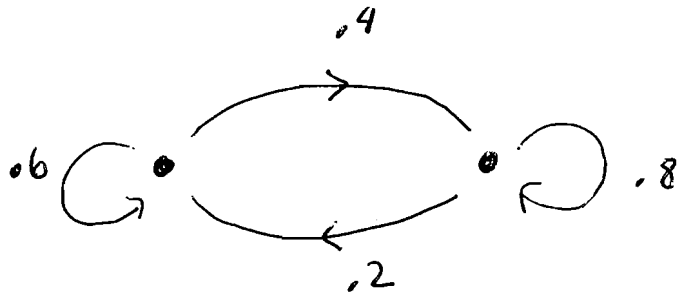
8.1 HW Solutions

Problem

1



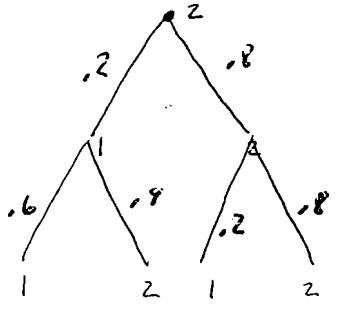
2 (a) .6

(b) .44

$(.6)^2 + (.4)(.2) = .36 + .08$

$= .44$

3 state 2



$Pr(1) = (.2)(.6) + (.8)(.2)$

$= .12 + .16 = .28$

$Pr(2) = (.2)(.4) + (.8)(.8)$

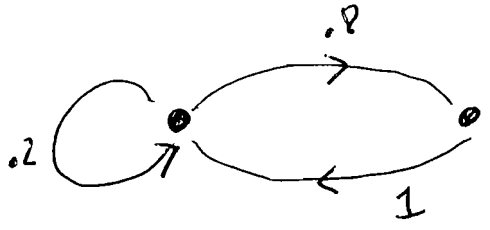
$= .08 + .64 = .72$

Problem

4 $Pr(2121) = (.2)(.4)(.2)$

$= .016$

5



6 $P = \begin{pmatrix} .3 & .7 \\ .8 & .2 \end{pmatrix}$

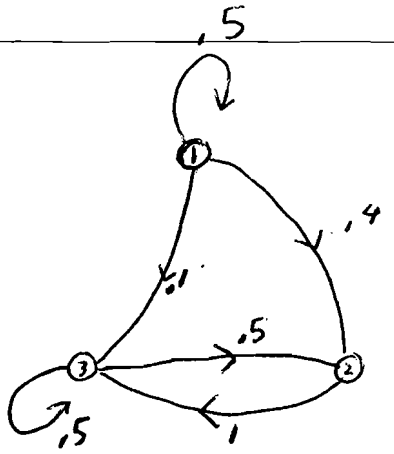
	bird feeder	tulip bulbs
Bird feeder	.3	.7
tulip bulbs	.8	.2

7 $P = \begin{pmatrix} 0 & 1 & 0 \\ 0 & .5 & .5 \\ .8 & 0 & .2 \end{pmatrix}$

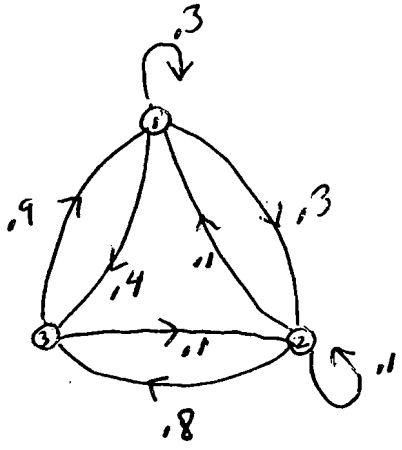
8 $P = \left(\begin{array}{cc|cc} .1 & .5 & 0 & .4 \\ 0 & .7 & .3 & 0 \\ \hline 0 & .6 & .1 & .3 \\ 0 & .8 & 0 & .2 \end{array}\right)$

