

# Python Blackjack with custom deck support

## Target assessment level

Target assessment level of this work is 3.

## Specification

The program

1. generates a deck of cards based on a .txt file
2. provides the user with a simple blackjack game against a dealer using said deck:
  - a. both the dealer and the user draw two cards, and the user knows one of the cards drawn by the dealer
  - b. the player may draw new cards until they choose to stand or they bust
  - c. the dealer draws cards until their total score is over 16
  - d. the winner is determined
3. allows the user to check for specific cards in the deck outside of the game

## Data format

### Data file

The input data text file consists of lines, each line containing a French-suited playing card. The cards are separated by newlines. The minimum amount of cards is 4.

Format: *[rank] of [suit]*

Example line: *Jack of Spades*

### User input

The user can choose whether they want to hit or stand during the blackjack game. This is done by either typing "h" for "hit" or "s" for "stand". Additionally, they can choose to search for a specific card in the deck file.

## Correctness

### Typical test case

The following is the terminal output when playing the game (the parts coloured red are user input):

```
Welcome to Blackjack!
```

- ```
- 1 to play
- 2 to check deck for a specific card
- 3 to quit
```

```
1
```

Dealer's hand: 3 of Spades  
Your hand: 2 of Clubs, 8 of Spades

Hit or stand? (h/s) **h**  
Your hand: 2 of Clubs, 8 of Spades, 5 of Clubs

Hit or stand? (h/s) **s**

Dealer hand: 3 of Spades, 7 of Spades  
Dealer draws a 8 of Clubs.

Dealer's hand value: 18  
Your hand value: 15  
You lost!

Input anything to proceed...  
Welcome to Blackjack!  
- 1 to play  
- 2 to check deck for a specific card  
- 3 to quit

**1**

Dealer's hand: 10 of Clubs  
Your hand: 10 of Hearts, 7 of Diamonds

Hit or stand? (h/s) **h**  
Your hand: 10 of Hearts, 7 of Diamonds, 8 of Spades  
Bust! You lost!

Input anything to proceed...  
Welcome to Blackjack!  
- 1 to play  
- 2 to check deck for a specific card  
- 3 to quit

**1**

Dealer's hand: 9 of Spades  
Your hand: 10 of Hearts, Ace of Diamonds

Hit or stand? (h/s) **s**

Dealer hand: 9 of Spades, 7 of Hearts  
Dealer draws a Ace of Clubs.

Dealer's hand value: 17  
Your hand value: 21  
You have a better hand than the dealer! You win!

## Sequential search

The user may choose option 2 when starting to search for a specific card, which uses sequential search:

Enter card name (e.g. '7 of Hearts'): king of spades  
This card is in the deck!  
Found 1 matches.

## Lists

- Cards in the deck are stored in a list (deck.cards)
- Cards in a player's hand are stored in a list (hand.cards)
- The same applies for the dealer's cards, as they use the same base class

## Classes

Classes used in the program include:

- Card(), which represents a singular card
- Deck(), which represents the entire deck and contains
  - a function to draw the top card
  - a function to fetch the cards from the .txt file
- Hand(), which is used for both the player and the dealer and contains
  - a function to add a card into the hand
  - a function to only show the first card in the hand
  - a function to calculate the total value of the hand, which takes the fact that the value of aces can change into account