

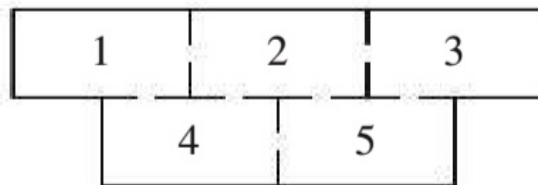
Math 2802 N1-N3 Worksheet 7

March 2nd, 2018

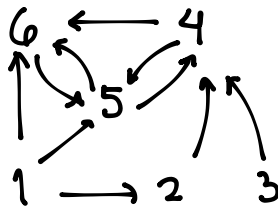
- Determine whether the following statements are true or explain why they are false (can use an example).
 - Every stochastic matrix has a unique steady vector.
 - If $Pq = q$ then for $\{x_k\}_{k \geq 0}$ (recall $x_k = Px_{k-1}$) converges to q regardless of the initial point x_0 .

- Consider a Markov Chain on $\{1, 2, 3\}$ with transition matrix $P = \begin{pmatrix} 1/2 & 0 & 1/2 \\ 1/2 & 1/2 & 0 \\ 0 & 1/2 & 1/2 \end{pmatrix}$
 - Show that P is a regular matrix
 - Find a steady-state vector for this markov chain
 - What fraction of the time does this chain spend in state 2?

- Consider a mouse traversing from room to room (uniformly) at random in the maze below. What fraction of time does it spend in room 3.



- Design the google matrix for the following web.



- Consider the production model $x = Cx + d$ for an economy with two sectors, where $C = \begin{pmatrix} 0 & .5 \\ .6 & .2 \end{pmatrix}$ and $d = \begin{pmatrix} 50 \\ 30 \end{pmatrix}$. Determine the production level x necessary to satisfy the final demand d .