Problem Set #6
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Questions 1, 2, 3 and 4

See appendix, figures 1-12 (in order).

Figure 12, the population growth rates in the economy, has a one time huge drop in growth. It looks weird, but the population dynamics in figure 11 seems correct. I do not know the source if this one time drop.

Question 5

The values that characterize the Steady state are

```
{'C_ss': 7.1439448401484844,
 'EulErr_ss': array([ -7.76143594e-11,   8.99060826e-11,  -1.36965994e-11, ...,
         5.67101921e-11,  -2.55193200e-10,   5.89396976e-10]),
 'K_ss': array([ 17.79850383]),
 'RCerr_ss': array([ 0.45785928]),
 'Y_ss': array([ 9.02149359]),
 'b_ss': array([ 0.05425846,  0.1088026 ,  0.16366529, ...,  0.30400355,
         0.17075284,  0.06940022]),
 'c_ss': array([ 0.88125416,  0.8862201 ,  0.89117986, ...,  0.35421473,
         0.30842664,  0.26567508]),
 'r_ss': array([ 0.12740383]),
 'ss_time': 0.037582915565053554,
 'w_ss': array([ 0.93716503])}
```

The Resource constraint error is way too big, probably due to a typo that I could not find. Notwithstanding, the solution seems to be correct. For the graph with the distribution of consumption and savings, see figure 13 in the appendix.
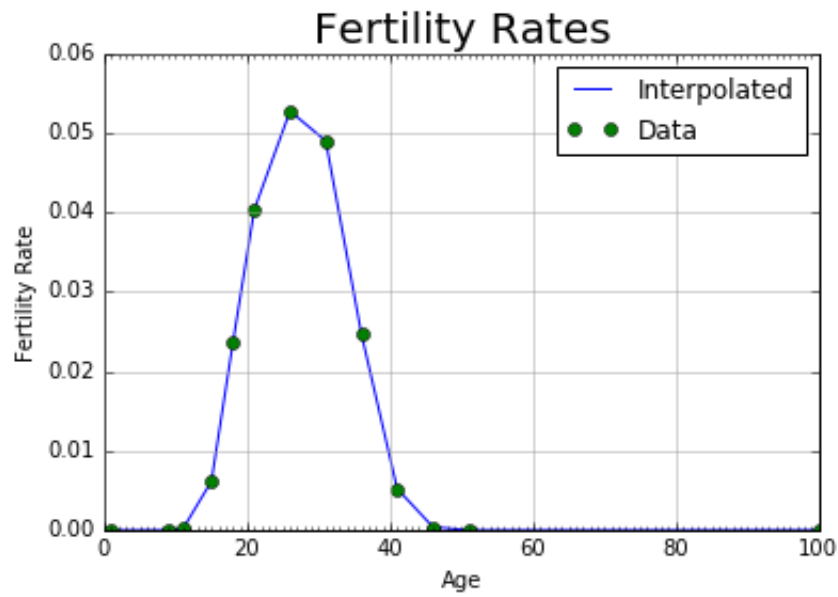
A Figures

Figure 1: Distribution of fertility rates by age, 100 years lived agent.
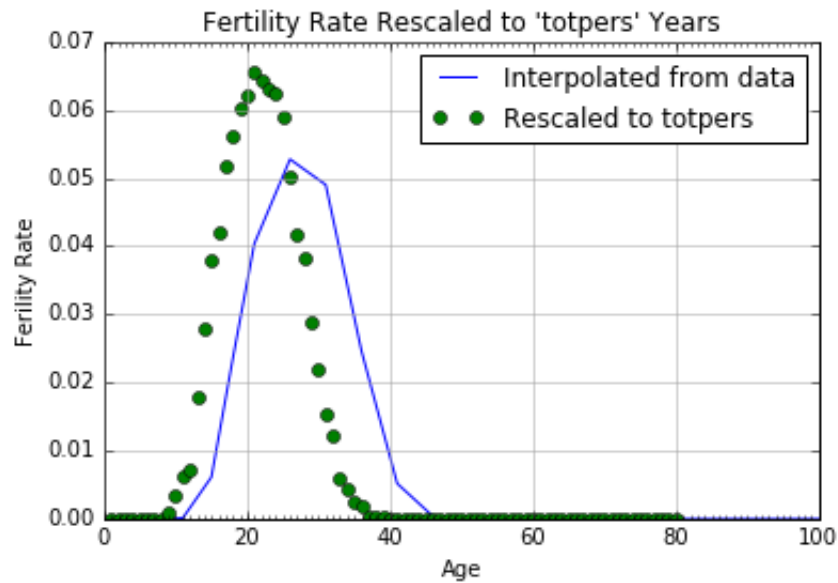

