Prim 알고리즘

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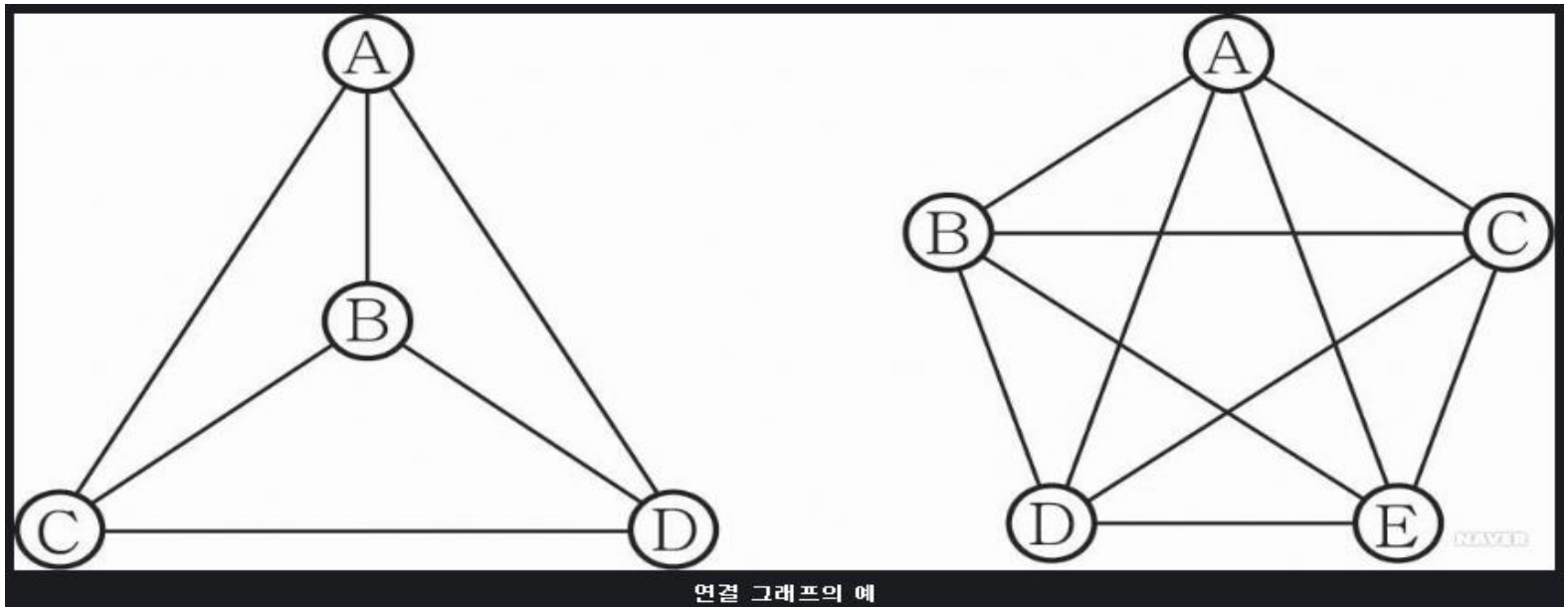
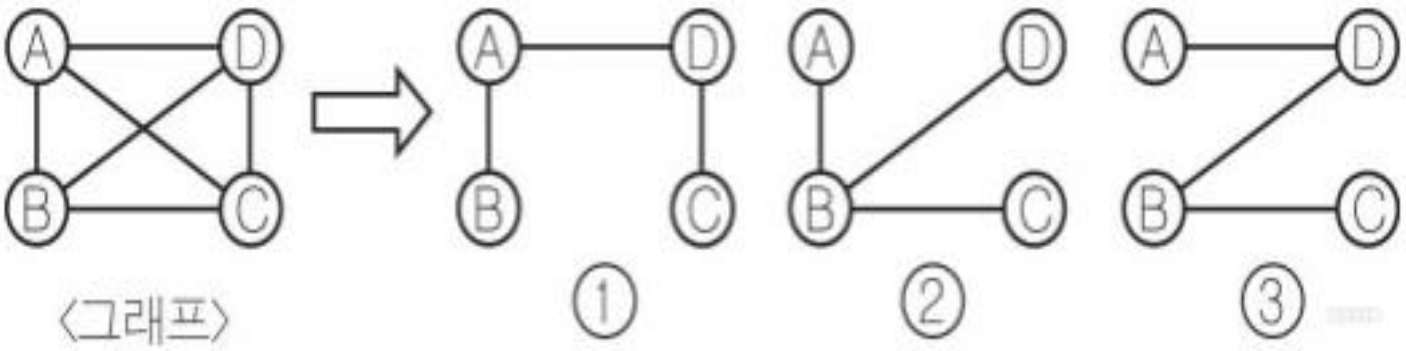
완전 그래프

- 모든 정점의 쌍을 연결하는 경로가 존재하는 그래프.



신장트리(*spanning tree*)

