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Final Project: Blackjack In Haskell Testing

Test Plan:
- Build a functioning blackjack game in Haskell that correctly handles card drawing, player decisions (hit/stay), dealer behavior, hand totals, aces adjustments, busts, wins/losses, ties, and multiple rounds with score tracking.

To do this, my code:
- Has a randomNumberGenerator function that, once given a number at the start of each game, generates random numbers based on that seed.
- Constructs a deck by appending the numbers 1–13 to the list 4 times (once for each suit).
- Includes a function that takes the numbers 1 and 11–13 and assigns them their names, with corresponding values of 10 for Jack, Queen, and King, and 11 for Ace.
- Has a helper function, handTotal, that adds the values of the hand and adjusts the value of Aces if the hand total is over 11.
- Contains functions to represent the player's and dealer's turns.
    - Within them, if the total is greater than 21, it outputs that the player or dealer has busted.
    - In playerTurn, includes logic that takes user input (h/s) when prompted whether they want to hit or stay.
    - The dealerTurn function has logic to prevent the dealer from hitting once the total of their hand is 17 or higher.
- Includes a function to track wins and another function to print who won the game after each round.
- Simulates multiple rounds until the user chooses to exit by entering "exit".
- Handles the case when the player busts, immediately ending the round as a loss for the player.

Limitations:
- I didn't track suits as I felt there was no point in doing so for my implementation.
- No betting or splitting features, as there were no instructions to implement such features.

Test Cases: This section consists of the output from the tests run, along with their corresponding screenshots from ghci. Since the numbers are randomly generated, there isn't really a fixed expected output to test against. However, one can verify correctness by tracing the output, performing the calculations for hand totals, checking busts, and ensuring that wins and losses are updated according to the game rules.

This is a test case demonstrating a tie
- **The number entered to start the random number generation was 7**

Enter any integer (seed) for the random number generator to begin game: 7

Current Score - Player: 0, Dealer: 0
Press Enter to play a round or type "exit" to quit: wexit
Dealer shows: 2
Your hand: 9, 9 (18)
Hit or Stay? (h/s): s
Dealer draws: Ace
Dealer draws: 5
Dealer stays at: 2, 10, Ace, 5 (18)

Your final: 9, 9 (18)
Dealer final: 2, 10, Ace, 5 (18)
Result: Tie!

Current Score - Player: 0, Dealer: 0

```
ghci> main
Enter any integer (seed) for the random number generator to begin game: 7

Current Score - Player: 0, Dealer: 0
Press Enter to play a round or type "exit" to quit: wexit
Dealer shows: 2
Your hand: 9, 9 (18)
Hit or Stay? (h/s): s
Dealer draws: Ace
Dealer draws: 5
Dealer stays at: 2, 10, Ace, 5 (18)

Your final:   9, 9 (18)
Dealer final: 2, 10, Ace, 5 (18)
Result: Tie!

Current Score - Player: 0, Dealer: 0
```

This is a test case that demonstrates when the player busts
- **The number entered to start the random number generation was 56**

Enter any integer (seed) for the random number generator to begin game: 56

Current Score - Player: 0, Dealer: 0
Press Enter to play a round or type "exit" to quit:
Dealer shows: 5
Your hand: 4, 4 (8)
Hit or Stay? (h/s): h
You drew: 6
Your hand: 4, 4, 6 (14)
Hit or Stay? (h/s): h
You drew: Jack
Your hand: 4, 4, 6, Jack (24)
Hit or Stay? (h/s): s
Bust:

Your final: 4, 4, 6, Jack (24)
Dealer final: 5, Queen (15)
Result: Dealer wins!

Current Score - Player: 0, Dealer: 1

```
ghci> main
Enter any integer (seed) for the random number generator to begin game: 56

Current Score – Player: 0, Dealer: 0
Press Enter to play a round or type "exit" to quit:
Dealer shows: 5
Your hand: 4, 4 (8)
Hit or Stay? (h/s): h
You drew: 6
Your hand: 4, 4, 6 (14)
Hit or Stay? (h/s): h
You drew: Jack
Your hand: 4, 4, 6, Jack (24)
Hit or Stay? (h/s): s
Bust:

Your final:   4, 4, 6, Jack (24)
Dealer final: 5, Queen (15)
Result: Dealer wins!

Current Score – Player: 0, Dealer: 1
```

This is a test case that demonstrates when the player gets blackjack
- **The number entered to start the random number generation was 78**

Enter any integer (seed) for the random number generator to begin game: 78

Current Score - Player: 0, Dealer: 0
Press Enter to play a round or type "exit" to quit:
Dealer shows: 3
Your hand: Jack, 2 (12)
Hit or Stay? (h/s): h
You drew: 9
Your hand: Jack, 2, 9 (21)
Hit or Stay? (h/s): s
Dealer draws: 2
Dealer draws: 3
Dealer draws: Ace
Dealer draws: 6
Dealer stays at: 3, 5, 2, 3, Ace, 6 (20)

Your final: Jack, 2, 9 (21)
Dealer final: 3, 5, 2, 3, Ace, 6 (20)
Result: Player wins!

