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Aim

Implement a text-based card game called **Blackjack**, also known as **21**.

Total Calculation

A player's total hand value is calculated by adding the values of each their cards. Face cards, such as Jacks, Queens and Kings are all worth 10. The Ace is an unusual card because, if the combined value with other cards in hand does not exceed 21, it will be worth 11, otherwise the Ace will be worth 1. Other number cards are worth the number value shown on the card.

Implementation

In a standard game of 2-player Blackjack the player and the dealer are dealt 2 cards. The player shows both cards face-up. The dealer shows one of their cards face-up and one face-down. The player

decides to draw cards by saying, "hit", or stop drawing cards by saying, "stand". They will draw cards trying to get their total hand value as close to 21 as possible without going over. If the total value of cards in their hand exceeds 21, the player "busts", which means they lose. If the player has not "bust" and they decide to "stand", then it is the dealer's turn to draw cards. The dealer has a special rule that, as soon as their hand value is equal to or greater than 17, they must "stand". If the dealer exceeds 21, the dealer will "bust", which means the player wins. It is possible that both the player and dealer end with the same hand value, in which case the game is tied and this is called, "push".

In this implementation, if either player gets 21 in their first hand of 2 cards, they get "blackjack", which means they win immediately. If the dealer has blackjack, they will reveal their second card, and it will be game over. If both players have blackjack in their first hand, it will be a "two player blackjack", which means the game is tied, "push". If neither player has blackjack in their opening hand, the player will play. If the player busts, the dealer will reveal their second card and win automatically, otherwise the dealer will play. If the dealer busts, the player wins, otherwise they decide the winner by comparing their hand totals; the highest hand total wins.

In this implementation, after the player quits the game, the player's name and average wins will be added to a text file. If their win percentage is higher than all other scores in the file, the game will display, "New High Score!", and display a table containing all players and their recorded scores.

Algorithm

1. The player and the dealer are dealt an initial hand of two cards each. The player shows both cards. The dealer shows only one card.
2. If the dealer has Blackjack (the first two cards dealt total 21 points) and the player does not, the dealer automatically wins.
3. If the player has Blackjack (the first two cards dealt total 21 points) and the dealer does not, the player automatically wins.
4. If both the player and the dealer have Blackjack (the first two cards dealt total 21 points) then it is a push (draw).
5. If neither have Blackjack, the player then plays out their hand. Note that the term Blackjack can only be achieved as a result of the first two cards dealt.
6. When the player has finished playing out their hand, the dealer (in this case the computer) plays out the dealer's hand.
7. During the player's turn, the player is faced with two options either:

- Hit (take a card): After the initial deal of two cards, a player may choose to receive additional cards as many times as they wish, adding the point value of each card to their hand total.
- Stand (end their turn): Do not receive any more cards. The player's turn is over.

8. The player repeatedly takes a card until, the player chooses to stand, or the player busts i.e., exceeds a total of 21. The player's turn is over after deciding to stand or if they bust.
9. Once the player has finished, if the player has not bust, the dealer reveals their hidden second card and plays out their hand. The dealer must hit until they have a point value of 17 or greater.

Rules

- If the player busts, they lose immediately.
- If the player and the dealer have the same point value, it is called a "push" and neither win the hand (draw).

- An initial two-card deal of 21 (an 11 plus a 10) in the very first hand is called Blackjack and wins the round automatically.
- An Ace counts as eleven (11) points unless this would cause the player/dealer to bust, in which case it is one (1) point.
- The dealer must hit until they have a point value of 17 or greater.
- The player with the higher hand that does not exceed 21 wins the game!

Sample Output

```
--------- Welcome to Blackjack ---------

File   : main.py
Author : Tan Duc Mai
Email  : tan.duc.work@gmail.com

Do you want to play blackjack (y/n): y
Enter your name: Royal

Dealer's hand: 3 of Diamonds
Hand Total: (3)

Royal's hand: 6 of Clubs, 6 of Spades
Hand Total: (12)

Do you want to hit or stand (h/s): h

Royal's hand: 6 of Clubs, 6 of Spades, 8 of Diamonds
Hand Total: (20)

Do you want to hit or stand (h/s): s

Dealer's hand: 3 of Diamonds, 4 of Clubs
Hand Total: (7)

Press "Enter" to continue...

Dealer's hand: 3 of Diamonds, 4 of Clubs, 10 of Diamonds
Hand Total: (17)

Press "Enter" to continue...

Dealer: 17 Royal: 20 -> Royal wins!

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Do you want to play again (y/n): y

Dealer's hand: 3 of Hearts
Hand Total: (3)
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Royal's hand: 2 of Diamonds, Ace of Diamonds
Hand Total: (13)

Do you want to hit or stand (h/s): s

Dealer's hand: 3 of Hearts, 10 of Clubs
Hand Total: (13)

Press "Enter" to continue...

Dealer's hand: 3 of Hearts, 10 of Clubs, 8 of Hearts
Hand Total: (21)

Press "Enter" to continue...

Dealer: 21 Royal: 13 -> Dealer wins!

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Would you like to play again (y/n): y

Dealer's hand: 7 of Diamonds
Hand Total: (7)

Royal's hand: King of Diamonds, 9 of Spades
Hand Total: (19)

Do you want to hit or stand (h/s): s

Dealer's hand: 7 of Diamonds, 3 of Diamonds
Hand Total: (10)

Press "Enter" to continue...

Dealer's hand: 7 of Diamonds, 3 of Diamonds, 9 of Diamonds
Hand Total: (19)

Press "Enter" to continue...

Dealer: 19 Royal: 19 -> Push!

----------------------------------------

Do you want to play again (y/n): n

You played 3 games.
 -> Won  : 1
 -> Lost : 1
 -> Tied : 1

New High Score!
```

```
NAME          SCORE
Royal         50.000
Tiffany       37.500
Mike          0.667

Thanks for playing!

---------- See you again soon ----------
```

Tree Structure

```
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├── README.md
├── blackjack.png
├── card_deck.py
├── highscores.txt
├── main.py
└── sample_output.pdf
```