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```
clc
clear
close all
% Create variable to allow for game to restart
play = 1 ;
% Initiate playerpot betting feature
playerpot = 100;
% Display welcome message
disp ('Welcome to Blackjack!')
% Little description for the players benefit.
fprintf('\n1. During the game there will be a small delay between each bet.')
fprintf('\n2. The Ace cards will only be counted as a score of 11.')
fprintf('\n3. Your intial bet is placed before the deal.')
fprintf('\n4. No money is lost on a push.')
pause(3)
fprintf('\n')
% Ask the player for their name
playername = string(input("What is your name? ", "s"));
%Ask player if they would like to bet
while play == 1 && playerpot > 0
```

```
fprintf('\nYou have %i dollars in your pot.\n', playerpot)
playerbet = input ('How much would you like to bet?\n');
% Error message if the bet is less than playerpot
if playerbet > playerpot
fprintf ('\nYour max bet is %i dollars. This will be your bet.', playerpot)
playerbet = playerpot ;
end
```

Deck of Cards

Initialize scene

```
my_scene = simpleGameEngine('retro_cards.png',16,16,8,[255,255,255]);
% Set up variables to name the various sprites and the background of the
% cards
empty_sprite = 1;
card_sprites = 21:72;
card_background = empty_sprite * ones(1,2);
% Shuffle the deck
ShuffledDeck = randperm(52);
```

```
% Set cards to score values
DeckValues = [11 2:10 10 10 10 11 2:10 10 10 10 11 2:10 10 10 10 11 2:10 10 10 10];
```

Dealer's First Hand

```
DealerHand = ShuffledDeck(1:2);
% The second layer includes the faces of the cards
face_display_dealer = card_sprites(DealerHand);
% Show dealer's initial hand
drawScene(my_scene,card_background,face_display_dealer)
% Dealer's total card count
dealerScore = sum(DeckValues(DealerHand));
% Messages for the player
fprintf('\n*****\n')
fprintf('\n')
disp('These are the dealers cards.')
fprintf('\nThe dealer's current total is %i.\n', dealerScore)
pause(3)
close all
```

Player First Hand

```
PlayerHand = ShuffledDeck(3:4);
% The second layer includes the faces of the cards.
face_display_player = card_sprites(PlayerHand);
% Show players initial hand.
drawScene(my_scene,card_background,face_display_player)
% Player's total card count
playerScore = sum(DeckValues(PlayerHand));
% Messages for the player.
fprintf('\n*****\n')
fprintf('\n')
disp('These are your cards.')
fprintf('\nYour current total is %i.\n',playerScore)
pause(3)
```

While Loop

Initialize variables used inside the loop

```
i=5;
d=2;
p=2;
% Ensure that no player has reached 21 or busted
while playerScore < 21 && dealerScore < 21
% It is the player's turn first
fprintf('\n*****\n')
fprintf('\nIt is your turn, %s.\n', playername)
% Ask the player if they will hit or stay
playerchoice = input('If you would like to hit, enter 1.\nIf you would like to stay, enter 2.\n');
% If the player chose to hit:
if playerchoice == 1
%Extend variables:
p = p + 1;
```

