

EE 381 Homework 4 Part 1

Name, I.D. #, and Date: _____

Instructions: Attempt each exercise and show your work. You can attach pages to your submission. Submit this part of homework 4 with the additional parts of homework 4 after notification from the faculty member. You may want to make copies of your work.

Population Stabilization Model

A sociologist made a regional study of the yearly shift of population between rural and urban areas. The annual shift was found to be that 76% of rural residents remain in rural areas, 24% move from rural to urban areas, 8% of urban residents move from urban to rural areas, and 92% remain in the urban areas.

With respect to the above do the following (as was discussed in the online lecture):

- 1.) Draw a state diagram
- 2.) Determine the 2×2 system
- 3.) Write the 2×2 system as a matrix algebra equation
- 4.) Determine the eigenvalues of the matrix
- 5.) If the system has a steady state determine the steady state vector
- 6.) On the back of the preceding, in the long term what will be the proportion of urban and rural populations?