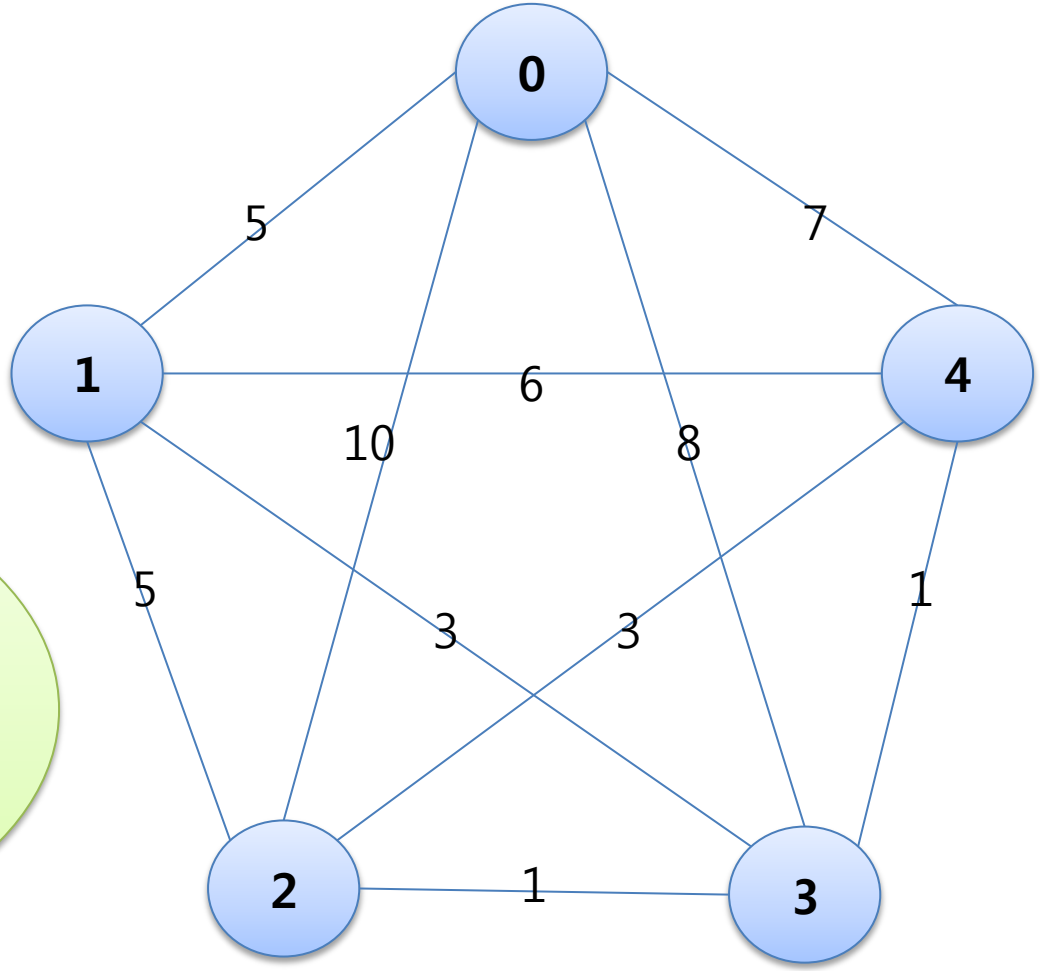
- 완전 그래프(모든 정점의 쌍을 연결하는 경로가 존재하는 그래프)의 부분 그래프로서 그 그래프의 모든 정점과 간선의 부분 집합으로 구성되는 트리. 모든 노드는 적어도 하나의 간선에 연결되어 있어야 한다.



