in-class problems

1. Bellman-Ford algorithm for single-source shortest path
2. Box-stack problem

   Given n boxes { (L_1, W_1, H_1), (L_2, W_2, H_2), …, (L_n, W_n, H_n) }, with (L_i, W_i, H_i) being the length, width, and height of the i-th box, find a box combination/subset that yields the highest stack, considering that (a) box i can only be stacked on top of box j, if $L_i < L_j$ and $W_i < W_j$, and (b) the boxes cannot be rotated in any direction.
3. Fibonacci

   Calculate the Fibonacci number series (each number is the sum of the previous two). Dynamic programming.
4. Grid traveler/NYC tourist

   You are traversing a m x n grid, with start the top-left corner and destination the bottom-right. You can only traverse by moving down or right. How many ways are there to reach the destination?
5. Longest common subsequence

   Find the longest subsequence present in two sequences in the same order, i.e., find the longest sequence that can be obtained by deleting some items from the first sequence and some other items from the second. Note that the subsequence items do not need to be contiguous in the original sequences.
6. 01 Knapsack

   Given n items of known values and weights, and a knapsack of weight capacity W, put items in the knapsack such that you maximize the value of its contents.