Assignment 10

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Problem 10

b) My solution uses a nested loop to get the input and another nested loop to find the optimal solution so the running time is O(n^2) + O(n^2) = O(n^2). Comparing it to the brute force approach, it is way faster as the brute force approach takes into consideration every possible path to find the one with the max sum and since for n lines the number of paths is 2^(n-1) so the time taken is exponential.

c) The only greedy choice we can make is in every step, we choose the number that is bigger out of the 2. But this choice does not give an optimal global solution and a counter example is the input given in the second exercise. For the input below the greedy algorithm would choose the path 7, 8, 1, 7, 5 which is not an optimal solution as we know the biggest sum is 30.

7

3 8

8 1 0

2 7 4 4

4 5 2 6 5