1 Boxes and Pointers II

Draw a box and pointer diagram for each code block.

(a) \[
\begin{align*}
\text{int[]} & \ x = \{1, 2, 3\}; \\
\text{int[]} & \ y = x; \\
y[2] & = 7;
\end{align*}
\]

(b) \[
\begin{align*}
\text{IntList} & \ l = \text{IntList.list}(1, 2, 3); \\
\text{IntList} & \ l2 = l; \\
l.tail.tail.head & = 7;
\end{align*}
\]

(c) \[
\begin{align*}
\text{IntList[]} & \ ll = \text{new IntList}[3]; \\
ll[0] & = \text{IntList.list}(1, 2); \\
ll[1] & = \text{IntList.list}(2);
\end{align*}
\]

2 Objects Refresher: Does this make sense?

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

```
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?

```
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
```

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) {
```