

FOR14

Algorithms and computer programming with Python

Autumn 2021

Practice assignment 3

The goal of this assignment is to help you practice loops and functions.

Blackjack Game Rules

The game starts with the house dealing cards from a shuffled deck to the player and to itself (the house). The first card is handed to the player, the second to the house, the third to the player, and the fourth to the house. Each gets two cards. Then the player is offered the opportunity to take an additional card, which is usually referred to as “to hit.”

The goal in blackjack is to get a hand whose card values add up to as close to 21 as possible without going over. The value of each number card is its rank, and the value of each face card is 10. The ace is valued at either 1 or 11, whichever works out better (i.e., gets closer to 21 without exceeding it). By hitting one or more times, the player tries to get his hand value closer to 21. If the player's hand value goes over 21 after a hit, he loses.

When the player decides to stand (i.e., pass the opportunity to hit), it is the house's turn to take additional cards. The house is required to use a fixed strategy: It must hit if its best hand value is less than 17 and stand if it is 17 or greater. Of course, if the house's best hand value goes over 21, the player wins.

When the house stands, the player's hand is compared with the house's hand. If the player has a higher-valued hand, he wins. If he has a lower-valued hand, he loses. In case of a tie, no one wins (i.e., the player keeps his bet) except if the player's and the house's hands tied at 21 and either the house or the player has a blackjack hand (an ace and a value 10 card), in which case the blackjack hand wins.

Task

Use functions to develop a blackjack application. The file `blackjack.py` suggest a structure with a list of function that would suffice to code a basic functional blackjack app. Use that file as a starting point. Your task is to create the code to make the empty functions useful, you may as well add additional functions if you needed for your program. As part of the submission you must provide pseudocode for the main function `blackjack()`.

All the code must be delivered as part of this assignment and must be documented with comments explaining the steps you took. You must submit at least a partial solution and the pseudocode for the main function for getting a complete on this assignment. Have fun!