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Assignment: Blackjack Project

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Introduction

This paper lays out a technical description of the final class assignment for my Introduction to Scripting Class at Texas A&M University Corpus Christi. The project was to create a Blackjack program in Python that would simulate an actual blackjack game with a random number of players to play a total of 10 rounds of blackjack.

Overview

My program was written in two separate files “main.py” and “elements.py” to keep the conformity of logic and ease of understanding the design. The main of course is comprised of the game structure and the elements are comprised of the elements required to play the actual game.

Elements Description: As mentioned above the elements.py file was created to keep conformity to the basic elements of the game separate from the games logic for ease of understanding the code and for making changes as I developed program. The first element in which I had to create was a “get one deck” function, a deck of cards contain four separate suits and are ranked individually. I chose to use a library for creating my deck of cards because I was able to rank each individual cards value and then assign it to a suite using the traditional suite symbols clubs, hearts, diamonds, and spades using a for loop. I then chose to use the “Random.suffle” function to shuffle each deck of cards before being placed in the shoe, more about this in the main.py description.

Next, I created a shoe class which contained the private variable cards and the private variable index to keep track of the cards placed in the shoe. I used a for loop to keep track of the individual cards and suite the card in the shoe, the range or number of decks of cards are determined using a random 4 to 8 functions inside of main. I then created a simple deal function within the shoe class that allows the dealer to deal one card at a time from the top of the deck.

The next element I created was the player class which deals with all the attributes needed of a player playing Blackjack; name, cards he is delt, ability to place bets, and a random amount of chips given to each player between $500 and $5000 dollars to bet with, all of which are private variables. I then created several functions that use the

private variables to do various things such as keep their bank totals, place bets, collect bets, hold cards, decide to hit or stand, total cards to know if they need to stand, hit bust or blackjack.

I created a dealer class that also worked in a similar way. The dealer class was comprised of several private variables, name, cards, and chips. I used these private variables in several functions that allowed the dealer to perform the basic operations that a dealer would be expected to do in a blackjack game. I created a bank of chips for him that totaled $500000. Which assured that the dealer would always be able to cover the bets being placed on the table. I made a function to either payout or collect at the end of each round. Another function to reset the cards at the end of each round , I created a function with a if loop to determine if the dealer should hit or stand based on if the card total of 17, or if the dealer hit a blackjack. Finally for the dealer I created two display functions to display his hand at the end of each round faceup and face down.

BlackJackMain Description: This file contains the game structure which has been automated to help narrow the amount of unnecessary overhead in coding that would be required if the game was actually being played by user inputs. The first section calls for the import of elements from the element file discussed above, in addition I declared several global variables such as random, shoe and dealer. Before the game is played a random numbers of players are determined between 1 and 6 players who are named player_1 through player_6 and are randomly given a bank between $500 and $5000 dollars.

The first hand begins with each player placing a bet and verifying that the player has enough chips to cover the bet, then a freshly shuffled shoe of cards is delt by the dealer one card at a time to each player and himself, the dealers card are delt face down. The second hand is delt after the first hand is completely delt again one card at a time from left the right and finally to the dealer which is delt face down.

The next hand verifies if the player is going to hit, or stand based on the hand that was delt to the player if less than17 the player hits and an additional card is delt to the player. If the players cards total equal or is greater than 17 the player stands and is skipped from being delt another card. Once all the players who hit are delt a third card they players hand are reevaluated to make sure that none of the players are below the 17 threshold and delt another card. This reoccurs until the condition is meet at which time the dealer faces up his hand and makes sure his condition is met before calling the hand. Each player is playing against the dealer not each other so if the players hand is more than the dealer and not over 21 the player wins and is paid out 2:1 on all hard hands that beat the dealer and 3:1 for any blackjack wins. All bets are either paid out or collected at the end of each game and added to the respective bank.

This procedure happens for 9 more rounds or games or until all players have lost or have been ejected from play based on the minimal bank. At the conclusion of 10 rounds the back is displayed for each player and dealer and then the user who initiated the program is asked if they would like to play any additional rounds using a try block to verify the users input was valid.

