Homework 4

EE412

Consider the following sequential problem. Social planner maximizes the lifetime utility of the representative consumer

$$\sum_{t=0}^{\infty} \beta^t u(c_t)$$

subject to

$$c_t + i_t = y_t,$$
$$y_t = f(k_t),$$
$$k_{t+1} = (1-\delta)k_t + i_t,$$
$$k_{t+1} \geq 0, \quad c_t \geq 0 \qquad k_0 \quad given$$

1) Derive the recursive formulation of the same problem.

2) Derive F.O.C.

3) Obtain the Euler equation

4) Given that $\Delta t \simeq dt$, find the curves of $\dot{c}(t) = 0$ *and* $\dot{k}(t) = 0$ used in the phase diagram.

Specify all the additional assumptions you needed. Draw the relevant saddle path for this case.