1 Boxes and Pointers II

Draw a box and pointer diagram for each code block.

(a)  
```java
int[] x = {1, 2, 3};
int[] y = x;
y[2] = 7;
```

(b)  
```java
IntList l = IntList.list(1, 2, 3);
IntList l2 = l;
l.tail.tail.head = 7;
```

(c)  
```java
IntList[] ll = new IntList[3];
ll[0] = IntList.list(1, 2);
ll[1] = IntList.list(2);
```

2 Objects Refresher: Does this make sense?

(a) Determine what would be printed after executing the main method of class `Avatar`.

```java
public class Avatar {
    public static String electricity;
    public String fluid;

    public Avatar(String str1, String str2) {
        Avatar.electricity = str1;
        this.fluid = str2;
    }

    public static void main(String[] args) {
        Avatar foo1 = new Avatar("one ", "two");
        Avatar foo2 = new Avatar("three ", "four");
        System.out.println(foo1.electricity + foo1.fluid);
        foo1.electricity = "I declare ";
        foo1.fluid = "a thumb war";
        System.out.println(foo2.electricity + foo2.fluid);
    }
}
```

(b) Consider swapping `Avatar` and `this` in lines 6 and 7. Which swaps, if any would cause errors if we tried to compile and run the code?

(c) Will adding the following method to class `Avatar` cause any errors during compilation or execution?

```java
public static String getFluid() {
    return fluid;
}
```
3 Min/Max

Given an array $A$, return a 2 element array $B$ where $B[0]$ is the minimum element of $A$ and $B[1]$ is the maximum element of $A$.

```java
import static java.lang.Math.max; // max(a, b) returns max of a, b
import static java.lang.Math.min; // min(a, b) returns min of a, b

public static int[] minMax(int[] A) {
    int maxVal = Integer.MIN_VALUE; // smallest int in Java
    int minVal = Integer.MAX_VALUE; // largest int in Java
    // code
}
```

4 Reverse

Given an array $A$, reverse its elements in place (i.e. do not create any new arrays; this should be a destructive method).

```java
public static void reverse(int[] A) {
   // code
}
```