```

% Add the next card in line to the player's hand
PlayerHand(p) = ShuffledDeck(i);
% Show the player's new hand
face_display_player = card_sprites(PlayerHand);
card_background = empty_sprite * ones(1,p);
drawScene(my_scene,card_background,face_display_player)
% Add new score to old total
playerScore = playerScore + DeckValues(PlayerHand(p));
% Message to player
fprintf('\nYou chose to hit and were dealt another card. This is your new hand, %s.', playername)
fprintf('\n')
fprintf('\nYour new total is %i.',playerScore)
pause(3)
% If the player receives a score of 21, the game ends
if playerScore == 21
break
end
% If the player now has a score larger than 21, the game ends
if playerScore > 21
break
end
% Select the next card in the deck
i = i + 1;
% Dealer's turn after the player hit, the dealer must hit if they
% possess a score of 17 or less, or if the player's score is higher
if (dealerScore <= 17 || playerScore > dealerScore )
%Extend variables
d = d + 1;
% Add the next card in line to the house's hand
DealerHand(d) = ShuffledDeck(i);
% Show the dealer's new hand
face_display_dealer = card_sprites(DealerHand);
card_background = empty_sprite * ones(1,d);
drawScene(my_scene,card_background,face_display_dealer)
% Add new score to old total
dealerScore = dealerScore + DeckValues(DealerHand(d));
% Message to player
fprintf('\n*****\n')
fprintf('\nIt is now the dealer's turn.')
fprintf('\nThe dealer chose to hit and is dealt another card. This is the dealer's new hand.')
fprintf('\n')
fprintf('\nThe dealer's new total is %i.',dealerScore)
pause(3)
% If the dealer now has a score of 21, the game ends
if dealerScore == 21
break
end
else
% If the dealer stays:
% Show the dealer's current hand
face_display_dealer = card_sprites(DealerHand);
card_background = empty_sprite * ones(1,d);
drawScene(my_scene,card_background,face_display_dealer)
% Message to player
fprintf('\n*****\n')
fprintf('\nIt is now the dealer's turn.')
fprintf('\nThe dealer chose to stay. This is the dealer's final hand.')
fprintf('\n')

```

```

fprintf('\nThe dealer"s total is %i.',dealerScore)
pause(3)
end
% Extend the variables for the next loop
i = i + 1;
elseif playerchoice == 2
% If the player chose to stay:
% Show the player"s hand
face_display_player = card_sprites(PlayerHand);
card_background = empty_sprite * ones(1,p);
drawScene(my_scene,card_background,face_display_player)
% Messages for the player
fprintf('\n')
disp('You chose to stay. This is your final hand.')
fprintf('\nYour total is %i.\n',playerScore)
pause(3)
% Dealer"s turn after the player stays
% The dealer must hit if the player has a higher score
if playerScore > dealerScore
% Extend variables
d = d + 1;
% Add the next card in line to the house"s hand
DealerHand(d) = ShuffledDeck(i);
% Show the dealers new hand
face_display_dealer = card_sprites(DealerHand);
card_background = empty_sprite * ones(1,d);
drawScene(my_scene,card_background,face_display_dealer)
% Add new score to old total
dealerScore = dealerScore + DeckValues(DealerHand(d));
% Message to player
fprintf('\n*****\n')
fprintf('\nIt is now the dealer"s turn.')
fprintf('\nThe dealer chose to hit and is dealt another card. This is the dealer"s new hand.')
fprintf('\n')
fprintf('\nThe dealer"s new total is %i.', dealerScore)
pause(3)
% If the dealer now has a score of 21, the game ends
if dealerScore == 21
break
% Dealer will hit again if they still have less than the player
elseif dealerScore < playerScore
% Extend variables
d= d+1;
i= i+1;
% Add the next card in line to the house"s hand
DealerHand(d) = ShuffledDeck(i);
% Show the dealer"s new hand
face_display_dealer = card_sprites(DealerHand);
card_background = empty_sprite * ones(1,d);
drawScene(my_scene,card_background,face_display_dealer)
% Add new score to old total
dealerScore = dealerScore + DeckValues(DealerHand(d));
% Message to player
fprintf('\nThe dealer chose to hit again and is dealt another card. This is the dealer"s new hand.')
fprintf('\n')
fprintf('\nThe dealer"s new total is %i.', dealerScore)
pause(3)
end

```

```

break
else
% If the dealer decides to stay after the player stays:
% Show the dealer's current hand
face_display_dealer = card_sprites(DealerHand);
card_background = empty_sprite * ones(1,d);
drawScene(my_scene,card_background,face_display_dealer)
% Message to player
fprintf('\n*****\n')
fprintf('\n')
disp('It is now the dealer's turn.')
fprintf('\nThe dealer chose to stay. This is the dealer's final hand.')
fprintf('\n')
fprintf('\nThe dealer's total is %i.',dealerScore)
pause(3)
end
break
else
%If the player fails to input 1 or 2, they can try again
fprintf('\nThat is an invalid input. Please enter 1 to hit or 2 to stay.\n')
pause(3)
end
end

```

Outcomes

