The following question requires you to write MATLAB (*not* pseudo) code. Assume a momentary objective function of the form

$$U(k, k') = \ln(k^\alpha + (1 - \delta)k - k').$$

Write out the computer code using MATLAB syntax for solving the dynamic programming problem

$$V(k) = \max_{k' \in [k_1, k_n]} \{U(k, k') + \beta V(k')\}.$$

In the above dynamic programming problem (to be solved on the computer), the choice variable, k', is to formulated as *continuous* variable, not discrete one. The value function $V(k)$ is to be approximated by piecewise linear functions on the grid $\mathfrak{K} = \{k_1, \cdots, k_n\}$; i.e., between any two grid points, say k_j and k_{j+1}, the function V is approximated by a *linear* function on the interval $[k_j, k_{j+1}]$. Assume $\alpha = 0.3$, $\delta = 0.1$, $\beta = 0.96$. Assume that the grid spans 10,001 points centered on the steady-state value for capital, k^*, spanning the interval $[k^* - .5k^*, k^* + .5k^*]$.

Hint 1: Suppose one has the values for a function V on the grid $\mathfrak{K}$. Code up the piecewise linear approximation to V.

Hint 2: The following information in MATLAB may help:

FMINBND: finds the minimum of a function of one variable within a fixed interval.

x = fminbnd(fun,x1,x2) returns a value x that is a local minimizer of the function that is described in fun in the interval x1 < x < x2. fun is a function_handle.