Homework 6

- 1. Suppose that the production function of the economy is Cobb-Douglas, $Y = K^{\alpha} (AL)^{1-\alpha}$ and that there is a constant rate of technological progress, g.
 - (a) Find the expressions for k^* , y^* , and c^* as functions of α , s, n, δ , g.
 - (b) What is the golden-rule level for k^* ?
 - (c) What is the golden-rule saving rate?
- 2. Consider the Solow model with technological progress.
 - (a) Show that, at the steady state, $MPK = f'(k^*)$.
 - (b) Suppose that all capital income is saved and all labor income is consumed. Thus, $\dot{K}_t = MPK_t \cdot K_t - \delta K_t$. Derive the equation characterizing the steady-state.
 - (c) Is the steady-state capital per capita larger than, less than, or equal to the golden-rule level?
- 3. Using the Penn World Table (pwt10.xlsx), conduct a growth accounting study of China. Variables to be used: rgdpna, rnna, and emp, which are described as follows.

rgdpna	Real GDP at constant 2017 national prices	_
rnna	Capital stock at constant 2017 national prices	
emp	Number of persons engaged (in millions)	
		Ξ.

You can set the share of capital income (α) to be 1/2. And you should obtain growth accounting in both the whole sample and subsamples (e.g., 1952-1977, 1978-2019). You can also try different segmentations.