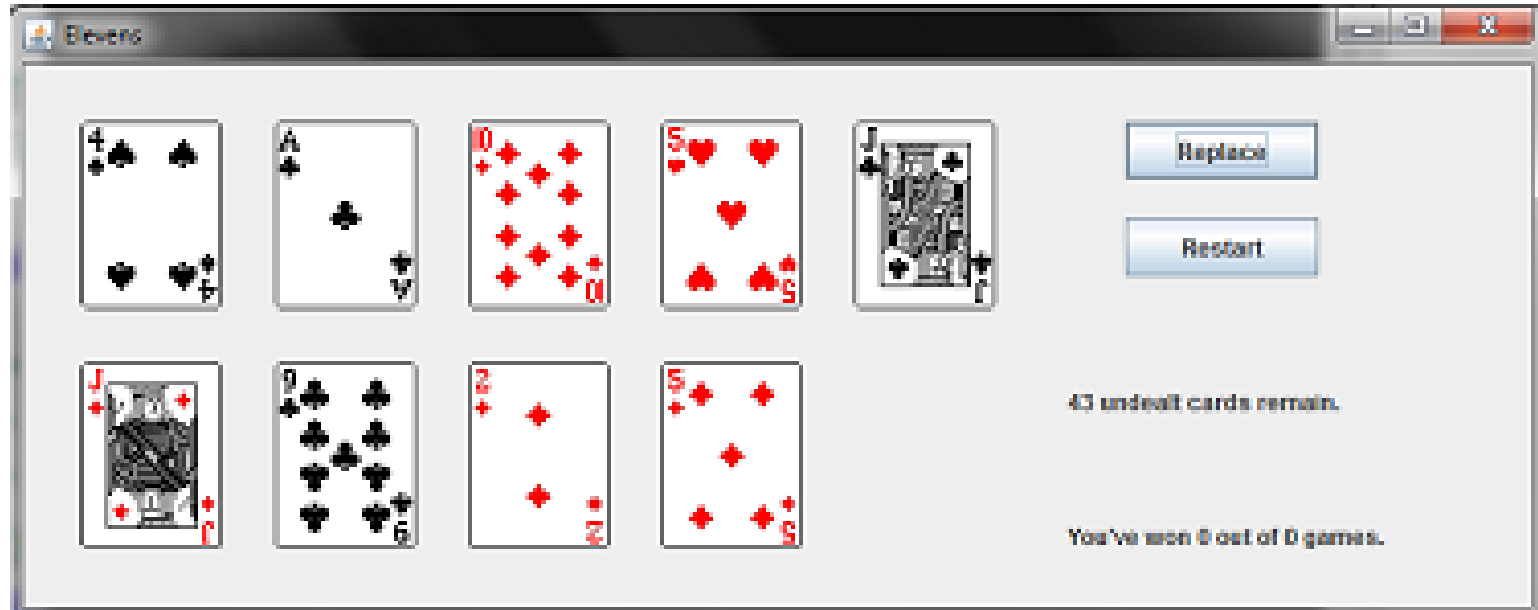


Elevens



What is Elevens?

Elevens is a lab about classes and Lists.

List< SomeClass> is a major concept being tested by the Elevens lab.

Elevens is a multi-class project that uses a Card and Deck class to simulate the playing of cards.

What is Elevens?

For Elevens, you must understand the basics of classes and Lists.

Building a class with instance variables, constructors, and methods is step 1.

```
public class Dog
{
    private int age;
    private String name;

    public Dog( String n, int a ) {
        age = a;
        name = n;
    }

    public int getAge() {
        return age;
    }

    public String getName() {
        return name;
    }

    public String toString() {
        return "Dog - " + name + " " + age;
    }
}
```

Basic Dog Class

open
Dog.java
DogRunner.java

What is Elevens?

For Elevens, you also understand Lists and how to store items in a list.

ArrayList is the class that will be used to store Card reference. ArrayList has many method that can be used to add and remove items.

ArrayList

frequently used methods

Name	Use
add(item)	adds item to the end of the list
add(spot,item)	adds item at spot – shifts items up->
set(spot,item)	put item at spot $z[\text{spot}] = \text{item}$
get(spot)	returns the item at spot $\text{return } z[\text{spot}]$
size()	returns the # of items in the list
remove()	removes an item from the list
clear()	removes all items from the list

```
import java.util.ArrayList;
```

Lists

```
List<String> ray;  
ray = new ArrayList<String>();  
ray.add("hello");  
ray.add("whoot");  
ray.add("contests");  
out.println(ray.get(0).substring(0, 1));  
out.println(ray.get(2).substring(0, 1));
```

OUTPUT

h

c

ray stores String references.

open Generics.java

What is Elevens?

Taking a class and loading instances of that class into a List is required for this project and to be successful on the AP CS A exam.

