Shuffle an Array

Shuffle a set of numbers without duplicates.

Example:

```
// Init an array with set 1, 2, and 3.
int[] nums = {1,2,3};
Solution solution = new Solution(nums);

// Shuffle the array [1,2,3] and return its result. Any permutation of [1,2,3] must
 equally likely to be returned.
solution.shuffle();

// Resets the array back to its original configuration [1,2,3].
solution.reset();

// Returns the random shuffling of array [1,2,3].
solution.shuffle();
```

Solution 1

```java
import java.util.Random;

public class Solution {
    private int[] nums;
    private Random random;

    public Solution(int[] nums) {
        this.nums = nums;
        random = new Random();
    }

    /** Resets the array to its original configuration and return it. */
    public int[] reset() {
        return nums;
    }

    /** Returns a random shuffling of the array. */
    public int[] shuffle() {
        if(nums == null) return null;
        int[] a = nums.clone();
        for(int j = 1; j < a.length; j++) {
            int i = random.nextInt(j + 1);
            swap(a, i, j);
        }
        return a;
    }

    private void swap(int[] a, int i, int j) {
        int t = a[i];
        a[i] = a[j];
        a[j] = t;
    }
}
```

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Solution 2

Straight-forward solution

```
class Solution {
    vector<int> nums;
public:
    Solution(vector<int> nums) {
        this->nums = nums;
    }

    /** Resets the array to its original configuration and return it. */
    vector<int> reset() {
        return nums;
    }

    /** Returns a random shuffling of the array. */
    vector<int> shuffle() {
        vector<int> result(nums);
        for (int i = 0;i < result.size();i++) {
            int pos = rand()%(result.size()-i);
            swap(result[i+pos], result[i]);
        }
        return result;
    }
};

/**
 * Your Solution object will be instantiated and called as such:
 * Solution obj = new Solution(nums);
 * vector<int> param_1 = obj.reset();
 * vector<int> param_2 = obj.shuffle();
 */
```

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Solution 3

Just for fun.

```
class Solution(object):
    def __init__(self, nums):
        self.reset = lambda: nums
        self.shuffle = lambda: random.sample(nums, len(nums))
```

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