Requirements: Poker Project

VERSION: 1.0

# Introduction

This document outlines the high-level business and functional requirements for a poker-playing game. This also includes the rules of poker, documented in the Business Rules section, for reference.

# Purpose

## Scope

The objective of this project is to produce a viable product in the computer-poker market. It will include both the infrastructure and the software needed to achieve this end, as defined by the requirements below. In order to prevent system complexity, the system shall utilize multiple human players rather than an AI opponents in the initial version.

## Assumptions and Constraints

We assume that only one developer is available for the project, and therefore the deadline is flexible to ensure highest quality.

# Business Requirements

## Requirements

### BREQ 1 – Poker

In order to provide entertainment to the consumer, the system shall provide the means to play a game of Poker.

#### BREQ **1.a—Texas Hold’em**

In order to be accessible to the majority of US virtual poker consumers, the system will use the No-Limit Texas Hold’em variant of the Poker rules

### BREQ 2 – Multiplayer

In order to provide a challenge, the system shall allow multiple players to play in the same game

### BREQ 3 – Internet

In order to grow the player-base for multiplayer, the system shall allow players to play together via the internet

# Functional Requirements

## Requirements

### FREQ 1 – Game

The solution shall provide a method to keep track of the states of individual games and keep them separated.

#### FREQ 1.1 – Autonomy

The solution shall never share cards or game state between games

#### FREQ 1.2 – Correctness

The solution shall implement the rules of Texas Hold’em as outlined in the Business Rules section of this document

### FREQ 2 – Cards

The system shall simulate the drawing of cards from a standard 52-card deck of playing cards, with the standard French design and English names.

#### FREQ 2.1 – Shuffling

The system shall provide some means of shuffling the cards to ensure randomness

#### FREQ 2.2 – Drawing

The system shall provide some means of drawing cards from the deck. The drawing of cards shall be suitably random that a casual player could not predict the next draw.

#### FREQ 2.3 – Dealing

The system shall provide some means of distributing cards to players or the table, colloquially called “dealing”

### FREQ 3 – Players

The system shall allow multiple Player entities to interact with the game state. The system shall allow at least two players to join any given game.

#### FREQ 3.1 – Internet play

Players must be able to connect to the game and interact with the game state in a distributed fashion via the internet

#### FREQ 3.2 – GUI

Players shall interact with the game state via a graphical interface

#### FREQ 3.3 – Autonomy

Players shall have separate hand and chip states. No player shall be able to witness any other player’s hand, nor shall any player directly exert influence over another player’s decision process or hand state.

#### FREQ 3.4 – Visibility

Each player shall be able to see what players are playing in their game, how many chips they have remaining, and how many chips they have bet.

#### FREQ 3.5 – Uniqueness

The system shall provide some means by which players can be uniquely identified and easily distinguished from each other.

#### FREQ 3.6 – Record

The system shall provide some means of recording the win-loss record for a player and displaying it.

#### FREQ 3.7 – Chips

The system shall keep a pool of chips for the player, deducting chips when they bet and adding chips when they win.

### FREQ 4 – Table

The system shall provide some representation of the state of the table that is visible to all players in a game.

#### FREQ 4.1 – Dealt cards

The system shall provide some means by which players can see face-up cards that have been dealt to the table

#### FREQ 4.2 – Pot

The system shall provide some means by which players can see how many chips have been bet this round (the “pot”)

### FREQ 5 – Lobbies

The system shall provide some form of “lobby”

#### FREQ 5.1 – Lobby players

Any player connected to the server but not in a game shall be shown in the lobby

#### FREQ 5.2 – Joining games

The lobby shall provide some means of finding and joining a game that has not yet started

#### FREQ 5.3 – Visibility

Players in the lobby shall be able to see other players that are in the lobby

#### FREQ 5.4 – Creating games

Players in the lobby shall be able to start a game, creating a table that other players can join.

# Business Rules: Betting

## BRUL 1 Ante

The Ante is defined as a small contribution to the pot made before any cards are dealt.

