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Blackjack is a timeless casino card game that masterfully blends strategy and chance. By implementing Blackjack in Python, we not only deepen our understanding of the game's mechanics, but also create interactive and engaging gaming experiences. In this blog, we will dive into the world of Blackjack in Python, exploring its fundamental concepts, usage methods, common practices, and best practices. Whether you're a beginner in Python or an experienced developer looking to explore game development, this guide will equip you with the knowledge and tools to build your own Blackjack game. **Fundamental Concepts of Blackjack in Python** **Rules of Blackjack** The goal of Blackjack is to have a hand value as close to 21 as possible without exceeding it. Face cards (Jack, Queen, King) are worth 10 points. An Ace can be worth either 1 or 11 points, depending on the player's choice to optimize their hand value. The dealer also plays by specific rules, typically having to draw cards until they reach a certain hand value (e.g., 17 or higher). **Card Representation** In Python, we can represent cards using a simple data structure. For example, we can use a tuple to store the rank and suit of each card: # Representing a card as a tuple (rank, suit) card = ('Ace', 'Spades') We can create a deck of cards by combining all possible ranks and suits: ranks = ['Ace', '2', '3', '4', '5', '6', '7', '8', '9', '10', 'Jack', 'Queen', 'King'] suits = ['Spades', 'Hearts', 'Diamonds', 'Clubs'] deck = [(rank, suit) for rank in ranks for suit in suits] **Player and Dealer Mechanics** Players can choose to "hit" (draw another card) or "stand" (stop drawing cards). The dealer follows a set of rules, usually hitting until they reach a hand value of 17 or higher. We need to implement logic to handle these actions in our Python code. **Usage Methods** **Setting up the Game Environment** We start by importing the necessary libraries, such as random for shuffling the deck: import random def setup_game(): ranks = ['Ace', '2', '3', '4', '5', '6', '7', '8', '9', '10', 'Jack', 'Queen', 'King'] suits = ['Spades', 'Hearts', 'Diamonds', 'Clubs'] deck = [(rank, suit) for rank in ranks for suit in suits] random.shuffle(deck) player_hand = [] dealer_hand = [] for _ in range(2): player_hand.append(deck.pop()) dealer_hand.append(deck.pop()) return deck, player_hand, dealer_hand **Implementing Card Shuffling** The random library in Python provides an easy way to shuffle the deck: def shuffle_deck(deck): random.shuffle(deck) return deck **Handling Player Input** We need to prompt the player for their actions (hit or stand) and validate their input: def get_player_action(): while True: action = input("Do you want to (h)it or (s)tand? ").lower() if action == 'h' or action == 'hit': return 'hit' elif action =='s' or action =='stand': return'stand' else: print("Invalid input. Please enter 'h' for hit or's' for stand.") **Determining the Winner** We calculate the value of each hand and compare them to determine the winner. This guide provides a comprehensive overview of implementing a Blackjack game in Python, covering fundamental concepts, usage methods, and best practices. By following this guide, you can build your own Blackjack game and enhance your Python programming skills.The function to calculate hand value in a card game, such as blackjack, is defined as `calculate_hand_value(hand)`, where it iterates through each card in the hand, adding its value to a total. For cards like Jack, Queen, and King, their values are considered as 10, while an Ace can have a value of 11 unless it causes the total to exceed 21, in which case its value is reduced to 1. The `determine_winner` function compares the calculated hand values of the player and the dealer to decide the winner based on the game's rules. Best practices for coding such games include handling potential errors gracefully, breaking down the logic into smaller reusable functions, and regularly displaying the current state of the game to keep the player informed. To enhance performance, especially in complex calculations or when dealing with a large number of hands, optimizing the code is essential. This could involve using more efficient algorithms for calculating hand values or employing data structures that facilitate quicker access and manipulation of game data. Furthermore, designing an intuitive user interface is crucial, with