

Poker Game Requirement

Version 0.2.1

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Log

Version	Reviser	Revision Date	Revision Content
0.1.0	Huang Chengyu	2018.4.16	Add the introduction Add the domain analysis UML Add the system composition UML Add the use case UML Add the requirement prioritization
0.1.1	Huang Chengyu	2018.4.21	Add the use case refinement UML Modify the domain analysis UML Modify the system composition UML Modify the use case UML Grade the requirements by stages
0.2.1	Huang Chengyu	2018.5.10	Add more properties to players Add more operations to game engine Specify operations of player UI

Introduction

Dou dizhu is played among three people with one pack of cards, including the two differentiated jokers. The game starts with players bidding for the "landlord" position. Those who lose the bid or don't bid enter the game as the "peasants" team competing against the landlord. The objective of the game is to be the first player to have no cards left.

Rules

A few fundamental and exceptive rules are essential for understanding the game play of the game. Some rules are structured differently from the other popular card games. Players who have prior experience with other card games, such as poker, and Big Two, often prejudice the rules.

- **Individual cards are ranked.** Colored Joker > Black & White Joker > 2 > Ace (A) > King (K) > Queen (Q) > Jack (J) > 10 > 9 > 8 > 7 > 6 > 5 > 4 >

3.

- **Suits are irrelevant.** Players can play the game with all the suits erased from the cards.

The Rocket and the Bomb

The **Rocket** and the **Bomb** are groups of cards that work differently in terms of game play.

Special Category	Description	Example	Special Note
<i>Rocket</i>	Colored Joker and black-and-white Joker	Colored Joker + black-and-white Joker	It can beat everything in the game.
<i>Bomb</i>	4 cards of the same rank	3-3-3-3 (the lowest ranking Bomb) 2-2-2-2 (the highest ranking Bomb)	It can beat any other category and individual card except <i>Rocket</i> or another Bomb with a higher or equal rank.

Category of hands

The game uses the concept of hands, similar to the hands in poker, except there are more variations and not necessarily consisted of only five cards.

- **Compare only the same Category.** A player can only beat the prior hand using of the same Category but not the others. Note that this means that the ordering of the rows in the following table is not relevant to gameplay.
- **Compare only the Chains with the same length.** Beat the prior hand using the same number of cards is a basic doctrine which only the Rocket and the Bomb may violate. For example, although both 9-10-J-Q-K and 3-4-5-6-7-8-9 are *Single Chains*, 9-10-J-Q-K cannot beat 3-4-5-6-7-8-9, nor vice versa.

- **Compare the rank in the Primal cards only.** The Kicker's rank is irrelevant to the comparison unless a variation with 2+ decks is being played.
- **Jokers and 2 are non-consecutive cards.** Colored Joker, black-and-white Joker, and 2 cannot be used in any of the Primal cards of the Chains since they are not traditionally considered as the consecutive cards sequentially next to the Ace. Examples of illegal *Chain*: 2-3-4-5-6, 2-2-2-3-3-3 w/ A-A-7-7, K-A-2 + B&W Joker + Colored Joker

Category			Description	Example	
<i>Primal</i>	with (+) kicker	Chain		Lowest rank and/or shortest chain	Highest rank and/or longest chain possible
<i>Solo</i>	—	—	Any single card	3	Colored joker
<i>Solo</i>	—	Chain	≥ Five consecutive individual cards	3-4-5-6-7	3-4-5-6-7-8-9-10-J-Q-K-A
<i>Pair</i>	—	—	Two matching cards of equal rank	3-3	2-2
<i>Pair</i>	—	Sisters	≥ Three consecutive pairs	3-3-4-4-5-5	5-5-6-6-7-7-8-8-9-9-10-10-J-J-Q-Q-K-K-A-A
<i>Trio</i>	—	—	Three-of-a-kind: Three individual cards of the same rank	3-3-3	2-2-2
<i>Airplane</i>	—	Chain	≥ Two consecutive	3-3-3-4-4-4	9-9-9-10-10-10-J-J-J-Q-Q-Q-K-K-K-