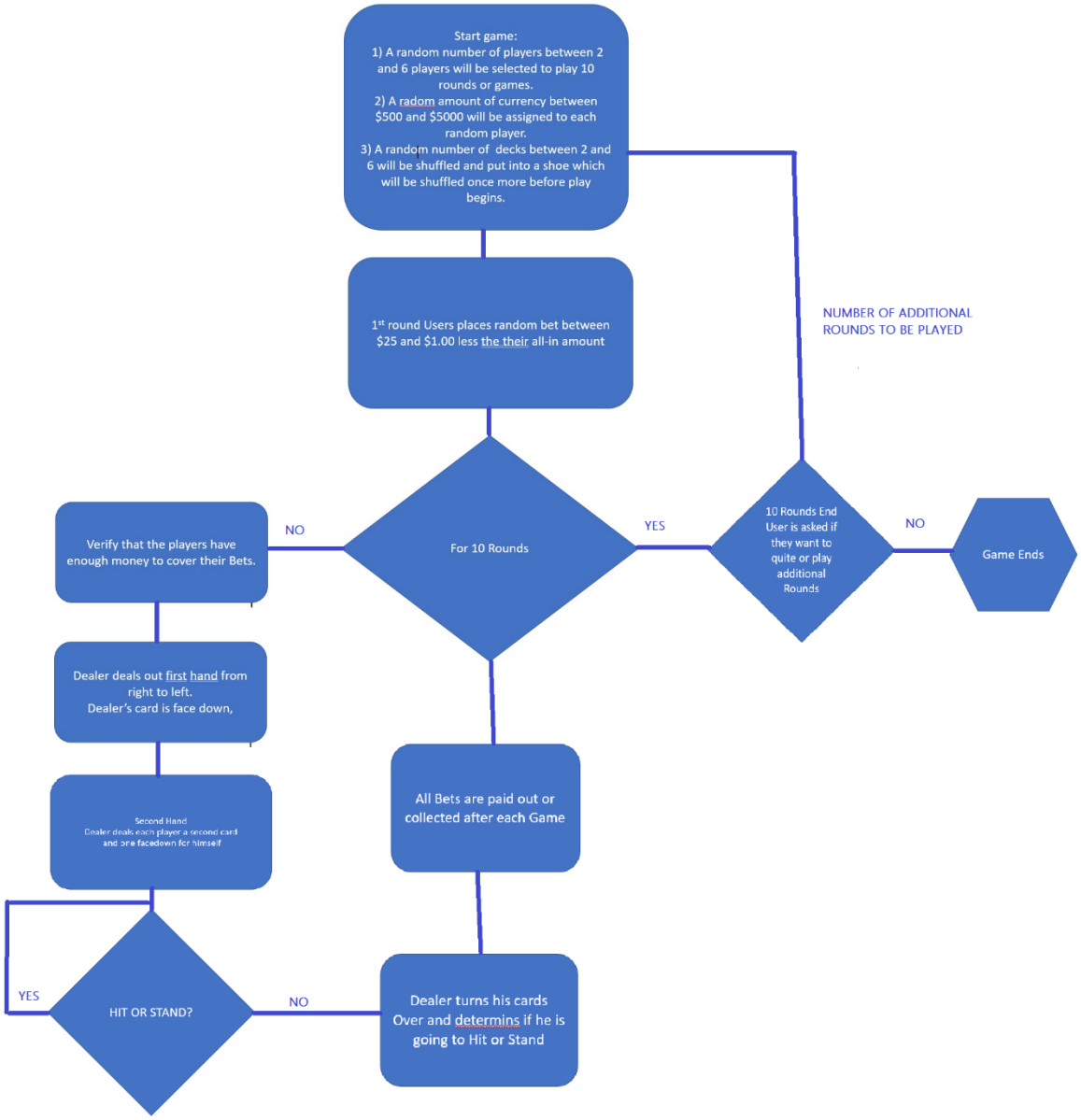
Conclusion and limitations: This program was designed to demonstrate the coding of Python that we learned this semester and is not intended to be played as a wagering game, it is just a show of competence on the programmers' behalf. In a real Blackjack game, there are many elements to consider and this program only accounts for a fraction of those elements.

One of the short falls in this program is it does not allow for exception handling this is the main reason it was automated to simplify any exceptions that might occur if it was a user input game. Even with automation there are exceptions that could cause the program to crash one of these exceptions is that there is always a possibility that the random number of decks in the shoe could be less then needed to complete 10 rounds, especially if the maximum number of players is randomly selected and the minimum number of decks of cards are randomly selected. In this case I could have programed in an exception that would place the used cards back into the shoe and be reshuffled for additional play. I did take this factor into account when I added a try block at the end of the game which asked the user if they wanted to play additional rounds but if for some reason the user said 100 rounds then the game would eventually run out of cards. Other issue where I should have put an exception error or try block is when the program initializes and writes an output file for the shoe shuffle. If for any reason the file is not able to be created the program crashes which is what I encounter on the last debug.

Obviously, there is always room to improve code but as previously mentioned this program was an exercise to demonstrate my understanding of the concepts of python programming as it was presented in this course. As my programing skills improve and I develop a better understanding of the programming language I am sure I will look back at this program and see where I could have and probably should have spent more time developing it.

