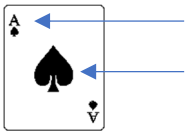
A Standard Deck of Playing Cards

(designed to accompany the AP® Computer Science A Elevens Lab)

- Consider the following questions first:

1. Look at the 10 cards that Lab 6 used for the card game. How could you change this information to be able to have a complete deck of standard playing cards (with Jacks, Queens, Kings, etc.)? If you are unfamiliar with what cards exist in a standard deck of cards, do some research and even print out a list of cards if needed.
2. If you answered the last question by thinking that you could make the three parallel arrays contain 52 elements each and that you would manually type out each of the 52 items for each array (a total of 156 elements) … your idea works, but it is coding by "brute force". Can you think of another way to do this (not an easy question)?

- Standard Playing cards:



4 of each type of card (4 Aces, 4 Jacks, four 2s, etc.)

13 cards of each suit (13 Spades, 13 Clubs, 13 Hearts, 13 Diamonds)
(each card contains a "point value" … 13 different "point values")

- How to create a standard playing card deck without manually typing 152 elements into 3 parallel arrays:

1. Create a default Deck constructor method in the Deck Class. This will build a standard deck.
2. Initialize 3 arrays containing all the information for each card characteristic (without repeating any elements)
3. Create a set of nested for-loops.
4. Set the outer loop to run 4 times (so that it cycles through each suit)
5. Set the inner loop to run 13 times (so that it cycles through each card – there are 13 types and values)
6. Inside the nested for-loop, write code that will add the specific card to the cards ArrayList in the deck.
7. After the nested for-loop is completed, initialize the size variable to the size of the deck.

- Below is the framework for the new default constructor method to be implemented. How would you complete it?

```
public Deck( ) {                                        //Method overloading = 2 Deck methods!
    //Initialize the cards variable to a new ArrayList
    //Initialize a new String array to contain all the types of cards in a deck (use one character per card)
    //Initialize a new String array to contain the different suits of cards (only 4 elements)
    //Initialize a new integer array to contain the possible card values (1-13)
    /* Complete the following for-loop using the directions above
        for(                    )
            for(                    )
                cards.add(                    );
    */
    //Set the size variable equal to the number of cards in the ArrayList
}
```

- Use the DeckTester Class from Lab #6 …

1. *Edit the class so that it only contains the following code:*

```
Deck myDeck = new Deck();
System.out.println(myDeck.toString());
myDeck.shuffle();
System.out.println("\n"+myDeck.toString());
```

2. *Run the new DeckTester Class multiple times to verify that it …*
   a. *Is working and produces the cards in a standard deck of cards*
   b. *Is creating random (different) decks of cards each time*