Prim 알고리즘

모든 정점을 연결하는
최소비용 신장트리
만들기

방문했던 각 정점들을 기준으로 방문하지 않은 정점을 가기 위한 최소값을 찾아가는 방식



Prim 알고리즘-1단계

before

t	f	f	f	f

0

i=0, j=0

Min : max

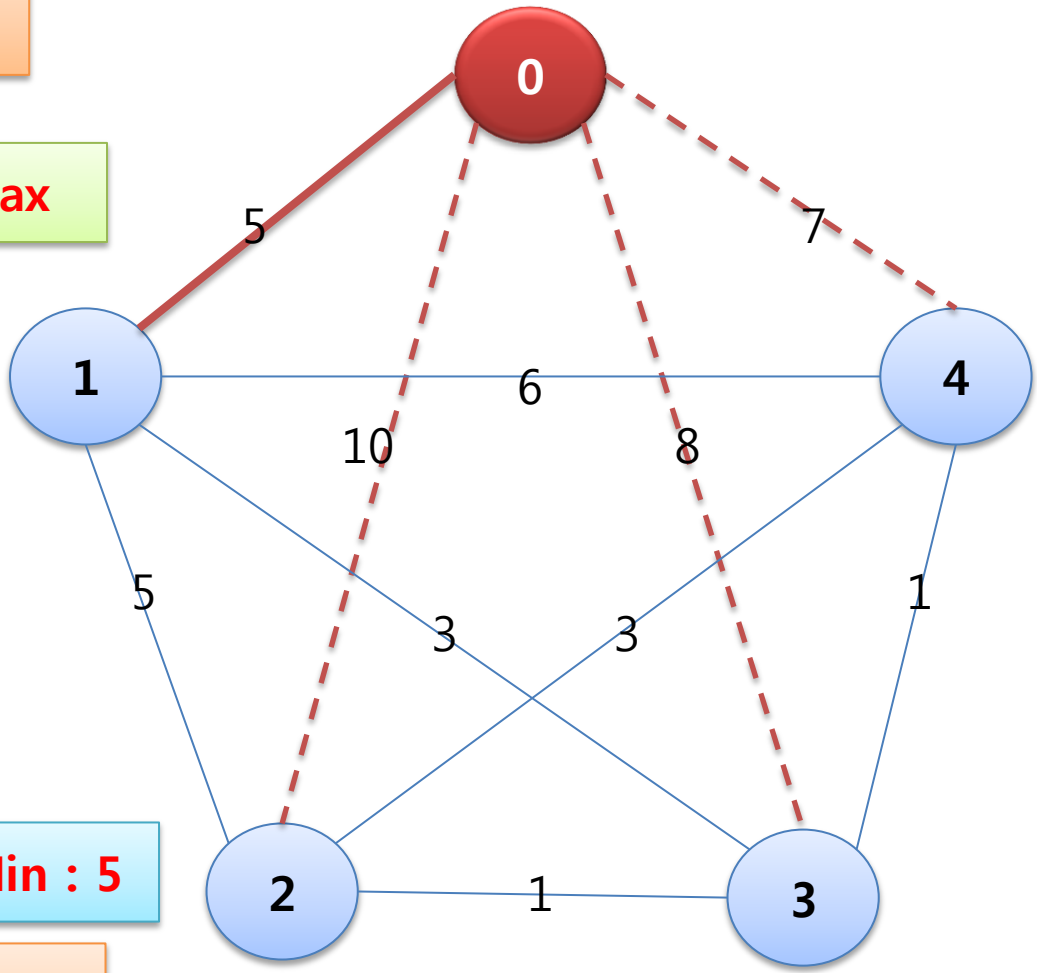
i=0, j=1 -> min = 5, index = 1

i=0, j=2 -> min = 5, index = 1

i=0, j=3 -> min = 5, index = 1

i=0, j=4 -> min = 5, index = 1

Min : 5



after

t	t	f	f	f

0 1

Prim 알고리즘-2-1단계

before