### BRUL 1.1 Mandatory

If the Ante rule is used, all players must ante to be considered during a round.

### BRUL 1.2 Interaction with Blinds

If Blinds are also being used, Ante must be contributed before any Blind is contributed. Any player not contributing to the ante is not considered when assigning the blinds.

## BRUL 2 Blinds

### BRUL 2.1 Small Blind

The Small Blind is to be contributed by the player to the left of the dealer. The small blind amount is equal to half of the Big Blind amount.

### BRUL 2.2 Big Blind

The Big Blind is to be contributed by the player to the left of the Small Blind contributor. The Big Blind is equal to the minimum bet for the round.

### BRUL 2.3 Live Blind

If no player has raised above the Big Blind amount in the first round of betting, the player contributing the Big Blind is given an extra chance to raise. If that player checks, the betting round is over.

### BRUL 2.4 Pay-to-play

No player may bet less than the Big Blind amount during the first round of betting. The first round of betting begins with the person to the left of the Big Blind; as such, the Small Blind must contribute extra chips when the betting reaches them even if every other player called.

## BRUL 3 Betting

Betting proceeds in a clockwise fashion around the table during any betting round. Each player may perform an action on their turn, after which the player to their left becomes the active player. The betting round ends when all players have chosen to call and are therefore betting the same amount (other than players who have gone all-in).

### BRUL 3.1 Skip non-players

If any player has gone bust, failed to ante, or folded, betting skips that player

### BRUL 3.2 Checking

When the current bet is 0 during a betting round, the active player may choose to “check”, or bet 0 and pass their turn to bet.

### BRUL 3.3 Calling

When the current bet is not 0 during a betting round, the active player may choose to “call”, or bet the minimum amount required.

### BRUL 3.4 Raising

During a betting round, the active player may choose to “raise”, or bet more than the minimum amount required.

### BRUL 3.5 Folding

During a betting round, the active player may choose to “fold”. They are removed from the game and forfeit any chips they have bet.

### BRUL 3.6 All-in

A player who bets the remainder of their betting pool is said to be “All-in”. A player who cannot meet the current bet on their turn must go all-in or fold. After going all-in, the player is immune to further betting requirements.

### BRUL 3.7 No over-betting

No player may bet more than the amount of chips they have in their betting pool.

### BRUL 3.8 The Pot

After each round of betting, all chips that are bet are placed into the communal pot.

# Business Rules: Playing

## BRUL 4 Stages of the Game

### BRUL 4.1 Ante

If the Ante rule is to be used, an Ante round happens before the first deal.

### BRUL 4.2 Hole Cards

The dealer must deal out two cards face-down to each player with chips remaining in their betting pool.

### BRUL 4.3 Pre-Flop Bet

The blinds must then contribute their blind amounts. A betting round occurs beginning with the player to the left of the Big Blind (see BRUL 3).

### BRUL 4.4 Flop

If there are at least two players remaining after the pre-flop betting round, the dealer will turn three cards face-up on the table.

### BRUL 4.5 Flop Bet

A round of betting follows the flop.

### BRUL 4.6 Turn

If there are at least two players remaining after the flop betting round, the dealer will turn one more card face-up on the table.

### BRUL 4.7 Turn Bet

A round of betting follows the Turn.

### BRUL 4.8 River

If there are at least two players remaining after the turn betting round, the dealer will turn one more card face-up on the table.

### BRUL 4.9 River Bet

A round of betting follows the River

### BRUL 4.10 Showdown

If at least two players remain after the River betting round, they each expose their hole cards. The best possible five-card hand is made for each player from their hole cards and the community cards.

##### BRUL 4.10.1 Single Winner

If one player wins, he receives the entire pot.

##### BRUL 4.10.2 Ties

If two players tie, they share the pot equally

# Business Rules: Hands

## BRUL 5 Hands

The following are considered the valid hands that can be made in Poker. No other hands are possible.

### BRUL 5.1 Flush

A series of five cards with the same suit is called a “Flush”.