Problem

9



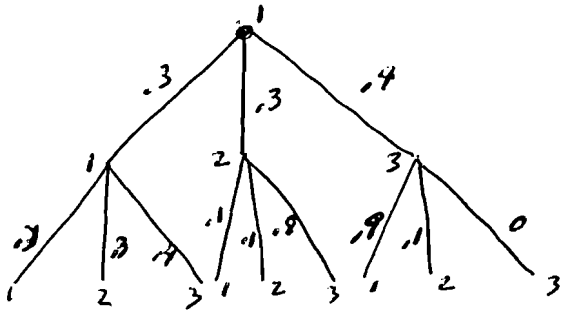
10



11 (a) .3

(b) state 3

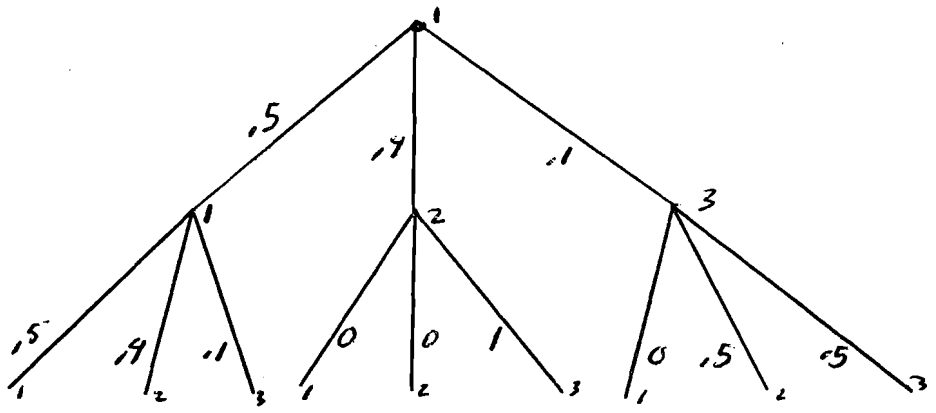
12 .48



$(.3)^2 + (.3)(.1) + (.4)(.9) = .48$

Problem

13 state 3



$Pr(1) = (.5)^2 + (.4)(0) + (.1)(0) = .25$

$Pr(2) = (.5)(.4) + (.4)(0) + (.1)(.5) = .25$

$Pr(3) = (.5)(.1) + (.4)(1) + (.1)(.5) = .50$

14 $Pr(2\,3\,1\,2\,1) = (.8)(.9)(.3)(.1) = .0216$

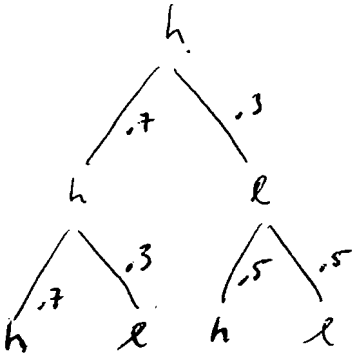
Problem

15 $P = \begin{bmatrix} .7 & .3 \\ .5 & .5 \end{bmatrix}$

	high val	low val
high val	.7	.3
low val	.5	.5

16 (a) .64

(b) $(.7)^3$

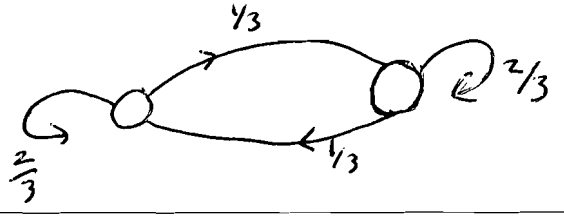


$(.7)^2 + (.3)(.5) = .49 + .15$

$= .64$

17

	meadow	woods
meadow	$\frac{2}{3}$	$\frac{1}{3}$
woods	$\frac{1}{3}$	$\frac{2}{3}$



