

**Students:**

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## 20.4 Program 1d: FiveCards

### Objectives

- Work with arrays that correspond to a standard poker card deck.
- Use Random number generator.
- Write various methods to convert index to a card suit and rank.

### Assignment

Write an application called `FiveCards.java` that randomly selects five unique numbers from 0 to 51 which will represent individual cards in a standard 52-card four-suited poker deck of cards.

### Methods

```
public static void main (String[] args)
```

- Call `initHand` to initialize the one-dimensional "hand" of cards with 52 card deck, 5 card hand and seed 1111.
- Call `showHand` to print the string representation of the number in the hand of cards array.
- Call `sameSuit` to print any cards in the hand that have the same suit.

```
public static int[] initHand(int deckSize, int handSize, long randomGeneratorSeed)
```

- This method returns a one-dimensional array of `handSize` integer values, each between 0 and `deckSize`.
- For this program, an example of a hand array is:

Array Index	Number Value	Corresponds to String value
0	2	Three of Clubs
1	16	Seven of Clubs
2	21	Nine of Diamonds
3	13	Ace of Diamonds

Array Index	Number Value	Corresponds to String value
4	46	Eight of Spades

- This method should create a Random object seeded with `randomGeneratorSeed` once BEFORE any loop is entered.
  - `Random rand = new Random(randomGeneratorSeed)`
- After this, `rand.nextInt(deckSize)` inside the loop will generate the next successive value.
- Unique cards: you must handle the case where number is randomly generated that has already been used in the hand array. For example, `initHand(52, 5, 31)` generates, in order, 20, 12, 20, ...

```
public static void showHand(int[] hand)
```

- This method displays each card on one line in the order it was dealt (placed into the hand array) by calling `getCardValue` for each card in the array.

```
public static void sameSuit(int[] hand)
```

- This method calls `getCardValue` to display any two or more cards having the same suit. This will be as few as two cards or as many as five. This method will require some strategy. It should be able to detect any of the following scenarios.
  - Two or more cards of the same suit. A hand may have more multiples of more than one suit, for example, two Hearts cards and two Clubs.
  - A "full house" would consist of two cards of one suit and three cards of another suit.
  - A "flush" would be five cards all of the same suit.
  - Cards should be printed in ascending rank order (sort the hand array from smallest to largest).

```
public static String getInfo()
```

- This method returns a string containing "Program 1, Student Name"

```
public static String getCardValue(int cardNumber)
```

- This method returns the value of a card having the form " of ". For example, "Ace of Hearts", "Two of Diamonds", "Queen of Spades."
  - The rank is determined by calling `getRank` and suit is determined by calling `getSuit`.

```
public static String getSuit(int cardNumber)
```

- Returns a string containing the suit of the card where

Card Value	Suit
0 - 12	Clubs

Card Value	Suit
13 - 25	Diamonds
26 - 38	Hearts
39 - 51	Spades

`public static String getRank(int cardNumber)`

- Returns a string containing the rank of the card where

Card Value	Rank		Card Value	Rank		Card Value	Rank
0	Ace		5	Six		10	Jack
1	Two		6	Seven		11	Queen
2	Three		7	Eight		12	King
3	Four		8	Nine			
4	Five		9	Ten			

## Notes

- import java.util.Arrays to use Arrays.sort(myHandArray) if desired
- import java.util.Random for random numbers

## Testing

Your program should run with a variety of inputs. Test as many as you can to find unique outputs! Focus on changing the seed value. Here are some examples: 1, 8, 81, 111, 1111, 11111, 31.

```
// Example 1: Given the following code segment: Everyone should
have this example to begin with.
```

```
int[] hand1= initHand(52, 5, 1111);
showHand(hand1);
sameSuit(hand1);
// showHand() output is:
Three of Clubs
Seven of Clubs
Nine of Diamonds
Ace of Diamonds
Eight of Spades
```

```
// sameSuit output is
Three of Clubs
Seven of Clubs
Ace of Diamonds
Nine of Diamonds

// Example 2:   Given the following code segment:

int[] hand2 = initHand(52, 5, 111);
showHand(hand2);
sameSuit(hand2);
//showHand output is
Nine of Diamonds
Two of Diamonds
King of Diamonds
Two of Clubs
Ten of Clubs
// SameSuit output is
Two of Clubs
Ten of Clubs
Two of Diamonds
Nine of Diamonds
King of Diamonds
```

**LAB  
ACTIVITY**

## 20.4.1: Program 1d: FiveCards

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## Submission Instructions

Compile command

```
javac FiveCards.java -Xlint:all -
encoding utf-8
```

*We will use this command to compile your code*

Upload your files below by dragging and dropping into the area or choosing a file on your hard drive.

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1: Unit test ^

1 / 1

getInfo() returns `Program 1, Student Name`

Test feedback

getInfo() correctly returned Program 1, et

2: Unit test ^

2 / 2

Test initHand(52, 5, 112)

Test feedback

initHand() correctly returned [8, 46, 14,

3: Unit test ^

1 / 1

Test initHand(52, 5, 71)

Test feedback

getCardValue() correctly returned [Ace of

4: Unit test ^

2 / 2

Test initHand(52, 5, 764L) generates duplicate number 10 which is ignored.  
Expected array is { 37, 26, 10, 46, 3}.

Test feedback

initHand() correctly returned [37, 26, 10,

5: Compare output ^

2 / 2

Input

Test output of showHand when initHand(52,

Your output correctly  
starts with

Three of Clubs  
Seven of Clubs  
Nine of Diamonds  
Ace of Diamonds  
Eight of Spades

## 6: Compare output ^

2 / 2

Input

```
Test output of sameSuit when initHand(52,
```

Your output correctly  
ends with

```
Three of Clubs  
Seven of Clubs  
Ace of Diamonds  
Nine of Diamonds
```

## 7: Unit test ^

1 / 1

Test getSuit(27)

Test feedback

```
getSuit(27) correctly returned Hearts
```

## 8: Unit test ^

2 / 2

Test getRank() returns ranks in order.

Test feedback

```
getRank() correctly returned [Ace, Two, Th
```

## 9: Unit test ^

2 / 2

Test getSuit() with various inputs

Test feedback

```
getSuit() correctly for all values
```

## 5 previous submissions

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