Running the program: There are two program files in the Blackjack Project folder BlackJackMain.py and elements.py the executable file is BlackJackMain.py and should run on any Python 3 compiler. Additionally once the program is executed within this folder there will be an output file written that displays the random shoe shuffle for that game. Enjoy!

Flow Chart


Start game:
1) A random number of players between 2 and 6 players will be selected to play 10 rounds or games.
2) A radom amount of currency between $500 and $5000 will be assigned to each random player.
3) A random number of decks between 2 and 6 will be shuffled and put into a shoe which will be shuffled once more before play begins.
1st round Users places random bet between $25 and $1.00 less the their all-in amount
For 10 Rounds
NO
YES
Verify that the players have enough money to cover their Bets.
10 Rounds End User is asked if they want to quite or play additional Rounds
NO
Game Ends
NUMBER OF ADDITIONAL ROUNDS TO BE PLAYED
Dealer deals out first hand from right to left.
Dealer's card is face down,
Second Hand
Dealer deals each player a second card and one facedown for himself
All Bets are paid out or collected after each Game
YES
HIT OR STAND?
NO
Dealer turns his cards Over and determins if he is going to Hit or Stand

Program Output:

Python 3.10.2 (tags/v3.10.2:a58ebcc, Jan 17 2022, 14:12:15) [MSC v.1929 64 bit (AMD64)] on win32

Type "help", "copyright", "credits" or "license()" for more information.

===== RESTART: C:\Users\William\Desktop\Blackjack Project\BlackJackMain.py =====

There will be 6 players playing 10 rounds

Player1 , your bank is: $ 960

Player2 , your bank is: $ 4369

Player3 , your bank is: $ 3920

Player4 , your bank is: $ 3397

Player5 , your bank is: $ 1566

Player6 , your bank is: $ 1981

********** Game 1 **********

Player1 bets $ 587

Player2 bets $ 2466

Player3 bets $ 1244

Player4 bets $ 2168

Player5 bets $ 949

Player6 bets $ 1366

========== 1st hand ==========

Player1: cards= ['6 ♣'], sum = 6

Player2: cards= ['K ♣'], sum = 10

Player3: cards= ['2 ♠'], sum = 2

Player4: cards= ['10 ♥'], sum = 10

Player5: cards= ['10 ♦'], sum = 10

Player6: cards= ['3 ♦'], sum = 3

Dealer: cards= ['FaceDown']

========== 2nd hand ==========

Player1: cards= ['6 ♣', '10 ♠'], sum = 16

Player2: cards= ['K ♣', '5 ♥'], sum = 15

Player3: cards= ['2 ♠', '5 ♦'], sum = 7

Player4: cards= ['10 ♥', '4 ♥'], sum = 14

Player5: cards= ['10 ♦', '2 ♦'], sum = 12

Player6: cards= ['3 ♦', 'K ♦'], sum = 13

Dealer: cards= ['FaceDown', '8 ♦']

========== next hand ==========

Player1: cards= ['6 ♣', '10 ♠', '2 ♥'], sum = 18 (final hand value)

Player2: cards= ['K ♣', '5 ♥', 'A ♦'], sum = 16

Player3: cards= ['2 ♠', '5 ♦', '3 ♠'], sum = 10

Player4: cards= ['10 ♥', '4 ♥', 'Q ♠'], sum = 24 (bust)

Player5: cards= ['10 ♦', '2 ♦', 'J ♦'], sum = 22 (bust)

Player6: cards= ['3 ♦', 'K ♦', '8 ♥'], sum = 21 (blackjack)

========== next hand ==========

Player3: cards= ['2 ♠', '5 ♦', '3 ♠', '5 ♦'], sum = 15

========== next hand ==========

Player3: cards= ['2 ♠', '5 ♦', '3 ♠', '5 ♦', '6 ♣'], sum = 21 (blackjack)

========== next hand ==========

(Dealer's hand)

Dealer: cards= ['Q ♦', '8 ♦'], sum = 18 (final hand value)

========== Money paid or collected ==========

Player2 loses by $2466. (Player2 has $1903, dealer has $502466)

Player3 wins by $3732. (Player3 has $7652, dealer has $498734)

Player4 loses by $2168. (Player4 has $1229, dealer has $500902)

Player5 loses by $949. (Player5 has $617, dealer has $501851)

Player6 wins by $4098. (Player6 has $6079, dealer has $497753)

********** Game 2 **********

Player1 bets $ 394

Player2 bets $ 1680

Player3 bets $ 3692

Player4 bets $ 444

Player5 bets $ 238

Player6 bets $ 1560

========== 1st hand ==========

Player1: cards= ['A ♠'], sum = 1

Player2: cards= ['4 ♠'], sum = 4

Player3: cards= ['J ♥'], sum = 10

Player4: cards= ['5 ♥'], sum = 5

Player5: cards= ['7 ♣'], sum = 7

Player6: cards= ['J ♠'], sum = 10

Dealer: cards= ['FaceDown']

