Name: _____

5. Concurrency II

Consider the code below:

```
public class StringArray {
     int len=0;
     String[] arr=new String[4];
     synchronized void checkAndResize(){
     //checks to see if array is full; if so, doubles size and copies over
     //if not, returns (nothing changes)
     }
     synchronized int getLen(){return len;}
     synchronized void incLen(){len++;}
     synchronized void set(int index,String s){arr[index]=s;}

     void add(String s){
          checkAndResize();
          int myLength=getLen();
          set(myLength,s);
          incLen();
     }
}
```

a. Does this code have a data-race? Explain briefly.

b. Show an interleaving of two threads, both calling add() on the same StringArray that results in one added String being lost, with null being in its place instead.

c. Show an interleaving of two threads, both calling add() on the same StringArray, that results in an array out of bounds exception.