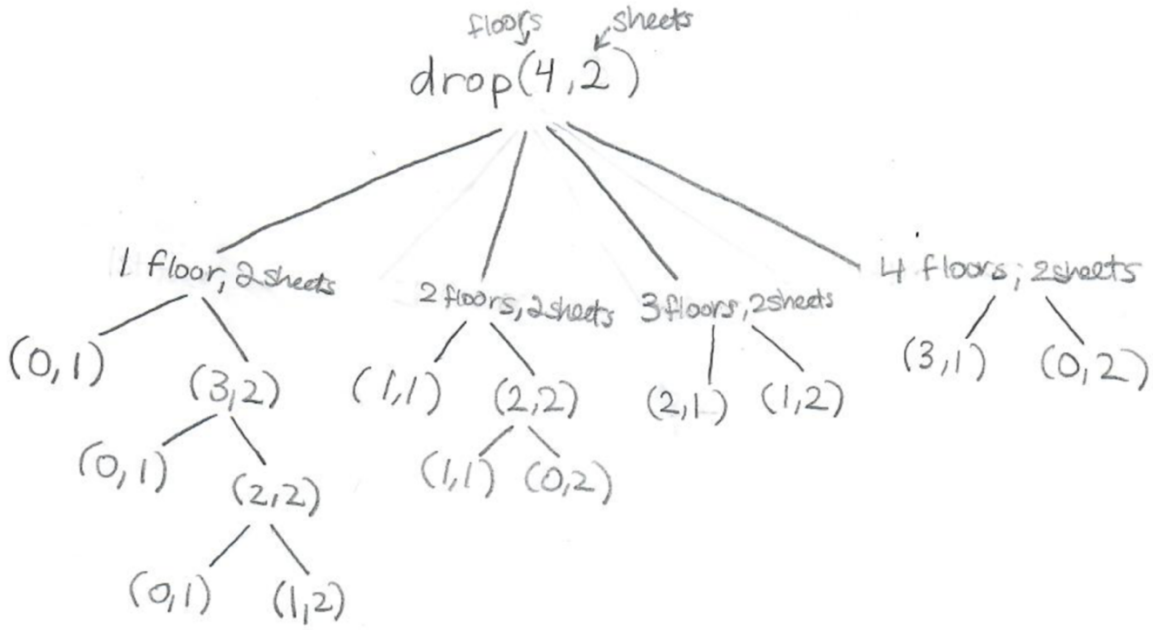
Polina Chernomaz

1. Falling Glass

(a) Outcome 1: If the sheet breaks after dropping from nth floor, then we only need to check for floors lower than n with the number of sheets left; which changes the problem to n-1 floors and m-1 sheets.
Outcome 2: If the sheet doesn't break after dropping from the nth floor, then we only need to check the floors above than n; which changes the problem to k-n floors and m sheets.

(b)



(d) You end up with 8 subproblems given 4 floors and 2 sheets.

(e) There are n*m distinct subproblems for n floors and m sheets.

(f) You would memoize GlassFallingRecur by creating a 2D-array to store the results of the subproblems. This improves the speed of the recursive function by not recalculating overlapping subproblems.

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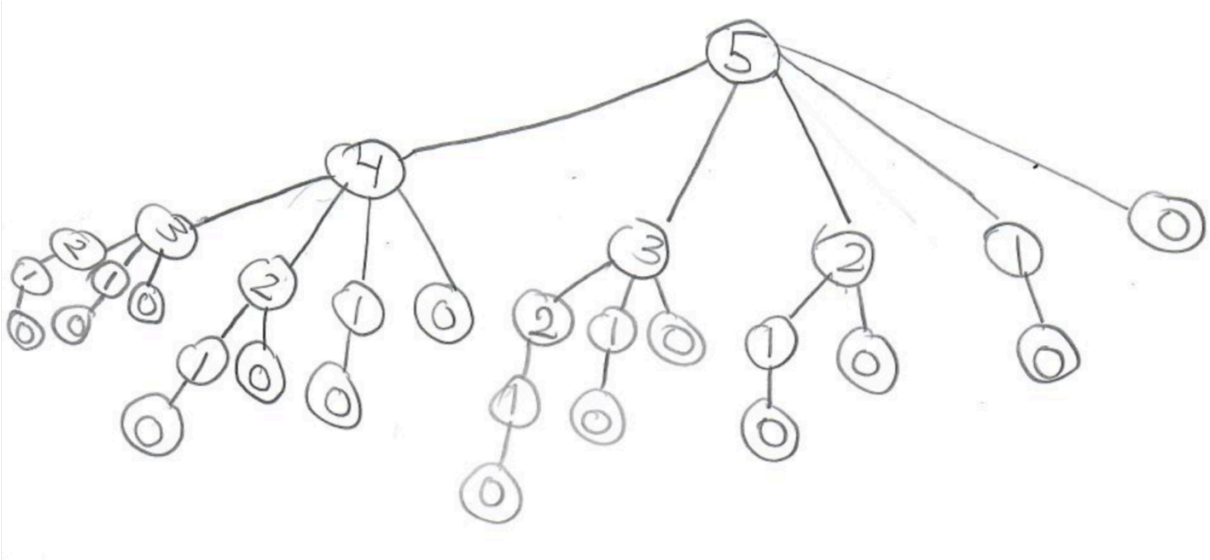
2. Rod cutting

(a)



(b)

Length i	1	2	3	4
Price p[i]	2	6	9	12

If you have a rod of length 4, the greedy algorithm will choose length 3 (price 9) and 1 (price 2) which give you a combined price of 11. However, there is a solution with a higher price, by choosing length 2 (price 6) and 2 (price 6) for a combined price of 12.