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Problem 1: n=int(input()) input_str=input() arr=list(map(int,input_str.split())) m=max(arr) print(m)

prblem 2:

def binarySearch(arr,low,high,x): if low <=high: mid = (high + low) // 2

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    if arr[mid] == x:
        return mid

    elif arr[mid] > x:
        return binarySearch(arr, low, mid - 1, x)
    else:
        return binarySearch(arr,mid+1,high,x)
return -1
```

n,target=map(int,input().split()) input_str=input() arr=list(map(int,input_str.split())) result=binarySearch(arr,0,len(arr)-1,target) if result==-1: print('false') else:print('true')

problem 3: def sol(input_str): if int(input_str)==0:return-1 arr = [int(i) for i in input_str] total_sum = sum(arr) if total_sum < 10: return total_sum else: return sol(str(total_sum))

input_str = input() result = sol(input_str) if result==-1: print() else: print(result)

problem 4: def count_swaps(carriages): swaps = 0

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for i in range(len(carriages)):
    for j in range(len(carriages) - i - 1):
        if carriages[j] > carriages[j + 1]:
            carriages[j], carriages[j + 1] = carriages[j + 1], carriages[j]
            swaps += 1

return swaps
```

N = int(input())

for i in range(N): L = int(input()) arr = list(map(int, input().split()))

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swaps_needed = count_swaps(arr)
print(f"Optimal train swapping takes {swaps_needed} swaps.")
```