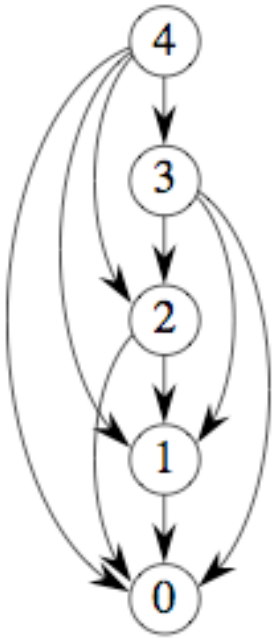
CSOR 4231 Lecture 11

Claire Monteleoni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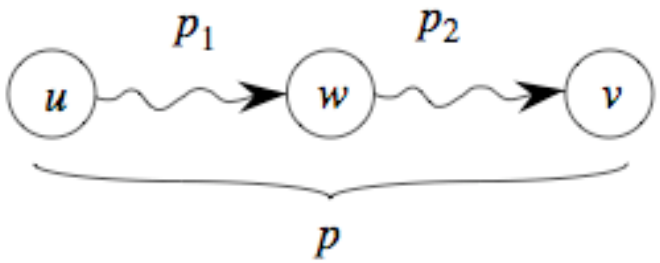
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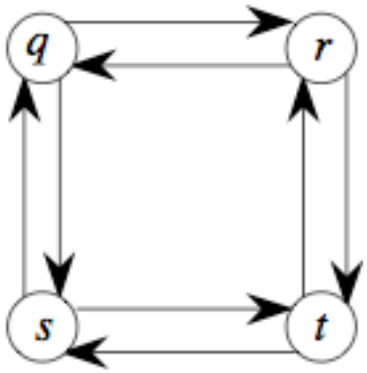
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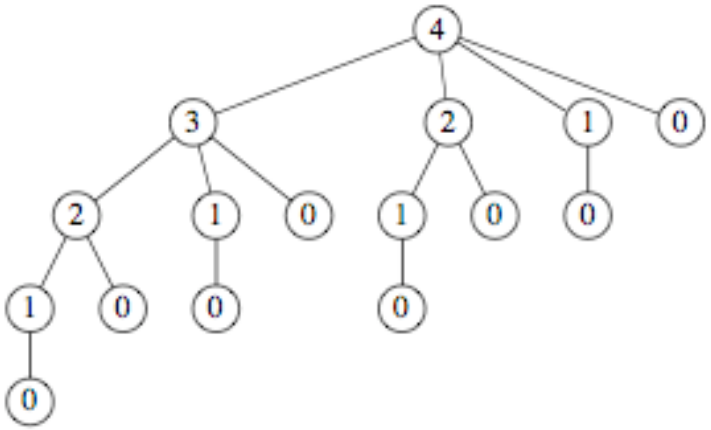
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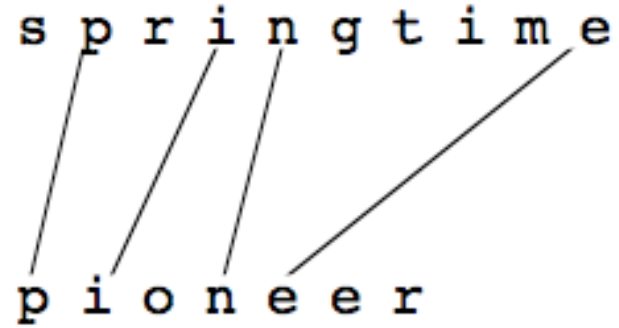
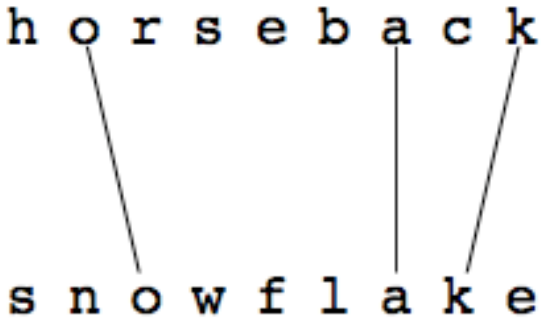
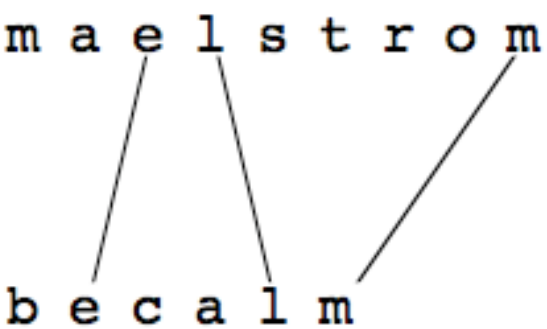