Figure 2: Distribution of fertility rates by age: comparison between 100 and 80 periods of life.
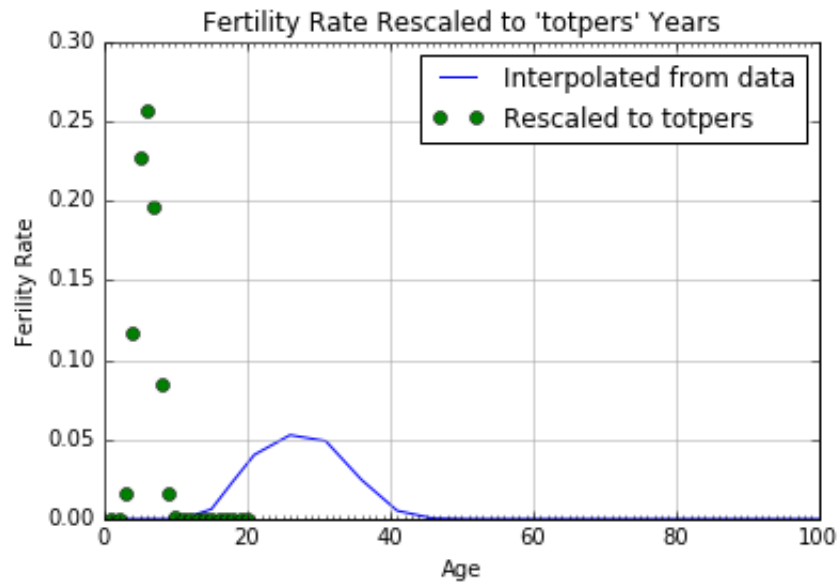
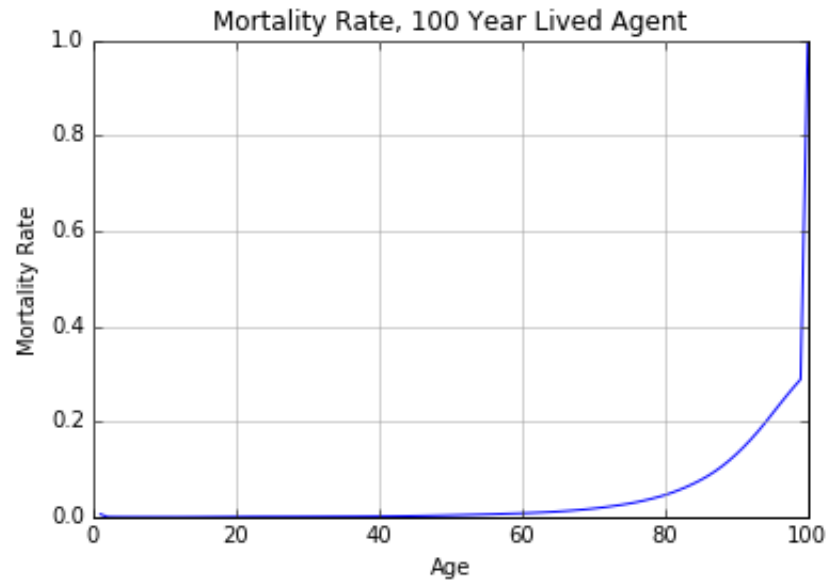Figure 3: Distribution of fertility rates by age: comparison between 100 and 20 periods of life.

