

Lesson 90: Elevens Lab #3 (W31D3)

Balboa High School

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Do Now

- Prepare HW to be checked:
 - Download [this driver](#) for questions 1 & 2 on [p9](#), insert your methods, and run.
 - run `Activity04/DeckTester.java`
- Read Activity 6's introduction and exploration sections (pp19-20) — this includes running `Elevens.jar`
- Answer questions 1–3 on p20

Students will reinforce OO programming principles and practice various tasks in Java via the College Board's [Elevens Lab](#).

Activity 4 Questions

Let's go over the [teacher's solutions](#)...

Activity 6: Playing Elevens

Solutions to questions 1–3 (p20):

A6Q1	Two possible plays: [5♠ + 6♣], [5♣ + 6♣]
A6Q2	(will show on later slides)
A6Q3	According to lab's author: No strategy — make whatever moves you can!

Activity 6: Question #2

A♥ 2♥ 3♥ 4♥ 5♥ 6♥ 7♥ 8♥ 9♥ 10♥ J♥ Q♥ K♥

A♦ 2♦ 3♦ 4♦ 5♦ 6♦ 7♦ 8♦ 9♦ 10♦ J♦ Q♦ K♦

A♠ 2♠ 3♠ 4♠ 5♠ 6♠ 7♠ 8♠ 9♠ 10♠ J♠ Q♠ K♠

A♣ 2♣ 3♣ 4♣ 5♣ 6♣ 7♣ 8♣ 9♣ 10♣ J♣ Q♣ K♣

If there are only 3 cards left after playing with one deck (cards shown above), could they be non-face cards?

Activity 6: Question #2

A♥ 2♥ 3♥ 4♥ 5♥ 6♥ 7♥ 8♥ 9♥ 10♥ J♥ Q♥ K♥

A♦ 2♦ 3♦ 4♦ 5♦ 6♦ 7♦ 8♦ 9♦ 10♦ J♦ Q♦ K♦

A♠ 2♠ 3♠ 4♠ 5♠ 6♠ 7♠ 8♠ 9♠ 10♠ J♠ Q♠ K♠

A♣ 2♣ 3♣ 4♣ 5♣ 6♣ 7♣ 8♣ 9♣ 10♣ J♣ Q♣ K♣

If there are only 3 cards left after playing with one deck (cards shown above), could they be non-face cards?

Let's say the first 4 plays involve flagging triples and removing them...

Activity 6: Question #2

A♥ 2♥ 3♥ 4♥ 5♥ 6♥ 7♥ 8♥ 9♥ 10♥

A♦ 2♦ 3♦ 4♦ 5♦ 6♦ 7♦ 8♦ 9♦ 10♦

A♠ 2♠ 3♠ 4♠ 5♠ 6♠ 7♠ 8♠ 9♠ 10♠

A♣ 2♣ 3♣ 4♣ 5♣ 6♣ 7♣ 8♣ 9♣ 10♣

If there are only 3 cards left after playing with one deck (cards shown above), could they be non-face cards?

Next plays involve removing values summing to 11...

Activity 6: Question #2

2♥ 3♥ 4♥ 5♥ 6♥ 7♥ 8♥ 9♥

2♦ 3♦ 4♦ 5♦ 6♦ 7♦ 8♦ 9♦

2♠ 3♠ 4♠ 5♠ 6♠ 7♠ 8♠ 9♠

2♣ 3♣ 4♣ 5♣ 6♣ 7♣ 8♣ 9♣

If there are only 3 cards left after playing with one deck (cards shown above), could they be non-face cards?

Next plays involve removing values summing to 11...

Activity 6: Question #2

3♥ 4♥ 5♥ 6♥ 7♥ 8♥

3♦ 4♦ 5♦ 6♦ 7♦ 8♦

3♠ 4♠ 5♠ 6♠ 7♠ 8♠

3♣ 4♣ 5♣ 6♣ 7♣ 8♣

If there are only 3 cards left after playing with one deck (cards shown above), could they be non-face cards?

Next plays involve removing values summing to 11...

Activity 6: Question #2

4♥ 5♥ 6♥ 7♥

4♦ 5♦ 6♦ 7♦

4♠ 5♠ 6♠ 7♠

4♣ 5♣ 6♣ 7♣

If there are only 3 cards left after playing with one deck (cards shown above), could they be non-face cards?

Next plays involve removing values summing to 11...

Activity 6: Question #2

5♥ 6♥

5♦ 6♦

5♠ 6♠

5♣ 6♣

If there are only 3 cards left after playing with one deck (cards shown above), could they be non-face cards?

Next plays involve removing values summing to 11...

