

```
In [1]: import random
import math
```

```
In [2]: suits = ('Hearts', 'Diamonds', 'Spades', 'Clubs')
ranks = ('Two', 'Three', 'Four', 'Five', 'Six', 'Seven', 'Eight', 'Nine', 'Ten', 'Jack', 'Queen', 'King', 'Ace')
values = {
    'Two':2 , 'Three':3 , 'Four':4 , 'Five':5 , 'Six':6 , 'Seven':7,
    'Eight':8, 'Nine':9, 'Ten':10, 'Jack':10, 'Queen':10, 'King':10, 'Ace':(1,11)
}

aces_values = { 0 : (0,0) , 1 : (1,11) , 2:(2,12) , 3:(3,13), 4:(4,14)}
```

```
In [3]: class Card:

    def __init__(self,suit,rank):
        self.suit = suit
        self.rank = rank
        self.value = values[rank]

    def __str__(self):
        return f'Card : {self.suit} Rank: {self.rank} Value: {self.value}'
```

```
In [4]: class Deck:

    def __init__(self):
        self.all_cards = [Card(suit,rank) for suit in suits for rank in ranks]

    def shuffle_card(self):
        random.shuffle(self.all_cards)
```

```
In [5]: class Player:

    def __init__(self, name, amount):
        self.name = name
        self.amount = amount
        self.cards = []

    def clear_cards(self):
        self.cards = []

    def make_bet(self, bet):
        if self.amount > bet:
            self.amount -= bet
            return True

        return False

    def hit(self):
        new_card = game_deck.all_cards.pop(0)
        self.cards.append(new_card)

    def closest_21_sum(self):
        no_of_aces = 0
        sum_of_cards = 0
        for card in self.cards:
            if card.rank == 'Ace':
                no_of_aces += 1
            else:
                sum_of_cards += card.value

        closest_21 = sum_of_cards
        aces = aces_values[no_of_aces]
        sum1 = (21 - aces[0] - closest_21)
        sum2 = (21 - aces[1] - closest_21)

        if sum1 < 0 and sum2 >= 0:
            closest_21 += aces[1]
        elif sum2 < 0 and sum1 >= 0:
            closest_21 += aces[0]
        else:
            if sum1 < sum2:
                closest_21 += aces[0]
```

```

        else:
            closest_21 += aces[1]

    return closest_21

def __str__(self):
    return f'Player\'s Name :{self.name} \nPlayer\'s Balance :{self.amount} \nTotal Cards :{len(self.cards)} '

```

In [6]: *## PYTHON COLOR CODES TO PRINT FONT OF OWN COLOR CHOICE*

```

color = {
    'PURPLE' : '\033[95m',
    'CYAN' : '\033[96m',
    'DARKCYAN' : '\033[36m',
    'BLUE' : '\033[94m',
    'GREEN' : '\033[92m',
    'YELLOW' : '\033[93m',
    'RED' : '\033[91m',
    'BOLD' : '\033[1m',
    'UNDERLINE' : '\033[4m',
    'END' : '\033[0m'
}

```

In [7]:

```

def display(message,msg_color=None):
    if msg_color != None:
        print((color['BOLD']+color[msg_color] + message +color['END'])).center(125))
    else:
        print()
        print(color['BOLD']+ message +color['END'])

## TESTING
display("Hey there! How are you",'GREEN')

