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

In [2]:
```
# GLOBAL VARIABLES FOR THE GAME

suits = ('Hearts', 'Diamonds', 'Spades', 'Clubs')
ranks = ('Two', 'Three', 'Four', 'Five', 'Six', 'Seven', 'Eight', 'Nine', 'Ten', 'Jack', 'Queen', 'King', 'Ac
e')
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]:
```
# CARD CLASS

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]:
```
# DECK CLASS (PACK OF 52 CARDS)

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]:
```
# PLAYER'S CLASS FOR THE GAMEPLAY

class Player:

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

#   CLEAR THE CARDS WHEN A NEW MATCH STARTS
    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)

#   FUNCTION GIVES THE SUM OF PLAYER'S CARDS WHICH IS CLOSEST TO 21
    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.ca
rds)}  '
```

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]:
```
# DISPLAY MESSAGE OF DIFFERENT COLOR ACC TO REQUIREMENT

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]:
```
# FUNCTION TO DISPLAY START OF THE GAME

def display_start():
    display("  #         ######  #######  ######      ######    #       ######   #      #","BLUE")
    display("  #         #          #     #           #    #    #       #    #      # #  ","BLUE")
    display("  #         #####      #     ######      ######    #       ######       #   ","BLUE")
    display("  #         #          #          #      #         #       #    #       #   ","BLUE")
    display("  ######    ######     #     ######      #         ######  #    #       #   ","BLUE")
```

In [9]:
```
# FUNCTION TO DISPLAY PLAYER'S INFO PLAYING THE GAME

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]:
```
# FUNCTION TO DISPLAY PLAYER'S CARDS OF SPECIFIC PLAYER

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]:
```
# FUNCTION TO DISPLAY MESSAGE IN THE GAME

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

In [12]:
```
# FUNCTION TO DISPLAY NEW INFO OR NEW ACTIVITY IN THE GAME

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

In [13]:
```
# FUNCTION TO CHECK WHETHER A PLAYER BUSTS OR NOT

def bust(total):
    if total > 21:
       return True
    return False

# FUNCTION TO CHECK WHETHER A PLAYER WINSS OR NOT

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

# FUNCTION TO DRAW A CARD FROM THE DECK

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

# FUNCTION TO INCREASE THE PLAYER'S AMOUNT IF HE/SHE WINS THE GAME

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

In [23]:
```
# FUNCTION TO CHECK WHETHER PLAYER MAKES A VALID BET OR NOT

def make_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]:
```
# FUNCTION TO MAKE A CHOICE
#   1) IF TYPE IS GAME , WHETHER PLAYER WANTS TO PLAY AGAIN OR NOT
#   2) IF TYPE IS PLAYER , WHETHER PLAYER WANTS TO HIT OT STAND

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]:
```
# FUNCTION TO PLAY A SINGLE MATCH

def match():

    game_on = True
#     SHUFFLE THE CARDS IN DECK
    game_deck.shuffle_card()

    show_players_info()
    bet_sum = make_bet()
    show_message(f"Match is played for bet of Rs. {bet_sum}","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 FOR PLAYER TO HIT OR STAND
        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}")

#         CHECKING WHETHER PLAYER BUST OR NOT
        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

#     GAME WILL CONTUNUE IF PLAYER DO NOT BUST
    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}")

#           CHECK WHETHER PLAYER WINS OR LOSE
            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]:
```
# INITIAZING GAMEPLAY AND PLAYER INFO
play_game = True
player = Player("John Carter" , 10000)
dealer = Player("Dealer",50000)

while play_game:
        game_deck = Deck()
        display_start()
#         CLEARING CARDS IN PLAYER'S POCKET
        player.clear_cards()
        dealer.clear_cards()

#         START A MATCH
        match()
        play_game = make_choice('game')
```

PLAYER'S INFO

Player Name	Amount
John Carter	10000
Dealer	50000

Enter the sum you want to bet
sdfsdf

****
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

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

Enter the sum you want to bet
3500

```
**********************************************************
            Match is played for bet of Rs. 3500
**********************************************************
```

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

```
                        CARD'S INFO
**********************************************************
  |  Card Name   |       Rank       |      Value       |
**********************************************************
  |    Hearts    |       Nine       |        9         |
  |    Clubs     |       Two        |        2         |
**********************************************************
```

```
   ----->>    Your's closest sum to 21 is 11    <<-----
```

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       |
**********************************************************
  |    Hearts    |       Nine       |        9         |
  |    Clubs     |       Two        |        2         |
```

```
**********************************************************

   ----->>    Your's closest sum to 21 is 11    <<-----

**********************************************************
      You decided to stand with 11 as closest 21 sum
**********************************************************

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

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

                        CARD'S INFO
**********************************************************
  |  Card Name   |       Rank       |      Value       |
**********************************************************
  |   Diamonds   |       Four       |        4         |
  |    Spades    |      Seven       |        7         |
**********************************************************

   ----->>   Dealer's closest sum to 21 is 11   <<-----

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

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

                        CARD'S INFO
**********************************************************
  |  Card Name   |       Rank       |      Value       |
**********************************************************
  |   Diamonds   |       Four       |        4         |
  |    Spades    |      Seven       |        7         |
```

```
  |   Diamonds   |      Three       |        3         |
**********************************************************
```

```
   ----->>   Dealer's closest sum to 21 is 14   <<-----
```

```
   ----->>   Dealer hit Spades with rank King   <<-----
```

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

```
                        CARD'S INFO
**********************************************************
  |  Card Name   |       Rank       |      Value       |
**********************************************************
  |   Diamonds   |       Four       |        4         |
  |    Spades    |      Seven       |        7         |
  |   Diamonds   |      Three       |        3         |
  |    Spades    |       King       |        10        |
**********************************************************
```

```
   ----->>   Dealer's closest sum to 21 is 24   <<-----
```

```
**********************************************************
    GAME ENDS : Sorry Dealer busted, John Carter wins!
**********************************************************
```

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

N

In [ ]:

In [ ]:

In [ ]:

In [ ]: