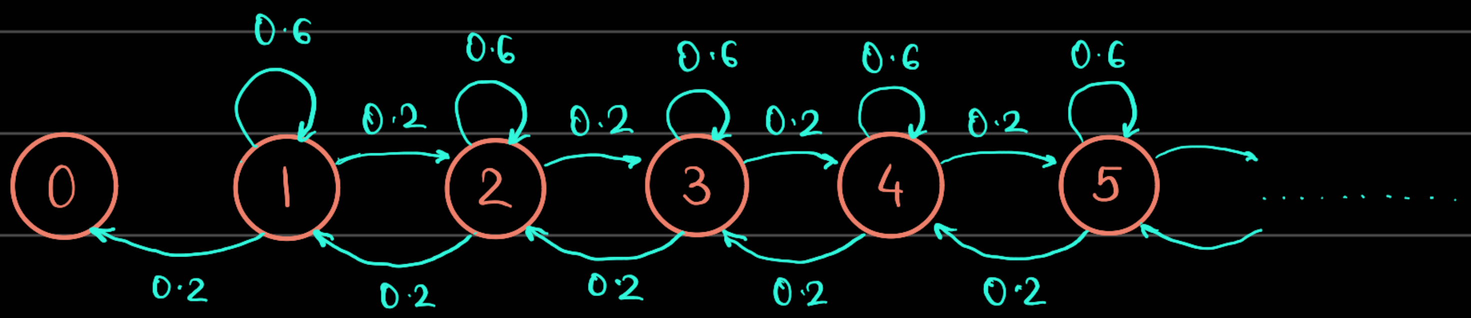
Assuming the following probability values and constructing the Markov chain :



$$0.2 + 0.2\times 0.6 + 0.2\times 0.2\times 0.2 + 0.2\times 0.6\times 0.6$$

$$A = \begin{bmatrix} 0.6 & 0.2 & 0.2^2 & 0.2^3 & 0.2^4 & \\ 0.2 & 0.6 & 0.2 & 0.2^2 & 0.2^3 & \\ 0.2^2 & 0.2 & 0.6 & 0.2 & 0.2^2 & \cdots \\ 0.2^3 & 0.2^2 & 0.2 & 0.6 & 0.2 & \\ 0.2^4 & 0.2^3 & 0.2^2 & 0.2 & 0.6 & \\ & & \vdots & & & \end{bmatrix}$$

A_{ij} = 0.6 for $i=j$

0.2^(max(i,j)) for $i \neq j$

$$\text{Total time} = \frac{0.2\left(1+\sum (j+1) P_{ij}\right)}{1+\sum (j+1)} \quad \text{for } j=1,2,3\ldots \; i=1$$

Let M_1 be the event that 1 signal is transmitted in the 1^{st} sec.

$E[M_2] = 1\times 0.6 + 0\times 0.2 + 2\times 0.2 = 1 = M_1$

Similarly, $\mathbb{E}[M_n] = M_1$ for $n>1$

Thus, we get a Martingale.