14.06 Problem Set 1 2005 - Solow Model

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Due: Tuesday, Feb. 15

Question 1: (The Solow Model in discrete time with technological progress.)
Consider the Solow model that was presented in class but now allow for labor augmenting technological progress so that:

$$Y_t = K_t^{\alpha}(A_t L_t)^{1-\alpha}$$

where labor and technologcal progress grow each period according to

$$\begin{aligned} L_t &= (1+n)L_{t-1} \\ A_t &= (1+g)A_{t-1} \end{aligned}$$

where L_0 and A_0 are taken as given.
As before, the evolution of capital is governed by

$$K_{t+1} = (1-\delta)K_t + I_t.$$

To complete the model, make Solow's assumption that a constant fraction s of output is invested.
Chose an appropriate normalization and fully characterize the steady state of the economy. What is the growth rate of output per worker in the steady state?

Question 2: Romer 1.4.

Question 3: Romer 1.6.

Question 4: Romer 1.9.