Deck of Cards Lab

Lab Number 1

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1 Hierarchical Index

1.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

- Comparable
  - **Card** **2**
- Iterable
  - **Deck** **4**
- **Numerals** **6**
- **Suits** **7**
- Comparator
  - **Deck** **4**

2 Class Index

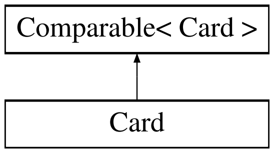
2.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

3 Class Documentation

3.1 Card Class Reference

Inheritance diagram for Card:



Public Member Functions

- Card (Suits aSuit, Numerals aNumeral)
- Card (Card aCard)
- Suits get_suit ()
- Numerals get_numeral ()
- String toString ()
- int compareTo (Card otherCard)
- boolean equals (Object other)

3.1.1 Detailed Description

A `Card` object is a product of two enumerations: `Suits` and `Numerals`, where `Suits` contain spades, hearts, diamonds, and clubs; `Numerals` contain deuce (2), through Jack, Queen, King,and Ace (high). which brings the number of numerals to 13. Thus, we have 52 possible possible cards (products) $4 \times 13 = 52$.

Author

CS Dept., UMD.

3.1.2 Constructor & Destructor Documentation

3.1.2.1 Card (Suits *aSuit,* Numerals *aNumeral*)

The most likely constructor that clients will use. Notice, this class does not support (expose) a default constructor—after all, what would be the default suit and default numeral for such a card?

Parameters

aSuit	[in]
aNumeral	[in]

3.1.2.2 Card (Card *aCard*)

The copy constructor is required (used by) the copy-constructor defined on the `Deck` class.

Parameters

aCard	[in]

3.1.3 Member Function Documentation

3.1.3.1 int compareTo (Card *otherCard*)

This method *compares only the* `Numeral`s of the two `Card` objects. The `compare()` method (qv) implemented on the `Deck` method implements a *more complete* notion of comparison, i.e., one that takes the `Suit` into account as well.

3.1.3.2 boolean equals (Object *other*)

Override must satisfy the requirement that `equals` returns `true` in the case where `compareTo` returns 0.

3.1.3.3 Numerals get_numeral ( )

Default read accessor that returns the `Numeral` belonging to `Card` objects.

Returns

this Card's Rank (Numeral)

3.1.3.4 Suits get_suit ( )

Default read accessor that returns the `Suit` belonging to `Card` objects.

Returns

this Card's Suit

3.1.3.5 String toString ( )

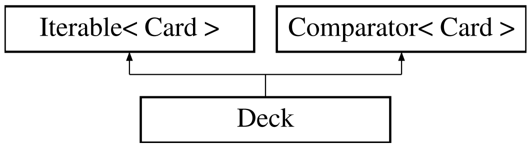
You don't need to override this method, but I strongly suggest doing so ....

The documentation for this class was generated from the following file:

- Card.java

3.2 Deck Class Reference

Inheritance diagram for Deck:



Public Member Functions

- Deck ()
- Deck (Deck otherDeck)
- Iterator< Card > iterator ()
- int compare (Card card1, Card card2)
- int size ()
- void shuffle ()
- void sort ()
- String toString ()
- boolean equals (Object other)

3.2.1 Detailed Description

A `Deck` allows for multiple kinds of comparisons, i.e., it implements the `Comparator<T>` interface. In addition, the `Deck` also must allow clients to *iteratively* operate over `Card` objects.

Author

UMD CS Dept.

3.2.2 Constructor & Destructor Documentation

3.2.2.1 Deck ( )

Returns a "sorted" deck of 52 cards. Note, this Deck must be sorted according to the logic embodied by your `compare` method that you defined on `Card`.

3.2.2.2 Deck (Deck *otherDeck*)

This is the copy-constructor for the Deck class. Note, although not strictly necessary, this version deep copies down to the individiual `Card` objects.

Parameters

otherDeck	

3.2.3 Member Function Documentation

3.2.3.1 int compare (Card *card1*, Card *card2*)

Implements a *two-faceted* comparison predicate: Facet one dispatches on the `Suit` of the `Card` with the following order (from least to greatest):

$$\{\text{clubs}, \text{diamonds}, \text{hearts}, \text{spades}\}$$

The second facet compares `Numerals`,

$$\{\text{deuce}, \text{three}, \ldots, \text{ace}\}$$

Thus the smallest `Numeral`, say `deuce` of spades is greater than any `ace` of a lower ranking suit, such as `hearts`.

Another way of visualizing this, passing the `compare` method to a standard sorting algorithm would result in a `Deck` sorted in its original order (i.e., in the order in which the constructor for the `Deck` class would create).

3.2.3.2 boolean equals (Object *other*)

Two `Deck`s are equal iff their corresponding `Card`s are `equal`, using the `Deck` object's `compare` method. (Why?)

3.2.3.3 Iterator<**Card**> iterator ( )

Returns the standard `Iterator<Deck>` (do this by either delegating to the data-type that you used to contain Cards, or by defining an inner-class that exposes this interface—your call.

3.2.3.4 void shuffle ( )

Delegates to the Java `Collections` `shuffle()` method. Note: this method changes the internal representation of the `Card`s.

3.2.3.5 int size ( )

Returns the number of `Card`s in this `Deck`.

Returns

the number of Cards in this Deck

3.2.3.6 void sort ( )

Delegates to the Java `Collections sort` method and the `Card`'s `compare` method in order to put the `Deck` in ascending order. Note: calling this method modifies the internal order of the Deck.

3.2.3.7 String toString ( )

You don't need to override this method, but I think it is helpful

The documentation for this class was generated from the following file:

- Deck.java

3.3 Numerals Enum Reference

Public Attributes

- **deuce**
- **three**
- **four**
- **five**
- **six**
- **seven**
- **eight**
- **nine**
- **ten**

- **jack**
- **queen**
- **king**
- **ace**

3.3.1 Detailed Description

`public enum` (enumeration) comprising thirteen *ranks*, starting with deuce(2), through Ace.

Author

UMD CS Department

The documentation for this enum was generated from the following file:

- Numerals.java

3.4 Suits Enum Reference

Public Attributes

- **clubs**
- **diamonds**
- **hearts**
- **spades**

3.4.1 Detailed Description

`public enum` (enumeration) that provides the standard 4 suits, ordered by the standard rules of Bridge (i.e., clubs (low), through spades (high).

Author

UMD CS Dept.

The documentation for this enum was generated from the following file:

- Suits.java

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