### BRUL 5.2 Straight

A series of five cards in numerical sequence is called a “Straight”

### BRUL 5.3 Straight Flush

A straight flush is a hand that contains five cards in sequence, all of the same suit. A straight flush is both a straight and a flush.

#### BRUL 5.1.1 Royal Flush

A straight flush with the highest card as an Ace is called a “Royal Flush”

### BRUL 5.4 Full House

A full house consists of three cards of the same numerical value and two cards of the same numerical value. The three cards and the two cards have different numerical values from each other.

### BRUL 5.5 Four of a Kind

A set of four cards matching in numerical value plus one extra card is considered a “four of a kind”.

### BRUL 5.6 Three of a Kind

A set of three cards matching in numerical value plus two extra cards that are not a pair is called a “three of a kind”. A three of a kind and a pair together make up a Full House (BRUL 5.4).

### BRUL 5.7 Pair

Two cards that match each other in numerical value are called a ‘pair’. A hand is considered a ‘pair’ when it contains two cards that match in numerical value plus three more cards, and it is not a Full House, a Three of a Kind, a Four of a Kind, or Two Pair.

### BRUL 5.8 Two Pair

If a hand contains two sets of cards that each match each other in numerical value plus one extra card, but is not a Four of a Kind, it is considered a “two pair” hand.

### BRUL 5.9 High Card

If a hand is not a Flush, Straight, Straight Flush, Full House, Four of a Kind, Three of a Kind, Pair, or Two Pair hand, it is considered a “High card” hand. This is often denoted by naming the highest numerical value of a card in the hand followed by the word “high”, such as “Ace High”.

## BRUL 6 Relative Hand Values

### BRUL 6.1 Straight Flush

If only one player has a Straight Flush hand during the Showdown, they win. If two or more players have a Straight Flush hand during the Showdown, evaluate a tiebreaker (6.11).

### BRUL 6.2 Four of a Kind

If no player has won due to rule 6.1, and only one player has a Four of a Kind hand during the Showdown, they win. If two or more players have a Four of a Kind hand, evaluate a tiebreaker (6.11).

### BRUL 6.3 Full House

If no player has won due to rules 6.1-2, and only one player has a Full House hand during the Showdown, they win. If two or more players have a Full House hand, evaluate a tiebreaker (6.10).

### BRUL 6.4 Flush

If no player has won due to rules 6.1-3, and only one player has a Flush hand during the Showdown, they win. If two or more players have a Flush, evaluate a tiebreaker (6.11).

### BRUL 6.5 Straight

If no player has won due to rules 6.1-4, and only one player has a Straight hand during the Showdown, they win. If two or more players have a Straight, evaluate a tiebreaker (6.11).

### BRUL 6.6 Three of a Kind

If no player has won due to rules 6.1-5, and only one player has a Three of a Kind hand during the Showdown, they win. If two or more players have a Three of a Kind, evaluate a tiebreaker (6.11).

### BRUL 6.7 Two Pair

If no player has won due to rules 6.1-6, and only one player has a Two Pair hand during the Showdown, they win. If two or more players have a Two Pair, evaluate a tiebreaker (6.11).

### BRUL 6.8 One Pair

If no player has won due to rules 6.1-7, and only one player has a One Pair hand during the Showdown, they win. If two or more players have a One Pair, evaluate a tiebreaker (6.11).

### BRUL 6.9 High Card

If all players have a High Card hand, evaluate a tiebreaker (6.11)

### BRUL 6.10 Tiebreaking a Full House

If evaluating a tied Full House hand, the tied player who has the highest set of three numerically matching cards wins. If there is a tie for the highest set of three, the tied player with the highest pair wins. If the hands are totally identical, a tie is declared as the final result and the pot is split.

### BRUL 6.11 Tiebreaking others

In any other tied hand, the tied player with the highest non-kicker card in their hand wins. In the event that the highest non-kicker card is tied, proceed to evaluate the remaining non-kicker cards. If the hands are identical except for kicker cards, the player with the highest kicker card wins. If the hands are completely identical, a tie is declared as the final result and the pot is split.

# Glossary