Peilin Yang 7/23
Envelop condition:

$$V_k = U_c \frac{\partial c_t}{\partial k_t}$$

$$y_t = k_t^{\alpha} e^{(1-\alpha)z_t}$$
$$r_t = \alpha \frac{y_t}{k_t}$$
$$w_t = (1-\alpha) y_t$$
$$c_t = w_t + (1 + r_t - \delta) k_t - k_{t+1}$$
$$i_t = y_t - c_t$$
$$u_t = \frac{c_t^{1-\gamma} - 1}{1-\gamma}$$

Steady State:

$$\bar{w} = (1-\alpha)\bar{y}$$
$$\bar{c} = \bar{w} + \bar{r} - \delta$$
$$\bar{\imath} = \bar{y} - \bar{c}$$

To find the steady state use the steady state version of the Euler equation $\bar{r}$:

$$1 = \beta(1 + \bar{r} - \delta)$$
$$\bar{y} = \bar{k}^{\alpha}$$

Next, use the first-order condition on capital from the firm's problem to find $\bar{k}$

$$\alpha \bar{k}^{\alpha-1} = \bar{r}$$

Using the exogenous grid algorithm to exercise Value Function Iteration.