```

Hey there! How are you

```
In [8]: def display_start():
display(" #          #####          #####          #####          #          #####          #          #", "BLUE")
display(" #          #          #          #          #          #          #          #          #          #", "BLUE")
display(" #          #####          #####          #####          #          #####          #          #", "BLUE")
display(" #          #          #          #          #          #          #          #          #          #", "BLUE")
display(" #####          #####          #          #####          #          #####          #          #          #", "BLUE")
```

```
In [9]: def show_players_info():
print()
display("PLAYER'S INFO", "DARKCYAN")
pattern = "*****"
display(pattern, "DARKCYAN")
columns_info = '| {0:^12} | {1:^16} |'.format("Player Name", "Amount")
display(columns_info, "DARKCYAN")
display(pattern, "DARKCYAN")
name_info = '| {0:^12} | {1:^16} |'.format(player.name, player.amount)
display(name_info, "DARKCYAN")
amount_info = '| {0:^12} | {1:^16} |'.format(dealer.name, dealer.amount)
display(amount_info, "DARKCYAN")
display(pattern, "DARKCYAN")
print()
```

```
In [25]: def show_cards_info(player,color):
    if player.name == "Dealer":
        show_info(f"{player.name} have following cards: ")
    else:
        show_info("You have following cards: ")

    print()
    display("CARD'S INFO",color)
    pattern = "*****"
    display(pattern,color)
    columns_info = '| {0:^12} | {1:^16} | {2:^16} |'.format("Card Name","Rank","Value")
    display(columns_info,color)
    display(pattern,color)
    for card in player.cards:
        card_info = '| {0:^12} | {1:^16} | {2:^16} |'.format(card.suit, card.rank, str(card.value))
        display(card_info,color)

    display(pattern,color)
    print()
```

```
In [26]: def show_message(message,color):
    print()
    pattern = "*****"
    display(pattern,color)
    # message = '| {0:^12} |'.format(message)
    display(message,color)
    display(pattern,color)
    print()
```

```
In [12]: def show_info(info):
    print()
    info = '----->> {0:^36} <<-----'.format(info)
    display(info,"YELLOW")
    print()
```

```
In [13]: def bust(total):
        if total > 21:
            return True
        return False

        def win(sum1,sum2):
            if abs(21-sum1) <= abs(21-sum2):
                return True
            else:
                return False

        def draw_cards(game_deck):
            cards = [game_deck.all_cards.pop(0) ,game_deck.all_cards.pop(0) ]
            return cards

        def increase_sum(player,bet_sum):
            player.amount += 2*bet_sum
```

```
In [23]: def make_bet():
        #     Make a bet
        bet = False
        while not bet:
            try:
                display("Enter the sum you want to bet ")
                bet_sum = int(input())
            except:
                show_message("ERROR: Invalid input,Please enter a number","RED")
            else:
                bet = player.make_bet(bet_sum)
                if not bet:
                    show_message("ERROR : You don't have enough balance,make a smaller bet","RED")

        return bet_sum
```

```
In [18]: def make_choice(type='game'):
          choice = False
          while choice not in ['Y','N']:
              if type!='game':
                  display("\nDo you wanna hit or stand , Please enter 'Y' to hit or 'N' to stand\n ")
                  choice = input()
                  if choice in ['Y','N']:
                      return choice == 'Y'
                  else:
                      show_message("ERROR : Invalid Input, Please enter valid input","RED")

              else:
                  display("\nDo you wanna play again , Please enter 'Y' for Yes or 'N' for No\n ")
                  choice = input()
                  if choice in ['Y','N']:
                      return choice == 'Y'
                  else:
                      show_message("ERROR : Invalid Input, Please enter valid input","RED")
```

```
In [16]: def match():

    game_on = True
    game_deck.shuffle_card()

    show_players_info()
    bet_sum = make_bet()
    message=f"Match is played for bet of Rs. {bet_sum}"
    show_message(message,"DARKCYAN")
    # Deal 2 cards to player and dealer
    player.cards.extend(draw_cards(game_deck))
    dealer.cards.extend(draw_cards(game_deck))

    make_hit = True
    show_cards_info(player,"PURPLE")
    player_sum = player.closest_21_sum()
    show_info(f"Your's closest sum to 21 is {player_sum}")

    while make_hit:

        choice = make_choice('players')
        if choice:
            player.hit()
            message = f"You hit {player.cards[-1].suit} with rank {player.cards[-1].rank}"
            show_info(message)
        else:
            make_hit = False

        show_cards_info(player,"PURPLE")
        player_sum = player.closest_21_sum()
        show_info(f"Your's closest sum to 21 is {player_sum}")
        if bust(player_sum) == True:
            message = f"GAME ENDS : Sorry {player.name} busted, {dealer.name} wins!"
            show_message(message,'DARKCYAN')
            increase_sum(dealer,bet_sum)
            make_hit = False
            game_on= False

    if game_on:
        show_message(f"You decided to stand with {player_sum} as closest 21 sum",'PURPLE')
        show_message(f"Now it's dealer turn for the gameplay","BLUE")
        show_cards_info(dealer,"GREEN")
```



```
dealer_sum = dealer.closest_21_sum()
show_info(f"{dealer.name}'s closest sum to 21 is {dealer_sum}")
while dealer_sum < 17:
    dealer.hit()
    message = f"{dealer.name} hit {dealer.cards[-1].suit} with rank {dealer.cards[-1].rank}"
    show_info(message)
    show_cards_info(dealer, "GREEN")
    dealer_sum = dealer.closest_21_sum()
    show_info(f"{dealer.name}'s closest sum to 21 is {dealer_sum}")

if bust(dealer_sum):
    message = f"GAME ENDS : Sorry {dealer.name} busted, {player.name} wins!"
    show_message(message, "DARKCYAN")
    increase_sum(player, bet_sum)
else:
    show_info(f"{dealer.name}'s closest sum to 21 is {dealer_sum}")
    if win(player_sum, dealer_sum):
        message = f"GAME ENDS : Sorry {dealer.name} loses, {player.name} wins!"
        show_message(message, "DARKCYAN")
        increase_sum(player, bet_sum)
    else:
        message = f"GAME ENDS : Sorry {player.name} loses, {dealer.name} wins!"
        show_message(message, 'DARKCYAN')
        increase_sum(dealer, bet_sum)
```

```
In [29]: play_game = True
player = Player("John Carter" , 10000)
dealer = Player("Dealer",50000)
while play_game:
    game_deck = Deck()
    display_start()
    player.clear_cards()
    dealer.clear_cards()
    match()
    play_game = make_choice('game')
```

```

#         #####  #####  #####  #####  #         #####  #         #
#         #         #         #         #         #         #         #         #
#         #####  #         #####  #####  #         #####  #         #
#         #         #         #         #         #         #         #         #
#####  #####  #         #####  #         #####  #         #

