

Question 19

Discrete the observation:

Since $\text{Max credit score} = 780$ and $\text{Min credit score} = 600$.

Separate credit score into three domain.

Excellent: Credit Score ≥ 720

Average: Credit Score ≥ 660

Average: $660 \leq \text{Credit Score} \leq 720$

Poor: Credit Score ≤ 660

The observation sequence: $[740, 650, 680] \rightarrow [A, P, A]$

Assume the initial ~~pro~~ matrix $\pi = [1/3, 1/3, 1/3]$.

Transition Matrix $A = \begin{bmatrix} 0,7 & 0,3 & 0,0 \\ 0,0 & 0,6 & 0,4 \\ 0,0 & 0,2 & 0,8 \end{bmatrix}$

Emission matrix B

$B = \begin{bmatrix} 0,8 & 0,15 & 0,05 \\ 0,2 & 0,6 & 0,2 \\ 0,05 & 0,15 & 0,8 \end{bmatrix}$

We have bijection $\sigma: \mathcal{S} = \{\text{low, Medium, High}\} = \{1, 2, 3\}$

$\omega: \mathcal{O} = \{\text{Excellent, Average, Poor}\} = \{1, 2, 3\}$

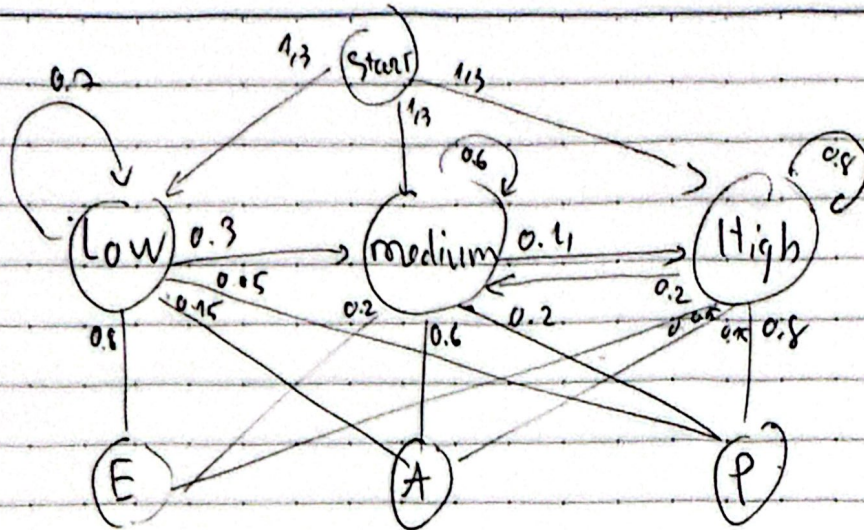
$\Rightarrow G = (A, B, A) \Rightarrow w(O) = (w_1, w_2, w_3)$



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No.



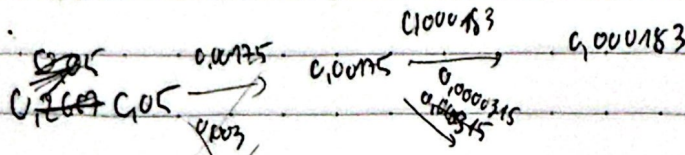
Apply Viterbi: R

A

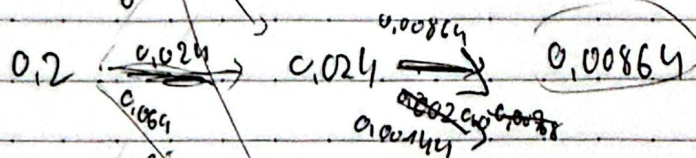
P

A

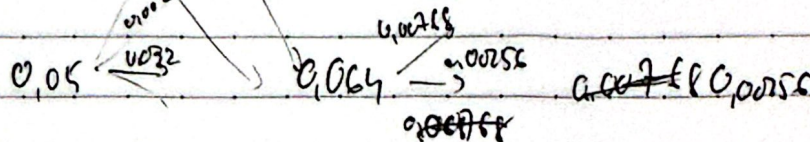
1 Low



2 medium



3 High



So the best sequence of state that most likely emit the observation is $S = [\text{Medium, Medium, Medium}]$.