Problem 1.   *1. Consider the growth model with two different social classes as seen in class. Show that if $g^i(K, a^i), i = \{R, P\}$ (the optimal saving decisions for $R = rich$ and $P = poor$) are linear in their second arguments, then aggregate capital is the only necessary aggregate state variable.*

2. Is this the case when utility is quadratic? ($u(c) = -\frac{1}{2}(c - b)^2$ where b is a constant) When the utility is CRRA? ($u(c) = \frac{c^{1-\sigma}-1}{1-\sigma}$)

Problem 2. *Redo the analysis of the above model (setup and definition of Recursive Competitive Equilibrium) using $\{K, k^R, k^P\}$ (aggregate capital, capital owned by Rich, capital owned by Poor) as aggregate state variables.*

Problem 3. *(optional) In the growth model with 2 social classes, define steady state. What are the conditions for a Steady State to exist?*

Problem 4. *In the growth model with land, show that condition (5) is redundant from the given definition of equilibrium*

Problem 5. *Take the growth model with government debt (last model seen in class). Show, by way of finding 'wedges', that the competitive equilibrium is inefficient*

Problem 6. *Write recursively a simple growth model with utility from leisure and government, where the government wants to throw a party of size $\overline{G}$ every period (not valued by the households), financed by either consumption taxes (τ_c) OR labor income taxes (τ_w) (the gov. budget is balanced from period to period). Find the relation between taxes in equilibrium. In terms of utility, when will τ_c be preferred over τ_w?*