			trios		A-A-A
<i>Trio</i>	Solo	—	Three cards of the same rank with a solo as the kicker	3-3-3 + 4	2-2-2 + colored joker
<i>Trio</i>	Solo	Airplane	≥ Two consecutive trios with each carries a distinct individual card as the kicker	3-3-3-4-4-4 + 5-6	10-10-10-J-J-J-Q-Q-Q-K-K-K-A-A-A + 7-8-9-2-colored joker
<i>Trio</i>	Pair	—	Full house: Three cards of the same rank with a pair as the kicker.	3-3-3 + 4-4	2-2-2 + A-A
<i>Trio</i>	Pair	Chain	≥ Two consecutive trios with each carrying a pair as the kicker	3-3-3-4-4-4 + 5-5-6-6	J-J-J-Q-Q-Q-K-K-K-A-A-A + 8-8-9-9-10-10-2-2
Bomb			Four-of-a-kind, with a kicker. Four cards of the same	3-3-3-3	2-2-2-2

			rank without the kicker is called a bomb, which defies category rules, even beats four <i>with</i> a kicker.		
<i>Four</i>	Dual solo	—	Four-of-a-kind with two distinct individual cards as the kicker	3-3-3-3 + 4 + 5	2-2-2-2 + A + colored joker
<i>Four</i>	Dual pair	—	Four-of-a-kind with two sets of pair as the kicker	3-3-3-3 + 4-4 + 5-5	2-2-2-2 + K-K + A-A

Chinese name literal translations

This section appears to contradict another section of this article on what are valid hands in this game and their order of precedence. Please see the talk page for more information. (May 2016)

'Individual card': 单牌

'Hook': 钩 – the jack; the Chinese name is based on the shape of "J"

'Circle': 圈 – the queen, named for the shape of "Q"

'K' – The King

'Tip', 'spear'; or 'pointy': 尖 or 枪, respectively – the ace, named for the shape of "A"

'King', 'ruler': 王 – the joker, named for its dominant position in the game

'One pair': 一对 – two cards of the same rank

'Chain': 顺子 or 单顺 – five or more consecutively numbered cards

'Pairs chain': 连对 or 双顺 – three or more consecutive pairs

'Trio with single card': 三带一 – trio, with an individual card as kicker

'Trio with pair': 三带二 or 三带一对 – trio, with a pair as kicker

'Airplane': 飞机 or 三顺 – two or more consecutive trios

'Airplane with small wings': 飞机带小翼 – two or more consecutive trios, with additional cards with the same amount of trios as kicker

'Airplane with large wings': 飞机带大翼 – two or more consecutive trios, with pairs with the same amount of trios as kicker

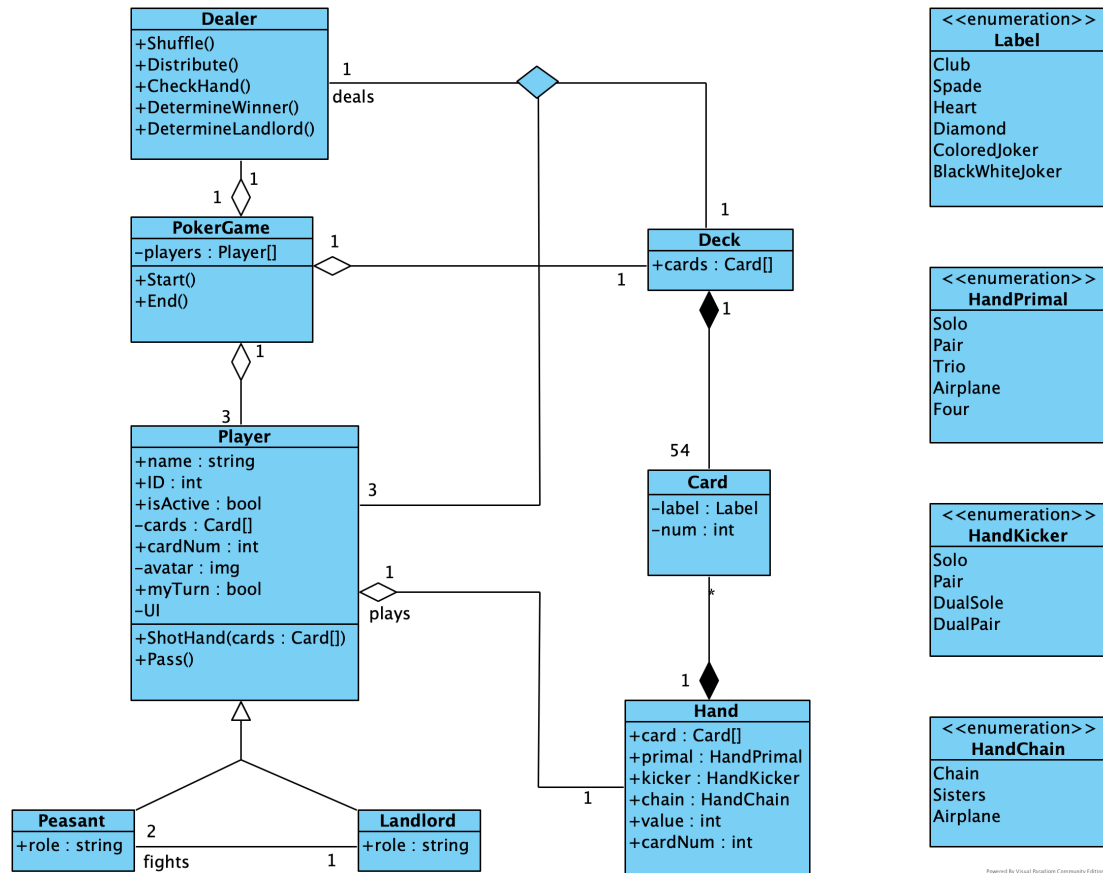
'Four with two single cards': 四带二 – four-of-a-kind, with two individual cards as kicker

