Exercise 3

Economic growth: Theory and Empirical Methods, UC3M

Question 1: Consider the Romer model.

1. Find the share of researchers that maximizes output per person along the balanced growth path. Interpret the result.
2. Assume the economy has currently too few researchers. How can the economy achieve this optimal number of researchers.

Question 2: The file *students*2 initializes the Romer model. Suppose there is a one-time increase in the productivity of research by 30%. Use a for loop to compute for 500 periods

1. the growth rate, $g_A(t)$, of technology.
2. the resulting level of technology next period as $A(t+1) = A(t) + g_A(t)A(t)$.
3. the size of the labor force next period as $L(t+1) = L(t) + nL(t)$.
4. Plot the growth rate of technology over time.

Write a new for loop where you simulate for those 500 periods

1. output per worker as $y(t) = \tilde{k}(t)^{\alpha} A(t)$.
2. the change in capital per efficient worker as $\dot{\tilde{k}}(t) = s\tilde{k}(t)^{\alpha} - (\delta + g_A(t) + n)\tilde{k}(t)$
3. the capital per efficient worker next period: $\tilde{k}(t+1) = \tilde{k}(t) + \dot{\tilde{k}}(t)$.

Question 3: In 2021, Brian Deese, Biden's top White House economic adviser, told the New York Times: "Having healthy competition is vital to an effective capitalist system, [...]. It is a driver of higher wages, lower prices, more innovation and more business creation."

1. Explain the assumption behind competition policy in the Romer and Schumpeter models and why this makes analyzing competition policy infeasible.
2. Why may competition policies, in particular patent laws, be linked to economic growth? What are the trade-offs when designing patent laws.