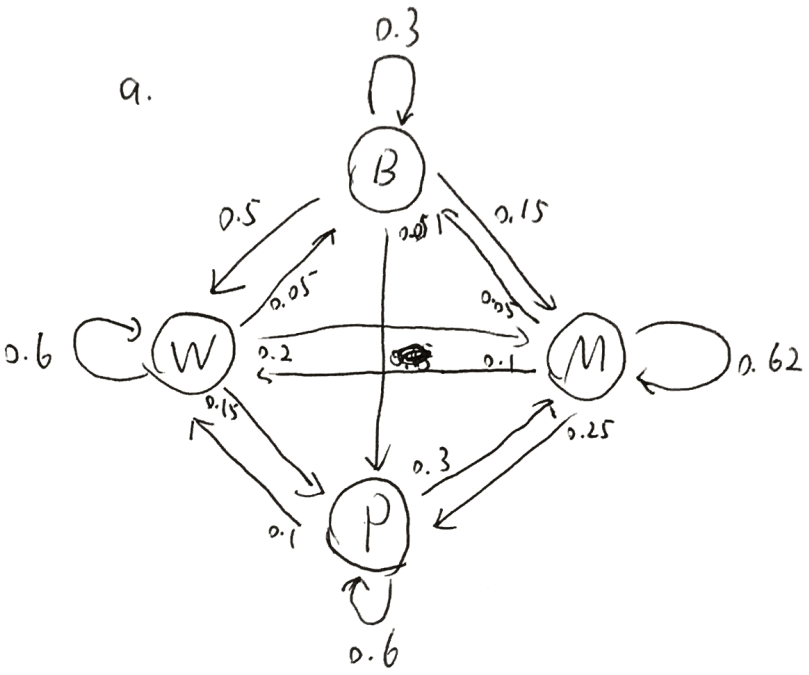
XINRUI ZHANG EECS 592 Project 5 ≥ xinrui

1. Markov chains:

b.

	B	W	M	P
B	0.3	0.5	0.15	0.05
W	0.05	0.6	0.2	0.15
M	0.03	0.1	0.62	0.25
P	0	0.1	0.3	0.6

a.



c. M: $X_{m_5} = \{0, 0, 1, 0\} = [0, 0, 1, 0]$

$X_{m_4} = X_{m_0} \cdot M^4 = [0.0324 \quad 0.2100 \quad 0.4145 \quad 0.3430]$

D. W: $X_{w_0} = \{0, 1, 0, 0\} = [0 \quad 1 \quad 0 \quad 0]$

$X_{w_{10}} = X_{w_0} \cdot M^{10} = [0.0336 \quad 0.2283 \quad 0.3997 \quad 0.3385]$

e. The steady probability vector X exists.