Problem

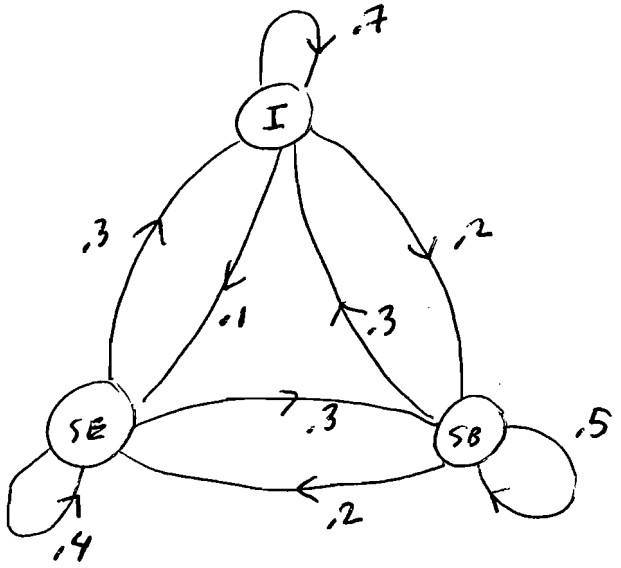
18

$\frac{2}{3}\ \frac{2}{3}\ \frac{2}{3} = \frac{8}{27}$

$\frac{1}{3}\ \frac{2}{3}\ \frac{2}{3} = \frac{4}{27}$

19

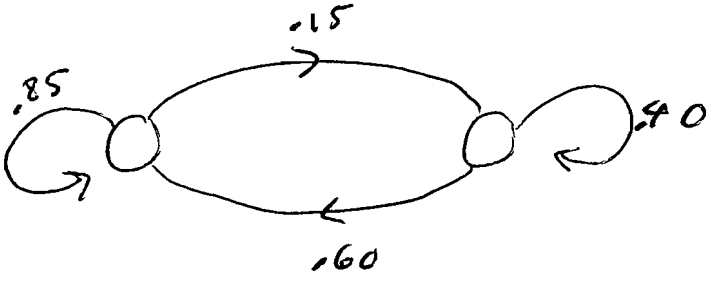
	Industry	small bus	self employ
Industry	.70	.20	.10
small bus	.30	.50	.20
self Employ	.30	.30	.40



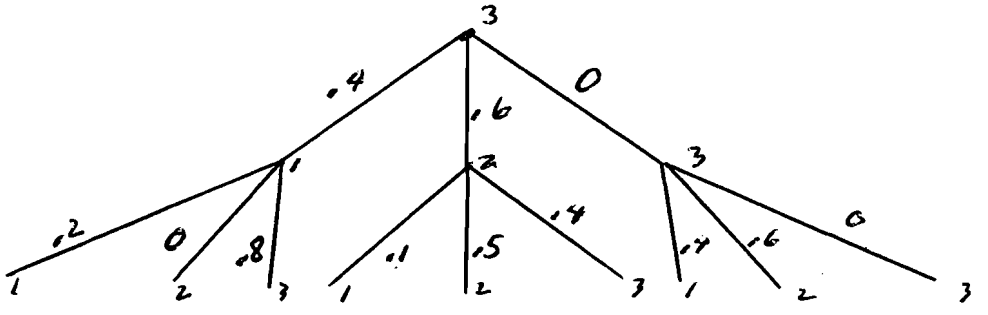
Problem

20

	make kick	miss kick
make kick	.85	.15
miss kick	.60	.40



21 .30



$(.4)(0) + (.6)(.5) + (0)(.6) = .30$

Problem

22

	attends class	misses class
attends class	1/3	2/3
misses class	3/4	1/4

$$P = \begin{bmatrix} \frac{1}{3} & \frac{2}{3} \\ \frac{3}{4} & \frac{1}{4} \end{bmatrix}$$