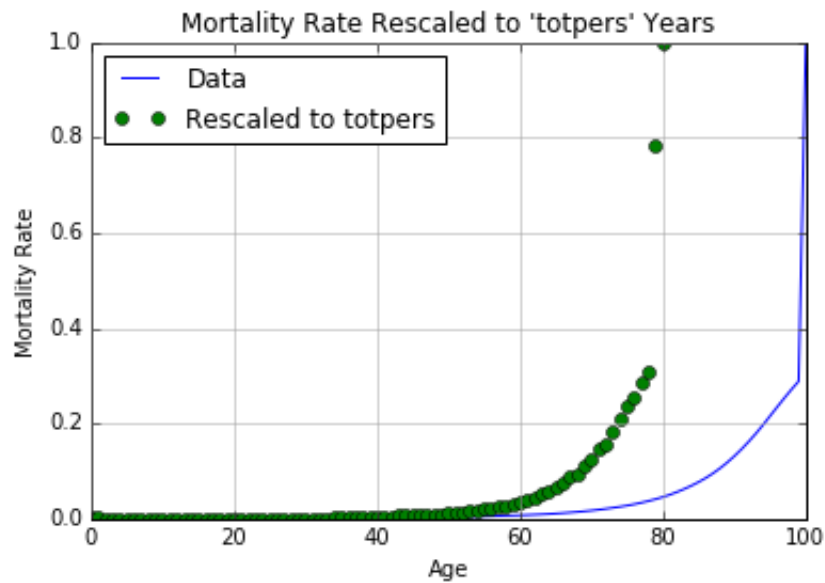Figure 4: Distribution of mortality rates by age, 100 years lived agent.

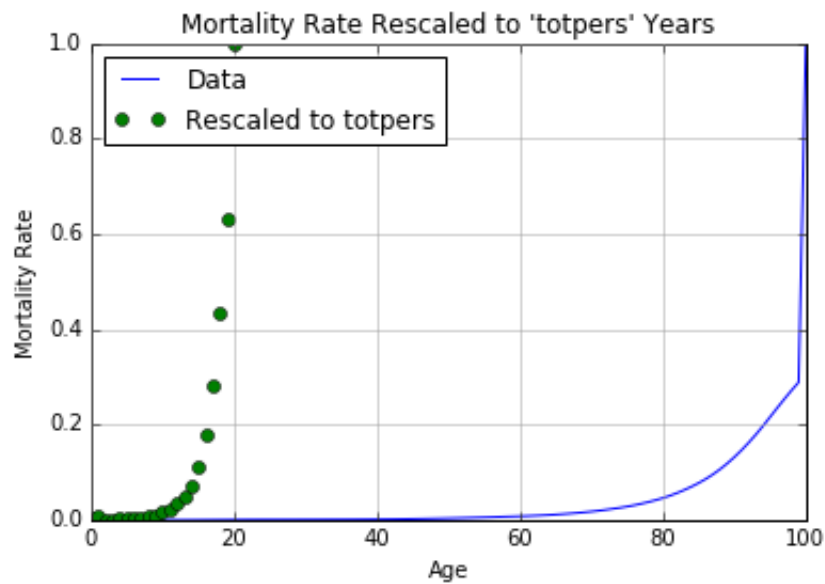Figure 5: Distribution of mortality rates by age: comparison between 100 and 80 periods of life.