s p r i n g t i m e
p i o n e e r


h o r s e b a c k
s n o w f l a k e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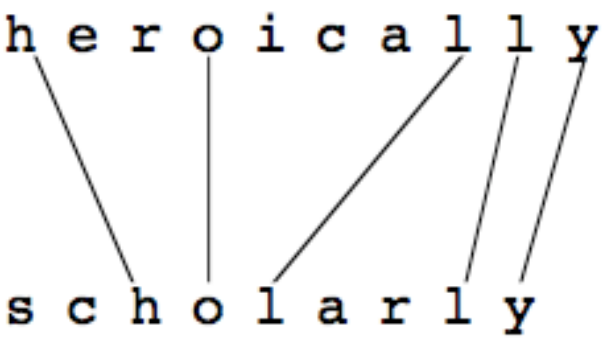
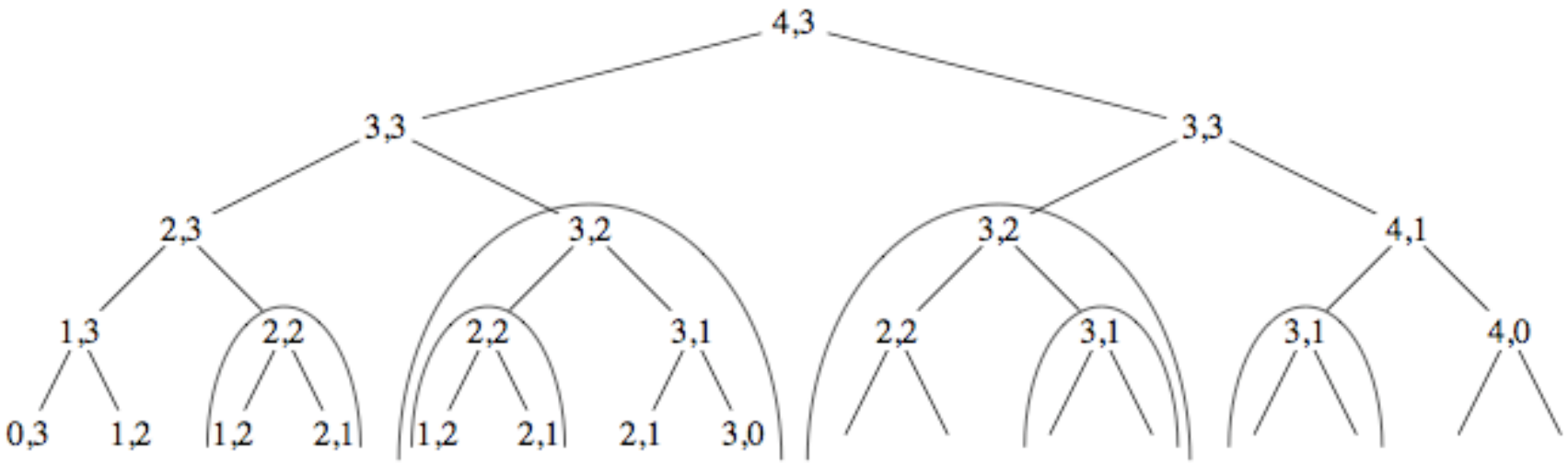
b e c a l m