23

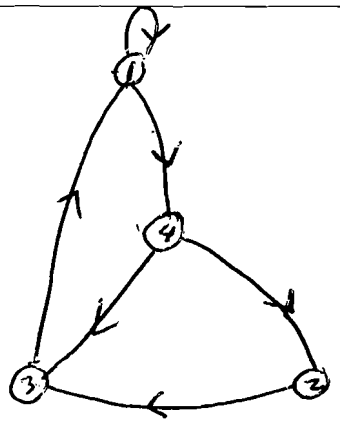
	Chinese	greek	italian
Chinese	0	$\frac{2}{3}$	$\frac{1}{3}$
greek	$\frac{1}{2}$	0	$\frac{1}{2}$
italian	$\frac{5}{6}$	$\frac{1}{6}$	0

$$P = \begin{bmatrix} 0 & \frac{2}{3} & \frac{1}{3} \\ \frac{1}{2} & 0 & \frac{1}{2} \\ \frac{5}{6} & \frac{1}{6} & 0 \end{bmatrix}$$

Problem

24

6



25

	makes shot	misses shot
makes shot	.8	.2
misses shot	.4	.6

$$P = \begin{bmatrix} .8 & .2 \\ .4 & .6 \end{bmatrix}$$

1. oblem

26

	attend class pay atten	attend class read news	miss class
attends class pay atten	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$
attend class read news	$\frac{2}{3}$	0	$\frac{1}{3}$
miss class	$\frac{3}{4}$	$\frac{1}{4}$	0

$$P = \begin{bmatrix} \frac{1}{3} & \frac{1}{3} & \frac{1}{3} \\ \frac{2}{3} & 0 & \frac{1}{3} \\ \frac{3}{4} & \frac{1}{4} & 0 \end{bmatrix}$$

Problem

27

	stocks stronger	bonds stronger	equal
stocks stronger	.60	.30	.10
bonds stronger	.30	.50	.20
equal	.40	.40	.20

$$P = \begin{bmatrix} .6 & .3 & .1 \\ .3 & .5 & .2 \\ .4 & .4 & .2 \end{bmatrix}$$

29

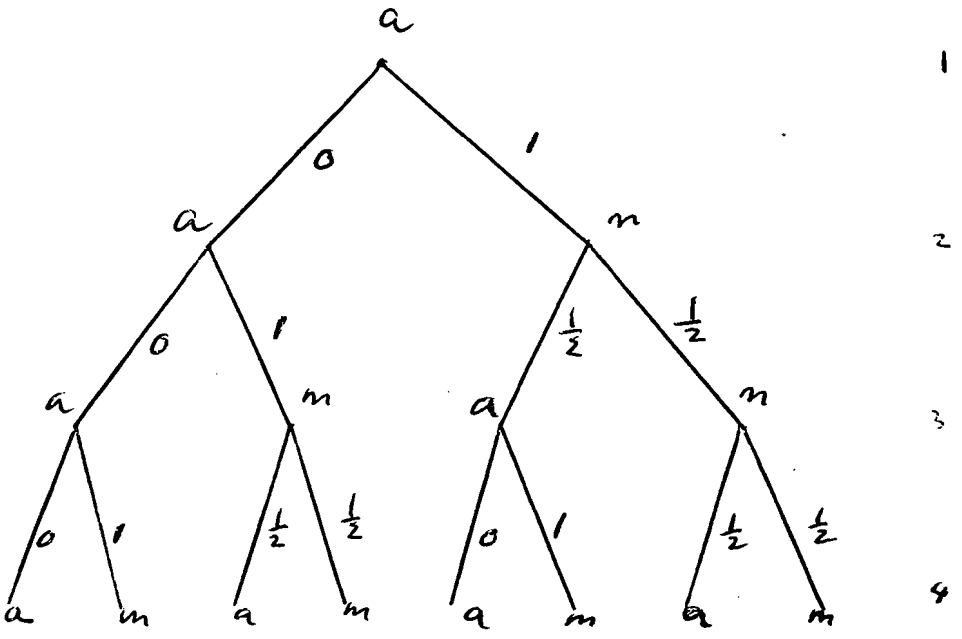
	cola	LL	D
cola	$\frac{1}{2}$	$\frac{1}{2}$	0
LL	0	$\frac{2}{3}$	$\frac{1}{3}$
D	$\frac{1}{4}$	0	$\frac{3}{4}$

