Question A: Imagine a world with the aggregate production function

$$y = \kappa k^{\alpha} l^{1-\alpha}.$$

There is one unit of labor in economy. Let the *quarterly* rate of time preference be 0.01. Similarly, take the *quarterly* rate of depreciation to be 0.015. The stock of labor in the economy is one.

1. Assume that the economy is in a steady state. Compute the capital stock.

2. Take the time period to be *one year*. Redo the above calculation. Is your capital stock the same? (Assume that $(1+x)^n = 1+nx$ for small n and x.)

3. What is the issue here?

Question B: Consider the following optimization problem:

$$V(y) = \max_{k_1, k_2} \{\ln c + \beta V(y')\},$$

subject to

$$c + k_1' + k_2' = y,$$

and

$$y' = x(k_1')^\alpha + z(k_2')^\alpha,$$

where x is a constant and $0 < \alpha, \beta < 1$. The random variable $z \in \{z^l, z^h\} \sqsubset \mathcal{R}_+$ is distributed as follows:

$$\Pr[z = z^i] = 1/2 \text{ for } i = l, h.$$

Characterize the solution for the decision rules for k_1' and k_2'. What is the solution for consumption? How does income evolve over time?