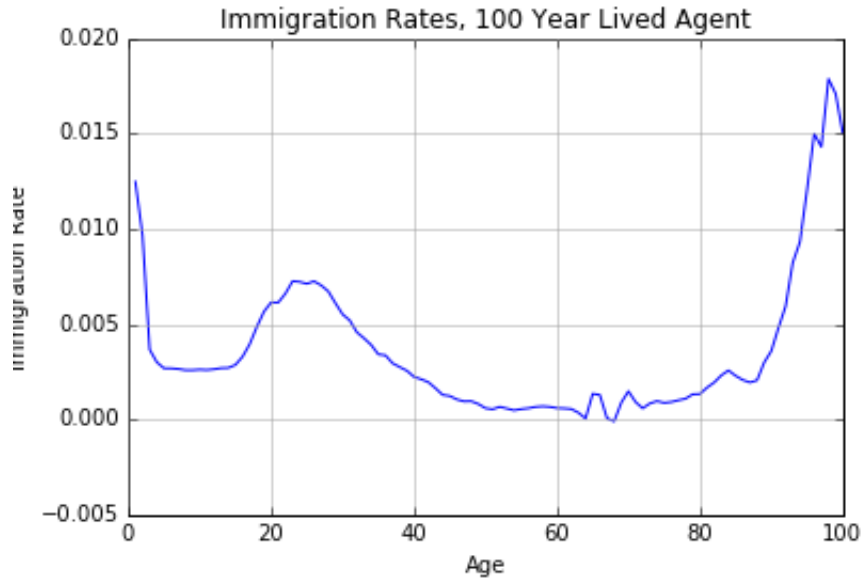Figure 6: Distribution of mortality rates by age: comparison between 100 and 20 periods of life.

Figure 7: Distribution of immigration rates by age, 100 year lived agent.
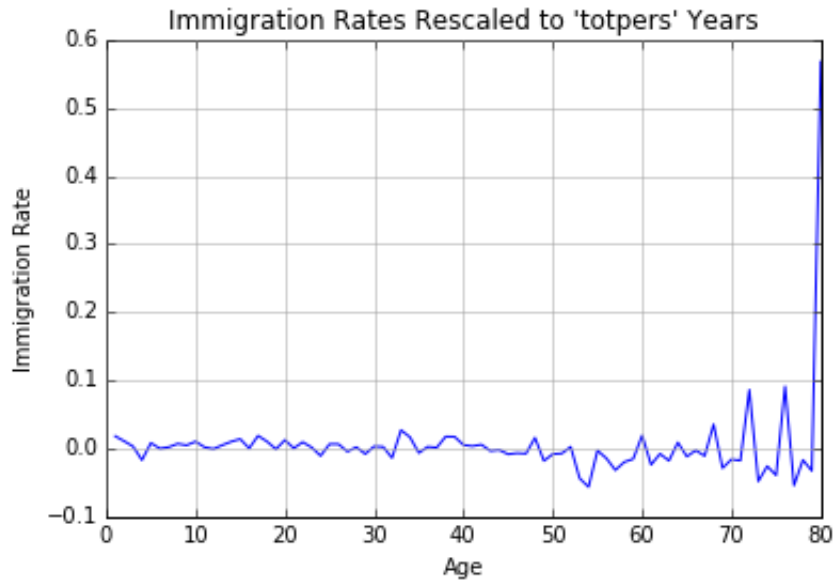