========== 2nd hand ==========

Player1: cards= ['A ♠', '2 ♣'], sum = 3

Player2: cards= ['4 ♠', '5 ♥'], sum = 9

Player3: cards= ['J ♥', 'A ♠'], sum = 11

Player4: cards= ['5 ♥', '3 ♠'], sum = 8

Player5: cards= ['7 ♣', '10 ♣'], sum = 17 (final hand value)

Player6: cards= ['J ♠', '7 ♥'], sum = 17 (final hand value)

Dealer: cards= ['FaceDown', 'K ♠']

========== next hand ==========

Player1: cards= ['A ♠', '2 ♣', 'A ♦'], sum = 4

Player2: cards= ['4 ♠', '5 ♥', 'A ♣'], sum = 10

Player4: cards= ['5 ♥', '3 ♠', '4 ♥'], sum = 12

========== next hand ==========

Player1: cards= ['A ♠', '2 ♣', 'A ♦', '7 ♠'], sum = 11

Player4: cards= ['5 ♥', '3 ♠', '4 ♥', '7 ♥'], sum = 19 (final hand value)

========== next hand ==========

(Dealer's hand)

Dealer: cards= ['6 ♦', 'K ♠'], sum = 16

Dealer: cards= ['6 ♦', 'K ♠', '2 ♦'], sum = 18 (final hand value)

========== Money paid or collected ==========

Player1 loses by $394. (Player1 has $566, dealer has $498147)

Player2 loses by $1680. (Player2 has $223, dealer has $499827)

Player3 loses by $3692. (Player3 has $3960, dealer has $503519)

Player4 wins by $888. (Player4 has $2117, dealer has $502631)

Player5 loses by $238. (Player5 has $379, dealer has $502869)

Player6 loses by $1560. (Player6 has $4519, dealer has $504429)

********** Game 3 **********

Player1 bets $ 359

Player2 bets $ 110

Player3 bets $ 3337

Player4 bets $ 2095

Player5 bets $ 93

Player6 bets $ 3251

========== 1st hand ==========

Player1: cards= ['9 ♦'], sum = 9

Player2: cards= ['9 ♥'], sum = 9

Player3: cards= ['J ♣'], sum = 10

Player4: cards= ['2 ♣'], sum = 2

Player5: cards= ['10 ♦'], sum = 10

Player6: cards= ['K ♦'], sum = 10

Dealer: cards= ['FaceDown']

========== 2nd hand ==========

Player1: cards= ['9 ♦', 'J ♥'], sum = 19 (final hand value)

Player2: cards= ['9 ♥', '6 ♦'], sum = 15

Player3: cards= ['J ♣', '4 ♥'], sum = 14

Player4: cards= ['2 ♣', '9 ♠'], sum = 11

Player5: cards= ['10 ♦', '6 ♦'], sum = 16

Player6: cards= ['K ♦', '4 ♥'], sum = 14

Dealer: cards= ['FaceDown', '9 ♦']

========== next hand ==========

Player2: cards= ['9 ♥', '6 ♦', '2 ♥'], sum = 17 (final hand value)

Player3: cards= ['J ♣', '4 ♥', '4 ♥'], sum = 18 (final hand value)

Player4: cards= ['2 ♣', '9 ♠', '7 ♣'], sum = 18 (final hand value)

Player5: cards= ['10 ♦', '6 ♦', 'Q ♥'], sum = 26 (bust)

Player6: cards= ['K ♦', '4 ♥', '4 ♦'], sum = 18 (final hand value)

========== next hand ==========

(Dealer's hand)

Dealer: cards= ['3 ♣', '9 ♦'], sum = 12

Dealer: cards= ['3 ♣', '9 ♦', '2 ♠'], sum = 14

Dealer: cards= ['3 ♣', '9 ♦', '2 ♠', '5 ♠'], sum = 19 (final hand value)

========== Money paid or collected ==========

Player2 loses by $110. (Player2 has $113, dealer has $504539)

Player3 loses by $3337. (Player3 has $623, dealer has $507876)

Player4 loses by $2095. (Player4 has $22, dealer has $509971)

Player5 loses by $93. (Player5 has $286, dealer has $510064)

Player6 loses by $3251. (Player6 has $1268, dealer has $513315)

********** Game 4 **********

Player1 bets $ 277

Player2 bets $ 43

Player3 bets $ 398

Player5 bets $ 249

Player6 bets $ 263

========== 1st hand ==========

Player1: cards= ['Q ♥'], sum = 10

Player2: cards= ['5 ♦'], sum = 5

Player3: cards= ['5 ♣'], sum = 5

Player5: cards= ['J ♣'], sum = 10

Player6: cards= ['10 ♣'], sum = 10

Dealer: cards= ['FaceDown']

