5-3-2 Card Game

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Task code - #5

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Introduction

This is a Python implementation of the 5-3-2 card game designed for 3 players. The game involves dealing cards, choosing a trump suit, and playing tricks to determine the winner based on the number of tricks won.

Game Rules

1. **Deck Composition**: The deck consists of 30 cards, with two sevens removed (7 of Diamonds and 7 of Clubs).
2. **Players**: There are 3 players in the game.
3. **Tricks**: The meaning of tricks is rounds.
4. **Suits**: The meaning of suits is [Hearts, Diamonds, Clubs, Spades].
5. **Quotas**:
   o Player 1 (dealer's right) needs to win 5 tricks.
   o Player 2 (dealer's left) needs to win 3 tricks.
   o Player 3 (dealer) needs to win 2 tricks.
6. **Trump Suit**: The player to the dealer's right chooses the trump suit after seeing the first 5 cards in their hand.
7. **Gameplay**:
   o Each trick consists of 3 cards, one from each player.
   o Players must follow the lead suit if possible; otherwise, they can play any card.
   o The player with the highest card of the lead suit or the highest trump card wins the trick.

How to Play

1. Run the game script in command prompt:

   ```
   python Card_Game.py
   ```

2. Follow the on-screen instructions to play the game.

Example Gameplay

1. The dealer is Player 3.
2. Player 1 chooses the trump suit.
3. Players take turns playing cards, with each trick being evaluated to determine the winner.
4. The game continues for 10 tricks, and the scores are displayed after each trick.
5. After all tricks are played, the game announces if players met their quotas or not.

Data Structures

Dictionary

We used dictionaries extensively in this game for the following purposes:

1. **Card Representation**: Each card is represented as a dictionary with 'rank' and 'suit' keys.

   ```
   {'rank': 'Ace', 'suit': 'Hearts'}
   ```

   Why? This allows us to easily access and manipulate card attributes, making it straightforward to compare cards based on rank and suit during gameplay.

2. **Card Power Mapping**: The POWER dictionary maps each rank to its corresponding power value.

   ```
   POWER = {
       '7': 7, '8': 8, '9': 9, '10': 10,
       'Jack': 11, 'Queen': 12, 'King': 13, 'Ace': 14
   }
   ```

   Why? This helps in determining the strength of cards when comparing them, especially in determining the winner of a trick.

3. **Quotas**: The QUOTAS dictionary defines the number of tricks each player needs to win.

   ```
   QUOTAS = {0: 5, 1: 3, 2: 2}  # Dealer's right (5), dealer's left (3),
   dealer (2)
   ```

Why? This allows for quick access to each player's quota, simplifying the logic for checking if a player has met their quota.

Benefits of Using Dictionaries

- **Readability**: Using dictionaries with descriptive keys makes the code more readable and self-explanatory.
- **Efficiency**: Accessing values in a dictionary by key is very efficient ($O(1)$ complexity).
- **Flexibility**: Dictionaries allow us to store related data together and easily extend or modify it if needed.

Functions

- **initialize_deck()**: Initializes the 30-card deck.
- **deal_cards(deck)**: Shuffles the deck and deals cards to players.
- **display_hand_start(player, hand)**: Displays the first 5 cards for the player choosing the trump suit.
- **display_hand(player, hand)**: Displays all cards in a player's hand.
- **play_card(player, hand, lead_suit, trump_suit)**: Prompts a player to play a card following the game rules.
- **determine_trick_winner(cards_played, trump_suit, lead_suit)**: Determines the winner of a trick based on cards played.
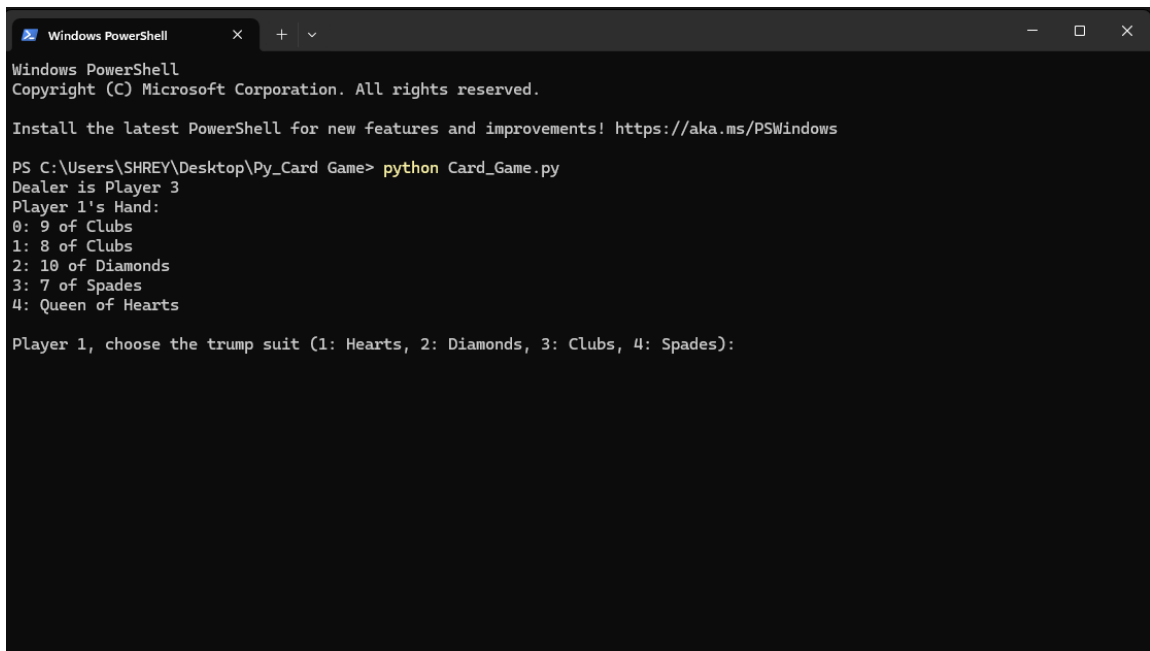- **check_winner(tricks_won)**: Checks if any player has won by meeting their quota.

