

GameOfWar.java

Objective: To implement a game using a singly linked list.

Background:

The Game of War is a simple card game played by children. It involves a standard deck of 52 cards and two players. Cards are ranked in ascending order from the lowest two up to ten, then jack, queen, king, and ace as the highest. The deck of cards is shuffled and each player is dealt a 26 card hand.



Each player draws a card from the top of their hand. The player with the highest rank card places both drawn cards into the bottom of their hand. If both cards drawn are of equal rank, then it is WAR! In WAR, each player draws three cards from their hand face-down and a fourth face-up. The player with the higher rank fourth card takes all of the drawn cards and puts them into the bottom of their hand. If the WAR draws fourth cards of equal rank, then successive WARs are executed until someone wins. The winner always gets all of the cards that were dealt. At any point a player runs out of cards in their hand, then the other player wins. Players can shuffle their hands occasionally to make the game more lively.

You will implement this simple game using a singly-linked list to represent the deck of cards, each of the two hands, and the dealt pile. The game will pit the user (player) and the computer against each other.

Assignment:

Download the zip file **GameOfWar.zip** and unzip. It will create a directory **GameOfWar** and do all of your work in this directory. Copy in your working **SinglyLinkedList.java** and **Prompt.java** files to use. The **Card.java**, **Rank.java**, **Suit.java**, and **ListNode.java** files are to be used as-is and must not be changed!

1. Edit the **DeckOfCards.java** file and add the functionality to make the deck work as specified.
2. Edit **GameOfWar.java** and create the interactive Game of War. Use the sample run below as your model. The prompt should accept "q" to quit the game and "s" to shuffle the player's (user's) hand. Any other entry, including the "Enter" key, will execute one turn in the game.

Following is a sample run of the game. User input is in **bold**.

```
% java GameOfWar
```

```
Welcome to the Game of War
```

```
Deck sizes: player = 26  computer = 26
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```
Press 'ENTER' to fight another battle or 'S' to shuffle your deck! -> (ENTER)
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```
You drew ACE of HEARTS
```

```
The computer drew QUEEN of DIAMONDS
```

```
You won two cards! Deck sizes: player = 27  computer = 25
```

```
Press 'ENTER' to fight another battle or 'S' to shuffle your deck! -> (ENTER)
```

```
You drew EIGHT of HEARTS
```

```
The computer drew QUEEN of SPADES
```

```
The computer won two cards! Deck sizes: player = 26  computer = 26
```

Press 'ENTER' to fight another battle or 'S' to shuffle your deck! -> **(ENTER)**
You drew SEVEN of HEARTS
The computer drew JACK of HEARTS
The computer won two cards! Deck sizes: player = 25 computer = 27

Press 'ENTER' to fight another battle or 'S' to shuffle your deck! -> **(ENTER)**
You drew JACK of CLUBS
The computer drew TWO of DIAMONDS
You won two cards! Deck sizes: player = 26 computer = 26

Press 'ENTER' to fight another battle or 'S' to shuffle your deck! -> **(ENTER)**
You drew FOUR of HEARTS
The computer drew FIVE of SPADES
The computer won two cards! Deck sizes: player = 25 computer = 27

Press 'ENTER' to fight another battle or 'S' to shuffle your deck! -> **(ENTER)**
You drew ACE of SPADES
The computer drew SEVEN of CLUBS
You won two cards! Deck sizes: player = 26 computer = 26

Press 'ENTER' to fight another battle or 'S' to shuffle your deck! -> **(ENTER)**
You drew FOUR of DIAMONDS
The computer drew JACK of DIAMONDS
The computer won two cards! Deck sizes: player = 25 computer = 27

Press 'ENTER' to fight another battle or 'S' to shuffle your deck! -> **(ENTER)**
You drew TEN of SPADES
The computer drew ACE of CLUBS
The computer won two cards! Deck sizes: player = 24 computer = 28

Press 'ENTER' to fight another battle or 'S' to shuffle your deck! -> **(ENTER)**
You drew FIVE of DIAMONDS
The computer drew FIVE of CLUBS
Its a tie! Battle again!
You drew SIX of SPADES
The computer drew TEN of CLUBS
The computer won 10 cards! Deck sizes: player = 19 computer = 33

Press 'ENTER' to fight another battle or 'S' to shuffle your deck! -> **s**
Your deck has been shuffled.