The List < SomeClass > concept must be isolated and mastered before attempting to build any type of real Card game.

```
public class Dog
{
    private int age;
    private String name;

    public Dog( String n, int a ) {
        age = a;
        name = n;
    }

    public int getAge() {
        return age;
    }

    public String getName() {
        return name;
    }

    public String toString() {
        return "Dog - " + name + " " + age;
    }
}
```

Basic Dog Class

List of References

```
List<Dog> ray;  
ray = new ArrayList<Dog>();
```

```
ray.add( new Dog( "fred", 11) );  
ray.add( new Dog( "ann", 21) );
```

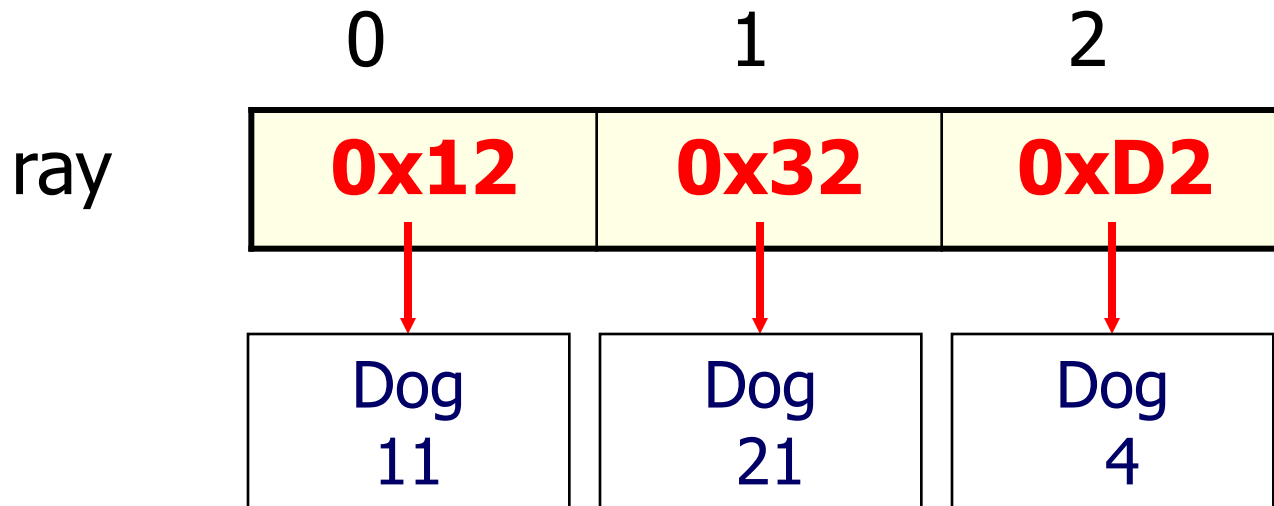
```
System.out.println( ray );
```

OUTPUT

[Dog - fred 11, Dog - ann 21]

List of References

```
ray.add( new Dog( "fred", 11) );  
ray.add( new Dog( "ann", 21) );  
ray.add( new Dog( "bob", 4) );
```



open

DoggiesRunner.java

What is Elevens?

Elevens is a lab about classes and Lists.

Elevens involves making Cards, a Deck, Players, a Dealer, and a game.

Any card game involving multi-classes using Cards, a Deck, and Players would illustrate the concepts in Elevens.

```
public class Card
{
    public static final String FACES[] = {"ZERO","ACE","TWO","THREE","FOUR",
        "FIVE","SIX","SEVEN","EIGHT","NINE","TEN","JACK","QUEEN","KING"};

    //instance variables
    private String suit;
    private int face;

    //constructors and modifiers

    //accessors methods

    //toString
    public String toString()
    {
        return FACES[face] + " of " + suit;
    }
}
```

Basic Card Class

This is a simple Card class. Card is extended to make specific types of cards. `getValue()` is implemented in each specific card.


```
public class Card
{
    private String face;
    private String suit;
    private int value;
```

```
//constructors and methods
//not shown
```

```
    public String toString() {
        return face + " " + suit + " " + value;
    }
}
```

11s Card Class

There are many ways to build a card class. The Card and other classes from Elevens will not be directly tested. Classes and Lists of Classes will be tested.

Open

Activity1 Starter Code

Card.java

CardTester.java

Basic Deck Class

```
public class Deck  
{  
    private List<Card> cards;
```

```
    public Deck() {  
        cards = new ArrayList<Card>();  
        //use loops to add new Cards  
        //to the List of Cards
```

```
    }  
}
```

You must spend considerable time
working with Lists of Classes /
References.

Open
Activity2 Starter Code
Card.java
Deck.java
DeckTester.java

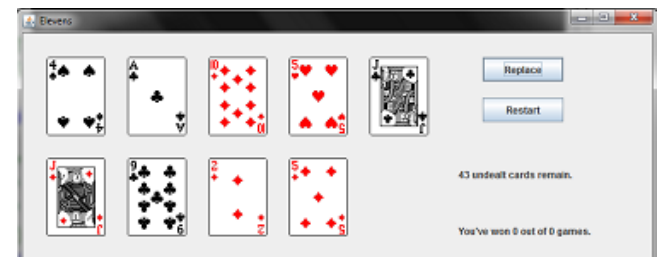
Basic Deck Class

```
public void shuffle()  
{  
    // implement a  
    // shuffle method  
  
    // go online and research  
    // shuffle methods  
}
```

Open
Activity4 Starter Code
Card.java
Deck.java
DeckTester.java

Building a Card Game

Card games require Card classes and a Deck of Cards. Most Card games require Player classes to be created. Often, you need a List < Player > in order to simulate a real game. Creating a Card game with List < Card > and List < Player > is great prep for the AP CS A Exam.



Elevens Alternatives

Any game that uses Cards and Deck of Cards is a perfectly good substitute for the Elevens project.

Blackjack – 21 is a great project as it has Cards, a Deck, Players, and a Dealer. Multi-player 21 is a very fun project.

21 Game

21 is a great card game that has relatively simple logic.

Objects needed : Card, Deck, Player, Dealer, Game

Deck - List of Cards

People - List of Players

Start work on Elevens,
Blackjack – 21,
or another List<Class> lab