TCSS 343 - Week 0

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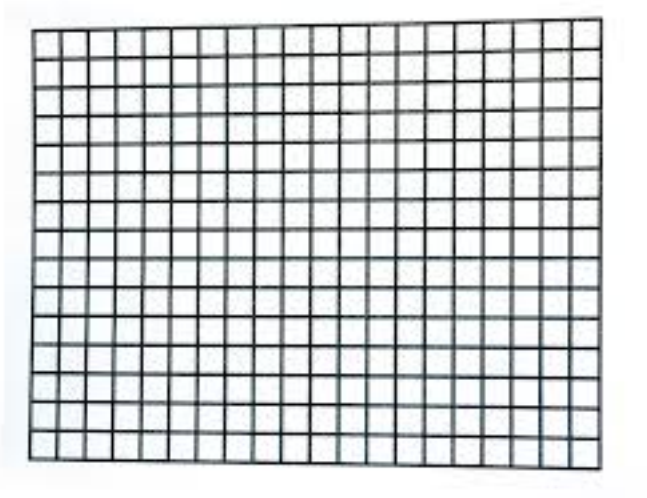
Recursion

1. Benin is a fisherman who is simply good at fishing. One day, he finds a nice place to go fishing with two ponds. Moving from the $i-th$ fish-pond (the one he starts at) to the $j-th$ fishpond would cost $|i-j|$ units of time. Initially Benin can get F_i fish in the $i-th$ fishpond. In the next turn at the same fishpond, the amount of fish he can get is decreased by D_i. Notice that Benin will not get negative amount of fish. Each turn of fishing takes Benin 1 unit of time if Benin is at that pond and $|i-j|$ units of time to switch.

For example, if $F_1 = 10$, $F_2 = 5$, $D_1 = 2$, $D_2 = 3$ and Benin can fish for up to eight units of time, then he will get $10 + 8 + 6 + 5 + 4 = 33$. Washington Department of Fish and Wildlife (WDFW) requires that Benin switch to the adjacent pond when it has more fish and he cannot fish for "negative" fish. Write a recursive algorithm to see how many fish Benin can fish for!



2. Emily loves figuring out all the ways to arrange dominos. Help her find all the ways to arrange dominos in that are 2×1 in a 2×1,2×2,2×3 and 2×4 grid!

3. Now that you've helped Emily find how many ways to arrange the dominos in problem 2 she gets really philosophical. She starts pondering the nature of zero and wants you to help her find how many ways to arrange a 2×1 domino in a 2×0 grid. (You don't have to be too smart: Follow the pattern from problem 2)

4. We've had a lot of fun arranging dominos but now Emily wants a recursive formula for the ways to arrange 2×1 dominos. The key to finding recursive definitions is to find the answer to larger problems by finding the answer to smaller problems.

D_n =# of tilings of a $2 \times n$ =