

## Problem Set #4

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### 1. Feasibility

(a) `bvec_guess = np.ones(S-1)`

```
b_cnstr = array([
    True, False, False, False, False, False, False, False, False],
    dtype=bool),
c_cnstr = array([
    True, False, False, False, False, False, False, False, False, False, False],
    dtype=bool),
K_cnstr = False
n_low = array([
    False, False, False, False, False, False, False, False, False, False],
    dtype=bool),
n_high = array([
    False, False, False, False, False, False, False, False, False, False],
    dtype=bool),
```

The first constraint is violated

(b) `b_cnstr = array([`  
    `True, True, False, False, False, False, False, False, False],`  
    `dtype=bool),`  
`c_cnstr = array([`  
    `False, True, False, False, False, False, False, False, False,`  
    `False],`  
    `dtype=bool),`  
`K_cnstr = False`  
`n_low = array([`  
    `False, False, False, False, False, False, False, False, False, False],`  
    `dtype=bool),`  
`n_high = array([`  
    `False, False, False, False, False, False, False, False, False, False],`  
    `dtype=bool)`

Savings at period 2 and 3 are violated. Consumption in period 3 is violated

(c) `b_cnstr = array([`  
    `False, False, False, False, False, False, False, False, False],`  
    `dtype=bool),`  
`c_cnstr = array([`

```

        False, False, False, False, False, False, False, False, False, False,
        False],
        dtype=bool),
K_cnstr = False
n_low = array([
False, False, False, False, False, False, False, False, False, False],
        dtype=bool),
n_high = array([
False, False, False, False, False, False, False, False, False, False],
        dtype=bool)
No constraint is violated

```

(d) Choose savings that are close to zero

```

(e) b_cnstr = array([
        False, False, False, False, False, False, False, False, False, False],
        dtype=bool),
c_cnstr = array([
        False, False, False, False, False, False, False, False, False, False],
        dtype=bool),
K_cnstr = False
n_low = array([
False, False, False, False, False, False, False, False, False, False],
        dtype=bool),
n_high = array([
False, False, False, False, False, False, False, False, False, False],
        dtype=bool)
No constraint is violated

```

## 2. SS state

(a) The `get_SS` function returns

```

{'C_ss': 4.0225326554758425,
'EulErr_ss': array([ 774.75590792, -358.61614856, -47.90056558,
 3.46097762, 1.10922474, 4.5879269 , 1.5173097 ,
 7.89437039, 109.55586555, 999. , 999. , 999. ,
 3.96064313, 3.11229059, 2.03012302, 2.24238483,
 1.77901315, 999. , 26.86771947]),
'K_ss': 1.7171526396138801,
'L_ss': 6.5716546977866095,
'RCerr_ss': 2.7755575615628914e-16,
'Y_ss': 4.1083902874565368,
'b_ss': array([-1.1012337 , -0.01626467, 0.35435197, 0.49995015,
 0.58187376, 0.56994466, 0.50783391, 0.3027871, 0.01790947]),
'c_ss': array([ 0.28218511, 0.12794504, 0.24350896, 0.43151604,
 0.47603639, 0.54883578, 0.54436976, 0.60584531,

```

```

0.51735883,0.24493142]),
'n_ss': array([ -2.01557682e+00,  5.11867318e+00,  1.54280258e+00,
  7.33584441e-01,  4.04325086e-01,  1.93773425e-01,
  8.24071688e-02,  2.29390855e-03, -1.45982194e-02,
  5.23969939e-01]),
'r_ss': 0.78739591195173131,
'ss_time': 0.01512999999999992,
'w_ss': 0.4063594040852726}

```

3.

- 4.
- More inequality in endowments between the old and the young so consumption in early periods increases but consumption in later time period falls. Also, young consumers will tend to save more in order to spend more when old, thus interest rate decreases.
  - Total time endowment decreased, so total consumption decreases.