6.262 Discrete Stochastic Processes
MIT, Spring 2011

Wednesday, Feb. 23, 2011

Due: Wednesday, March 2

Problem Set 4

Reading Assignment: Chapter 3, Section 5 to 6.1.

1) Exercise 2.28 in text.

2) Exercise 3.2 in text.

3) Exercise 3.3 in text.

4) Describe how to generalize the graph in Figure 3.4 to an arbitrary number of states $\mathsf{M} \geq 3$ such that, as in Fig. 3.4, there are only two distinct cycles, one of length M and the other of length $\mathsf{M}-1$. For $\mathsf{M}=4$, let node 1 be the node not in the cycle of length $\mathsf{M}-1$ and list the set of states accessible from node 1 in n steps for each n, $2 \leq n \leq 12$. Observe that the bound in Theorem 3.2.4 is met with equality and describe (with no attempt at being rigorous), why this equality is met for all other $\mathsf{M} \geq 3$.

5) Exercise 3.8 in text.

6) Exercise 3.9 in text.

7) Exercise 3.10 in text. Turn in the solution only for the first graph in Figure 3.2, but think through how the same ideas apply to the second graph.

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