'Four with two pairs': 四带两对 – four-of-a-kind, with two pairs as kicker

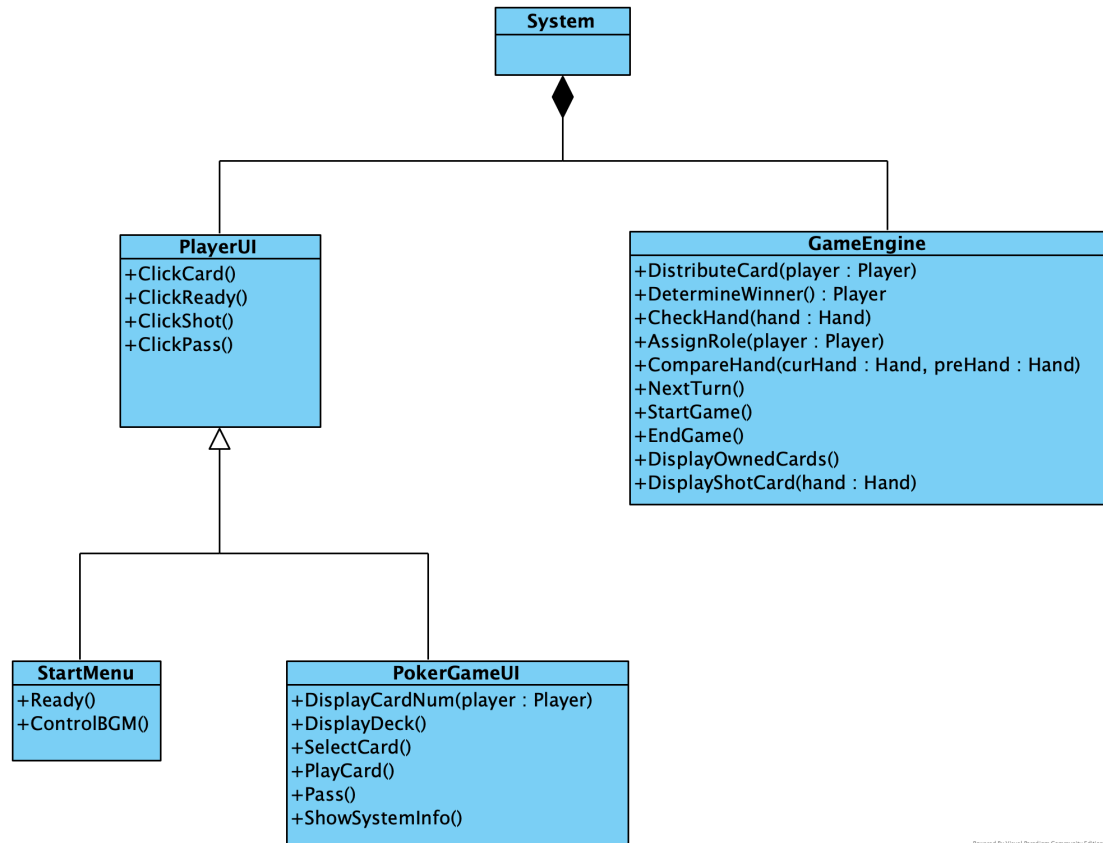
'Bomb': 炸弹 – four cards of the same rank