Notes

- Make sure to enter valid indices and choices when prompted.
- The game includes validation to ensure players follow the rules, such as following the lead suit.

Gameplay-

Open the game folder and then right click on the file and select **"Open in Terminal".**
Then write this script in the command prompt : **python Card_Game.py**
And now you'll be able to play the game!!!

1. As per the rules, the player responsible for deciding the trump suit must select the trump suit after receiving the initial 5 cards from the dealer. Once the trump suit is chosen, the player then receives the remaining 5 cards.
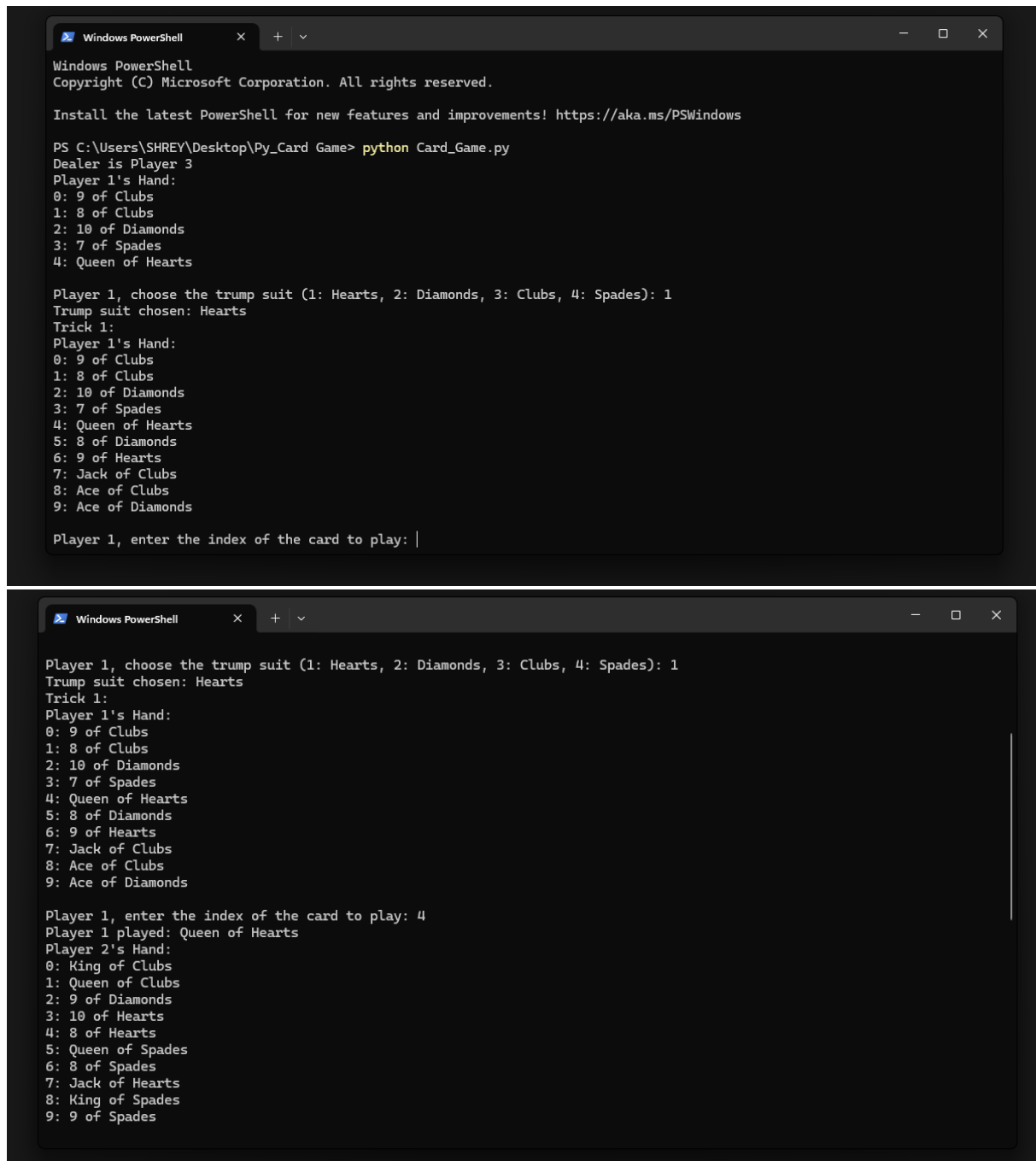
```
Windows PowerShell
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PS C:\Users\SHREY\Desktop\Py_Card Game> python Card_Game.py
Dealer is Player 3
Player 1's Hand:
0: 9 of Clubs
1: 8 of Clubs
2: 10 of Diamonds
3: 7 of Spades
4: Queen of Hearts

Player 1, choose the trump suit (1: Hearts, 2: Diamonds, 3: Clubs, 4: Spades):
```

