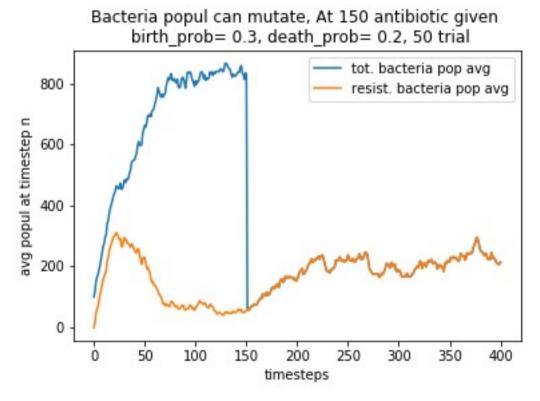
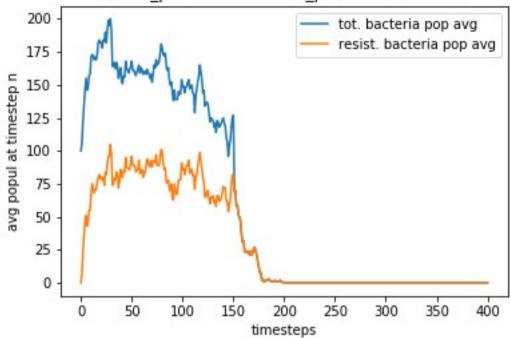


mean of simulation without antibiotic, and mutation is 769.0, and 95% confid interval is 0.0 at time step 299



mean of simA for tot popul is 190.0, and 95% confid interval is 0.0 at time step 299 mean of simA for resist. popul. is 190.0, and 95% confid interval is 0.0 at time step 299

## Bacteria popul can mutate, At 150 antibiotic given birth prob= 0.17, death prob= 0.2, 50 trial



mean of simB for tot popul is 0.0, and 95% confid interval is 0.0 at time step 299 mean of simB for resist. popul. is 0.0, and 95% confid interval is 0.0 at time step 299