t	t	f	f	f

0	1

i=0, j=0

Min : max

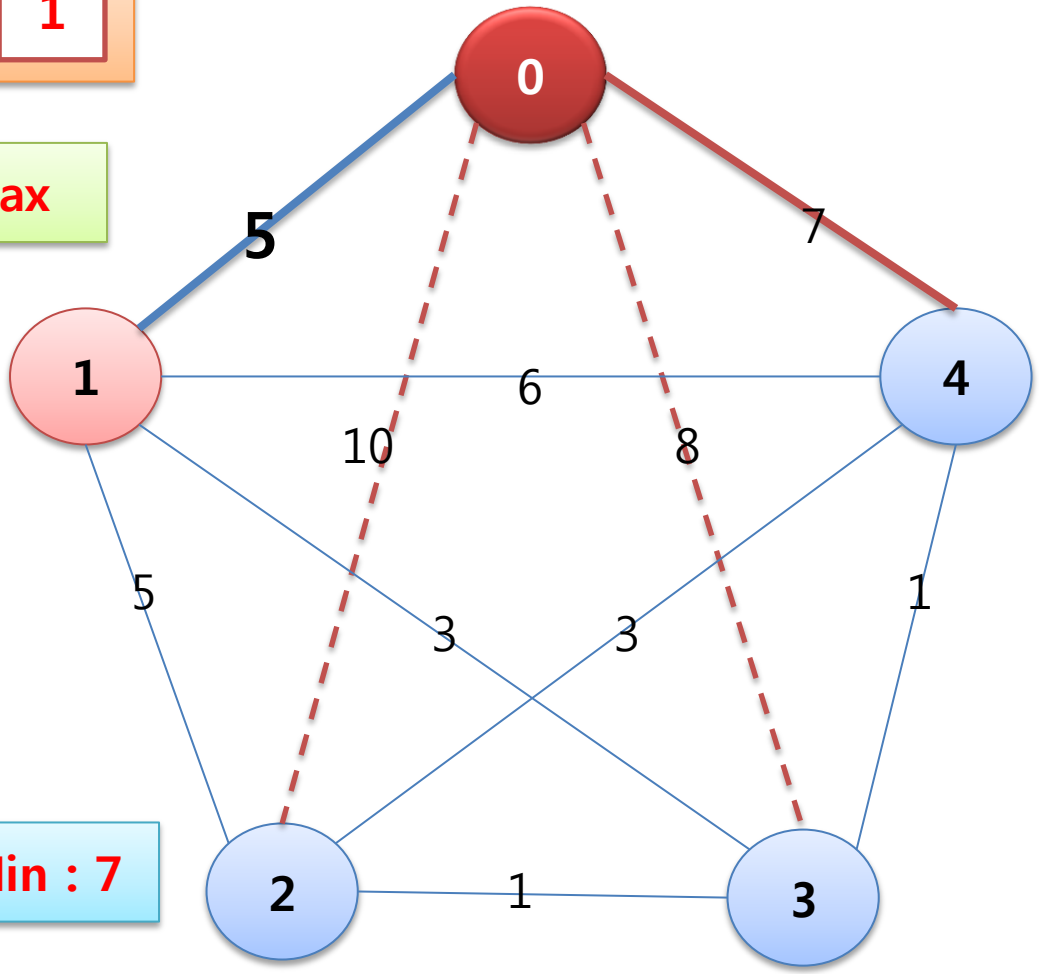
i=0, j=1

i=0, j=2 -> min = 10, index = 2

i=0, j=3 -> min = 8, index = 3

i=0, j=4 -> min = 7, index = 4

Min : 7



Prim 알고리즘-2-2단계

before

t	t	f	f	f

0	1

i=1, j=0

Min : 7

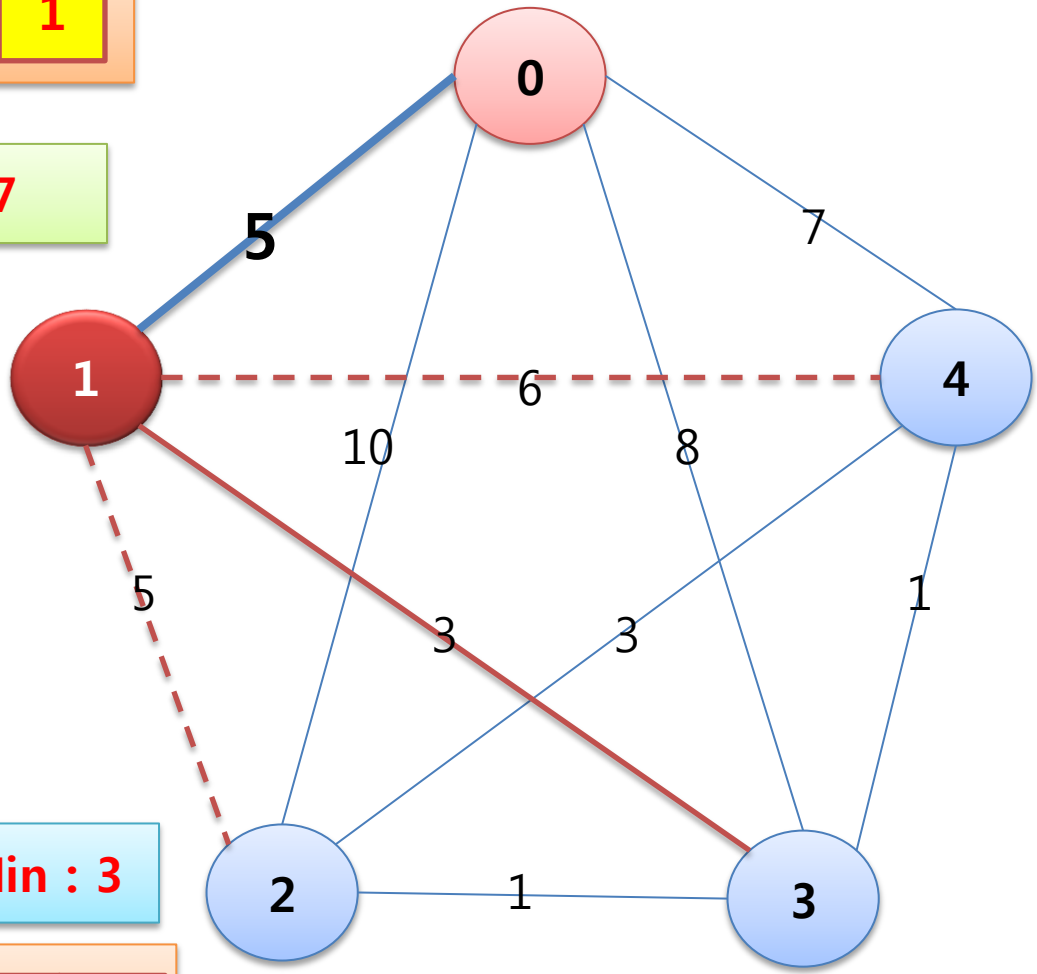
i=1, j=1

i=1, j=2 -> min = 5, index = 2

i=1, j=3 -> min = 3, index = 3

