Activity 3 Questions

1. Write a static method named flip that simulates a flip of a weighted coin by returning either "heads" or "tails" each time it is called. The coin is twice as likely to turn up heads as tails. Thus, flip should return "heads" about twice as often as it returns "tails."

```java
public static String flip() {
  Random rand = new Random();
  // Generate a number between 1 and 3, inclusive
  int r = rand.nextInt(3) + 1

  // 2 out of the 3 cases result in heads
  if (r == 1 || r == 2){
    return "heads";
  }

  // The other returns tails
  else {
    return "tails";
  }
}
```

2. Write a static method named arePermutations that, given two int arrays of the same length but with no duplicate elements, returns true if one array is a permutation of the other (i.e., the arrays differ only in how their contents are arranged). Otherwise, it should return false.

```java
public static boolean arePermutations(int[] a, int[] b) {
  // Check each value in a for a pair
  for(int valueA : a) {
    boolean check = false;
    // Compare each value in b, to the current value in a
    for(int valueB : b) {
      if(valueA == valueB) {
        check = true;
      }
```

```
    }
    // If no match is found, automatically return false
    if(check == false) {
      return false;
    }
  }
  return true;
}
```

3. Suppose that the initial contents of the values array in Shuffler.java are {1, 2, 3, 4}. For what sequence of random integers would the efficient selection shuffle change values to contain {4, 3, 2, 1}?

   a. The sequence 0, 1, 1,

      i.   0: Switched 4 and 1

      ii. 1: Switches 2 and 3

      iii. 1: Switches 3 with itself

   b. Output: {4, 3, 2, 1}