# Problem Set #1

Danny Edgel
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*Produced in Collaboration with []*

1. The dynamic programming problem is:

$$\max_{\{K_{t+1},C_t\}_{t=1}^{\infty}} \mathbb{E}\left[\sum_{t=1}^{\infty}\beta^t \log\left(C_t\right)\right] \text{ s.t. } C_t + K_{t+1} - (1-\delta)K_t \leq Z_t K_t^{\theta} \ \forall t = 1, 2, 3, ...$$

   Which can be represented by the following Bellman equation:

$$V(K, Z) = \max_{K'} \left\{\log\left(ZK^{\theta} + (1-\delta)K - K'\right) + \beta\mathbb{E}\left[V(K', Z)|Z\right]\right\}$$

2.

3.