

Problem 6.3.2

The birth and death process is completely specified by the birth and death parameters. Therefore, we only need to specify the parameters λ_0 and μ_N .

The most natural option is to apply reflecting boundary conditions, which implies that the process always reverts to its previous state whenever it is at a boundary state. This would lead to the parameters $\lambda_0 = m_0^{-1}$ and $\mu_N = m_N^{-1}$.

Another option is to put extra weight on the final collar such that it takes longer time for the beetle to leave the final collars.

Note that it is not allowed to let the beetle transition to other collars than those proposed above as this would violate the postulates of the birth and death process.