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Longest Increasing Subsequence Source Code

```
package LongestIncreasingSubsequence;

import java.util.ArrayList;
import java.util.List;
public class LongestIncSub {
        public static List<Integer> LongestIncSub(int[] nums) {
                int n = nums.length;
                List<Pile> piles = new ArrayList<>();
                for (int i = 0; i < n; i++) {
                        int num = nums[i];
                        Pile newPile = new Pile(num);
                        int pileIndex = findPileIndex(piles, num);
                        if (pileIndex == piles.size()) {
                                piles.add(newPile);
                        }
                        else {
                                piles.set(pileIndex, newPile);
                        }
                }
                List<Integer> lis = new ArrayList<>();
                for (Pile pile : piles) {
                        lis.add(pile.top);
                }
                return lis;
        }
        private static int findPileIndex(List<Pile> piles, int num) {
                int left = 0, right = piles.size() - 1;
                while (left <= right) {
                        int mid = left + (right - left) / 2;
                        if (piles.get(mid).top < num) {
                                left = mid + 1;
                        }
                        else {
                                right = mid - 1;
                        }
                }
                return left;
        }
        private static class Pile {
                int top;
                public Pile(int top) {
                        this.top = top;
                }
        }
        public static void main(String[] args) {
                int[] nums = {21, 8, 33, 40, 45, 15, 77, 90, 10};
                List<Integer> lis = LongestIncSub(nums);
                System.out.println("Longest Increasing Subsequence: " + lis);
        }
}
```