Figure 8: Distribution of immigration rates by age, 80 period lived agent.
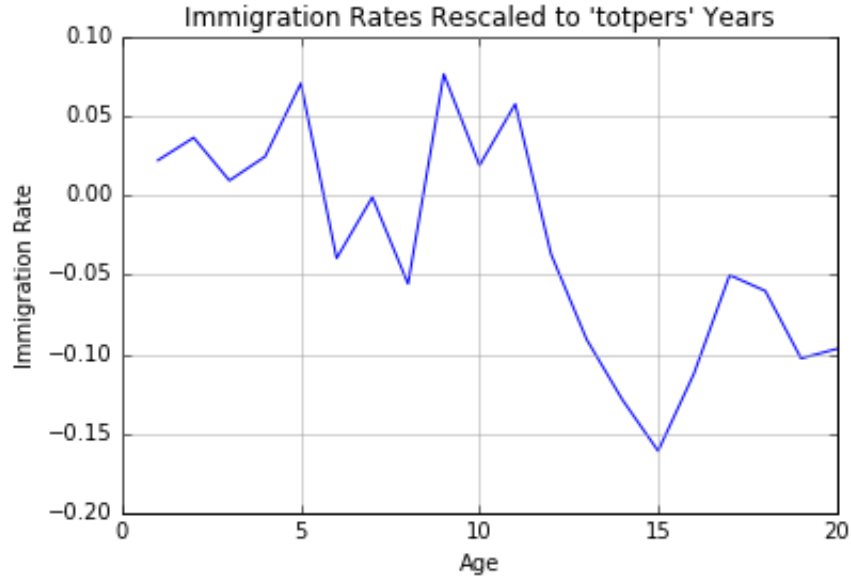
Figure 9: Distribution of immigration rates by age, 20 period lived agent.
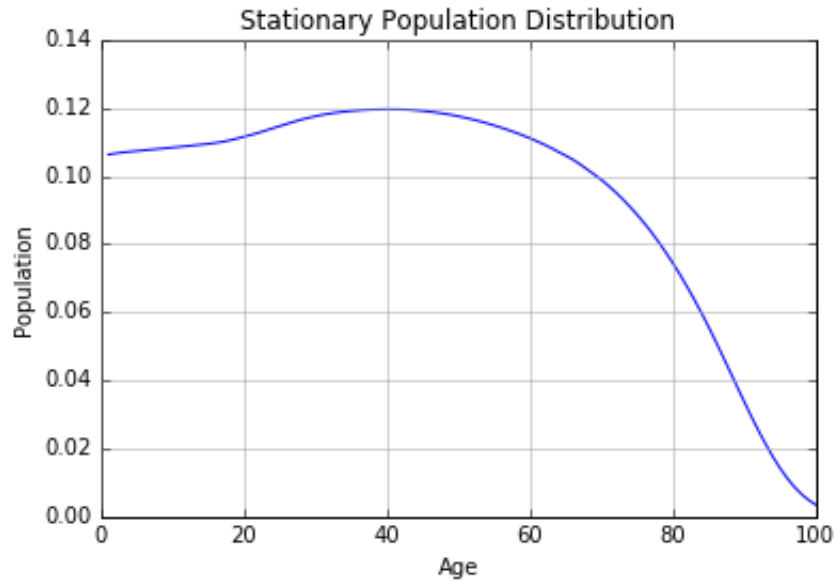

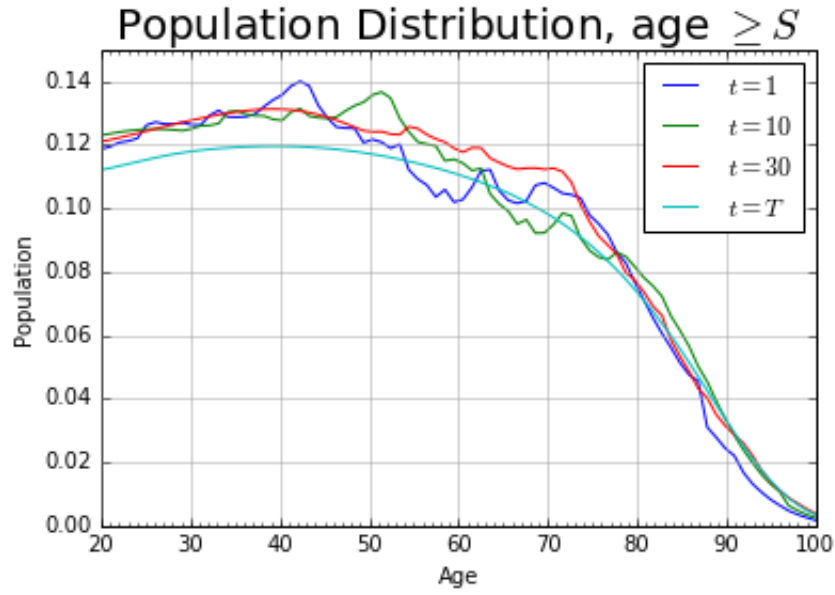Figure 10: Steady-state stationary population distribution, $\bar{\omega}_s$.

