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Date: 5/16/2019

**18.05 Elevens Lab Worksheet**

**Directions**: Make note of your responses to the following questions as you work through the activities and exercise in the lesson.

**Activity 3 Exercise Results**

1. After running the Shuffler.java class, paste the output results of the perfect shuffle and efficient selection shuffle. Ensure the integers are shuffled a minimum of five times per demonstration.

Results of 5 consecutive perfect shuffles:

1: 2 0 3 1

2: 3 2 1 0

3: 1 3 0 2

4: 0 1 2 3

5: 2 0 3 1

Results of 5 consecutive efficient selection shuffles:

1: 2 0 3 1

2: 1 2 0 3

3: 2 0 3 1

4: 0 1 2 3

5: 2 3 1 0

## **Activity 3 Questions:**

1. Suppose that the initial contents of the values array in Shuffler.java are {1, 2, 3, 4}. What sequence of random integers would the efficient selection shuffle change values to contain {4, 3, 2, 1}? Show values of k, the random integer, and the array contents.

|  |  |  |
| --- | --- | --- |
| **k** | **random integer** | **values array** |
| - | - | {1, 2, 3, 4} |
| 3 | 0 | {4, 2, 3, 1} |
| 2 | 1 | {4, 3, 2, 1} |

**Activity 4 Exercise Results**

1. For the shuffle method, write the steps for its algorithm for the shuffle method.   
   For each card starting at the last card,

Create a random number that can be any number 0 to 50.

Make a placeholder card equal to the current card being looked over.

Set a card at the index of the random number to the position of the placeholder card.

Set the placeholder card to the position of the random number to swap the two cards.

Since the deck is still at 52 cards, reset the size back to the size of the list of cards.

1. Run the DeckTester.java file, and paste the results of at least one shuffle of the deck of 52 cards below.  
   Deck after dealing a card:

//…51 cards here

Dealt cards:

jack of diamonds (point value = 11)

Shuffling the Deck

size = 52

Undealt cards:

jack of diamonds (point value = 11), 3 of clubs (point value = 3),

3 of hearts (point value = 3), ace of clubs (point value = 1),

king of clubs (point value = 0), queen of spades (point value = 12),

8 of diamonds (point value = 8), 2 of spades (point value = 2),

4 of hearts (point value = 4), 7 of clubs (point value = 7),

ace of spades (point value = 1), 9 of hearts (point value = 9),

7 of hearts (point value = 7), 6 of hearts (point value = 6),

10 of spades (point value = 10), jack of hearts (point value = 11),

jack of clubs (point value = 11), 10 of clubs (point value = 10),

4 of diamonds (point value = 4), king of diamonds (point value = 0),

7 of spades (point value = 7), jack of spades (point value = 11),

10 of diamonds (point value = 10), 5 of hearts (point value = 5),

9 of clubs (point value = 9), queen of diamonds (point value = 12),

2 of clubs (point value = 2), 9 of spades (point value = 9),

5 of spades (point value = 5), queen of clubs (point value = 12),

3 of diamonds (point value = 3), 2 of diamonds (point value = 2),

8 of spades (point value = 8), 6 of clubs (point value = 6),

5 of clubs (point value = 5), 6 of diamonds (point value = 6),

queen of hearts (point value = 12), 5 of diamonds (point value = 5),

9 of diamonds (point value = 9), 4 of clubs (point value = 4),

8 of hearts (point value = 8), 6 of spades (point value = 6),

king of hearts (point value = 0), 2 of hearts (point value = 2),

ace of diamonds (point value = 1), 8 of clubs (point value = 8),

7 of diamonds (point value = 7), 4 of spades (point value = 4),

10 of hearts (point value = 10), 3 of spades (point value = 3),

ace of hearts (point value = 1), king of spades (point value = 0)