Greedy Algorithms and Techniques

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Problem 1:

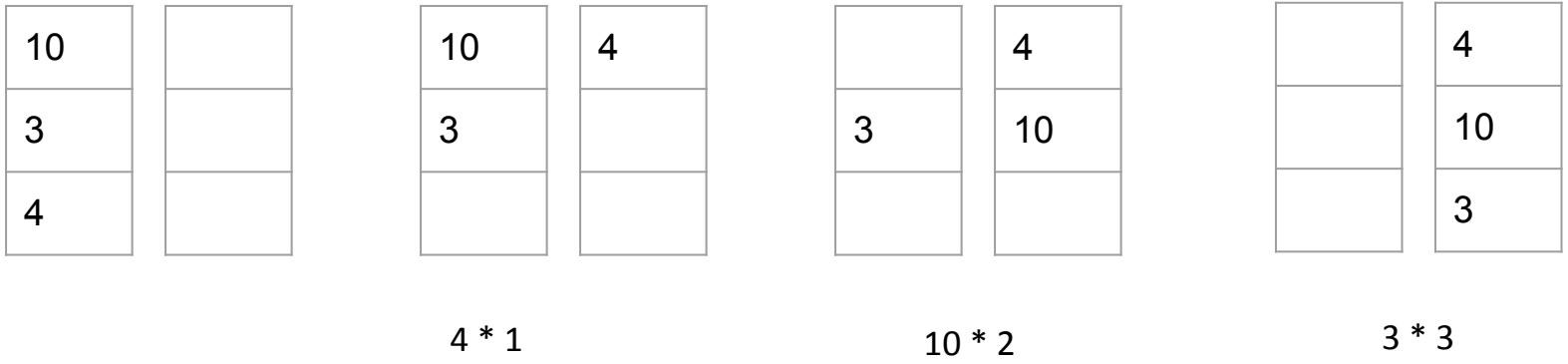
Given an array of integers find the minimum absolute difference between any two elements of the array. (1 <= N <= 1e5)

10	9	20	3	5	1

Ans = 2

Problem 2:

Given an array of integers, you want to transfer every element from it to another array (initially empty). The cost of moving an element X on the i^{th} step is i * X. Find minimum total cost.



Problem 3:

Given an array of positive integers, select 3 elements from it such that they can form a triangle and perimeter of the triangle is maximized. (1 <= N <= 1e5)

10	6	2	4	3	1

Choosing 6, 4, 2 will give the best biggest perimeter

Problem 4: Activity Selection Link

Given N event with start and end times, find the maximum number of events you can attend such that no two selected events overlap.
(1 <= N <= 1e5), (1 <= start times <= end times <= 1e9)

1 - 2	3 - 7	5 - 6	8 - 9	7 - 10	10 - 11

1 - 2	3 - 7	5 - 6	8 - 9	7 - 10	10 - 11

Bonus: Weighted Activity Selection

Given N event with start, end times and profits, find the maximum number of events you can attend such that no two selected events overlap.
(1 <= N <= 1e5), (1 <= start times <= end times <= 1e9) (1 <= profits <= 1e9)

To be covered after Dynamic Programming

Problem 5: Fractional Knapsack

Given N items with each item having 2 parameters X_i and Y_i which means picking X_i units of item i will give you a profit of Y_i points. You are not required to pick all X_i units of an item. You are also given a value D. You can pick up to D units in total. Find the maximum profit you can make.