2. Once the trump suit is selected, the player who chose the trump suit plays the first card. The turn then proceed in a clockwise direction, with each player playing their card in turn.

```
Windows PowerShell

Windows PowerShell
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PS C:\Users\SHREY\Desktop\Py_Card Game> python Card_Game.py
Dealer is Player 3
Player 1's Hand:
0: 9 of Clubs
1: 8 of Clubs
2: 10 of Diamonds
3: 7 of Spades
4: Queen of Hearts

Player 1, choose the trump suit (1: Hearts, 2: Diamonds, 3: Clubs, 4: Spades): 1
Trump suit chosen: Hearts
Trick 1:
Player 1's Hand:
0: 9 of Clubs
1: 8 of Clubs
2: 10 of Diamonds
3: 7 of Spades
4: Queen of Hearts
5: 8 of Diamonds
6: 9 of Hearts
7: Jack of Clubs
8: Ace of Clubs
9: Ace of Diamonds

Player 1, enter the index of the card to play:
```
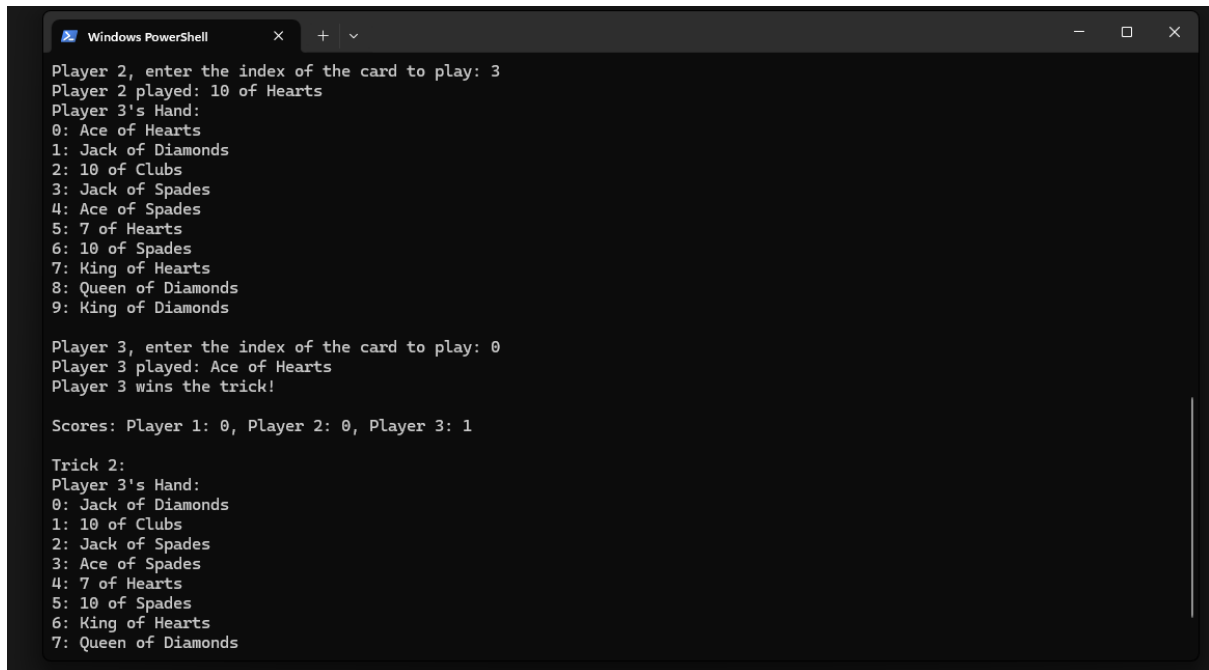
```
Windows PowerShell

Player 1, choose the trump suit (1: Hearts, 2: Diamonds, 3: Clubs, 4: Spades): 1
Trump suit chosen: Hearts
Trick 1:
Player 1's Hand:
0: 9 of Clubs
1: 8 of Clubs
2: 10 of Diamonds
3: 7 of Spades
4: Queen of Hearts
5: 8 of Diamonds
6: 9 of Hearts
7: Jack of Clubs
8: Ace of Clubs
9: Ace of Diamonds

Player 1, enter the index of the card to play: 4
Player 1 played: Queen of Hearts
Player 2's Hand:
0: King of Clubs
1: Queen of Clubs
2: 9 of Diamonds
3: 10 of Hearts
4: 8 of Hearts
5: Queen of Spades
6: 8 of Spades
7: Jack of Hearts
8: King of Spades
9: 9 of Spades
```