Activity 6: Question #2

5♥ 6♥

5♦ 6♦

5♠ 6♠

If there are only 3 cards left after playing with one deck (cards shown above), could they be non-face cards?

Next plays involve removing values summing to 11...

Activity 6: Question #2

5♥ 6♥

5♦ 6♦

If there are only 3 cards left after playing with one deck (cards shown above), could they be non-face cards?

Next plays involve removing values summing to 11...

Activity 6: Question #2

5♥ 6♥

If there are only 3 cards left after playing with one deck (cards shown above), could they be non-face cards?

By the last move, there will only be two cards left if they're NOT face cards.

∴ the last three cards cannot be non-face cards.

Activity 6: Question #2

5♥ 6♥

J♦ Q♦ K♦

If there are only 3 cards left after playing with one deck (cards shown above), could they be non-face cards?

But if we didn't get to remove one of the face-card triples earlier, we might have these cards left near the end of a successful game...

Activity 6: Question #2

5♥ 6♥

J♦ Q♦ K♦

If there are only 3 cards left after playing with one deck (cards shown above), could they be non-face cards?

Removing a pair summing to 11...

Activity 6: Question #2

J♦ Q♦ K♦

If there are only 3 cards left after playing with one deck (cards shown above), could they be non-face cards?

If three cards are left, they must be face cards!

Activity 7: ElevensBoard Design

Read introduction section on p21 and answer questions 1-4

- #1: Think about needed instance vars (fields)
- #2: Answer in pseudocode or plain English
- #3: Does ElevensBoard.java meet your expectations?
- #4: Become familiar with the provided methods and when they're used

Activity 7: ElevensBoard Design

Solutions:

- 1: Deck of cards and a list of cards on the board. The `ElevensBoard` class would need `Deck` and `Card[]` instance variables.

Activity 7: ElevensBoard Design

Solutions:

2: Author's answer follows.

Shuffle the deck;

Deal nine cards;

While there is a possible move,

 If a pair exists that sums to 11,

 Remove the pair;

 Replace the two removed cards if possible;

 Else if a triplet that contains J,Q,K exists,

 Remove the triplet;

 Replace the three removed cards if possible;

If no cards left on the board, you win, else you lose.

Activity 7: ElevensBoard Design

Solutions:

- 3: In the `ElevensBoard` class, as written, there are no methods that actually select the cards to be removed, only ones to check already selected cards.

Activity 7: ElevensBoard Design

Solutions:

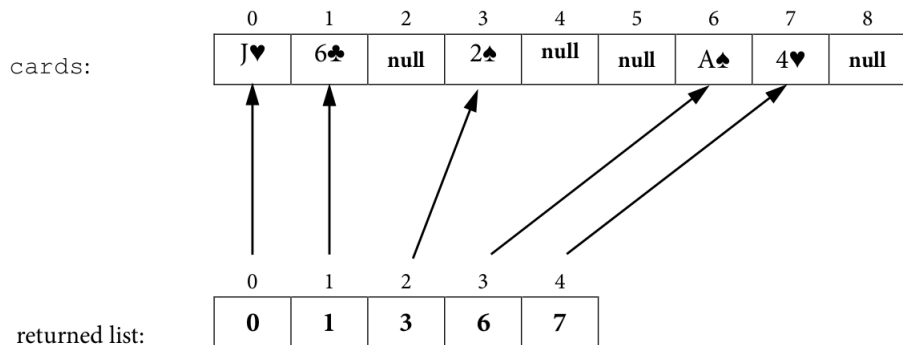
4a: `dealMyCards()` is called in `ElevensBoard()` and `newGame()`.

4b: `isLegal()` and `anotherPlayIsPossible()` should call `containsPairSum11()` and `containsJQK()`.

Activity 7: ElevensBoard Design

Solutions:

4c: See image below.



Activity 7: ElevensBoard Design

Solutions:

4d: See code below.

```
public static printCards(ElevensBoard board) {  
    List<Integer> cIndexes = board.cardIndexes();  
  
    for (Integer kObj : cIndexes) {  
        int k = kObj.intValue();  
        System.out.println(board.cardAt(k));  
    }  
}
```

Activity 7: ElevensBoard Design

Solutions:

- 4e: `anotherPlayIsPossible()` needs to call `cardIndexes()` before calling `containsPairSum11()` and `containsJQK()`. It needs to do this in order to get the indexes of all the cards on the board (non-null cards) so that it can check to see if the board contains another pair of cards that sum to 11 or a JQK-triplet.

Activity 8: Abstract Board Class

- Read introduction and exploration sections on pp25-27
- Work on exercises 1–3 on p27

Finish Activity 8, questions 1–3 (p27)