C3_solution analyze

Exercise 1

두가지 방향으로 나뉘었습니다. 모든 state에서 transient 하다는 답안과 모든 state에서 recurrent 하다는 답안.

Example 1

$$P = \begin{pmatrix} 1/2 & 1/2 & 0 \\ 1/2 & 1/4 & 1/4 \\ 0 & 1/3 & 2/3 \end{pmatrix}$$

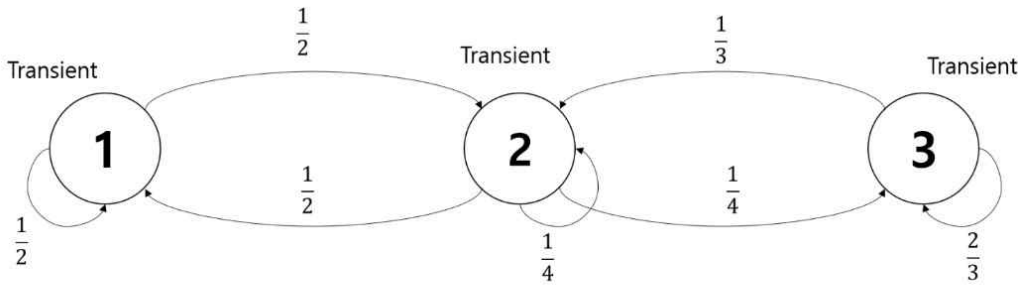

그림 1: Example 1 Diagram

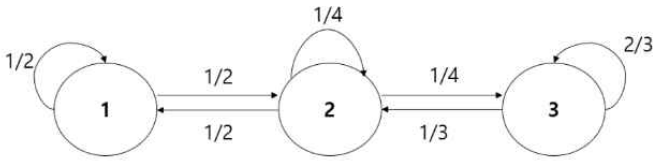

그림 1: Example 1 Trainsition Diagram

Remark

- A state i is said to be recurrent if, starting from i, the probability of getting back to i is 1
- A state i is said to be trainsient if, starting from i, the probability of getting back to i is less than 1

recurrent state :{1,2,3} ,All states communicate, all states recurrent

#교수님 comment (Exercise 1)

+ 모든 스테이트가 하나의 클래스이다. (서로서로communicate하다)
+ transiency와recurrency는class property이기 때문에 모든 스테이트는 transient하거나 모든state는recurrent하다.
+ **State가 유한한MC에서 모든state가transient할 수는 없다** (만약에 그렇다면 어디로 갈수 있다는 말인가?)

Exercise 2

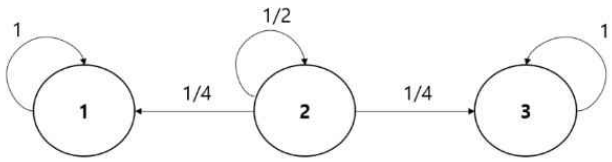

그림 2: Example 2 Trainsition Diagram

Remark

- A state i is said to be recurrent if, starting from i, the probability of getting back to i is 1
- A state i is said to be trainsient if, starting from i, the probability of getting back to i is less than 1
- A state i is said to be abosrbing state, as a special case of reccurent state, if $P_i i = 1$ (You can naver leave the state i if you get there)

recurrent state : {1,3}

trainsient state : {2}

#교수님 comment (Exercise 2)

+P_{ii}로 써야 합니다. 지금은P_ii로 되어있습니다.

Exercise 3

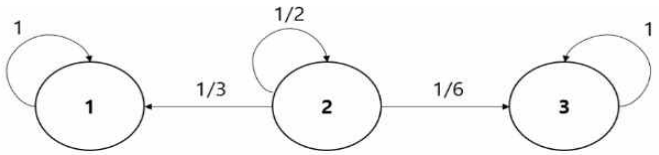

그림 3: Example 3 Trainsition Diagram

Remark

- A state i is said to be recurrent if, starting from i, the probability of getting back to i is 1
- A state i is said to be trainsient if, starting from i, the probability of getting back to i is less than 1
- A state i is said to be abosrbing state, as a special case of reccurent state, if $P_i i = 1$ (You can naver leave the state i if you get there)

recurrent state : {1,3}

trainsient state : {2}

#교수님 comment (Exercise 3)

+P_{ii}로 써야 합니다. 지금은P_ii로 되어있습니다.

Exercise 4

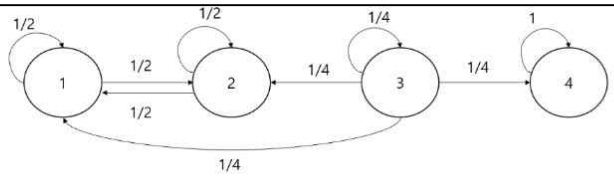

그림 4: Example 4 Trainsition Diagram

Remark

- A state i is said to be recurrent if, starting from i, the probability of getting back to i is 1
- A state i is said to be trainsient if, starting from i, the probability of getting back to i is less than 1
- A state i is said to be abosrbing state, as a special case of reccurent state, if $P_i i = 1$ (You can naver leave the state i if you get there)

recurrent state : {1,2}

trainsient state : {3}

abosrbing state : {4}

#교수님 comment (Exercise 4)

+ Recurrent: 1,2,4** (absorbing은recurrent의subset이므로)**

+ Transient: 3

+ Absorbing: 4