========== 2nd hand ==========

Player1: cards= ['Q ♥', '2 ♣'], sum = 12

Player2: cards= ['5 ♦', '10 ♣'], sum = 15

Player3: cards= ['5 ♣', 'A ♦'], sum = 6

Player5: cards= ['J ♣', '9 ♦'], sum = 19 (final hand value)

Player6: cards= ['10 ♣', 'K ♠'], sum = 20 (final hand value)

Dealer: cards= ['FaceDown', '4 ♥']

========== next hand ==========

Player1: cards= ['Q ♥', '2 ♣', 'Q ♣'], sum = 22 (bust)

Player2: cards= ['5 ♦', '10 ♣', '5 ♠'], sum = 20 (final hand value)

Player3: cards= ['5 ♣', 'A ♦', '10 ♠'], sum = 16

========== next hand ==========

(Dealer's hand)

Dealer: cards= ['A ♠', '4 ♥'], sum = 5

Dealer: cards= ['A ♠', '4 ♥', '3 ♥'], sum = 8

========== Money paid or collected ==========

Player1 loses by $277. (Player1 has $289, dealer has $513592)

Player2 wins by $86. (Player2 has $199, dealer has $513506)

Player3 wins by $796. (Player3 has $1419, dealer has $512710)

Player5 wins by $498. (Player5 has $784, dealer has $512212)

Player6 wins by $526. (Player6 has $1794, dealer has $511686)

********** Game 5 **********

Player1 bets $ 195

Player2 bets $ 141

Player3 bets $ 870

Player5 bets $ 597

Player6 bets $ 514

========== 1st hand ==========

Player1: cards= ['9 ♠'], sum = 9

Player2: cards= ['3 ♣'], sum = 3

Player3: cards= ['4 ♣'], sum = 4

Player5: cards= ['5 ♣'], sum = 5

Player6: cards= ['2 ♠'], sum = 2

Dealer: cards= ['FaceDown']

========== 2nd hand ==========

Player1: cards= ['9 ♠', 'K ♣'], sum = 19 (final hand value)

Player2: cards= ['3 ♣', '5 ♥'], sum = 8

Player3: cards= ['4 ♣', '9 ♥'], sum = 13

Player5: cards= ['5 ♣', '5 ♥'], sum = 10

Player6: cards= ['2 ♠', 'A ♣'], sum = 3

Dealer: cards= ['FaceDown', 'A ♥']

========== next hand ==========

Player2: cards= ['3 ♣', '5 ♥', '6 ♥'], sum = 14

Player3: cards= ['4 ♣', '9 ♥', '8 ♣'], sum = 21 (blackjack)

Player5: cards= ['5 ♣', '5 ♥', 'Q ♦'], sum = 20 (final hand value)

Player6: cards= ['2 ♠', 'A ♣', '2 ♠'], sum = 5

========== next hand ==========

Player2: cards= ['3 ♣', '5 ♥', '6 ♥', '2 ♣'], sum = 16

Player6: cards= ['2 ♠', 'A ♣', '2 ♠', '9 ♥'], sum = 14

========== next hand ==========

Player2: cards= ['3 ♣', '5 ♥', '6 ♥', '2 ♣', 'K ♦'], sum = 26 (bust)

========== next hand ==========

(Dealer's hand)

Dealer: cards= ['J ♦', 'A ♥'], sum = 11

========== Money paid or collected ==========

Player1 wins by $390. (Player1 has $679, dealer has $511296)

Player2 loses by $141. (Player2 has $58, dealer has $511437)

Player3 wins by $2610. (Player3 has $4029, dealer has $508827)

Player5 wins by $1194. (Player5 has $1978, dealer has $507633)

Player6 wins by $1028. (Player6 has $2822, dealer has $506605)

********** Game 6 **********

Player1 bets $ 632

Player2 bets $ 54

Player3 bets $ 2502

Player5 bets $ 956

Player6 bets $ 585

========== 1st hand ==========

Player1: cards= ['6 ♦'], sum = 6

Player2: cards= ['4 ♣'], sum = 4

Player3: cards= ['7 ♥'], sum = 7

Player5: cards= ['J ♣'], sum = 10

Player6: cards= ['A ♣'], sum = 1

Dealer: cards= ['FaceDown']

========== 2nd hand ==========

Player1: cards= ['6 ♦', '2 ♥'], sum = 8

Player2: cards= ['4 ♣', 'Q ♥'], sum = 14

Player3: cards= ['7 ♥', '7 ♣'], sum = 14

Player5: cards= ['J ♣', '3 ♦'], sum = 13

Player6: cards= ['A ♣', '8 ♣'], sum = 9

Dealer: cards= ['FaceDown', '4 ♦']