$$P = \begin{bmatrix} \frac{1}{2} & \frac{1}{2} & 0 \\ 0 & \frac{2}{3} & \frac{1}{3} \\ \frac{1}{4} & 0 & \frac{3}{4} \end{bmatrix}$$

Problem

29

7/4



X	4	3	3	2	3	2	2	1

Random variable

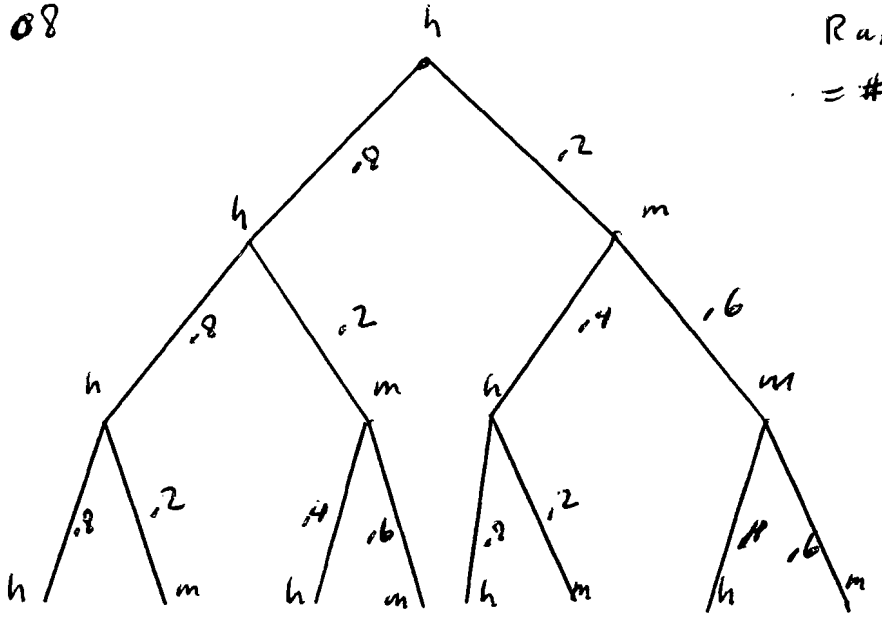
X = # of Herdance

X	Pr	XPr
1	1/4	1/4
2	3/4	3/2
3	0	0
4	0	0
		7/4

Problem

30

3.208



Random var X
= # hits

X 4 3 3 2 3 2 2 1

X	Pr	X Pr
4	.512	2.048
3	.256	.768
2	.160	.320
1	.072	.072
		3.208

Problem

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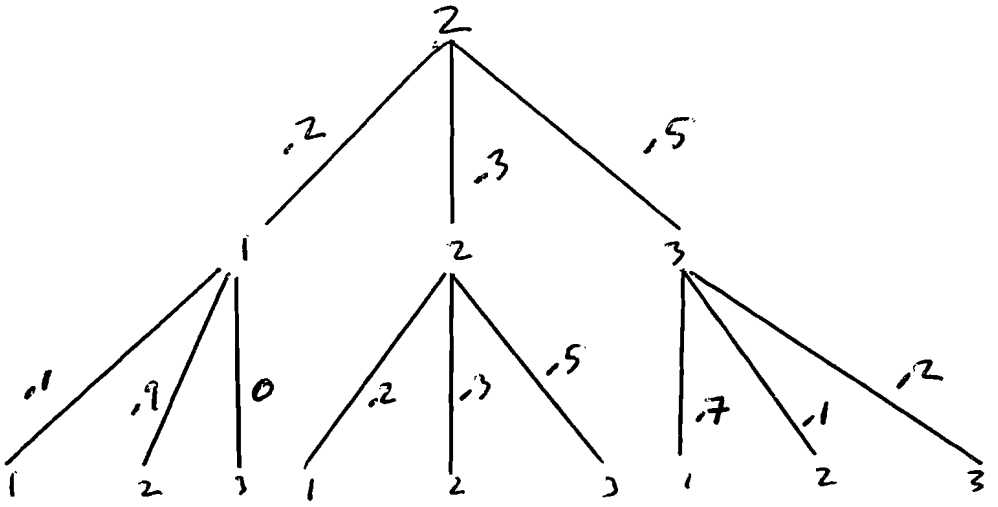
1 is most Likely



$$P(1) = (.2)(.1) + (.3)(.2) + (.5)(.7)$$
