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Blackjack

MIS 411

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SUMMARY OF GAME RULES:

Wildcat Blackjack is a modified, point-based version of the traditional casino game Blackjack (21). The main goal is to finish the game with the highest total score while keeping your hand values as close to 21 as possible without going over (busting).

Our version supports up to four human players in the same session. Players can choose between two modes: Head-to-head (players compete against each other) or Versus House (each player competes against the dealer). Instead of money and wagers this game points for winning hands, achieving 21, and final placement. A global high score is tracked and stored in an external file so that records persist between runs of the program.

Each player is initially dealt with two cards. Cards 2 through 10 are worth their face value, Jacks, Queens, and Kings are worth 10, and Aces can be worth either 11 or 1 (depending on what gives the best total without busting. Players take turns choosing to Hit (take another card) or Stand (keep their current total). In Versus House mode and with exactly two cards, plyers may also Double Down. After all players finish, the dealer players have their hand (Versus House), or rankings are calculated (Head-to-Head), and points are awarded.

GETTING STARTED WITH THE GAME:

When you run Wildcat Blackjack, the program displays a welcome message and, if available, the current global high score stored in the external file (Data/HighScore.txt).

1. Choosing the Number of Players:
   a. The program asks how many players will participate
   b. You may enter a number from 1 to 4. Input is validated, so invalid values are rejected with a helpful message.
2. Entering Player Information:
   a. For each player, the program asks for first name, last name, and a unique username,
   b. Usernames must be unique for this game session. If a username is already taken by another player, the program will ask the player to choose a different one.
   c. After entering valid information, the player receives a personalized welcome message. These welcome messages rotate so each player sees a slightly different greeting.
3. Player Reset:
   a. At the start of each new game, all players' statistics (points, wins, losses, busts, etc.) are reset for that game. The global high score is not reset it is loaded from the external file.

CHOOSING THE GAME MODE:

After setting up the players, the program asks which game mode you want to play:

1. Head-to-Head (Players vs Player):
   a. All players are compared against each other each hand.
   b. The ranking is calculated based on hand total that does not bust. The highest non-bust total receives first place for that hand.
   c. Points are awarded for placement (for example, first, second, and third place) and for achieving 21.
2. Versus House (Player vs Dealer):
   a. Each player plays against the dealer.
   b. The dealer has its own hand and follows standard rules: the dealer hits until reaching at least 17 and stands at 17 or higher.
   c. Players each point for defeating the dealer and for achieving 21. Pushes (ties) are also tracked.

The user selects the mode by entering 1 for Head-to-Head or 2 for Versus House. Input is validated to ensure a valid choice.

PLAYING A HAND:

For each hand:

1. Deck Setup:
   a. At the start of every hand, the deck is reset to a full 52-card deck and shuffled.
   b. This ensures enough cards for all players and simplifies deck management.
2. Dealing Cards:
   a. Each player is dealt with two cards.
   b. In Versus House mode the dealer also dealt with two cards. One of the dealers' cards is shown, and the other is initially hidden.
3. Player Turns:
   a. Players take turns one at time.
   b. In Head-to-Head mode, the program displays one card and indicates that the other card is hidden to mimic traditional play.
   c. In Versus House mode, both of the players cards are displayed.
4. Automatic Blackjack Check:
   a. If a players first two cards total 21, the program announces a Blackjack. The player's turn ends automatically, and this is tracked in their stats.

PLAYER ACTIONS: HIT, STAND, DOUBLE DOWN:

During their turn, each player chooses what to do based on their current hand total:

- Hit (H): The player takes another card from the deck. The new card and the updated total are displayed. If the total exceeds 21 the player busts and their turn ends.
- Stand (S): The player ends their turn and keeps their current total. No more cards are drawn.
- Double Down (D):
    - Available only in Versus House mode and only when the player has exactly two cards.
    - The player receives exactly one additional card.
    - The new total is displayed, and the turn ends immediately.
    - In the games points systems, doubling down is strategic option and is clearly indicated in the console output.

The program uses input validation to ensure only valid choices are allowed. Players can type H/Hit, S/Stand, or D/Double/Double Down where applicable.

DEALER TURN (VERSUS HOUSE MODE):

In Versus House mode, after all players have taken their turns, the dealer reveals the hidden card and plays according to standard Blackjack rules:

- The dealer reveals the second card and the total is displayed.
- If the total is less than 17, the dealer continues to hit (draw cards) until reaching at least 17.
- If the dealers' total exceeds 21, the dealer busts and all non-bust players win that round against the house.
- If the dealer stands (17-21), each player's total is compared against the dealers total determine wins, losses, or pushes.