========== next hand ==========

Player1: cards= ['6 ♦', '2 ♥', 'A ♦'], sum = 9

Player2: cards= ['4 ♣', 'Q ♥', '8 ♥'], sum = 22 (bust)

Player3: cards= ['7 ♥', '7 ♣', '8 ♠'], sum = 22 (bust)

Player5: cards= ['J ♣', '3 ♦', '6 ♠'], sum = 19 (final hand value)

========== next hand ==========

(Dealer's hand)

Dealer: cards= ['K ♥', '4 ♦'], sum = 14

Dealer: cards= ['K ♥', '4 ♦', '10 ♦'], sum = 24 (bust)

========== Money paid or collected ==========

Player1 wins by $1264. (Player1 has $1943, dealer has $505341)

Player5 wins by $1912. (Player5 has $3890, dealer has $503429)

Player6 wins by $1170. (Player6 has $3992, dealer has $502259)

********** Game 7 **********

Player1 bets $ 832

Player2 bets $ 41

Player3 bets $ 2125

Player5 bets $ 1218

Player6 bets $ 3585

========== 1st hand ==========

Player1: cards= ['3 ♣'], sum = 3

Player2: cards= ['9 ♣'], sum = 9

Player3: cards= ['Q ♥'], sum = 10

Player5: cards= ['3 ♦'], sum = 3

Player6: cards= ['K ♥'], sum = 10

Dealer: cards= ['FaceDown']

========== 2nd hand ==========

Player1: cards= ['3 ♣', 'A ♥'], sum = 4

Player2: cards= ['9 ♣', '9 ♠'], sum = 18 (final hand value)

Player3: cards= ['Q ♥', '6 ♥'], sum = 16

Player5: cards= ['3 ♦', 'A ♠'], sum = 4

Player6: cards= ['K ♥', '5 ♣'], sum = 15

Dealer: cards= ['FaceDown', '9 ♥']

========== next hand ==========

Player1: cards= ['3 ♣', 'A ♥', 'Q ♣'], sum = 14

Player3: cards= ['Q ♥', '6 ♥', 'J ♦'], sum = 26 (bust)

Player5: cards= ['3 ♦', 'A ♠', '4 ♠'], sum = 8

Player6: cards= ['K ♥', '5 ♣', 'A ♣'], sum = 16

========== next hand ==========

(Dealer's hand)

Dealer: cards= ['A ♣', '9 ♥'], sum = 10

========== Money paid or collected ==========

Player1 wins by $1664. (Player1 has $3607, dealer has $500595)

Player2 wins by $82. (Player2 has $140, dealer has $500513)

Player3 loses by $2125. (Player3 has $1904, dealer has $502638)

Player5 loses by $1218. (Player5 has $2672, dealer has $503856)

Player6 wins by $7170. (Player6 has $11162, dealer has $496686)

********** Game 8 **********

Player1 bets $ 2490

Player2 bets $ 45

Player3 bets $ 1229

Player5 bets $ 1046

Player6 bets $ 6194

========== 1st hand ==========

Player1: cards= ['4 ♣'], sum = 4

Player2: cards= ['10 ♥'], sum = 10

Player3: cards= ['J ♣'], sum = 10

Player5: cards= ['4 ♣'], sum = 4

Player6: cards= ['10 ♣'], sum = 10

Dealer: cards= ['FaceDown']

========== 2nd hand ==========

Player1: cards= ['4 ♣', '5 ♣'], sum = 9

Player2: cards= ['10 ♥', '4 ♦'], sum = 14

Player3: cards= ['J ♣', 'Q ♠'], sum = 20 (final hand value)

Player5: cards= ['4 ♣', '5 ♠'], sum = 9

Player6: cards= ['10 ♣', 'K ♠'], sum = 20 (final hand value)

Dealer: cards= ['FaceDown', 'J ♦']

========== next hand ==========

Player1: cards= ['4 ♣', '5 ♣', '5 ♦'], sum = 14

Player2: cards= ['10 ♥', '4 ♦', 'Q ♦'], sum = 24 (bust)

Player5: cards= ['4 ♣', '5 ♠', '8 ♥'], sum = 17 (final hand value)

========== next hand ==========

Player1: cards= ['4 ♣', '5 ♣', '5 ♦', 'K ♥'], sum = 24 (bust)

========== next hand ==========

(Dealer's hand)

Dealer: cards= ['2 ♣', 'J ♦'], sum = 12

Dealer: cards= ['2 ♣', 'J ♦', '9 ♣'], sum = 21 (blackjack)