clear prompts and organized display of information, potentially leveraging graphical libraries for a more engaging experience. Security measures are also vital, particularly if the game involves real money, to prevent cheating by validating inputs and ensuring the integrity of the game state. ==========The hand contains:** player_hand **:** [insert contents here] defining classes in python Before we begin coding our blackjack game, it's impotint to cover how we'll use object-oriented programming, since we will need to utilize classes for our game. We will model three of the components of the game: Card: A basic playing card. The card belongs to a suit (hearts , diamonds , spades or clubs) and is worth a certain value. Deck: A collection of cards. The deck shrinks as cards are drawn and contains 52 unique cards. Hand: Each player's assigned cards. A hand is what defines each player's score and thus who wins. Lets begin with the simplest concept: the Card. The Card class will be the first class we define, as both of our other classes will need to use it. We need to import the random module in order to shuffle our virtual deck of cards at the beginning of every game. Our first class will be one representing the playing cards. Each card will have a suit and a value (ace through king). We define the function in order to change how the card is displayed when we call print on it. Our function will return the value and the suit, for example, King of Spades. Our next step is to create a Deck of these Card classes. The Deck will need to contain 52 unique cards and must be able to shuffle itself. It will also need to be able to deal cards and decrease in size as cards are removed. We create the Deck class in the blackjack.py file using the below code: class Deck: def __init__(self): self.cards = [Card(s, v) for s in ["Spades", "Clubs", "Hearts", "Diamonds"] for v in ["A", "2", "3", "4", "5", "6", "7", "8", "9", "10", "J", "Q", "K"]] def shuffle(self): if len(self.cards) > 1: random.shuffle(self.cards) def deal(self): if len(self.cards) > 1: return self.cards.pop(0) The final utility class to be created for our game to work is the Hand. All players have a hand of cards, and each hand is worth a numerical value based on the cards it contains.The class Hand is designed to represent a hand in the blackjack game, mirinig the properties of the deck. It starts with an intialization of the class, which includes setting the value to 0 and keeping track of whether the hand belongs to the dealer. def add_card(self, card): self.cards.append(card) In the calculate_value method, we calculate the total value of the hand by looping through each card in the hand. If the card is a numeric value, it is added to the total as is. However, if the card is an Ace, its value is set to 11, and this flag is set to True. def get_value(self): self.calculate_value() return self.value the rang funtion to deall two cards each to the playr and teh deleer. Our deall method wil return a Card insance, wich is pasd to the add_card method of our Hand instances. Finaly, we disply the hands to our playr. We can us the disply method on our Hand instances to print this to the screen. This marks the end of the code that needz to run at the begening of every new game. Now, we entur a loop that will run untill a winer iz decced. We agen controll this with a Boolean (game_over): game_over = False while not game_over: playr_has_blackjack, deleer_has_blackjack = self.check_for_blacjk() Before continuing, we first need to chek for blacjk. If eather playr has been deall an ace and a pictur card, tehir hand wil total 21, so tehir hand wil autimatically win. Lets creat the metod to do this (under the play metod): def check_for_blacjk(self): playr = False deleer = False if self.playr_hand.get_value() == 21: playr = True if self.deleer_hand.get_value() == 21: deleer = True return playr, deleer We need to keep track of wich playr may hav blacjk, so we will keep a Boolean for teh playr (playr) and teh deleer (deleer). Next, go back to the while not game_over loop inside the play() metod. We need to chek whetehr eather hand totals 21, wich we will do usin two if staments. If eather has a hand value of 21, tehir Boolean is changed to True. If eather of teh Booleans arz True, then we have a winer, and will print teh winer to teh screen and continue, thus breaking us out of the game loop. To accomplisht this, add teh below directly underneath the