i=0, j=4 -> min = 3, index = 3

Min : 3



after

t	t	f	t	f

0	1	3

Prim 알고리즘-3-1단계

before

t	t	f	t	f

0	1	3

i=0, j=0

Min : max

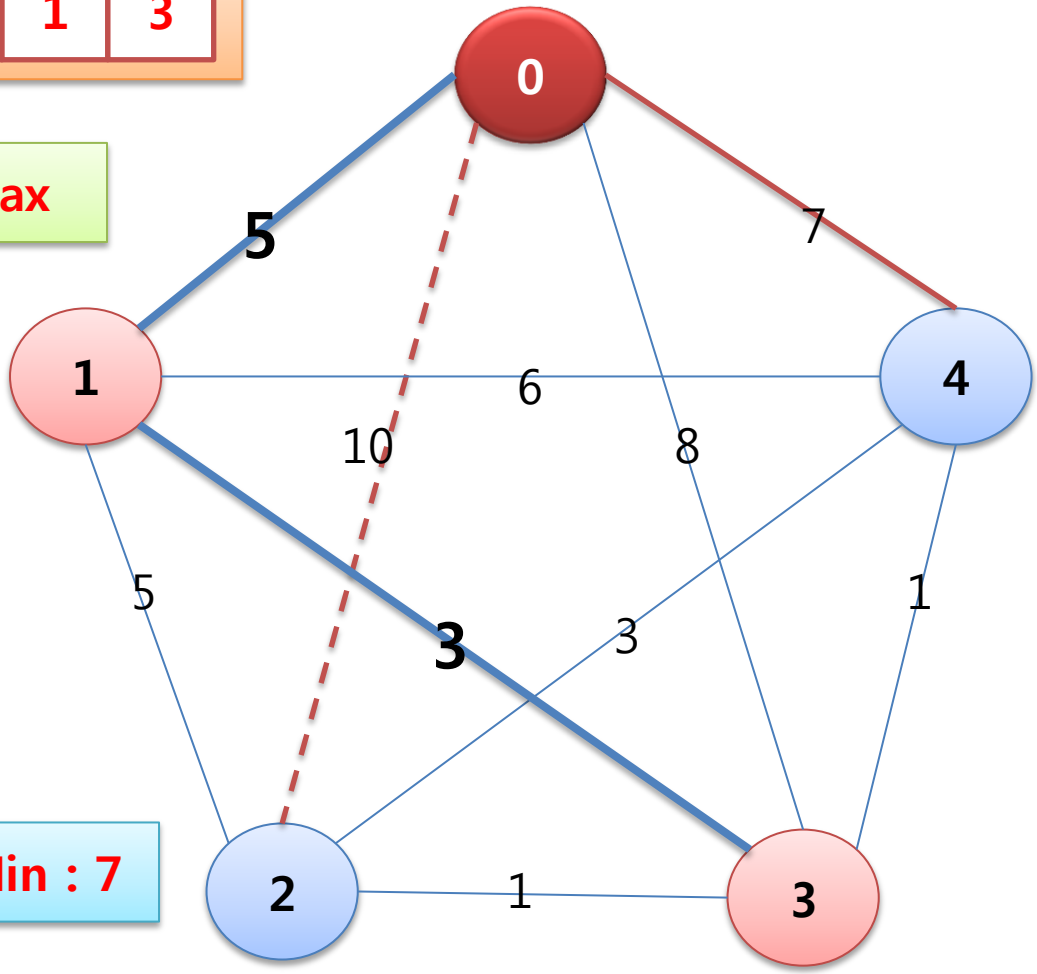
i=0, j=1

i=0, j=2 -> min = 10, index = 2

i=0, j=3

i=0, j=4 -> min = 7, index = 4

Min : 7



Prim 알고리즘-3-2단계

before

t	t	f	t	f

0	1	3

i=1, j=0

Min : 7

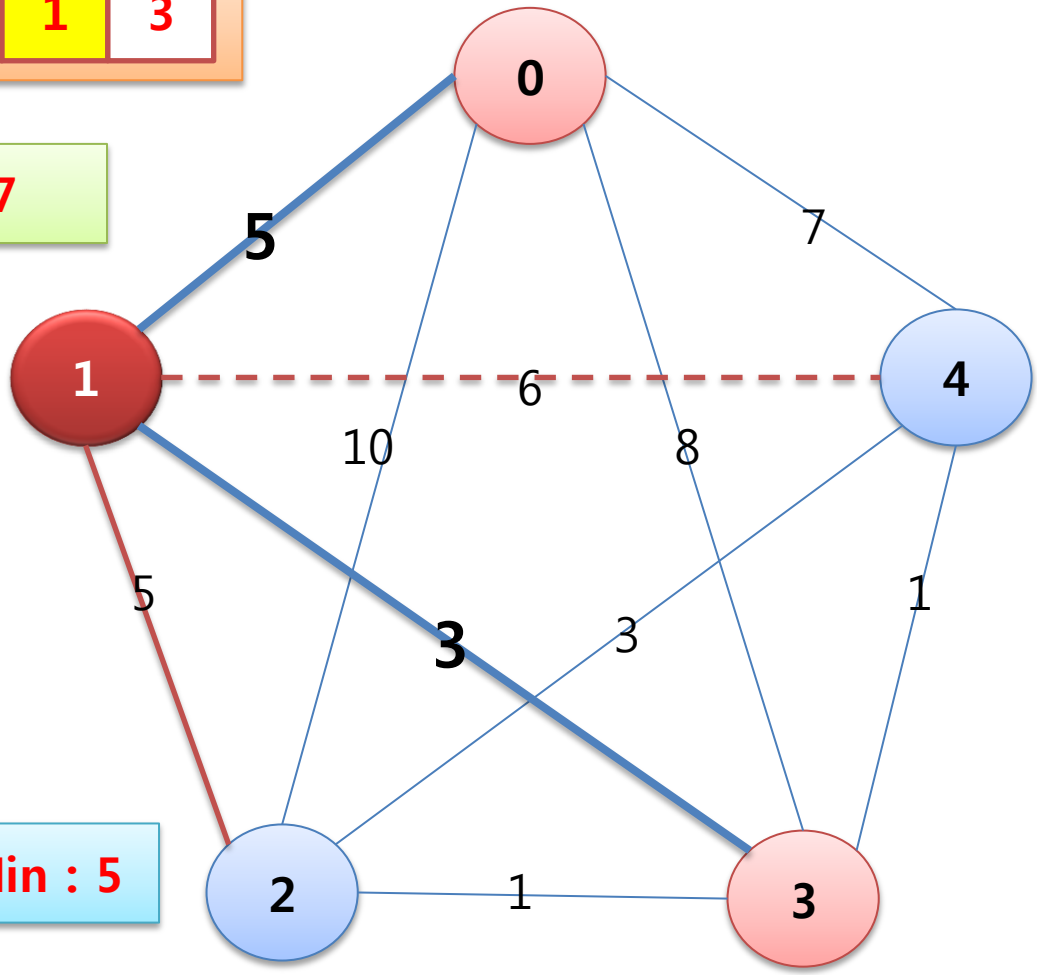
i=1, j=1

