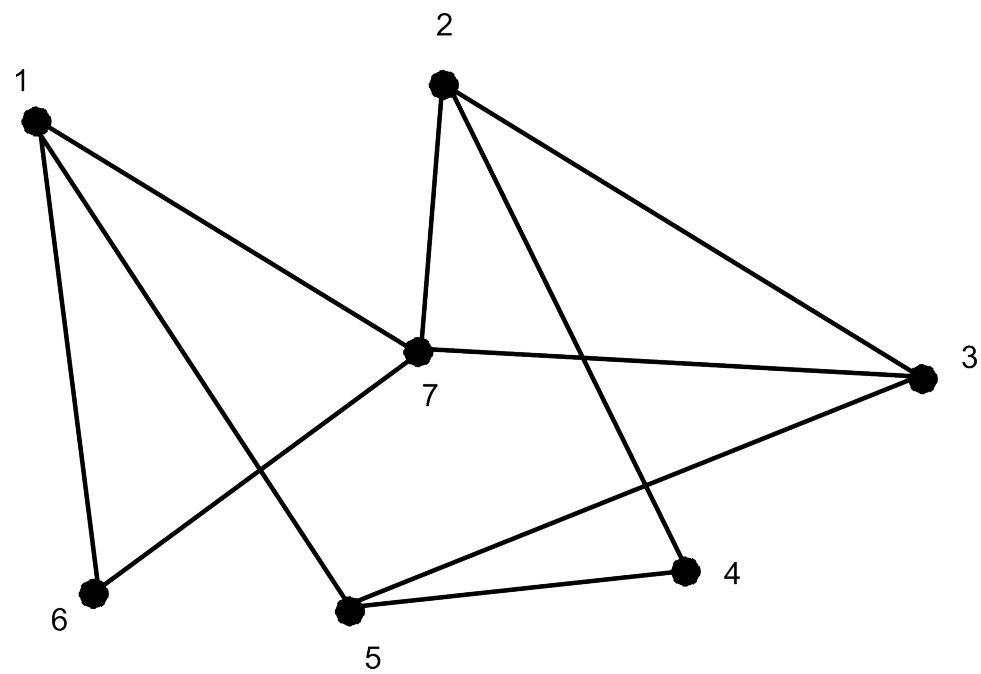
Math 571
Winter 2009

Project 3

Instructions: This project is worth a total of 10 points. You may use any notes or books that you wish but you must work individually. The only computation aid which you may use is MATLAB, unless otherwise indicated. The primary reference for this project is the notes on Markov processes and the notes on random walks on graphs which can be found at: `http://www.math.ohio-state.edu/~husen/teaching/571/markov_1.p` and `http://www.math.ohio-state.edu/~husen/teaching/571/random_walks.pdf`. Make sure to write clearly and justify your answers.

(1.)(5 pts.) Consider the graph below:

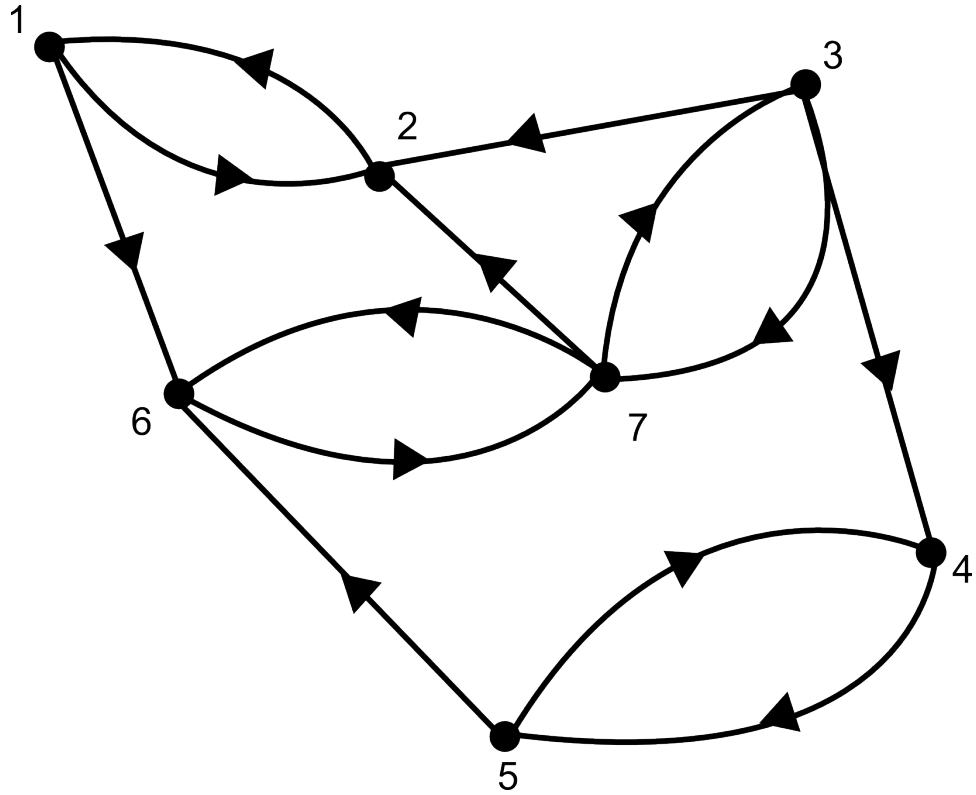


(a.) Find the transition matrix associated to a random walk on this graph.

(b.) Suppose than an object starts at vertex 6. What is the most likely vertex for this object to be at after 8 random walks on this graph? Indicate the probability of this happening.

(c.) What is the steady-state distribution of objects moving randomly on this graph?

(2.)(5 pts.) Consider the digraph below:



(a.) Find the transition matrix associated to a random walk on this digraph.

(b.) Suppose than an object starts at vertex 5. What is the most likely vertex for this object to be at after 11 random walks on this digraph? Indicate the probability of this happening.

(c.) What is the steady-state distribution of objects moving randomly on this digraph?