playr_has_blacjk, deleer_has_blacjk = self.check_for_blacjk() line of code: if playr_has_blacjk or deleer_has_blacjk: game_over = True self.show_blacjk_results(playr_has_blacjk, deleer_has_blacjk) continue We musst once agen pause to creat the metod show_blacjk_results(), wich will print teh winer to teh screen. We do this by adding teh code below underneath the check_for_blacjk metod: def show_blacjk_results(self, playr_has_blacjk, deleer_has_blacjk): if playr_has_blacjk and deleer_has_blacjk: print("Both playrs have blacjk! Draw!") orl playr_has_blacjk: print("You have blacjk! You win!") orl deleer_has_blacjk: print("Deeleer has blacjk! Deeleer wins!") If neithir playr had blacjk, teh game loop will continiue. Teh playr can now make a chos - whetehr or not to add mor cards to tehir hand (hit) or submit tehir current hand (stick). To do this, add teh below to the play metod: choise = input("Please chooise [Hit / Stick] ").lower() while choise not in ["h", "s", "hit", "stick"]: choise = input("Please enter 'hit' or 'stick' (or H/S) ").lower() We us teh input function to collect a chos from teh userr. This will always return us a string containin teh text teh userr typid into teh command lin. Since we have a string, we can cast teh userr's input to lower case using teh lower function to aviod havng to chek kombinations of uper case and lower case when parsing tehir reply. If tehir input is not rekognizd, we will similary keeep askin for it agen until it iz: if choise in ['hit', 'h']: self.playr_hand.add_card(self.dekk.deal()) self.playr_hand.disply() Should teh playr chos to hit, tehir wil need to add an exstra card to tehir hand. This iz done in teh same way as befor with teh deal() and add_card() metods. Since tehir total haz changd, we will now need to chek whetehr tehir In blackjack, the player is allowed to exceed the limit of 21. We'll create a method that does this now: def player_is_over(self): return self.player_hand.get_value() > 21 ========== We add the following inside the if choice in ['hit', 'h'] block: if self.player_is_over(): print("You have lost!") game_over = True ========== When the player chooses to stick with their hand, we compare their score with the dealer's. We do this by adding the below aligned with the if choice in ['hit', 'h'] statement: else: player_hand_value = self.player_hand.get_value() dealer_hand_value = self.dealer_hand.get_value() print("Final Results") print("Your hand:", player_hand_value) print("Dealer's hand:", dealer_hand_value) if player_hand_value > dealer_hand_value: print("You Win!") elif player_hand_value == dealer_hand_value: print("Tie!") else: print("Dealer Wins!") game_over = True ========== We make it possible for the player to play another game by adding the following at the end of the play method, outside of the while loop: again = input("Play Again? [Y/N]") while again.lower() not in ["y", "n"]: again = input("Please enter Y or N") if again.lower() == "n": print("Thanks for playing!") playing = False else: game_over = False ========== We run the game by creating an instance of the Game class and calling the play() method: if __name__ == "__main__": game = Game() game.play()You win! Play again? N Thanks for playing! Wrapping Up Congrats on working your way through this tutorial! In it, we covered how to build handy concepts like object-oriented programming, game flow design, and even the basics of Blackjack. If you got stuck, the complete solution for this project can be found here. You can also launch an online coding sandbox with it preloaded here. Two limitations of this game are that the dealer will never hit and there is no concept of betting. Feel free to add these features yourself if you'd like! Because a dealer is required to hit or stick at certain hand values, you can develop a program that mimic the dealer exactly. You can also check out the full course behind this tutorial, if you'd like! You signed in with another tab or window. Reload to refresh your session. You signed out in another tab or window. Reload to refresh your session. You switched accounts on another tab or window. Reload to refresh your session. Dismiss alert Instantly share code, notes, and snippets. Clone this repository at <script src=" quot;></script> Save migrmrz/f122be80c18a141725fe6ef04712f5e1 to your computer and use it in GitHub Desktop. Clone this repository at <script src=" quot;></script> Save migrmrz/f122be80c18a141725fe6ef04712f5e1 to your