i=1, j=2 -> min = 5, index = 2

i=0, j=3

i=0, j=4 -> min = 5, index = 2

Min : 5



Prim 알고리즘-3-3단계

before

t	t	f	t	f

0	1	3

i=3, j=0

Min : 5

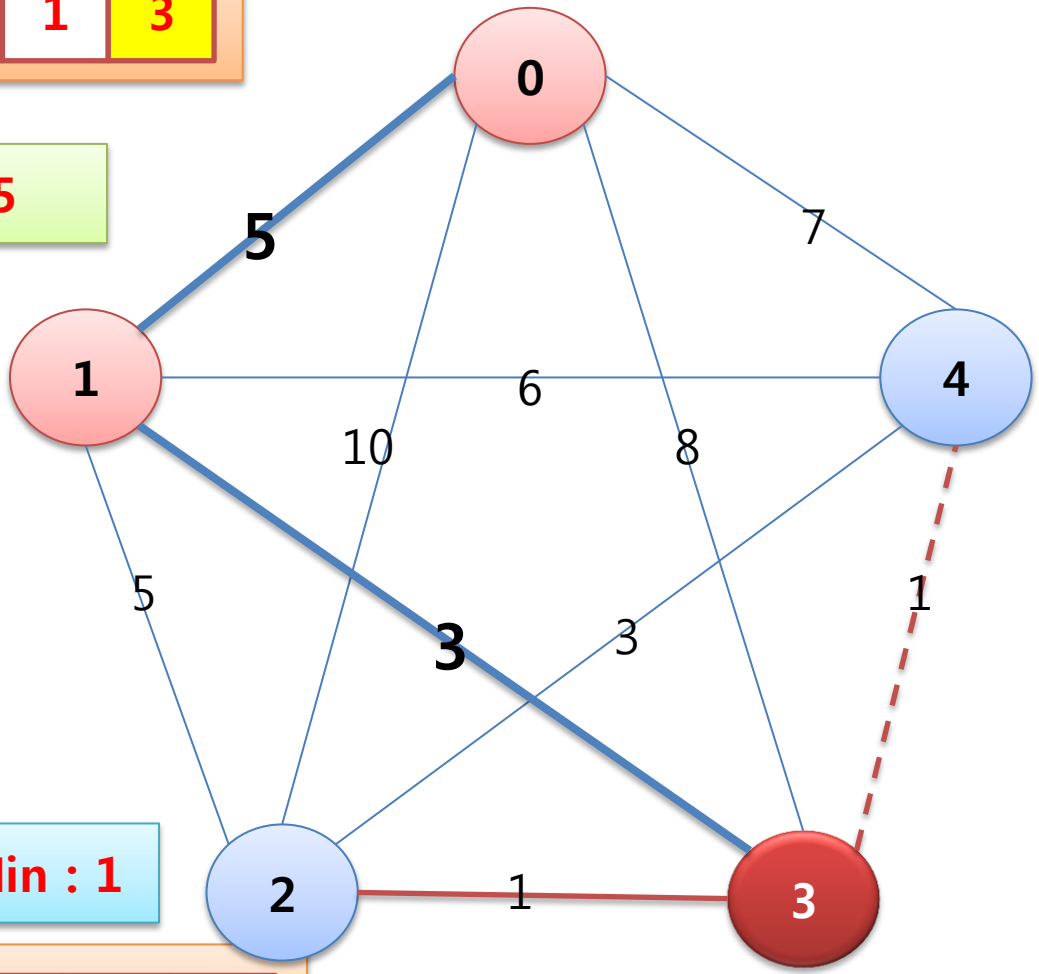
i=3, j=1

i=3, j=2 -> min = 1, index = 2

i=3, j=3

i=3, j=4 -> min = 1, index = 2

Min : 1



after

t	t	t	t	f

0	1	3	2

Prim 알고리즘-4-1단계

before	t	t	t	t	f

0	1	3	2

i=0, j=0

i=0, j=1

