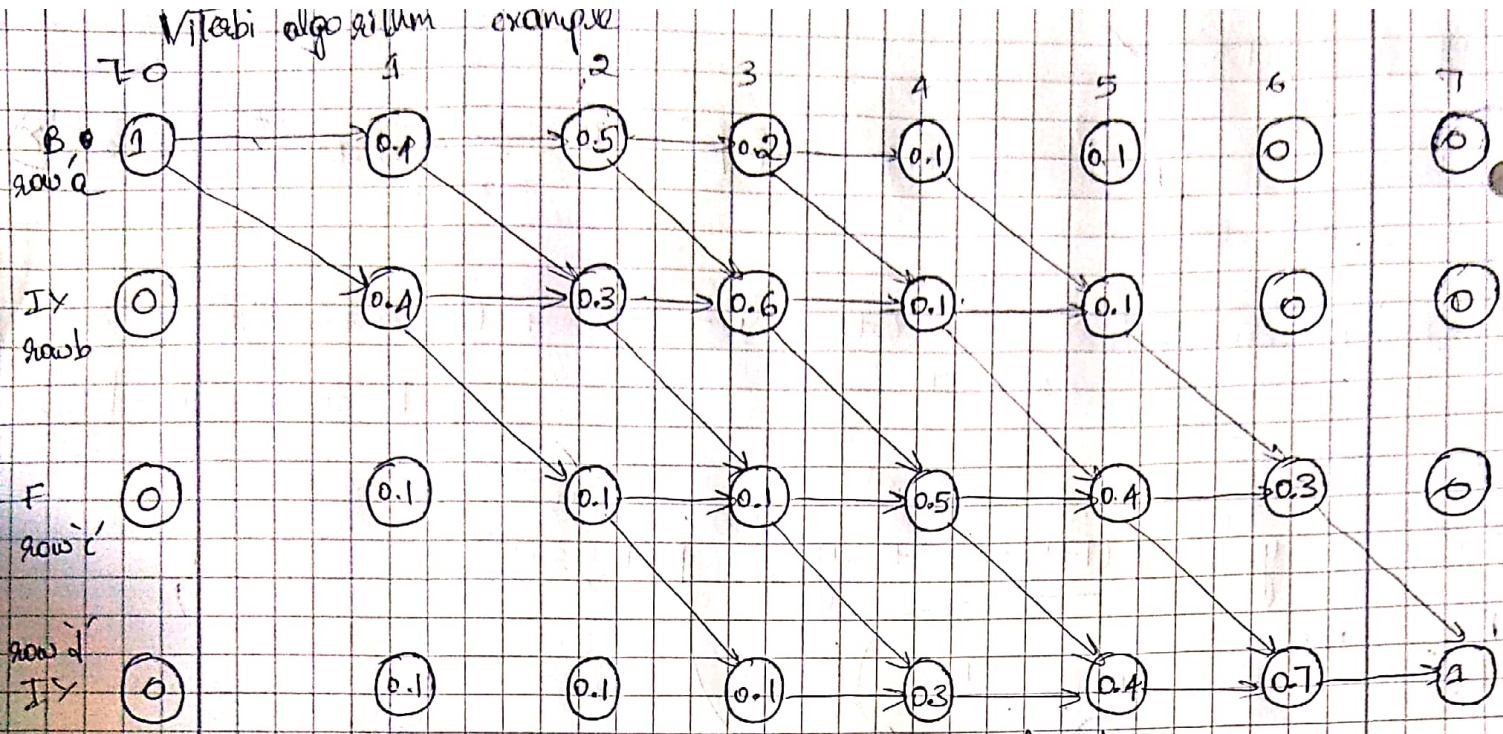
Viterbi algorithm example



Principle: Select best incoming ~~node~~ link at each node

Initialization

$Bscr(0,0) = 1$ → 0^{th} Time Step, $Bscr(0,i) = -\infty$ for $i = 1 \dots K-1$

at T=1

for row 'a' node $Bscr = 0.4 \times 1 = 0.4$

row b node $Bscr = 0.4 \times 1 = 0.4$

at T=2

- row 'a' node ⇒ $Bscr = 0.5 \times 0.4 = 0.2$
- row 'b' node ⇒ $\max(0.3 \times 0.4, 0.3 \times 0.4) = 0.12$ = both connection
- row 'c' node ⇒ $bscr = 0.4 \times 0.1 = 0.04$

at T=3

- row 'a' ⇒ $bscr = 0.2 \times 0.2 = 0.04$
- row 'b' ⇒ $bscr = \max(0.6 \times 0.2, 0.6 \times 0.12) = 0.12$ (BP = row 'a')
- row 'c' ⇒ $bscr = \max(0.1 \times 0.12, 0.0 \times 0.12) = 0.012$ (BP = row 'b')
- row 'd' ⇒ $bscr = \max(0.1 \times 0.01 = 0.004$