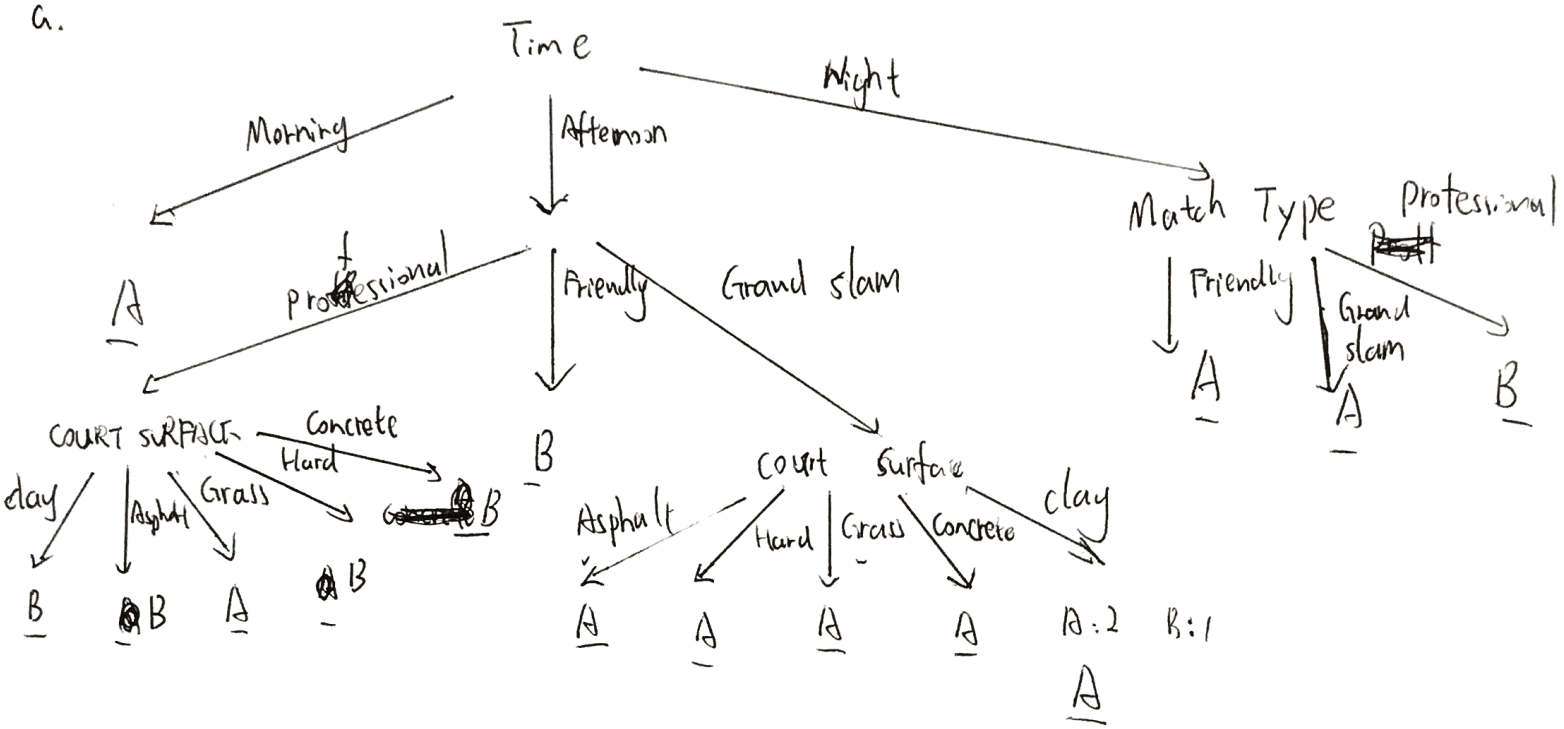
steady state $S = [0.0334 \quad 0.2267 \quad 0.4205 \quad 0.3195]$

According to power iteration and eigenvalue decomposition $M^T = V \Lambda V^{-1}$

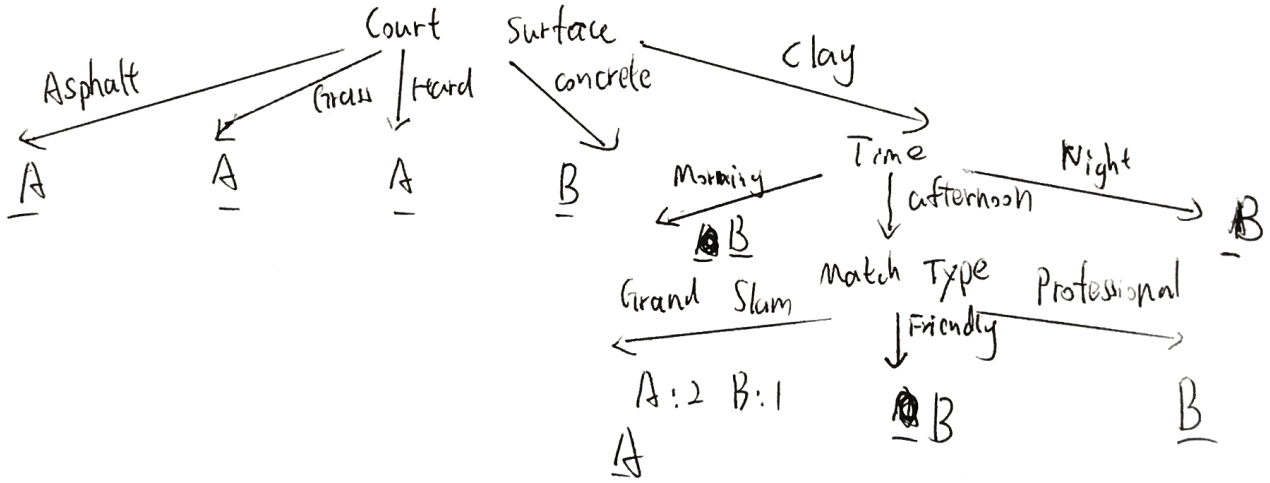
$S = \frac{V_1^T}{\|V_1\|}$ V_1 is the vector according to M^T's largest eigenvalue.

4. Decision Tree Classification

a.



b.



C. Given a. the most likely outcome is A

Give b. . . . . A as well