IME625: Stochastic Processes

2021-22 Sem-II

Homework-7

Consider an absorbing Markov Chain with the following transition probability matrix. It's obvious that the chain will end up in state 2. Find the probability that when the chain moves into state 2, it does so from state 1. Take $X_0 = 0$.

p_{ij}	0	1	2
0	0.7	0.2	0.1
1	0.3	0.5	0.2
2	0	0	1

Hint: Let $w_i := P(X_{T-1} = 1 | X_0 = i)$. Obviously, $w_2 = 0$. For $i \in \{0,1\}$, you need to use the first-step analysis. We are looking for w_0. See the notes to know about more uses of first-step analysis.