========== Money paid or collected ==========

Player1 loses by $2490. (Player1 has $1117, dealer has $499176)

Player2 loses by $45. (Player2 has $95, dealer has $499221)

Player3 loses by $1229. (Player3 has $675, dealer has $500450)

Player5 loses by $1046. (Player5 has $1626, dealer has $501496)

Player6 loses by $6194. (Player6 has $4968, dealer has $507690)

********** Game 9 **********

Player1 bets $ 341

Player2 bets $ 83

Player3 bets $ 419

Player5 bets $ 1220

Player6 bets $ 3899

========== 1st hand ==========

Player1: cards= ['Q ♦'], sum = 10

Player2: cards= ['K ♠'], sum = 10

Player3: cards= ['8 ♥'], sum = 8

Player5: cards= ['7 ♦'], sum = 7

Player6: cards= ['A ♥'], sum = 1

Dealer: cards= ['FaceDown']

========== 2nd hand ==========

Player1: cards= ['Q ♦', '5 ♣'], sum = 15

Player2: cards= ['K ♠', 'Q ♠'], sum = 20 (final hand value)

Player3: cards= ['8 ♥', '5 ♥'], sum = 13

Player5: cards= ['7 ♦', '7 ♠'], sum = 14

Player6: cards= ['A ♥', 'K ♥'], sum = 11

Dealer: cards= ['FaceDown', 'Q ♣']

========== next hand ==========

Player1: cards= ['Q ♦', '5 ♣', '8 ♦'], sum = 23 (bust)

Player3: cards= ['8 ♥', '5 ♥', '7 ♦'], sum = 20 (final hand value)

Player5: cards= ['7 ♦', '7 ♠', 'A ♠'], sum = 15

========== next hand ==========

(Dealer's hand)

Dealer: cards= ['9 ♦', 'Q ♣'], sum = 19 (final hand value)

========== Money paid or collected ==========

Player1 loses by $341. (Player1 has $776, dealer has $508031)

Player2 wins by $166. (Player2 has $261, dealer has $507865)

Player3 wins by $838. (Player3 has $1513, dealer has $507027)

Player5 loses by $1220. (Player5 has $406, dealer has $508247)

Player6 loses by $3899. (Player6 has $1069, dealer has $512146)

********** Game 10 **********

Player1 bets $ 99

Player2 bets $ 148

Player3 bets $ 1391

Player5 bets $ 196

Player6 bets $ 94

========== 1st hand ==========

Player1: cards= ['6 ♦'], sum = 6

Player2: cards= ['9 ♠'], sum = 9

Player3: cards= ['8 ♠'], sum = 8

Player5: cards= ['3 ♥'], sum = 3

Player6: cards= ['4 ♠'], sum = 4

Dealer: cards= ['FaceDown']

========== 2nd hand ==========

Player1: cards= ['6 ♦', '6 ♠'], sum = 12

Player2: cards= ['9 ♠', '10 ♠'], sum = 19 (final hand value)

Player3: cards= ['8 ♠', 'K ♣'], sum = 18 (final hand value)

Player5: cards= ['3 ♥', 'J ♦'], sum = 13

Player6: cards= ['4 ♠', '6 ♠'], sum = 10

Dealer: cards= ['FaceDown', 'J ♥']

============== next hand ==============

Player1: cards= ['6 ♦', '6 ♠', '7 ♣'], sum = 19 (final hand value)

Player5: cards= ['3 ♥', 'J ♦', 'K ♣'], sum = 23 (bust)

Player6: cards= ['4 ♠', '6 ♠', '8 ♦'], sum = 18 (final hand value)

============== next hand ==============

(Dealer's hand)

Dealer: cards= ['A ♦', 'J ♥'], sum = 11

============== Money paid or collected ==============

Player1 wins by $198. (Player1 has $974, dealer has $511948)

Player2 wins by $296. (Player2 has $557, dealer has $511652)

Player3 wins by $2782. (Player3 has $4295, dealer has $508870)

Player5 loses by $196. (Player5 has $210, dealer has $509066)

Player6 wins by $188. (Player6 has $1257, dealer has $508878)

How many more rounds you want to play ? (0 for quit)