3. The player who wins the trick(round) gets to play first in the next trick.

```
Windows PowerShell        ×    +  ∨                                    —   □   ×

Player 2, enter the index of the card to play: 3
Player 2 played: 10 of Hearts
Player 3's Hand:
0: Ace of Hearts
1: Jack of Diamonds
2: 10 of Clubs
3: Jack of Spades
4: Ace of Spades
5: 7 of Hearts
6: 10 of Spades
7: King of Hearts
8: Queen of Diamonds
9: King of Diamonds

Player 3, enter the index of the card to play: 0
Player 3 played: Ace of Hearts
Player 3 wins the trick!

Scores: Player 1: 0, Player 2: 0, Player 3: 1

Trick 2:
Player 3's Hand:
0: Jack of Diamonds
1: 10 of Clubs
2: Jack of Spades
3: Ace of Spades
4: 7 of Hearts
5: 10 of Spades
6: King of Hearts
7: Queen of Diamonds
```
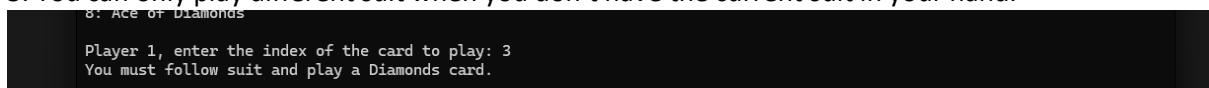
4.If the previous player has played a suit(Hearts, Diamonds, Spades, Cloves) and you have that suit in your hand then you have to play that suit only you can't play any other suit.

5. You can only play different suit when you don't have the current suit in your hand.

```
8: Ace of Diamonds

Player 1, enter the index of the card to play: 3
You must follow suit and play a Diamonds card.
```

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6. If the current suit different form the trump and you don't have the current suit but you have the trump suit card, so you can play that card (trump) and you will win the trick.

```
Player 1, enter the index of the card to play: 1
Player 1 played: 10 of Diamonds
Player 2's Hand:
0: 8 of Hearts
1: Queen of Spades
2: 8 of Spades
3: Jack of Hearts
4: 9 of Spades

Player 2, enter the index of the card to play: 0
Player 2 played: 8 of Hearts
Player 2 wins the trick!

Scores: Player 1: 2, Player 2: 2, Player 3: 2

Trick 7:
Player 2's Hand:
0: Queen of Spades
1: 8 of Spades
2: Jack of Hearts
3: 9 of Spades

Player 2, enter the index of the card to play: |
```

7. A total of 10 tricks (rounds) are played, after which the results are displayed. The user is then given the option to decide whether they want to play another game or not.

```
Scores: Player 1: 4, Player 2: 3, Player 3: 3

Game Over!
Player 1 won 4 tricks (Quota: 5)
Player 2 won 3 tricks (Quota: 3)
Player 3 won 3 tricks (Quota: 2)
Player 1 did not meet their quota and loses.
Player 2 has met their quota and wins.
Player 3 has met their quota and wins.
Press 1 to play again or 2 to quit: |
```