Deck sizes: player = 19 computer = 33

Press 'ENTER' to fight another battle or 'S' to shuffle your deck! -> **(ENTER)**
You drew QUEEN of DIAMONDS
The computer drew THREE of DIAMONDS
You won two cards! Deck sizes: player = 20 computer = 32

Press 'ENTER' to fight another battle or 'S' to shuffle your deck! -> **(ENTER)**

... many turns (and minutes) later ...

Press 'ENTER' to fight another battle or 'S' to shuffle your deck! -> **(ENTER)**
You drew EIGHT of DIAMONDS
The computer drew EIGHT of SPADES
Its a tie! Battle again!
You drew TEN of CLUBS
The computer drew SEVEN of CLUBS
You won 10 cards! Deck sizes: player = 51 computer = 1

Press 'ENTER' to fight another battle or 'S' to shuffle your deck! -> **(ENTER)**
You drew TWO of CLUBS
The computer drew JACK of CLUBS
The computer won two cards! Deck sizes: player = 50 computer = 2

Press 'ENTER' to fight another battle or 'S' to shuffle your deck! -> **(ENTER)**
You drew TWO of SPADES
The computer drew TWO of CLUBS
The computer won 2 cards! Deck sizes: player = 49 computer = 3

Press 'ENTER' to fight another battle or 'S' to shuffle your deck! -> **(ENTER)**
You drew QUEEN of DIAMONDS
The computer drew JACK of CLUBS
You won two cards! Deck sizes: player = 50 computer = 2

Press 'ENTER' to fight another battle or 'S' to shuffle your deck! -> **(ENTER)**
You drew EIGHT of HEARTS
The computer drew TWO of SPADES
You won two cards! Deck sizes: player = 51 computer = 1

Press 'ENTER' to fight another battle or 'S' to shuffle your deck! -> **(ENTER)**
You drew ACE of CLUBS
The computer drew TWO of CLUBS
You won two cards!
Deck sizes: player = 52 computer = 0

Congratulations - PLAYER won!!!

The end of another game where the computer wins.

You won two cards! Deck sizes: player = 6 computer = 46

Press 'ENTER' to fight another battle or 'S' to shuffle your deck! -> **(ENTER)**
You drew FOUR of DIAMONDS
The computer drew FIVE of HEARTS
The computer won two cards! Deck sizes: player = 5 computer = 47

Press 'ENTER' to fight another battle or 'S' to shuffle your deck! -> **(ENTER)**
You drew TWO of SPADES
The computer drew NINE of CLUBS
The computer won two cards! Deck sizes: player = 4 computer = 48

Press 'ENTER' to fight another battle or 'S' to shuffle your deck! -> **(ENTER)**
You drew EIGHT of DIAMONDS
The computer drew TEN of CLUBS
The computer won two cards! Deck sizes: player = 3 computer = 49

Press 'ENTER' to fight another battle or 'S' to shuffle your deck! -> **(ENTER)**
You drew SIX of DIAMONDS
The computer drew SEVEN of HEARTS
The computer won two cards! Deck sizes: player = 2 computer = 50

Press 'ENTER' to fight another battle or 'S' to shuffle your deck! -> **(ENTER)**
You drew FIVE of CLUBS
The computer drew SEVEN of DIAMONDS
The computer won two cards! Deck sizes: player = 1 computer = 51

Press 'ENTER' to fight another battle or 'S' to shuffle your deck! -> **(ENTER)**
You drew THREE of SPADES
The computer drew EIGHT of CLUBS
The computer won two cards! Deck sizes: player = 0 computer = 52

Sorry - COMPUTER won.