'Rocket', 'Nuke', 'King Bomb': 核弹, 火箭, 王炸, respectively – colored joker with black-and-white joker cards

Domain Analysis

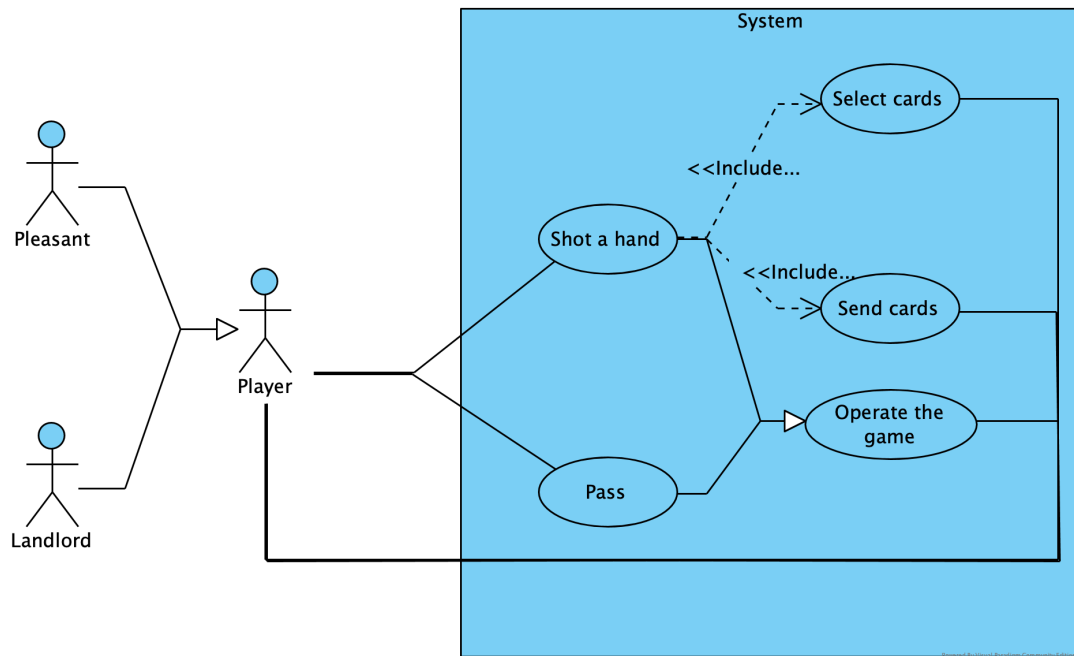


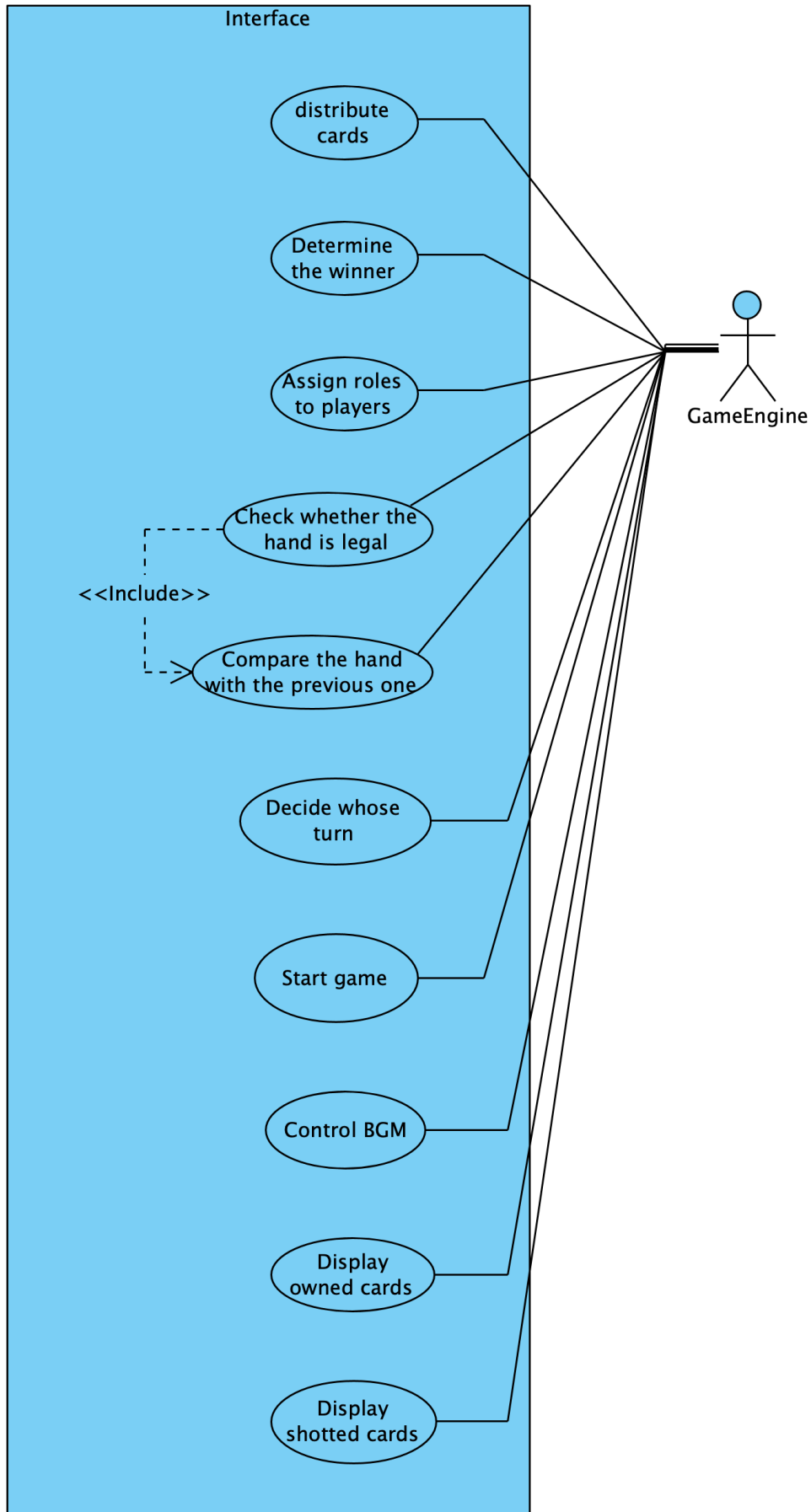
System Composition



- In the system, the game engine is the substitute for the dealer in the domain analysis.

