blackjack Online - Placing a bet

```
                    ( Send bet request )
                            |
                            v
        Bet < 5?        Bet placed?       Bet in budget?
    ◇ ── no ──→ ◇ ── no ──→ ◇ ── Yes ──→ [ Set bet for player ]
    no              no           Yes                 |
    |               |            |                   v
    Yes             Yes          No         [ Set bet placed for
    |               |            |                  player ]
    v               v            v                   |
[ Return fail ] [ Return fail ] [ Return fail ]      v
  response        response        response      All bets placed?
                                             ◇ ── Yes ──
                                             |
                                             No
                                             |
                                             v
                                     [ Return success
                                       bet response ]

   No cards left?
   ◇ ── Yes ──→ [ New deck ]        [ Start game ] ←── Yes
   |                 |
   No                |
   |                 |
   v                 v
[ Remove cards ] ←───┘
  from players ]
        |
        v
[ Deal 2 cards to
     players ]
        |
        v
[ Deal 2 cards to
  dealer (1 face
     down) ]
        |
        v
[ Return success
  bet response ]
```

Blackjack Online - Player won logic

```
        ( Check if player won )
                |
                v                            [ Return success
        Is player bust?                         response ]
            ◇ ── No ──→ All players standing?      ↑
            No              ◇ ── No ──────────────┘
            |               |
            Yes             Yes
            |               |
            v               v
    [ Set player bust ] [ Set dealer cards  →  [ Deal to dealer
            |               face up ]            while hand value
            v                                         <17 ]
    [ Set player stand ]                               |
            |                                          v
            └──────────────────────→           Dealer hand == 21
                                               ◇ ── Yes ──→ [ All players lose ]
                                               No
                                               |
                                               v
                                           Dealer hand < 21
                                           Player hand == 21
                                           ◇ ── Yes ──→ [ Player wins ]
                                           No
                                           |
                                           v
                                           Dealer bust &
                                           player not bust
                                           ◇ ── Yes ──→ [ Player wins ]
                                           No
                                           |
                                           v
                                           Dealer not bust &
                                           Player hand >
                                           Dealer hand
                                           ◇ ── Yes ──→ [ Player wins ]
                                           No
                                           |
                                           v
    [ Set all players ]  ←── Yes ── All players    [ Player lost ]
       finished ]                   won or lost?        |
            |                       ◇ ←─────────────────┘
            |                       No
            v                       |
    [ Return successful ]           v
       response ]  ←─────── [ Wait for next
                              player to hit or
                                  stand ]
```

Blackjack Online - Hit request

```
        ┌─────────────────┐
        │ Send hit request │
        └─────────────────┘
                 │
                 ▼
        Bet placed?        Player bust?        Player standing?
         ◇ ──No──→ ◇ ──No──→ ◇ ──No──→ ┌──────────────────┐
         │          │          │         │ Add card to player│
         No         Yes        Yes       │       hand       │
         │          │          │         └──────────────────┘
         ▼          ▼          ▼                  │
   ┌──────────┐ ┌──────────┐ ┌──────────┐        ▼
   │Return fail│ │Return fail│ │Return fail│ ┌──────────────┐
   │ response │ │ response │ │ response │ │Start player won│
   └──────────┘ └──────────┘ └──────────┘ │     logic     │
                                           └──────────────┘
```

Blackjack Online - Stand request

```
        ┌───────────────────┐
        │ Send stand request │
        └───────────────────┘
                 │
                 ▼
        Bet placed?        Player standing?
         ◇ ──No──→ ◇ ──No──→ ┌──────────────┐
         │          │         │ Set player to │
         No         Yes       │   standing   │
         │          │         └──────────────┘
         ▼          ▼                │
   ┌──────────┐ ┌──────────┐        ▼
   │Return fail│ │Return fail│ ┌──────────────┐
   │ response │ │ response │ │Start player won│
   └──────────┘ └──────────┘ │     logic     │
                             └──────────────┘
```
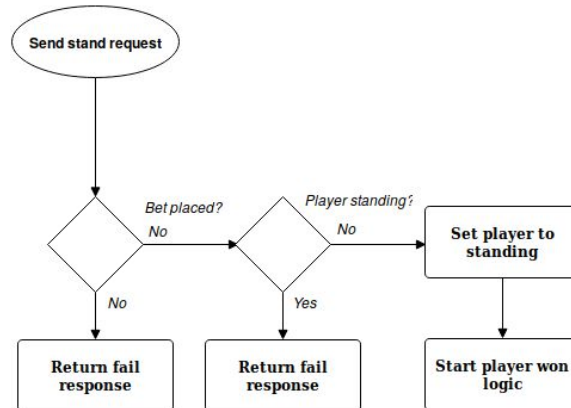
Graphical User Interface

- Observer pattern

- Clients are observable

- GUI screens are observers

- Observers are notified when the client is updated

- Resources folder to hold graphical components

- Resizing HUD interface

Thank you for listening

We will now show a demonstration of our Blackjack card game.