Design and Analysis of Algorithms

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4.2 Sorting by Permutations

The task is to create a program that will sort a given array of n distinct integers by generating and evaluating all possible permutations of the given n-sized input array. The goal is to find and output the permutation that represents the earliest non-decreasing arrangement, thereby sorting the array in ascending order. You must implement a brute-force approach to solve this problem, such that the program looks through all permutations and verify if the sequence is sorted.

In [ ]:
```python
import random

def is_sorted(arr):
    # Check if the list is sorted
    return all(arr[i] <= arr[i+1] for i in range(len(arr) - 1))

def bogo_sort(arr):
    while not is_sorted(arr):
        # Shuffle the list until it's sorted
        random.shuffle(arr)

# Example list of numbers
numbers = [64, 25, 12, 22, 11, 1, 6, 17, 19, 8]

print("Original list:", numbers)
bogo_sort(numbers)
print("Sorted list (Bogo Sort):", numbers)
```

```
Original list: [64, 25, 12, 22, 11, 1, 6, 17, 19, 8]
Sorted list (Bogo Sort): [1, 6, 8, 11, 12, 17, 19, 22, 25, 64]
```