

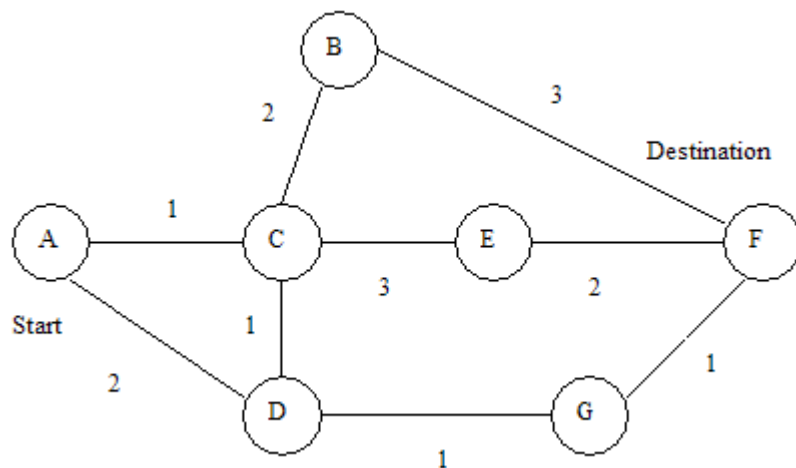
Data Structure

KyuDong SIM

1. Dijkstra 알고리즘

Dijkstra's algorithm

- 가중치가 있는 그래프의 최단 경로를 구하는 알고리즘



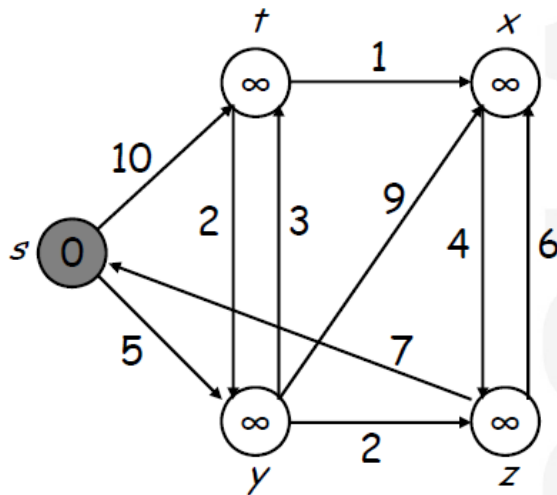
Dijkstra's algorithm

1. 가중치가 0인 시작점에서 시작한다.
2. 현재 node에서 연결된 node까지의 거리가 더 짧아지면 짧아진 거리로 갱신한다.
3. 방문하지 않거나 짧아진 node에서 2번을 반복 Or Queue