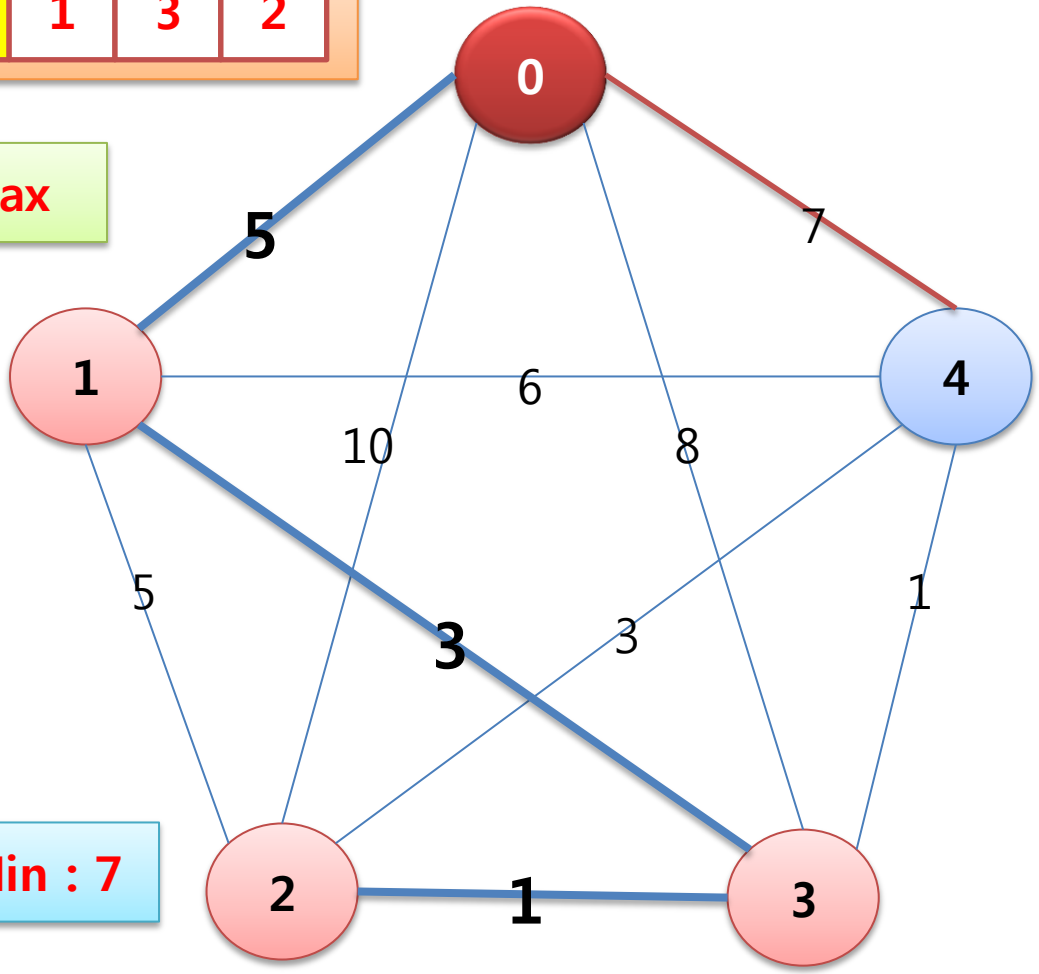
i=0, j=2

i=0, j=3

i=0, j=4 -> min = 7, index = 4

Min : max

Min : 7



Prim 알고리즘-4-2단계

before

t	t	t	t	f

0	1	3	2

i=1, j=0

Min : 7

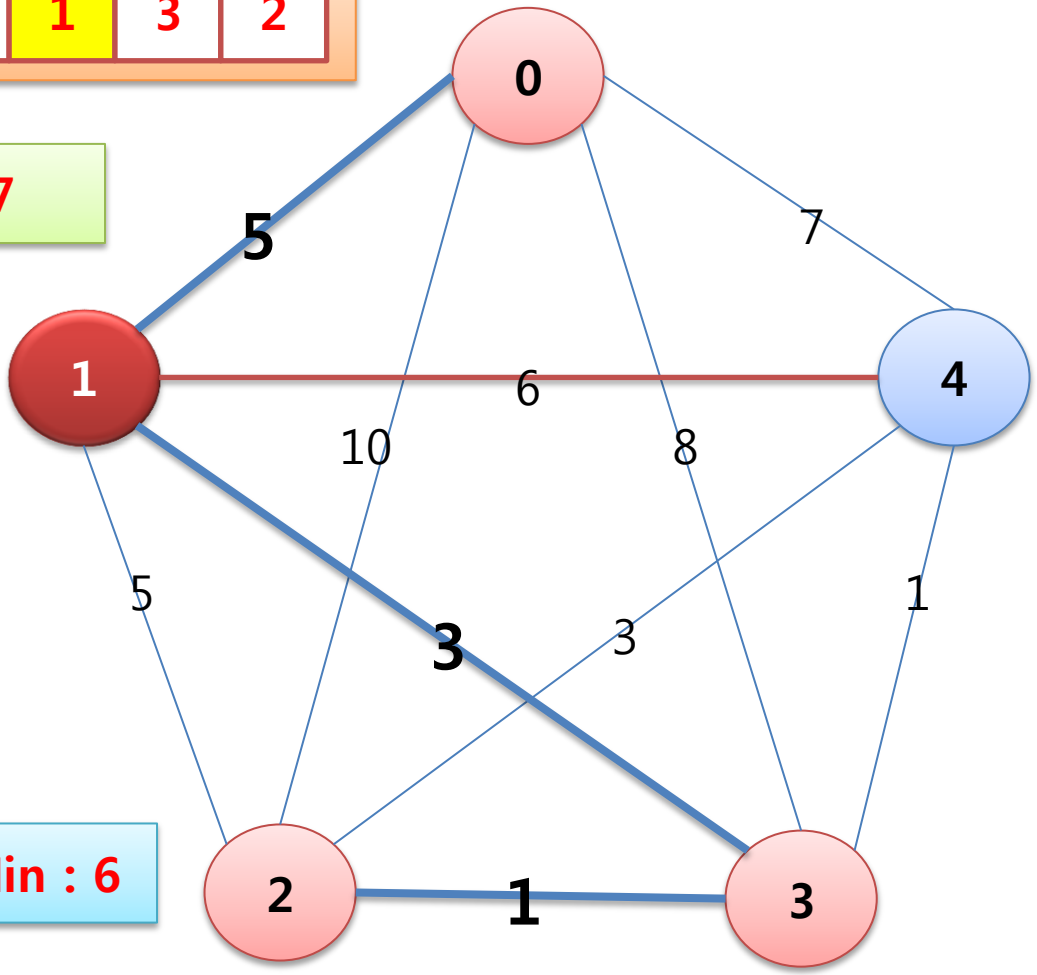
i=1, j=1

i=1, j=2

i=1, j=3

i=1, j=4 -> min = 6, index = 4

Min : 6



Prim 알고리즘-4-3단계

before

t	t	t	t	f

0	1	3	2

i=3, j=0

Min : 6

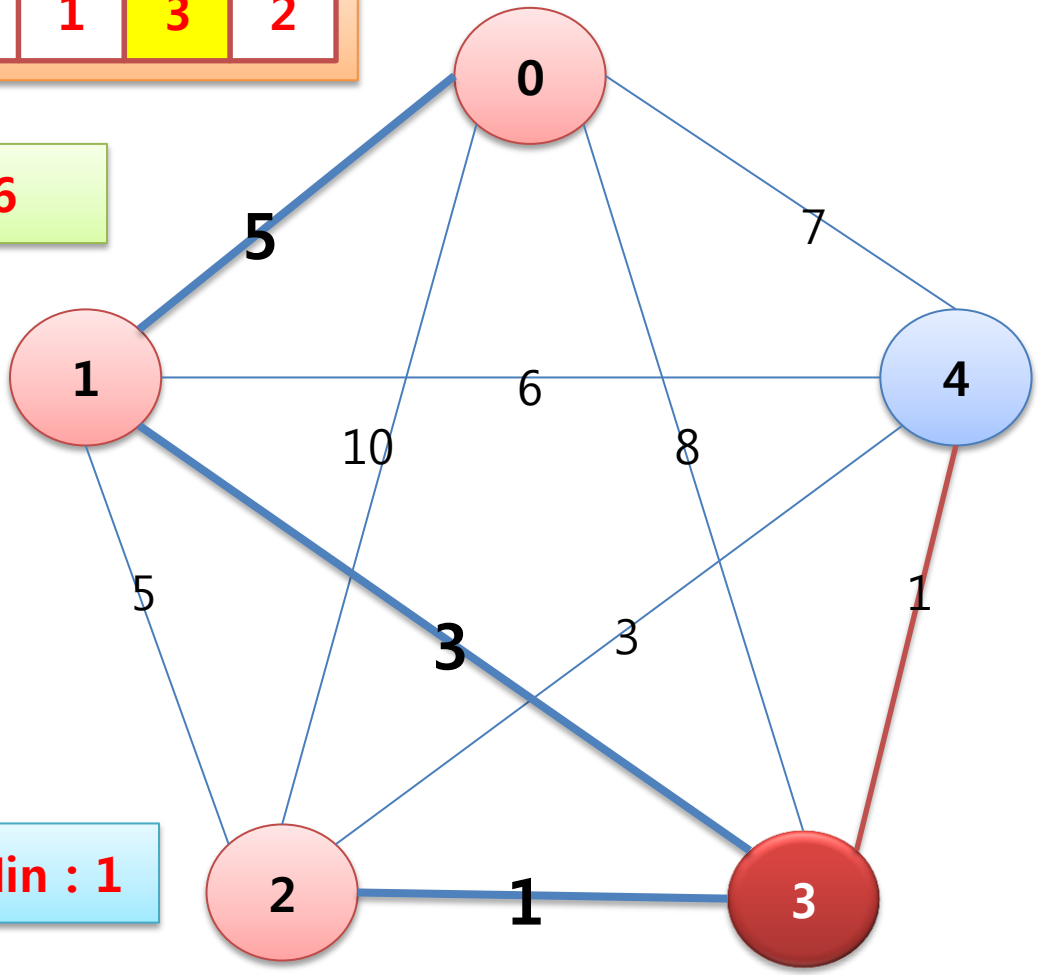