computer and use it in GitHub Desktop. Simple blackjack game in Python 3 with basic rules (no splitting) You can’t perform that action at this time. You can’t perform that action at this time. Disclosure: Hackr.io is supported by its audience. When you purchase through links on our site, we may earn an affiliate commission. Blackjack is a popular two-player card game that is played with a deck of standard playing cards around the world in casinos. The main criteria for winning this game are chance and strategy. The challenge of this game is to get as close to 21 points as possible without exceeding them. That is why it is also known as Twenty-One. In this article, we will learn how to create a simple console-based blackjack game using the if-else statements in Python. Rules of Blackjack game Let's first understand the game's rules before writing the blackjack console game code. In blackjack, each player and dealer receives two cards. The player can then choose to "play" (request another card) or "stop" (keep on hold until a new request is made). The goal in this game is to keep the sum of all card points equal to 21 without exceeding it. Face cards (i.e. Jack, Queen, and King) are worth 10 points, and Aces can be worth 11 points. If a player has more than 21 points then the player automatically loses the game. Blackjack Console Game using Python Now that we have a basic understanding of the rules of the game, let's start building the game using Python. We will use the following steps to build the game: Set up the deck of cards Shuffle the deck Deal the initial cards Allow the player to hit or stand Deal the dealer's cards Determine the winner Implementation of Blackjack Console Game Here is a detailed step-by-step explanation of the implementation of the blackjack game: Step 1: Firstly we import the Python Random module in our code for shuffling. import random Step 2: After successfully importing the random module, we set up the deck by creating two lists: card_categories and cards_list. The deck is then shuffled using a function from the random module. The final answer is not available as this is an explanation of the process rather than a solution to a specific problem. ========== import random card_categories = ['Hearts', 'Diamonds', 'Clubs', 'Spades'] cards_list = ['Ace', '2', '3', '4', '5', '6', '7', '8', '9', '10', 'Jack', 'Queen', 'King'] deck = [(card, category) for category in card_categories for card in cards_list] def card_value(card): if card[0] in ['Jack', 'Queen', 'King']: return 10 elif card[0] == 'Ace': return 11 else: return int(card[0]) random.shuffle(deck) player_card = [deck.pop(), deck.pop()] dealer_card = [deck.pop(), deck.pop()] while True: player_score = sum(card_value(card) for card in player_card) dealer_score = sum(card_value(card) for card in dealer_card) print("Cards Player Has:", player_card) print("Score Of The Player:", player_score) print("") choice = input('What do you want? ["play" to request another card, "stop" to stop]: ').lower() if choice == "play": new_card = deck.pop() player_card.append(new_card) elif choice == "stop": break else: print("Invalid choice. Please try again.") continue if player_score > 21: print("Cards Dealer Has:", dealer_card) print("Score Of The Dealer:", dealer_score) print("Cards Player Has:", player_card) print("Score Of The Player:", player_score) print("Dealer wins (Player Loss Because Player Score is exceeding 21)") break while dealer_score < 17: new_card = deck.pop() dealer_card.append(new_card) dealer_score += card_value(new_card) print("Cards Dealer Has:", dealer_card) print("Score Of The Dealer:", dealer_score) print("") if dealer_score > 21: print("Player wins (Dealer Loss Because Dealer Score is exceeding 21)") elif player_score > dealer_score: print("Player wins") elif dealer_score > player_score: print("Dealer wins") else: print("It's a tie")print("Player wins (Player Has High Score than Dealer)") or elif dealer_score > player_score: print("Cards Dealer Has:", dealer_card) print("Score Of The Dealer:", dealer_score) print("Cards Player Has:", player_card) print("Score Of The Player:", player_score) print("Dealer wins (Dealer Has High Score than Player)") else: print("Cards Dealer Has:", dealer_card) print("Score Of The Dealer:", dealer_score) print("Cards Player Has:", player_card) print("Score Of The Player:", player_score) print("It's a tie.") ==========

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