Stochastic HW3 - Problem 3

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Problem 3

State Variables

Barrels of oil (s) and years (t).

Choice variables

How many barrels of oil to process (x_t).

Dynamics

$(s, t) \rightarrow (s + b_t - x_t, t + 1)$

Bellman Equation

$$V(s,t) = max_{0 \leq x_t \leq s}[(p * x_t - x_t^2) + \delta V(s + b_t - x_t, t + 1)]$$

where δ is the discount factor and b_t is the number of barrels discovered in a year.

Terminal Condition

$$V(s,t) = 0$$