i=3, j=1

i=3, j=2

i=3, j=3

i=3, j=4 -> min = 1, index = 4

Min : 1



Prim 알고리즘-4-4단계

before

t	t	t	t	f

0	1	3	2

i=2, j=0

Min : 1

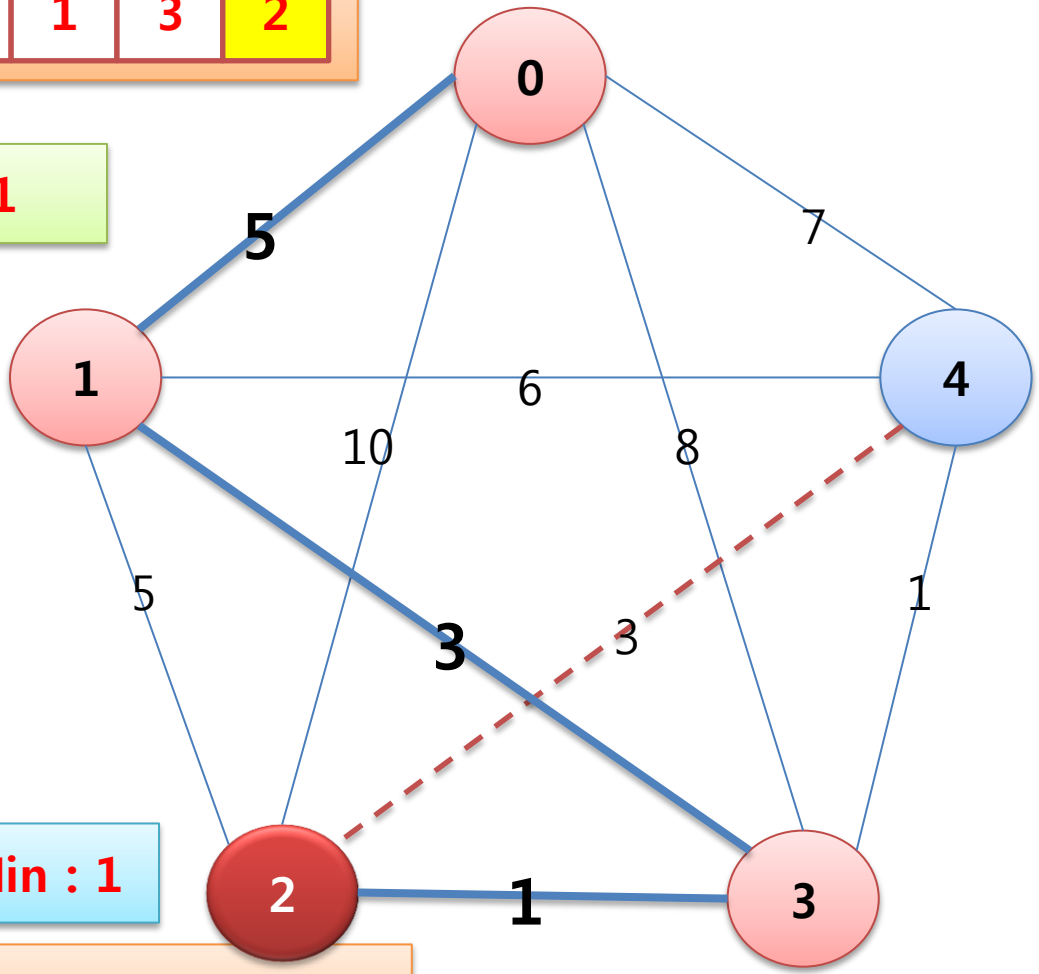
i=2, j=1

i=2, j=2

i=2, j=3

i=3, j=4 -> min = 1, index = 4

Min : 1



after

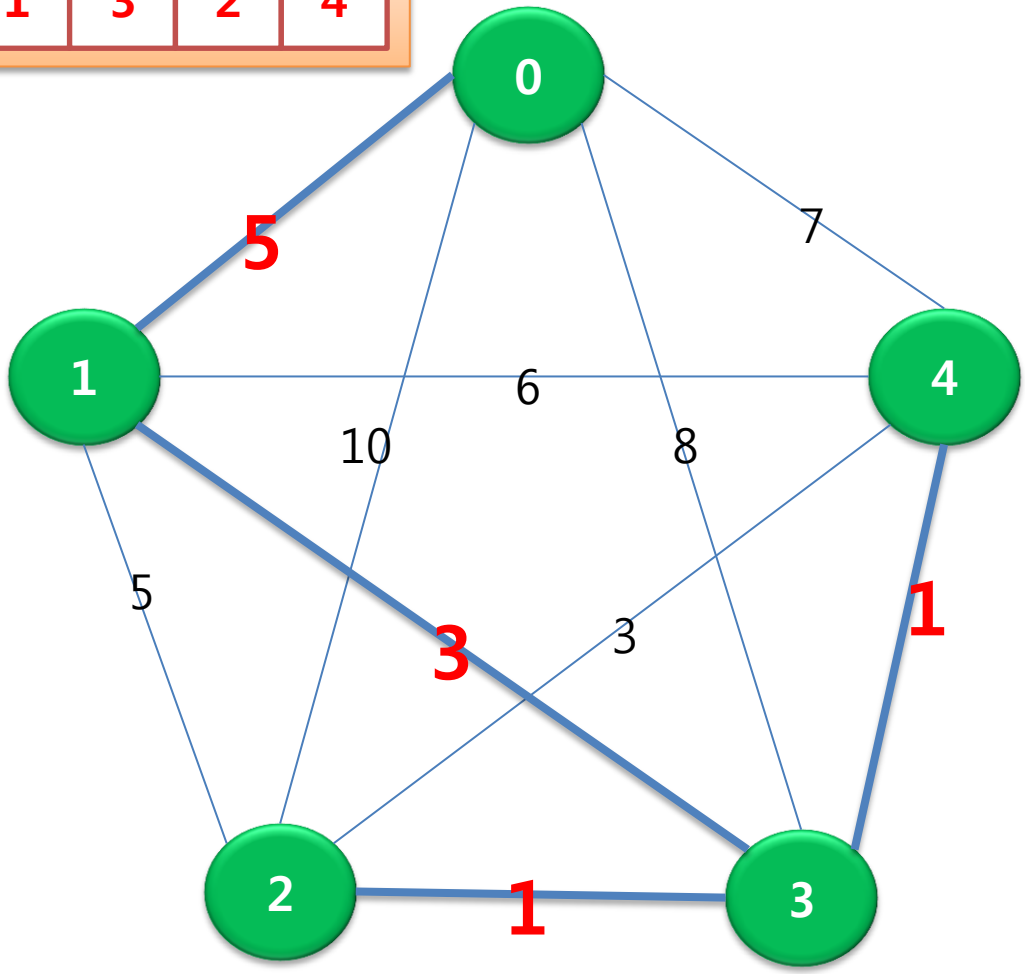
t	t	t	t	t

0	1	3	2	4

Prim 알고리즘-완성

end	t	t	t	t	t

0	1	3	2	4



최소비용 : 10