Figure 11: Stationary population distribution at times $t = 1, 10, 30$, and $T = 200$.
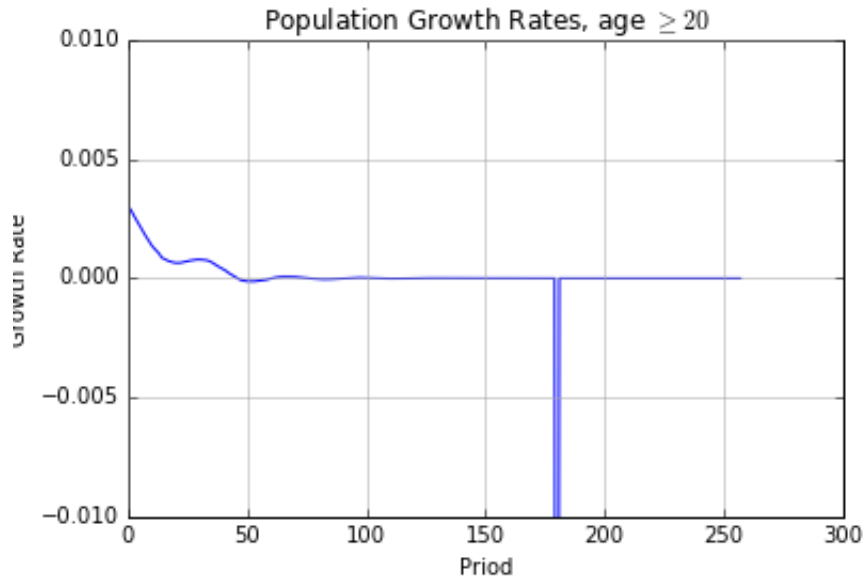

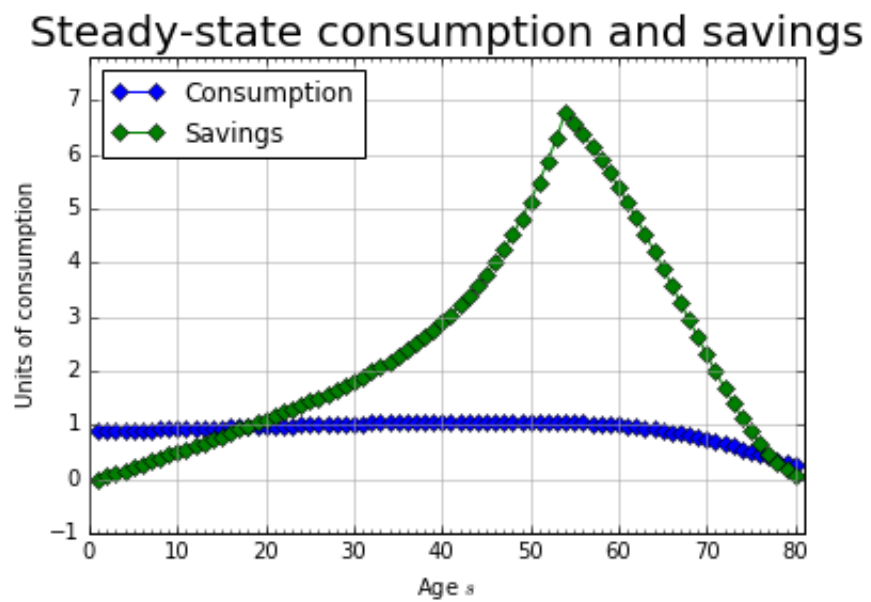Figure 12: Population growth rate of the economically relevant population.

Figure 13: Steady-state distribution of consumption and savings.