SCORING AND POINTS SYSTEM:

Wildcat Blackjack uses a point-based system instead of money:

- Winning a hand (Versus House) or finishing in first place (Head-to-Head) awards a base number of points.
- Second and third place in Head-to-Head mode earn fewer points
- Any hand totaling exactly 21 (including but not limited to Blackjack) earns a bonus defined in the program

Each player's total points accumulate over all hands played in the game. After each hand, the program displays:

- The players hand total (or BUST if over 21)

- Points earned that round
- Updated total points and a short result label (WIN, LOSE, BUST, PUSH, or PLACE X).

The program also tracks detailed stats for each player, including:

- Hands Played
- Wins, Losses, Pushes (in Versus House)
- Number of Blackjacks
- Number of Busts
- Hands that ended exactly at 21
- Best win streak
- Most cards drawn in a single hand
- Total cards drawn across the game

ADDITIONAL FEATURES:

At the end of the game, Wildcat Blackjack calculated several special recognitions:

- Winner:
  - The player (or players, in case of a tie) with the highest total points at the end of the game.
- Marathoner:
  - The player who drew the most cards in a single hand across the entire game.
- Short Stop:
  - The player who drew the fewest total cards (TotalCardsDrawn) across all hands in the game.
- Lucky Son of a Gun:
  - Awarder only if the game was set to exactly 5 hands.
  - Any player who finishes all 5 hands without a single bust (Busts = 0) earns this title.

These recognitions are printed in a dedicated section at the end of the game called "Special Recognitions."

GLOBAL HIGH SCORE AND EXTERNAL FILE:

Wildcat Blackjack maintains a global high score that persists between program runs using an external text file.

- The high score file is stored in a folder named Data with the filename HighScore.txt.
- The program uses a relative path so that it can find the file regardless of the computer it runs on, if the folder structure is kept intact.

At the end of each game:

- The highest scoring players are compared to the stored global high score.
- If the new score is higher, the program announces a NEW GLOBAL HIGH SCORE and overwrites the file with the new name and score.
- If no one beat the record, the existing global high score is reported back to the players.
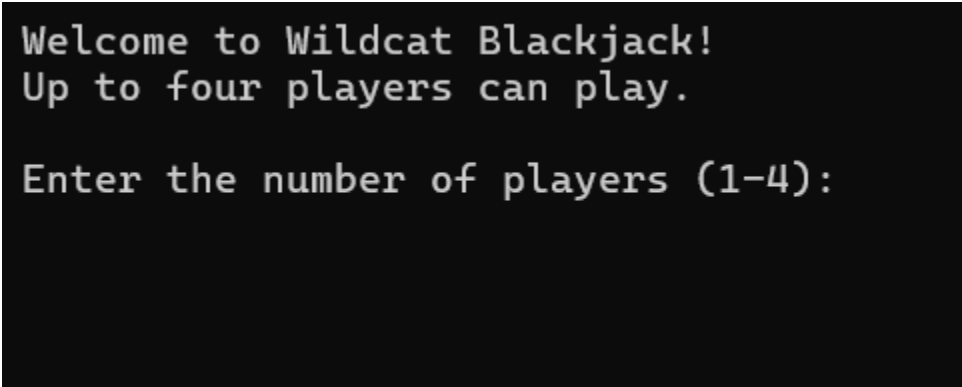
The file store the high score in the format: Name|Score (for example: "Taylor Swift|120").

GAME-SPECIFIC TERMS:

Even though not all of these actions are implemented in code, they are common Blackjack terms and are defined here for clarity.

- Hit: Take another card from the deck.
- Stand: End your turn and keep your current total.
- Bust: When your hand total exceeds 21, you automatically lose that hand.
- Blackjack: A starting hand of two cards that totals 21 (typically and Ace and a 10-value card).
- Double Down: In this game, it is available in Versus House mode when a player has exactly two cards. The player takes exactly one more card and then stands.
- Splitting Pairs (not implemented): If a player's first two cards have the same value, they may split them into two separate hands in traditional Blackjack.
- Insurance (not implemented): A side bet offered when the dealer shows and Ace, betting that the dealer has Blackjack.
- Surrender (not implemented): Giving up the hand early and losing only half the wager.

SCREENSHOTS FOR DOCUMENTATION: