MATH 371 - Markov Processes

Justin Overstreet, Austin Spurlin, and Jonas Smith

Spring 2020

Transition Matrix						
0.1	0.7	0.2	0	0	0	0
0.2	0.6	0.2	0	0	0	0
0.4	0.2	0.4	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0

Transpose						
0.1	0.2	0.4	0	0	0	0
0.7	0.6	0.2	0	0	0	0
0.2	0.2	0.4	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0

V
0
0
1
0
0
0
0

Power
1

Output
0.4
0.2
0.4
0
0
0
0

Birth Process

n	N(0)	λ	t		P_n(t)
5	0	0.3	5		0.01412

Death Process

n	N(0)	μ	t		P_n(t)
5	10	0.5	10		0.1754674

M/M/1/K SYSTEMS

λ	ρ	K	n
10	1/3	4	4

ρ_n	L	λ-bar
0.008264463	0.47934	9.917

Problem 24.7

M/M/s/K SYSTEMS

λ	ρ	s	K	n
2	3/4	4	7	7

ρ_0	ρ_2	L_q
0.044987259	0.06405	0.476847377

Problem 24.8

FOR STUDY PURPOSES (M/M/1 SYSTEMS)

λ	μ
24	30

ρ	L	L_q	W	W_q
0.8	4	3.2	1/6	0.1333333

Time Scaling	W(t)	$W_q(t)$
1	0.002478752	0.001983002

Problem 23.3

Problem 24.5 Attempt

λ	μ	S	n	t
100	60	2	4	0

ρ	P_0	P_n
5/6	0.090909091	0.531939768

Lq	W(t)
3.787878788	1

Wq(t)
0.757575758