Current Score - Player: 1, Dealer: 0

```
ghci> main
Enter any integer (seed) for the random number generator to begin game: 78

Current Score - Player: 0, Dealer: 0
Press Enter to play a round or type "exit" to quit:
Dealer shows: 3
Your hand: Jack, 2 (12)
Hit or Stay? (h/s): h
You drew: 9
Your hand: Jack, 2, 9 (21)
Hit or Stay? (h/s): s
Dealer draws: 2
Dealer draws: 3
Dealer draws: Ace
Dealer draws: 6
Dealer stays at: 3, 5, 2, 3, Ace, 6 (20)

Your final:   Jack, 2, 9 (21)
Dealer final: 3, 5, 2, 3, Ace, 6 (20)
Result: Player wins!

Current Score - Player: 1, Dealer: 0
```

This is a test case that demonstrates when the player gets multiple Aces, and the adjustment that takes place
- The number entered to start the random number generation was 67

Enter any integer (seed) for the random number generator to begin game: 67

Current Score - Player: 0, Dealer: 0
Press Enter to play a round or type "exit" to quit:
Dealer shows: 4
Your hand: Ace, 3 (14)
Hit or Stay? (h/s): h
You drew: Ace
Your hand: Ace, 3, Ace (15)
Hit or Stay? (h/s): h
You drew: 7
Your hand: Ace, 3, Ace, 7 (12)
Hit or Stay? (h/s): h
You drew: 2
Your hand: Ace, 3, Ace, 7, 2 (14)
Hit or Stay? (h/s): h
You drew: 6
Your hand: Ace, 3, Ace, 7, 2, 6 (20)
Hit or Stay? (h/s): s
Dealer draws: 9
Dealer stays at: 4, Jack, 9 (23)

Your final: Ace, 3, Ace, 7, 2, 6 (20)
Dealer final: 4, Jack, 9 (23)
Result: Player wins!

Current Score - Player: 1, Dealer: 0

This test case is a sample game consisting of a best-of-3 series. It starts with a given number for the RNG, and then multiple games are played consecutively without requiring additional input for the RNG.

- **The number entered to start the random number generation was 22**

Enter any integer (seed) for the random number generator to begin game: 22

Current Score - Player: 0, Dealer: 0
Press Enter to play a round or type "exit" to quit:
Dealer shows: Jack
Your hand: Ace, 4 (15)
Hit or Stay? (h/s): h
You drew: 7
Your hand: Ace, 4, 7 (12)
Hit or Stay? (h/s): h
You drew: Jack
Your hand: Ace, 4, 7, Jack (22)
Hit or Stay? (h/s): s
Bust:

Your final: Ace, 4, 7, Jack (22)
Dealer final: Jack, King (20)
Result: Dealer wins!

Current Score - Player: 0, Dealer: 1
Press Enter to play a round or type "exit" to quit:
Dealer shows: 9
Your hand: Ace, 5 (16)
Hit or Stay? (h/s): s
Dealer draws: 2
Dealer draws: 8
Dealer stays at: 9, 4, 2, 8 (23)

Your final: Ace, 5 (16)
Dealer final: 9, 4, 2, 8 (23)
Result: Player wins!

Current Score - Player: 1, Dealer: 1
Press Enter to play a round or type "exit" to quit: h
Dealer shows: 7
Your hand: King, 8 (18)
Hit or Stay? (h/s): s
Dealer draws: 2
Dealer draws: 4
Dealer stays at: 7, 4, 2, 4 (17)

Your final: King, 8 (18)
Dealer final: 7, 4, 2, 4 (17)
Result: Player wins!

Current Score - Player: 2, Dealer: 1
Press Enter to play a round or type "exit" to quit: exit

```
ghci> main
Enter any integer (seed) for the random number generator to begin game: 22

Current Score — Player: 0, Dealer: 0
Press Enter to play a round or type "exit" to quit:
Dealer shows: Jack
Your hand: Ace, 4 (15)
Hit or Stay? (h/s): h
You drew: 7
Your hand: Ace, 4, 7 (12)
Hit or Stay? (h/s): h
You drew: Jack
Your hand: Ace, 4, 7, Jack (22)
Hit or Stay? (h/s): s
Bust:

Your final:   Ace, 4, 7, Jack (22)
Dealer final: Jack, King (20)
Result: Dealer wins!

Current Score — Player: 0, Dealer: 1
Press Enter to play a round or type "exit" to quit:
Dealer shows: 9
Your hand: Ace, 5 (16)
Hit or Stay? (h/s): s
Dealer draws: 2
Dealer draws: 8
Dealer stays at: 9, 4, 2, 8 (23)

Your final:   Ace, 5 (16)
Dealer final: 9, 4, 2, 8 (23)
Result: Player wins!

Current Score — Player: 1, Dealer: 1
Press Enter to play a round or type "exit" to quit: h
Dealer shows: 7
Your hand: King, 8 (18)
Hit or Stay? (h/s): s
Dealer draws: 2
Dealer draws: 4
Dealer stays at: 7, 4, 2, 4 (17)

Your final:   King, 8 (18)
Dealer final: 7, 4, 2, 4 (17)
Result: Player wins!

Current Score — Player: 2, Dealer: 1
Press Enter to play a round or type "exit" to quit: exit
```