Problem Set 1

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1 Model

- There are 4 state variables:
  - $e \in \{0, 1\}$ employment status.
  - $h \in \mathbb{R}_+$ human capital.
  - $k \in \mathbb{R}_+$ assets.
  - $S \in \mathbb{R}_+$ (accumulated) schooling.
- There are 2 firms $I \in \{L, H\}$
- Firm $I = L$ hires all workers.
- Firm $I = H$ hires only workers with $S \geq \underline{S}$.
- Workers con invest in schooling a fraction of time $s \leq 1$.
- Law of motion of human capital is: $h' = \exp(z)H(h, s)$ where $z \in \mathbb{R}_+$ is a random shock.

1.1 Unemployed Workers

- Search for a job with intensity γ, $(\gamma + s \leq 1)$.
- Recieve a job offer with probability $\pi(\gamma, S)$, $(\pi(0, \cdot) = 0)$.
- Dependent on S they migth recieve an offer from just L or both firms.
- Recieve unemployment beneffits b.

Value Function if $S < \underline{S}$

$$U_t(h,k,S) = \max_{k,s} \left\{ u(c) + \beta \mathbb{E}\left[\pi(\gamma,S) W^L_{t+1}(h',k',S') + (1-\pi(\gamma,S)) U^L_{t+1}(h',k',S') \right] \right\}$$

Value Function if $S \geq \underline{S}$