```

fprintf('\n*****\n')
if playerScore > 21 && dealerScore > 21
% If both the player and the dealer end with more than 21:
disp('You both busted! No one wins :(')

% Update pot
playerpot = playerpot + 0;
fprintf('\nYou didn't lose or gain any money.\n')
pause(3)
elseif dealerScore > 21
% If only the dealer had a score of more than 21:
fprintf ('\nThe dealer busted! %s wins!\n', playername)

% Update pot
playerpot = playerpot + playerbet;
fprintf ('\nYou won %i dollars!\n', playerbet)
pause(3)
elseif playerScore > 21
% If only the player had a score of more than 21:
fprintf ('\n%s busted The dealer wins!\n', playername)

% Update pot
playerpot = playerpot - playerbet;
fprintf ('\nYou lost %i dollars :(\n', playerbet)
pause(3)
else
% If both the player and the dealer got 21:
if playerScore == 21 && dealerScore == 21
fprintf('\nIt's a tie! You both win!\n')

%update pot

```

```

playerpot = playerpot + 0 ;
fprintf('\nYou didn"t lose or win any money.\n')
pause(3)
elseif playerScore == 21
% If the player got 21 and the dealer didn't bust:
fprintf('\n%s got 21! %s wins!', playername, playername)

% Update pot
playerbet = 2 * playerbet;
playerpot = (playerpot + playerbet);
fprintf ('\nYou won %i dollars!\n', playerbet)
pause(3)
elseif dealerScore == 21
% If the dealer got 21 and the player didn't bust:
fprintf('\nThe dealer got 21! %s loses!\n', playername)

% Update pot
playerpot = playerpot - playerbet;
fprintf ('\nYou lost %i dollars :(\n', playerbet)
pause(3)
else % If no one got 21 or busted, check who was closest to 21
% Find the absolute difference between the player's score and 21
playerdif = abs(21-playerScore);
% Find the absolute difference between the dealer's score and 21
dealerdif = abs(21-dealerScore);
% Compare whose score was closer
if playerdif == dealerdif
% If the player and the dealer have the same score under 21:
fprintf('\nIt"s a tie! You both win!')
% Update pot
playerpot = playerpot + 0 ;
fprintf('\nYou didn"t gain or lose any money.\n')
pause(3)
elseif playerdif > dealerdif
% If the dealer was closer to 21 than the player:
fprintf('\nThe dealer was closer to 21! %s loses!', playername)

% Update pot
playerpot = playerpot - playerbet;
fprintf ('\nYou lost %i dollars :(', playerbet)
pause(3)
else
% If the player was closer to 21 than the dealer:
fprintf('\n%s was closer to 21! %s wins!', playername, playername)

%Update pot
playerpot = playerpot + playerbet;
fprintf ('\nYou won %i dollars!', playerbet)
pause(3)
end
end
end

```

Playing another round

If the player still has money left, ask player if they would like to play again, and if so restart the game

```
if playerpot == 0
fprintf('\n*****\n')
fprintf ('\nYou are out of money! Run the game again to restart at $100.')
fprintf('\n')
fprintf('\nThanks for playing!\n')
else
fprintf('\n*****\n')
play = input('\nIf you would like to play again, enter 1. To quit, enter 0. \n');
fprintf('\n*****\n')
end
```

```
end
if play == 0
fprintf('\nThanks for playing!\n')
end
```

Welcome to Blackjack!

1. During the game there will be a small delay between each bet.
2. The Ace cards will only be counted as a score of 11.
3. Your initial bet is placed before the deal.
4. No money is lost on a push.

Error using input
Cannot call INPUT from EVALC.

Error in blackjacktest1 (line 18)
playername = string(input("What is your name? ", "s"));