File Output

6 ♣

K ♣

2 ♠

10 ♥

10 ♦

3 ♦

Q ♦

10 ♠

5 ♥

5 ♦

4 ♥

2 ♦

K ♦

8 ♦

2 ♥

A ♦

3 ♠

Q ♠

J ♦

8 ♥

5 ♦

6 ♣

A ♠

4 ♠

J ♥

5 ♥

7 ♣

J ♠

6 ♦

2 ♣

5 ♥

A ♠

3 ♠

10 ♣

7 ♥

K ♠

A ♦

A ♣

4 ♥

7 ♠

7 ♥

2 ♦

9 ♦

9 ♥

J ♣

2 ♣

10 ♦

K ♦

3 ♣

J ♥

6 ♦

4 ♥

9 ♠

6 ♦

4 ♥

9 ♦

2 ♥

4 ♥

7 ♣

Q ♥

4 ♦

2 ♠

5 ♠

Q ♥

5 ♦

5 ♣

J ♣

10 ♣

A ♠

2 ♣

10 ♣

A ♦

9 ♦

K ♠

4 ♥

Q ♣

5 ♠

10 ♠

3 ♥

9 ♠

3 ♣

4 ♣

5 ♣

2 ♠

J ♦

K ♣

5 ♥

9 ♥

5 ♥

A ♣

A ♥

6 ♥

8 ♣

Q ♦

2 ♠

2 ♣

9 ♥

K ♦

6 ♦

4 ♣

7 ♥

J ♣

A ♣

K ♥

2 ♥

Q ♥

7 ♣

3 ♦

8 ♣

4 ♦

A ♦

8 ♥

8 ♠

6 ♠

10 ♦

3 ♣

9 ♣

Q ♥

3 ♦

K ♥

A ♣

A ♥

9 ♠

6 ♥

A ♠

5 ♣

9 ♥

Q ♣

J ♦

4 ♠

A ♣

4 ♣

10 ♥

J ♣

4 ♣

10 ♣

2 ♣

5 ♣

4 ♦

Q ♠

5 ♠

K ♠

J ♦

5 ♦

Q ♦

8 ♥

K ♥

9 ♣

Q ♦

K ♠

8 ♥

7 ♦

A ♥

9 ♦

5 ♣

Q ♠

5 ♥

7 ♠

K ♥

Q ♣

8 ♦

7 ♦

A ♠

6 ♦

9 ♠

8 ♠

3 ♥

4 ♠

A ♦

6 ♠

10 ♠

K ♣

J ♦

6 ♠

J ♥

7 ♣

K ♣

8 ♦

6 ♦

8 ♠

A ♠

Q ♠

8 ♣

J ♥

4 ♣

9 ♥

10 ♥

10 ♠

10 ♦

A ♥

9 ♦

2 ♠

6 ♥

A ♥

K ♣

8 ♠

A ♥

A ♣

9 ♣

Q ♦

9 ♣

8 ♣

3 ♦

5 ♠

10 ♥

5 ♦

3 ♥

2 ♣

10 ♣

10 ♦

K ♥

J ♥

3 ♦

4 ♠

2 ♦

Q ♠

A ♦

J ♠

3 ♥

6 ♠

3 ♦

8 ♦

Q ♦

4 ♠

J ♥

3 ♠

2 ♥

3 ♥

7 ♥

7 ♣

K ♠

9 ♣

10 ♦

10 ♠

5 ♦

10 ♠

2 ♠

8 ♦

A ♣

9 ♠

3 ♣

7 ♥

8 ♣

6 ♠

6 ♠

J ♠

10 ♦

9 ♣

J ♦

7 ♠

K ♣

3 ♠

J ♥

7 ♦

6 ♣

Q ♥

2 ♥

4 ♠

K ♦

8 ♠

5 ♣

4 ♦

K ♦

Q ♠

J ♦

K ♠

2 ♦

K ♠

2 ♠

7 ♠

2 ♣

6 ♣

7 ♦

6 ♥

7 ♠

A ♠

2 ♦

4 ♦

3 ♠

10 ♥

3 ♠

J ♣

Q ♣

8 ♥

5 ♠

6 ♥

9 ♥

A ♥

3 ♥

K ♥

6 ♣

3 ♦

6 ♠

9 ♠

10 ♠

2 ♦

4 ♥

4 ♦

5 ♦

3 ♥

Q ♣

6 ♥

6 ♥

10 ♥

2 ♥

9 ♥

8 ♥

9 ♣

A ♦

Q ♣

3 ♣

8 ♠

4 ♣

4 ♣

6 ♦

8 ♦

J ♠

7 ♥

J ♣

K ♥

7 ♣

Q ♥

2 ♦

4 ♦

J ♠

9 ♠

2 ♥

6 ♣

5 ♣

J ♠

K ♦

Q ♠

K ♣

9 ♦

J ♣

7 ♠

5 ♠

4 ♠

7 ♦

10 ♣

K ♦

3 ♣

Q ♥

10 ♥

3 ♠

9 ♦

8 ♣

8 ♣

7 ♥

J ♠

Q ♣

3 ♣

7 ♠

6 ♣

Q ♦

8 ♥

8 ♦

7 ♦

10 ♣

7 ♦

8 ♠

7 ♣

5 ♥

5 ♠