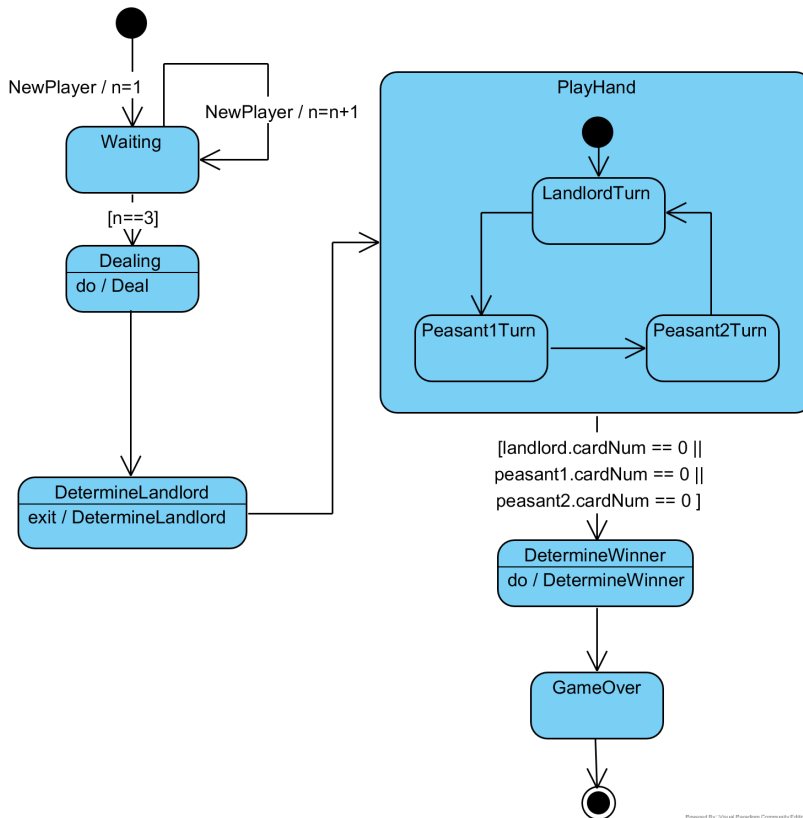
Use Case





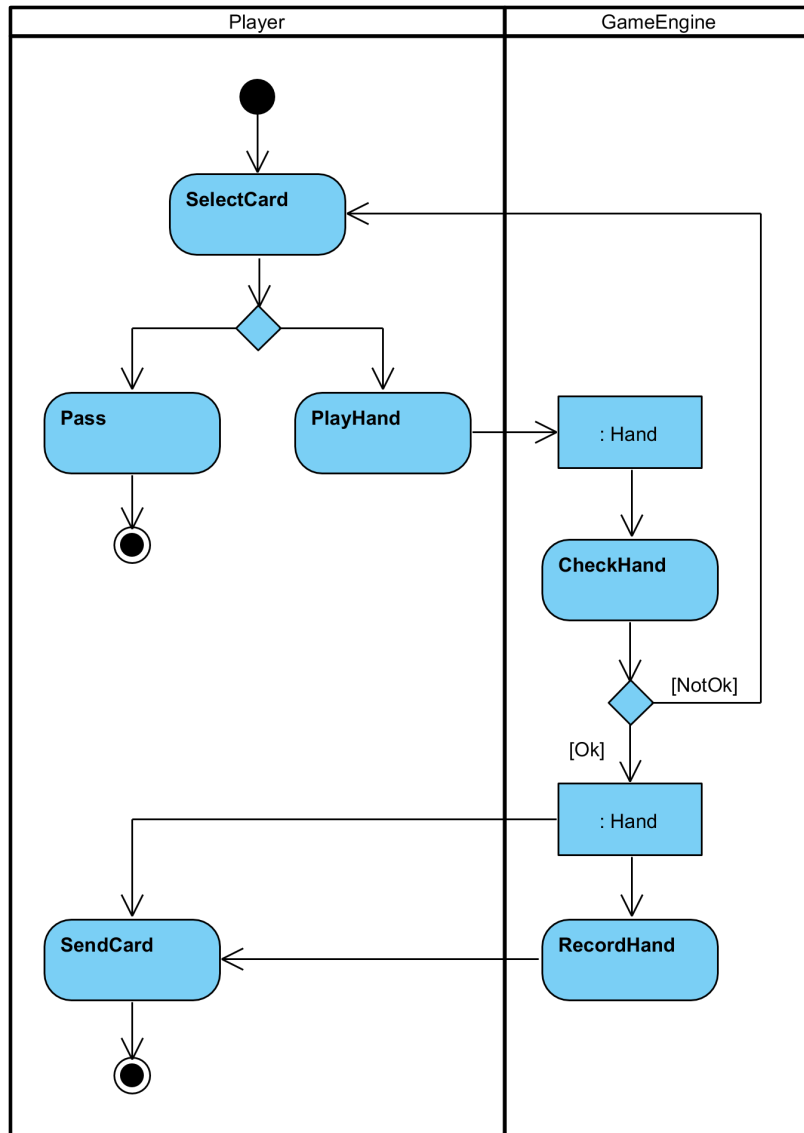
Use Case Refinement

Overall system



- In the **DetermineLandlord** State, the game engine randomly determines the landlord.
- In the **PlayHand** State, players take turns to operate in the corresponding substate.
- In the **DetermineWinner** State, the game engine determines the winner(s) according to the number of cards of each players. If the number of cards of the landlord is zero, the winner is the landlord. If the number of cards of some peasant is zero, the winners are the two peasants.

Operate the game



- The player can choose play a hand or skip the round in the corresponding *PlayHand* state.
- If the player skips the round, he or she should stop operating and the next player should operate.
- If the player plays a hand, the game engine check whether the hand is legal i.e. the hand matches one type of patterns and is greater than the previous one.
- If it is legal, the game engine should record the hand and the cards will be deducted from the player. If not, the player should operate again.

Requirement Prioritization

Stage 0

1. Three players can start a poker game
2. The game engine can randomly serve card
3. The game engine can randomly determine the landlord
4. A player can select cards
5. Show cards number

Stage 1

1. Three players can play a poker game with limited card types
2. According to the 'Ready' state of players determine when to start the game
3. A player can play a hand in the corresponding *PlayHand* state
4. Players should take turns to operate the game
5. The game engine can determine the winner
6. Show hand cards in UIs with corresponding label and number

Stage 2

1. Complete all cards type rule
2. The game engine can check the hand after a player plays a hand
3. Synchronize the shot cards in the middle of every play's UI
4. A player can skip the round in the corresponding *PlayHand* state
5. Add system information
6. Show avatar
7. Background music
 - a) in room
 - b) deal
 - c) in playing
 - d) win
8. Background music control