ECO 6353:
Consumption and Investment Dynamics

Ongoing Coding Problems

Part 1

1 Explanation of the bugs and their corrections:

- Error 1:
  - Unrecognized function or variable 'xxxxxxx'.
  - Correction:
    xxxxxxx should be replaced with linspace, which is the function called in MATLAB to set up the income grid.
- Error 2:
  - Error using linspace (Too many input arguments).
    The variable 'rho' used in the line was not defined and not required.
    The zero was also not required.
  - Correction:
    The proper way to call the linspace function is:
    Y = linspace(starting point, ending point, number of points);
- Error 3:
  - Arrays have incompatible sizes for this operation.
  - Correction:
    Ensuring compatibility between the dimensions of the arrays.

- Error 4:
  - Out-of-Bound indexing.
  - Correction:
    V_0 is initialized with an integer value to avoid "NaN" outcomes.
- Error 5:
  - An issue with the update of the value function in the main loop.
  - Correction:
    The update of V_0 with $V_{candidate}$ instead of V_1 at the end of each iteration in the loop.
- Error 6:
  - The Function "c" was overwritten.
  - Correction:
    Ensuring consistency in the definition and usage of "c".
- Error 7:
  - "dtmc" requires Econometrics Toolbox.
  - Correction:
    The state transitions are generated from the transition probability matrix P using the random number generation function in MATLAB.
- Error 8:
  - Some variables were not defined to enable the plot command
    (simulated consumption and asset values).
  - Correction:
    Defining the variables in the "simulations" section.

2 Explanation of how the (c, ($a\prime$) would qualitatively change if the borrowing constraint was set to 0:

If the borrowing constraint was set to 0, It would imply that households would be restricted from borrowing any assets. This would result in a situation where households would rely only on their current income and savings. This limitation on borrowing would lead to a reduction in (c) and a more conservative approach to asset accumulation ($a\prime$), particularly in response to fluctuations in income.

3 Explanation of how the (c, ($a\prime$) would qualitatively change if the if the relative risk aversion parameter was doubled:

The relative risk aversion parameter is in the utility function, and it captures the household's preference for consumption smoothing over time. A higher value of γ implies greater aversion to risk. That is, households would want to save more and consume less. The consumption function (c) would depict a more prudent behavior. The optimal asset choice ($a\prime$) would increase, depicting the household's desire to exhibit the "saving for a rainy day" approach.