

1. How a human player should play with the game?

A : The Jacks or Better game flow are:

- Enter the player's name, for simplify, player is replaced by P in the remainder.
- Decide how much money P wants to bet for 1-5 P-dollars.
- Computer will deal card for the P.
- P should choose cards to keep with cases below:
 - a. If P wants keep single card (a), he/she enters **a** for that, enters **b** for keep card (b) and so on. The example shows in Q3, round 1.
 - b. If P wants keep multiple cards, he/she enter multiple codes for that, and notice that input sequence does not matter, **dec** equals **cde** for the result. The example shows in Q3, round 2 and round 3.
 - c. If P wants to keep all cards, he/she enter **abcde** or **q** for that. And enter **x** for drop all the hand cards. The example shows in Q3, round 4 and round 5.
- Computer will judge P's hand cards and decide the biggest hand set to give payoff.
- After computing payoff, the game round is over, P can decide keeping play or not. He/ She enters **0** to quit game or 1-5 for a new round. The example shows in Q3, round 6.

2. How I tested the correctness of my program?

A : There are conditions error may occur:

- a. P enter wrong code not contains in {a, b, c, d, e, q, x} of keeping card:

In class player, method keepCard(), I use a char array playerChoose[] to record p's enter, then I use an int array j[] to translate P's enter to integer value for keeping cards. Special case with q and abcde will keep all cards, x will be re-deal all of the hand cards has done at the first line of keepCard(), but x is just a hint to P, in fact, other wrong enter will be translate to a integer value by method Character.getNumericValue(), only if the value entered is bound in 1-5, the hand card will not be kept, the computer will do the re-deal process.
- b. The computer does not check the wright set of card such that pay the wrong coins off:

In Class Computer, method judgeCard(), following variable are used:

 - int flush, straight, fourKind, threeKind, pair, royal to record card set.
 - int count is used to record number of different card faces.
 - int end is used for recording the biggest face place of P's hand.
 - int start=end-count+1 to check if there's straight in P's hand
 - int suit[]=new int[4], face[]=new int[13] to count suit and each faces in P's hand.

In the first step, method judgeCard() try to find pair, 2 pair, 3 of a kind and 4 of a kind by checking suit[i] and face[i], for example if face[12]=4, we know that there are 4As in p's hand, thus fourKind++; pair, 2 pair and 3 of a kind can be derived as the same.

After first step, the second step checks if a straight exists. Now assume (a)C3 (b)H4 (c)C5 (d)S6 (e)D7 in P's hand, then suit={2,1,1,1}, face={0,1,1,1,1,1,0,...,0}, count=5, end=5 has computed in first step. Then we find start=1 and checking if face[start+i]=1 in 5 round of for loop to find a straight. There are 2 special case with {10,J,Q,K,A} and {A,2,3,4,5}, these 2 condition are written at the first line of the second step.

3. The output from 3 rounds of the game

A : As shown in Figure 3 at the bottom.

4. Any part that I implemented.

A : For the speed and sorting efficiency, I use an 1-dimension array `deck[i]`, $i \in \{0-51\}$ to present a deck of card, `deck[i]=1` means i has dealt, 0 means not, which is shown in Figure 1,

suit = $i \% 4$ for 0: club, 1: diamond, 2: heart, 3: spade,

face = $i / 4 + 2$,

As above, dealing card process could be done by random number generation from 0 to 51.

For example: if p gets 37, then $37/4=9...1$, which means p gets DJ for Diamond Jack, and `deck[37]` will set to 1.

Deck[i]	0	1	2	3
Face	C2	D2	H2	S2
Deck[i]	4	5	6	7
Face	C3	D3	H3	S3
...
Deck[i]	44	45	46	47
Face	CK	DK	HK	SK
Deck[i]	48	49	50	51
Face	CA	DA	HA	SA

Figure 1: A deck of card.

Under the concept, each class and method unit are described in Figure 2:

class Card	Defines card actions
showCard()	Shows the suit and face of input cards.
class player	Defines a player and actions.
player()	Generates a player with his/her name.
keepCard()	Records player's hand card that he/ she wants to keep.
class Computer	Defines actions that computer do.
dealCard()	Deal card (one to multi-card) to a player.
drawMoney()	Draw money to a player
judgeCard()	Judge the biggest set in player's hand and return code of the set.
class JacksOrBetter	Main function of PXXCasino, controls the flow of the game, and <code>deck[]</code> was kept in main.

Figure 2: Function of Class and method.

Game Start, Please enter your name: Pero
Welcome Pero, you got 1000 P-dollars!!
Throw coins you want to bet for round 1:
(1-5 to bet and 0 to quit)
7
(1-5 to bet and 0 to quit)
Throw coins you want to bet for round 1:
(1-5 to bet and 0 to quit)
4
You got cards: (a)H4 (b)C5 (c)C8 (d)D8 (e)HA
Which cards you "want keep":
(Type "abcde" to keep each and "q"to hold all)
(x to re-deal all)
e
Your new cards are: (a)S6 (b)C8 (c)SJ (d)DQ (e)HA
You got a nothing hand.
The payoff is 0
You have 996 P-dollars now
Throw coins you want to bet for round 2:
(1-5 to bet and 0 to quit)
3
You got cards: (a)H4 (b)C8 (c)D9 (d)S9 (e)D10
Which cards you "want keep":
(Type "abcde" to keep each and "q"to hold all)
(x to re-deal all)
dec
Your new cards are: (a)H2 (b)D6 (c)D9 (d)S9 (e)D10
You got a nothing hand.
The payoff is 0
You have 993 P-dollars now
Throw coins you want to bet for round 3:
(1-5 to bet and 0 to quit)
2
You got cards: (a)S3 (b)H4 (c)C5 (d)CJ (e)DJ
Which cards you "want keep":
(Type "abcde" to keep each and "q"to hold all)
(x to re-deal all)
de
Your new cards are: (a)H3 (b)S6 (c)D8 (d)CJ (e)DJ
You got a Jacks or Better hand.
The payoff is 2
You have 993 P-dollars now
Throw coins you want to bet for round 4:
(1-5 to bet and 0 to quit)
4
You got cards: (a)S5 (b)C9 (c)CJ (d)DQ (e)HA
Which cards you "want keep":
(Type "abcde" to keep each and "q"to hold all)
(x to re-deal all)
q
Your new cards are: (a)S5 (b)C9 (c)CJ (d)DQ (e)HA
You got a nothing hand.
The payoff is 0
You have 989 P-dollars now
Throw coins you want to bet for round 5:
(1-5 to bet and 0 to quit)
5
You got cards: (a)C3 (b)H7 (c)CJ (d)SK (e)SA
Which cards you "want keep":
(Type "abcde" to keep each and "q"to hold all)
(x to re-deal all)
abcde
Your new cards are: (a)C3 (b)H7 (c)CJ (d)SK (e)SA
You got a nothing hand.
The payoff is 0
You have 984 P-dollars now
Throw coins you want to bet for round 6:
(1-5 to bet and 0 to quit)
0
Good ByePero. you play for 6 round and have 984 now

Figure 3: Rounds of the game.