Example

Q

s	t	y	x	z
0	∞	∞	∞	∞



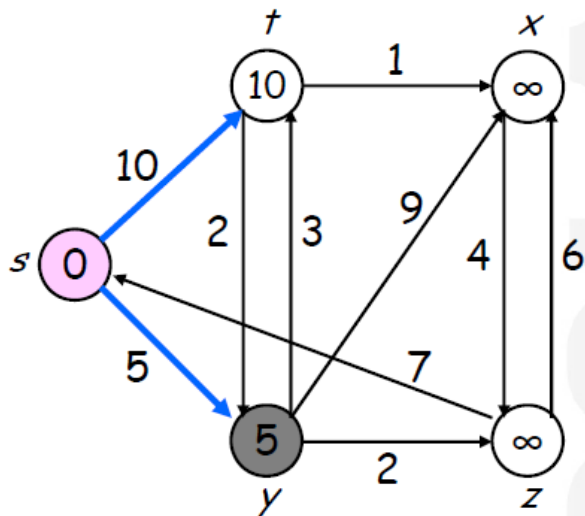
S

Dong Kyue Kim: Algorithm

Example

Q

s	t	y	x	z
0	∞	∞	∞	∞
	10	5	-	-



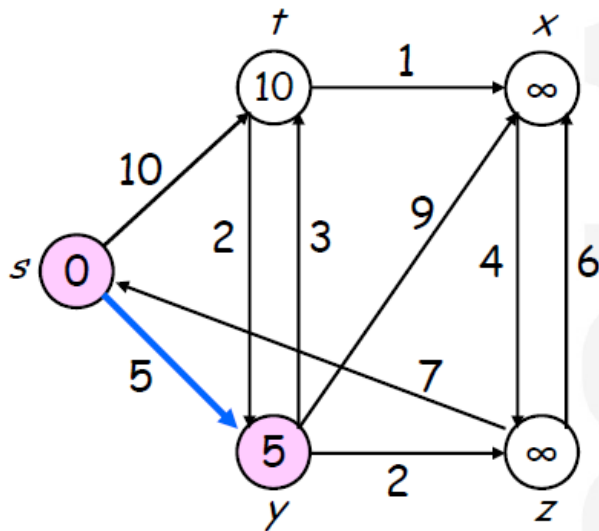
$S\{s\}$

Dong Kyue Kim: Algorithm

Example

Q

s	t	y	x	z
0	∞	∞	∞	∞
	10	5	-	-



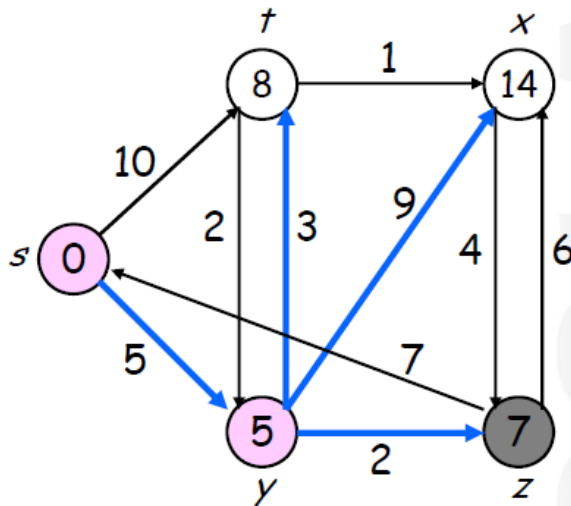
$S\{s, y\}$

Dong Kyue Kim: Algorithm

Example

Q

s	t	y	x	z
0	∞	∞	∞	∞
	10	5	-	-
	8		14	7



$S\{s, y\}$

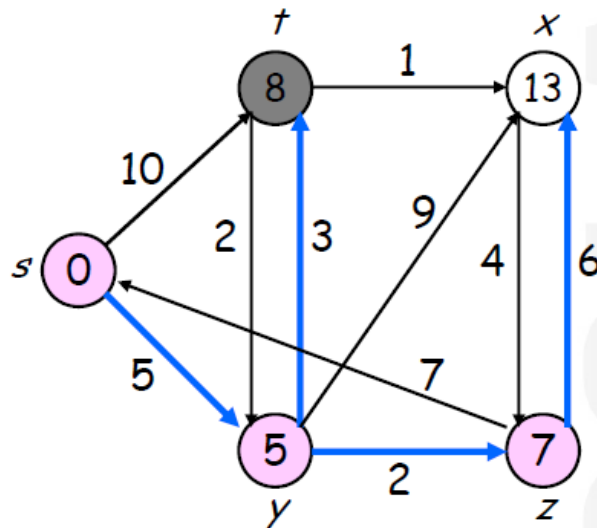
Dong Kyue Kim: Algorithm

Example

Q

s	t	y	x	z
0	∞	∞	∞	∞
	10	5	-	-
	8		14	7
	8		13	

$S\{s, y, z, t\}$