at T=4

- row 'a' ⇒ $bscr = 0.1 \times 0.04 = 0.004$
- 'b' ⇒ $bscr = \max(0.1 \times 0.04, 0.1 \times 0.12) = 0.012$ (BP = row 'b')
- 'c' ⇒ $bscr = \max(0.5 \times 0.12, 0.5 \times 0.012) = 0.06$ (BP = row 'b')
- 'd' ⇒ $bscr = \max(0.3 \times 0.004, 0.012 \times 0.3) = 0.0036$ (BP = row 'c')

at T = 5

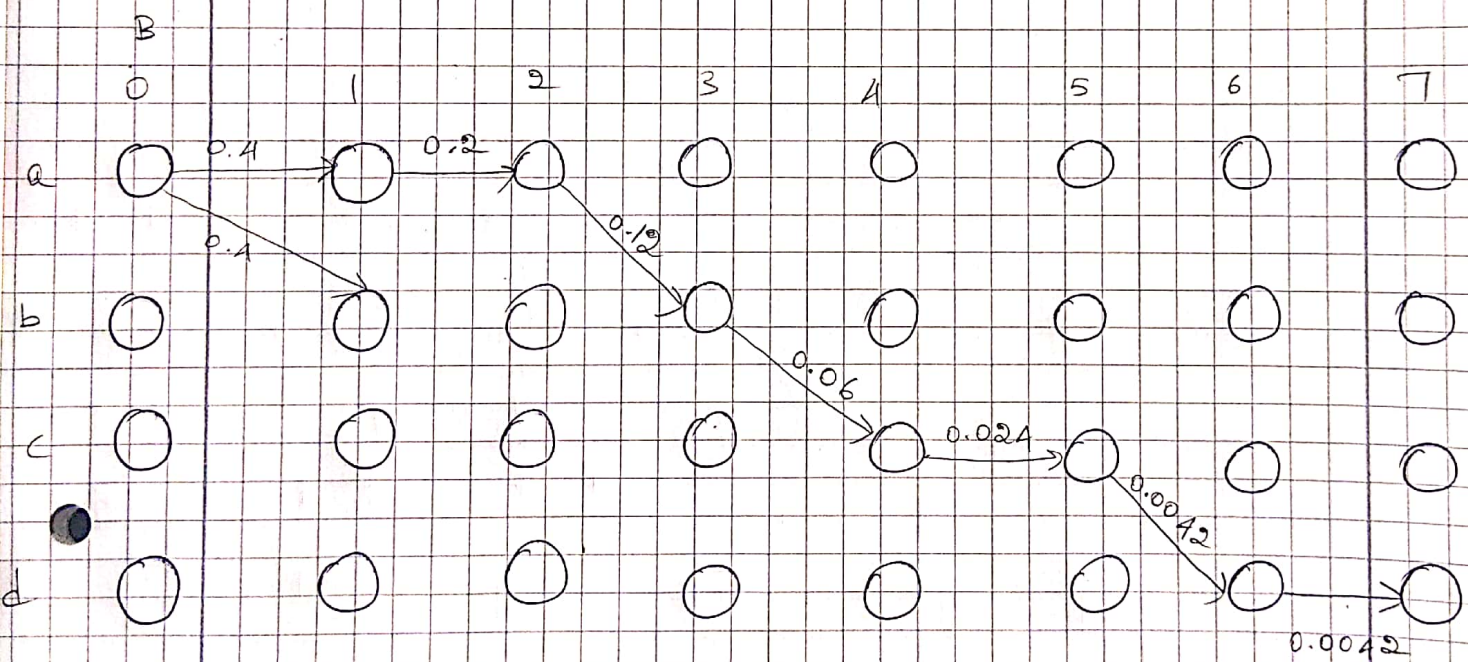
- 'a' => ?
- 'b' => max(0.1 × 0.0011, 0.1 × 0.012) = 0.0012 (BP = row 'b')
- 'c' => max(0.1 × 0.012, 0.1 × 0.06) = 0.024 => BP = row 'c'
- 'd' => max(0.1 × 0.06, 0.1 × 0.0036) = 0.0024 => BP = row 'c'

at T = 6

- 'a', 'b' = null
- 'c' => max(0.3 × 0.012, 0.3 × 0.06) = 0.0018 => (BP = row 'c')
- 'd' => max(0.7 × 0.06, 0.7 × 0.036) = 0.0042 => (BP = row 'c')

at T = 7

- 'a', 'b', 'c' = null
- 'd' => max(1 * 0.0018, 1 * 0.0042) = 0.0042 => (BP = row 'd')



Sequence Final seqno

Final sequence :- |B| |B| |B| |IY| |F| |F| |IY| |IY|

T=0 1 2 3 4 5 6 7