Longest Common Subsequence

Given two strings a, b; find the longest common subsequence.

Eg:

 a: abbabcba
 b: babbabc

 bba is a common subsequence.
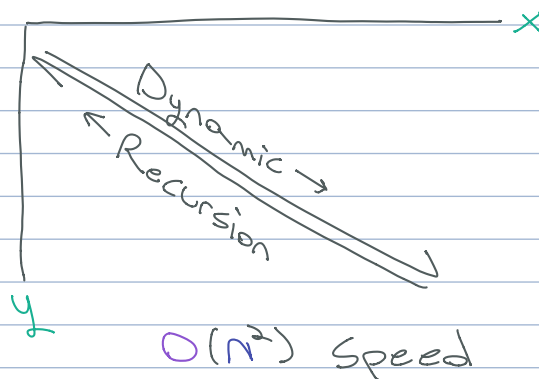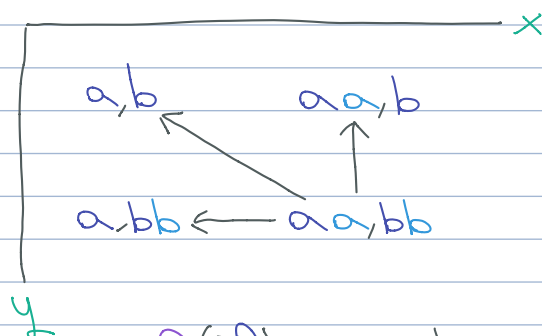
Target: Worst-Case $O(n^2)$

The LCS Algrothim:

1. $LCS(a, \wedge) = \wedge$
2. $LCS(\wedge, b) = \wedge$
3. $LCS(aa, ba) = LCS(a, b) a$
4. $LCS(aa, bb)$ where $a \neq b = \max\{LCS(a, bb), LCS(aa, b)\}$

Visualized:

$O(2^n)$ speed $O(n^2)$ speed

Recursion:

 Repeats jobs

Dynamic Programming:

 Never repeat a job