**Matrix Game**

Maximus created a game that involves a matrix, and is asking your help to create an optimal solution program to the game. Given a 2**N** x 2**N** matrix, can you do the following operations which leave you with the largest sum in the upper left quadrant of the matrix?

The following operations are:

* You can reverse the order of any column
* You can reverse the order of any row

You may do as many operations as you like, as long as the largest possible sum is achieved.

**Input:** The first line of input contains **T**, the number of test cases. The first line of each test case contains **N**. The next 2\***N** lines contains 2\***N** space-separated integers which denote the rows and columns of the given matrix as well as their elements.

**Output:** You will output “CASE #(case number): “ followed by the maximum possible sum of the upper left quadrant.

**Example Input:**

1

2

112 42 83 119

56 125 56 49

15 78 101 43

62 98 114 108

**Example Output:**

CASE #1: 414

**Explanation:** To start, we begin with the following matrix:

We can perform the following operations to maximize the upper left quadrant of the matrix:

1. Reverse column 2 ([83, 56, 101, 114] -> [114, 101, 56, 83]) which results in:

1. Reverse row 0 ([112, 42, 114, 119] -> [119, 114, 42, 112]) which results in:

This gives us our answer. The sum of the upper left quadrant is 119 + 114 + 56 + 125 = **414**.