$$= .02 + .06 + .35$$
$$= .43$$

$$P(2) = (.2)(.9) + (.3)(.3) + (.5)(.1)$$
$$= .18 + .09 + .05$$
$$= .32$$

$$P(3) = 0 + (.3)(.5) + (.5)(.2)$$
$$= 0 + .15 + .10$$
$$= .25$$

Problem

32

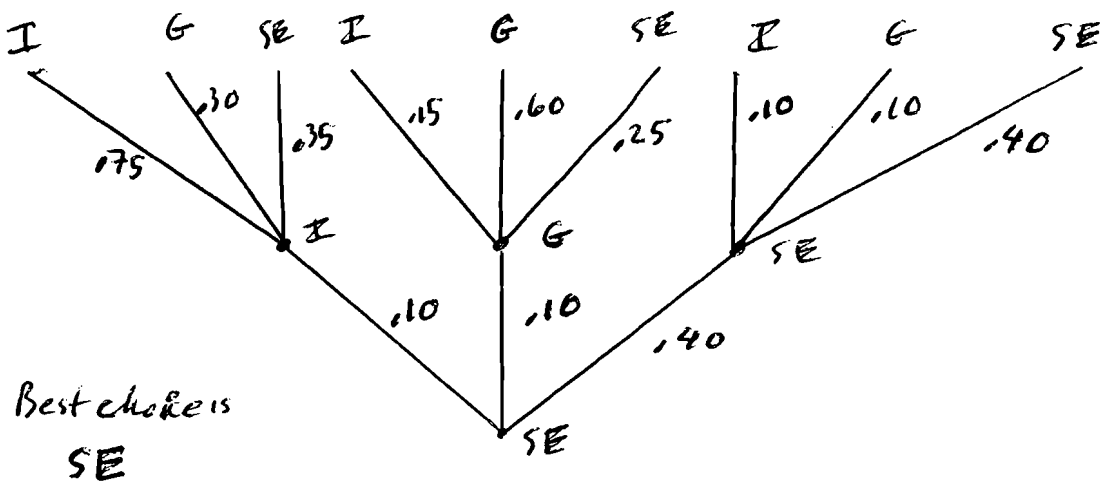
	I	G	SE
I	.75	.15	.10
G	.30	.60	.10
SE	.35	.25	.40

$$P = \begin{bmatrix} .75 & .15 & .10 \\ .30 & .60 & .10 \\ .35 & .25 & .40 \end{bmatrix}$$

$$Pr(I \to SE) = (.75)(.10) + (.15)(.10) + (.10)(.40)$$
$$= .130$$

$$Pr(G \to SE) = (.30)(.10) + (.60)(.10) + (.10)(.40)$$
$$= .100$$

$$Pr(SE \to SE) = (.35)(.10) + (.25)(.10) + (.40)(.40)$$
$$= .220$$



Best choice is
SE