```

### PLAYER'S INFO

```

*****
| Player Name | Amount |
*****
| John Carter | 10000 |
| Dealer      | 50000 |
*****

```

Enter the sum you want to bet  
sdfsd

```

*****
ERROR: Invalid input,Please enter a number
*****

```

Enter the sum you want to bet  
345345

```

*****
ERROR : You don't have enough balance,make a smaller bet
*****

```

Enter the sum you want to bet  
5000

```

*****
Match is played for bet of Rs. 5000
*****

```

----->>      You have following cards:      <<-----

### CARD'S INFO

```

*****
|  Card Name  |      Rank      |      Value      |
*****
|  Diamonds   |      Eight     |      8          |
|  Spades     |      Two       |      2          |
*****

```

----->>    Your's closest sum to 21 is 10    <<-----

Do you wanna hit or stand , Please enter 'Y' to hit or 'N' to stand

Y

----->>    You hit Clubs with rank Six    <<-----

----->>    You have following cards:    <<-----

```

CARD'S INFO
*****
|  Card Name  |      Rank      |      Value      |
*****
|  Diamonds   |      Eight     |      8          |
|  Spades     |      Two       |      2          |
|  Clubs      |      Six       |      6          |
*****

```

----->>    Your's closest sum to 21 is 16    <<-----

Do you wanna hit or stand , Please enter 'Y' to hit or 'N' to stand

N

----->>    You have following cards:    <<-----

## CARD'S INFO

```
*****
| Card Name | Rank | Value |
*****
| Diamonds | Eight | 8 |
| Spades | Two | 2 |
| Clubs | Six | 6 |
*****
```

----->> Your's closest sum to 21 is 16 <<-----

```
*****
You decided to stand with 16 as closest 21 sum
*****
```

```
*****
Now it's dealer turn for the gameplay
*****
```

----->> Dealer have following cards: <<-----

## CARD'S INFO

```
*****
| Card Name | Rank | Value |
*****
| Diamonds | Jack | 10 |
| Spades | Six | 6 |
*****
```

----->> Dealer's closest sum to 21 is 16 <<-----

----->> Dealer hit Hearts with rank Three <<-----

----->> Dealer have following cards: <<-----

## CARD'S INFO

*****			
Card Name	Rank	Value	
*****			
Diamonds	Jack	10	
Spades	Six	6	
Hearts	Three	3	
*****			

----->> Dealer's closest sum to 21 is 19 <<-----

----->> Dealer's closest sum to 21 is 19 <<-----

\*\*\*\*\*  
 GAME ENDS : Sorry John Carter loses, Dealer wins!  
 \*\*\*\*\*

Do you wanna play again , Please enter 'Y' for Yes or 'N' for No

Y

```

#         #####  #####  #####  #####  #         #####  #         #
#         #         #         #         #         #         #         #         #
#         #####  #         #####  #####  #         #####  #         #
#         #         #         #         #         #         #         #         #
#####  #####  #         #####  #         #####  #         #         #

```

## PLAYER'S INFO

*****			
Player Name	Amount		
*****			
John Carter	5000		
Dealer	60000		
*****			

Enter the sum you want to bet  
 5000