h e r o i c a l l y
s c h o l a r l y

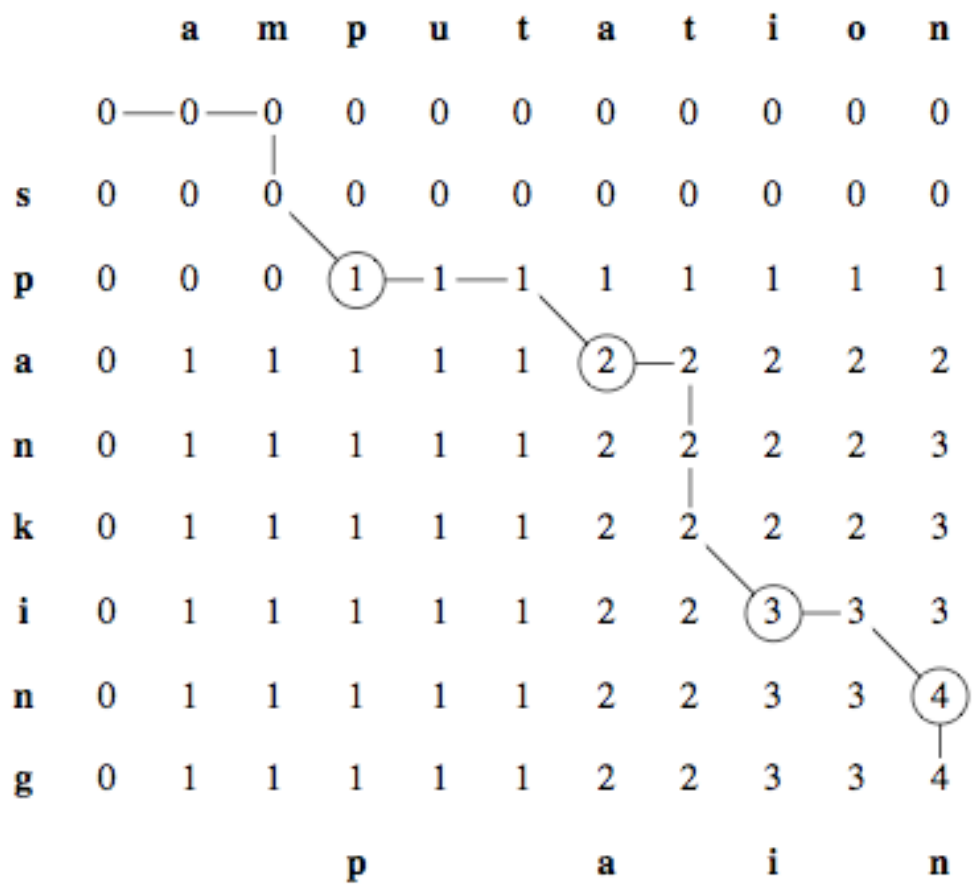
$$c[i,j] = \begin{cases} 0 & \text{if } i = 0 \text{ or } j = 0\,, \\ c[i-1,j-1]+1 & \text{if } i,j > 0 \text{ and } x_i = y_j\,, \\ \max(c[i-1,j], c[i,j-1]) & \text{if } i,j > 0 \text{ and } x_i \neq y_j\,. \end{cases}$$

$$c[i,j] = \begin{cases} 0 & \text{if } i = 0 \text{ or } j = 0\,, \\ c[i-1,j-1]+1 & \text{if } i,j > 0 \text{ and } x_i = y_j\,, \\ \max(c[i-1,j], c[i,j-1]) & \text{if } i,j > 0 \text{ and } x_i \neq y_j\,. \end{cases}$$



```
LCS-LENGTH(X, Y, m, n)
let b[1..m, 1..n] and c[0..m, o..n] be new tables
for i = 1 to m
    c[i, 0] = 0
for j = 0 to n
    c[0, j] = 0
for i = 1 to m
    for j = 1 to n
        if x_i == y_j
            c[i, j] = c[i − 1, j − 1] + 1
            b[i, j] = "↖"
        else if c[i − 1, j] ≥ c[i, j − 1]
                c[i, j] = c[i − 1, j]
                b[i, j] = "↑"
            else c[i, j] = c[i, j − 1]
                b[i, j] = "←"
return c and b
```

```
PRINT-LCS(b, X, i, j)
if i == 0 or j = 0
    return
if b[i, j] == "↖"
    PRINT-LCS(b, X, i − 1, j − 1)
    print x_i
elseif b[i, j] == "↑"
    PRINT-LCS(b, X, i − 1, j)
else PRINT-LCS(b, X, i, j − 1)
```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s 0 0 0 0 0 0 0 0 0 0 0
p 0 0 0 1 1 1 1 1 1 1 1
a 0 1 1 1 1 1 2 2 2 2 2
n 0 1 1 1 1 1 2 2 2 2 3
k 0 1 1 1 1 1 2 2 2 2 3
i 0 1 1 1 1 1 2 2 3 3 3
n 0 1 1 1 1 1 2 2 3 3 4
g 0 1 1 1 1 1 2 2 3 3 4
p a i n