Problem B.3

Provide a detailed write-up:

1) We first fix a time period T (realistically equal to 10, but convergence can require up to 200) Compute initial and final steady state after (MIT shock)
2) Make a guess on the sequence of interest rates $\{r_t^m\}_{t=1}^{T-1}$ by interpolation between r_0 and r_T

3) Go to the firms problem and use the guess in 2) to obtain

$$\{w_t^n = w_t(1-\tau_m)\}_{t=1}^{T-1} \quad \text{where } \tau_m \text{ is the tax rate}$$

Then compute the pension ~~contribution~~ system

$$\tau_m = \frac{rr\ \sum_{j=jr+1}^{J} N_j}{\sum_{j=0}^{jr} N_j + \overline{rr} \sum_{j=jr}^{J} N_j}$$

4) Calculate now the solution to the household problem given $r_m, w_m(1-\tau_m)$ and $\overline{rr}$

$$\left\{\left\{v^m(t,j,\cdot),\ a_{t+1}^m(t,j,\cdot),\ c^m(t,j,\cdot)\right\}_{j=0}^{J-1}\right\}_{t=1}^{T-1}$$

by iterating backwards in time

5) Use $\{a_{t+1}^m(t,j,a_t,\eta_t)\}_{t=0}^{T-1}$ and $\pi(\eta'|\eta)$ to calculate the transition laws $\{H_t^m(j)\}_{t=1}^{T-1}$

6) Iterate forward on $\Phi_0(j)$ to get the law of motion of Φ : $\Phi_{t+1}^m = H_t^m(\Phi_t^m)$ up to $T-1$

7.) Aggregate assets: $A_t^m = \int a_t^m(j-1, a_{t-1}, \eta_{t-1}) \Phi_{t-1}^m$ $(d_j \times d\eta \times da)$

8) Compute the new $\{r_t^m\}_{t=1}^{T-1}$ implied by clearing the capital market $\tilde{K}_t^m = A_t^m \ \forall t$

9) Check if dist $< \varepsilon$ where dist is the sup norm on $\tilde{r}_t^m - r_t$

→ if yes, then stop the iteration, otherwise update $r_t^{m+1} = \omega \tilde{r}_t^m + (1-\omega) r_t^m$ for some small ω and go back to 3)

10) Once convergence is reached, check $\| A_T - K_T \| < \varepsilon$ if not increase T and goto 2)