1. In a multi-state model, a person can be in one of three states:
   a. State 0 is healthy;
   b. State 1 is disabled; and
   c. State 2 is dead.

   The following transition matrix applies during each year of this multi-state model:

   \[
   \begin{bmatrix}
   0.90 & 0.08 & 0.02 \\
   0.60 & 0.25 & 0.15 \\
   0 & 0 & 1
   \end{bmatrix}
   \]

   An three year term insurance policy pays a benefit of 100,000 at the end of the year of death. The policy also pays a benefit of 10,000 at the end of each year that the insured is disabled.

   The net annual premium is paid at the beginning of each year and is only paid by those who are healthy.

   Using \( v = 0.9 \), calculate the net annual premium.
2. A multiple decrement table has two decrements: Lapses (1) and Deaths (2). You assume that these decrements are uniformly distributed over each year of age in the multiple decrement table.

The multiple decrement table is created from two associated single decrement tables. You are given the following from the single decrement tables:

a. \( q_{80}^{(1)} = 0.25 \)
b. \( q_{80}^{(2)} = 0.05 \)

The Aziz Assurance Company has 100,000 insureds who are age 80.

Calculate the number of lives that will die during the next year.