

# Assignment-12

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# Outline

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# Question

## Papoulis book exercise 15

Q-14 Determine the mean time to absorption for the given genetic models.

$$\lambda_0 = 1 \quad \lambda_1 = 1 \quad \lambda_r = 2^r \left( \binom{2N-r}{N-r} / \binom{2N}{N} \right) < 1$$

where  $r = 2, 3, \dots, N$

# Solution

From (15-240), the mean time to absorption vector is given by

$$m = (I - W)^{-1}E, \quad E = [1, 1, \dots, 1]^T \quad (1)$$

Where

$$W_{ik} = p_{jk}, \quad j, k = 1, 2, \dots, N-1 \quad (2)$$

with

$$P_{jk} = \binom{N}{k} \left(\frac{j}{N}\right)^k \left(1 - \frac{j}{N}\right)^{N-k} \quad j, k = 0, 1, \dots, N \quad (3)$$