Blackjack - The Game

## Introduction

Blackjack, also known as 21, is a popular card game played in casinos around the world. The game is simple to understand yet offers a thrilling mix of strategy and luck. The objective of the game is to have a hand value closer to 21 than the dealer without exceeding 21. This write-up covers the rules of Blackjack, instructions for playing the game, and details about the project implementation.

## Rules of Blackjack

1. **Card Values:**
   * Number cards (2-10) are worth their face value.
   * Face cards (Jack, Queen, King) are worth 10 points each.
   * Aces can be worth either 1 or 11 points, depending on which value benefits the hand the most. In this program, we are setting it to 11 points.
2. **Gameplay:**
   * The game is played with one or more standard 52-card decks.
   * Each player is dealt two cards, and the dealer is dealt two cards (one face up and one face down).
   * Players can see their own cards and the dealer's face-up card.
3. **Player Options:**
   * **Hit:** Draw a card from the deck. Players can continue to hit as many times as they like unless they exceed 21, which is called a "bust."
   * **Stand:** Keep the current hand and end the turn.
4. **Dealer's Turn:**
   * After all players have completed their turns, the dealer reveals the face-down card.
   * The dealer must hit until the hand value is at least 17.
   * If the dealer busts (exceeds 21), all remaining players win.
5. **Winning the Game:**
   * If the player's hand value is closer to 21 than the dealer's hand value without busting, the player wins.
   * If the dealer's hand value is closer to 21 than the player's hand value without busting, the dealer wins.
   * If both the player and the dealer have the same hand value, it's a tie (push).

## Instructions for Playing Blackjack

1. **Starting the Game:**
   * Initialize the deck(s) and shuffle them.
   * Deal two cards to each player and the dealer. Display the player's cards and the dealer's face-up card.
2. **Player's Turn:**
   * Players decide whether to "hit" or "stand" based on their hand value and the dealer's face-up card.
   * If a player chooses to hit, draw a card and add it to the player's hand value.
   * If a player busts, they lose immediately.
   * If a player chooses to stand, their turn ends, and the next player takes their turn.
3. **Dealer's Turn:**
   * After all players have completed their turns, the dealer reveals the face-down card.
   * The dealer must hit until the hand value is at least 17.
   * If the dealer busts, all remaining players win.
4. **Determining the Winner:**
   * Compare each player's hand value with the dealer's hand value.
   * If the player's hand value is closer to 21 without busting, the player wins.
   * If the dealer's hand value is closer to 21 without busting, the dealer wins.
   * If both the player and the dealer have the same hand value, it's a tie (push).

## Project Implementation

The project implements a simplified version of Blackjack using C++. The game includes the following features:

1. **Card Dealing:**
   * Randomly deals cards from a simulated deck without using arrays or functions.
2. **Player's Turn Logic:**
   * Allows the player to choose between hitting or standing.
3. **Dealer's Turn Logic:**
   * Automates the dealer's actions based on standard rules.
4. **Winner Determination:**
   * Compares the player's and dealer's hand values to determine the winner.
5. **File I/O:**
   * Records the deals in a file named card.dat.

The project is developed in stages, with each version building upon the previous one, ensuring a clear progression of development.

**End**

## Conclusion

Blackjack is an engaging game that combines luck and strategy. This project demonstrates the fundamental aspects of programming, including the use of primitive and reference data types, conditionals, loops, input/output operations, and file handling. The implementation provides a basic but functional simulation of Blackjack, adhering to the project's constraints and requirements. As a next step, this program can be enhanced to include betting, increase number of players from 2 to 8, keeping track of players and records of all players in separate files, leaderboard, and total winnings for the dealer.