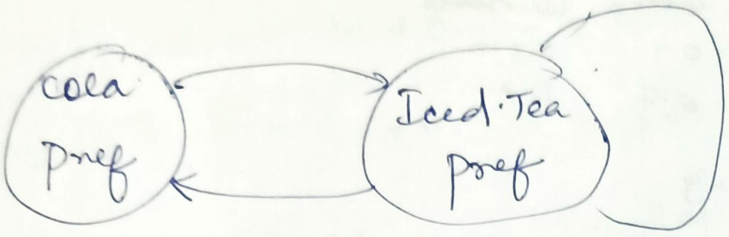
Trellis - The backward procedure:

1. Initialization :

$\beta_i(T+1) = 1 \quad , \quad 1 \le i \le N$

$$\frac{\alpha_{cp}(1) \times \beta_{cp}(1)}{\alpha_{cp}(1) \times \beta_{cp}(1) \times \alpha_{ip}(1) \times \beta_{ip}(1)}$$

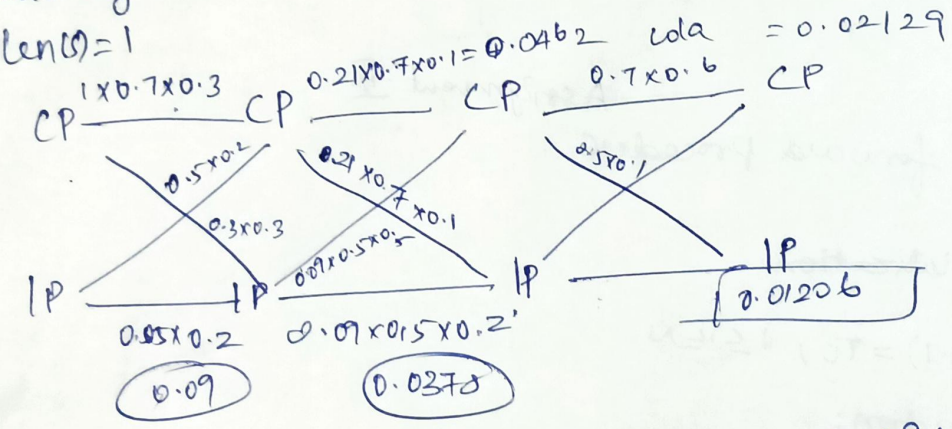


Assignment-III CSE425

Trellis Algorithm

Forward algo:

Len(O) = 1



$\alpha_p(1) = 1$

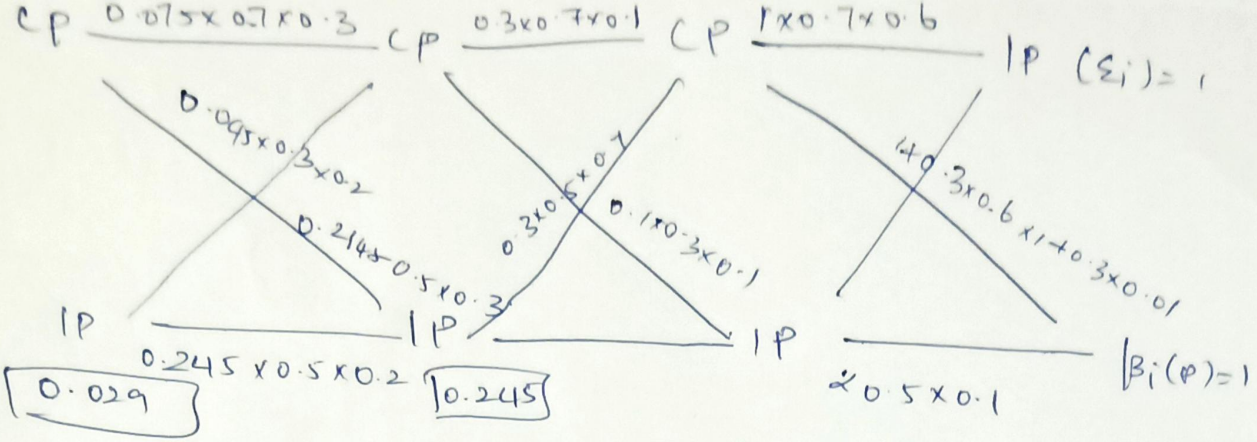
$P(h, ice, cola) = 0.631496$

Backward algo:

i) $B_i(T+1) = 1$

ii) $\beta_i(t) = \sum_{j=1}^{N} a_{ij} b_{ij} \alpha_t \beta_j(t+1)$

iii) $= \sum_{i=1}^{N} \pi_i \beta_i(1)$



$P(\text{lime}, \text{ice}, \text{cola}) = 1 \times 0.0315 \times 0.009$

$= 0.0315$

$$Y_{CP(1)} = \frac{\alpha_{CP(1)} \times \beta_{CP(1)}}{\alpha_{CP(1)} \times \beta_{CP} + \alpha_{IP(1)} \times \beta_{IP(1)}}$$

$$\alpha_{CP(1)} = \frac{1 \times 0.031}{1 \times 0.0315 + 0 \times 0.29} = 1$$

$$Y_{IP(1)} = \frac{0 \times 0.029}{0.0315 + 0 \times 0.029} = 0$$

$$Y_{CP(2)} = \frac{0.21 \times 0.045}{0.21 \times 0.045 + 0.09 \times 0.245}$$

$$= \frac{0.00945}{0.0315} = 0.3//$$

$$Y_{CP(3)} = \frac{0.042 \times 0.3}{0.0462 \times 0.3 + 0.1 \times 0.00378}$$

$$= \frac{0.01386}{0.01764} = 0.755$$

$$Y_{IP(2)} = \frac{0.09 \times 0.243}{0.21 \times 0.045 + 0.09 \times 0.25}$$

$$= 0.7$$

$$Y_{IP(3)} = \frac{0.0462 \times 0.3}{0.0462 \times 0.3 + 0.1 \times 0.00375}$$

$$= 0.01764$$

$$Y_{CP(4)} = \frac{0.2129 \times 1}{0.02129 \times 1 + 1 \times 0.010261}$$

$$= 0.671$$

$$Y_{IP(4)} = \frac{0.01026 \times 1}{0.02129 \times 1 + 1 \times 0.010261}$$

$$= 0.32//$$