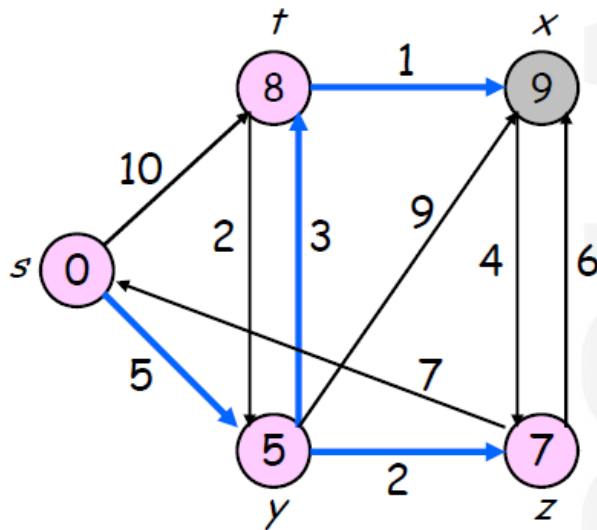
Dong Kyue Kim: Algorithm

Example

Q

s	t	y	x	z
0	∞	∞	∞	∞
	10	5	-	-
	8		14	7
	8		13	
			9	

$S\{s, y, z, t\}$



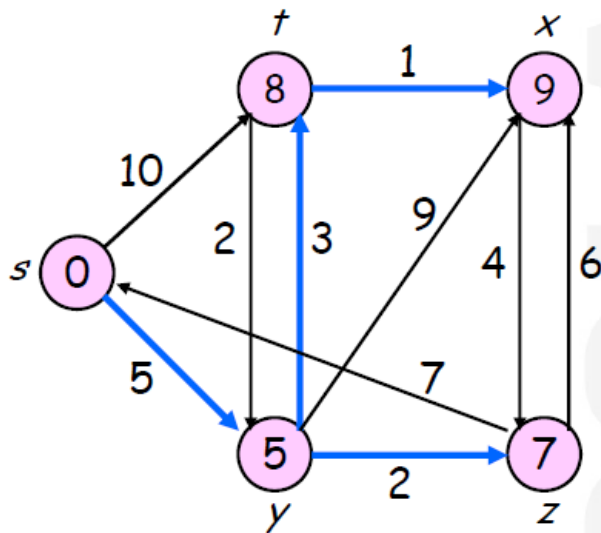
Dong Kyue Kim: Algorithm

Example

Q

s	t	y	x	z
0	∞	∞	∞	∞
	10	5	-	-
	8		14	7
	8		13	
			9	

$S\{s, y, z, t\}$

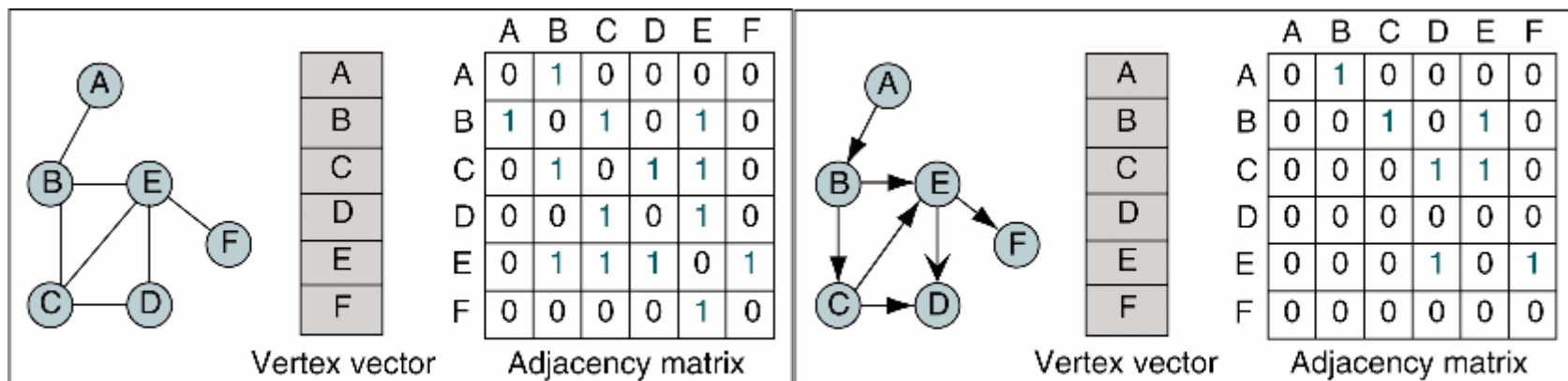


Dong Kyue Kim: Algorithm

2. Graph 표현

Graphs의 표현방법 (1)

- Adjacency Matrix

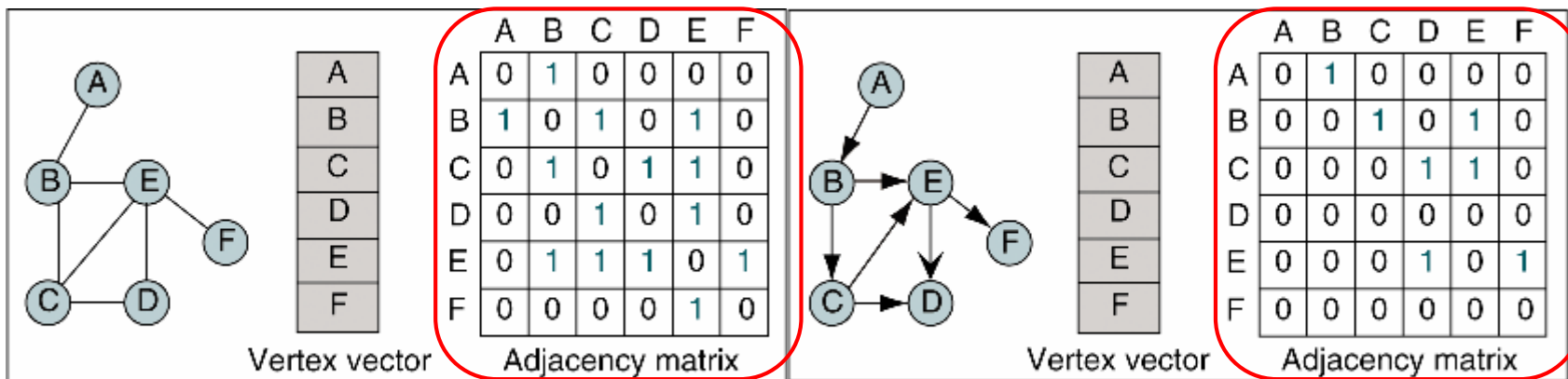


(a) Adjacency matrix for nondirected graph

(b) Adjacency matrix for directed graph

Graphs의 표현방법 (1)

- Adjacency Matrix

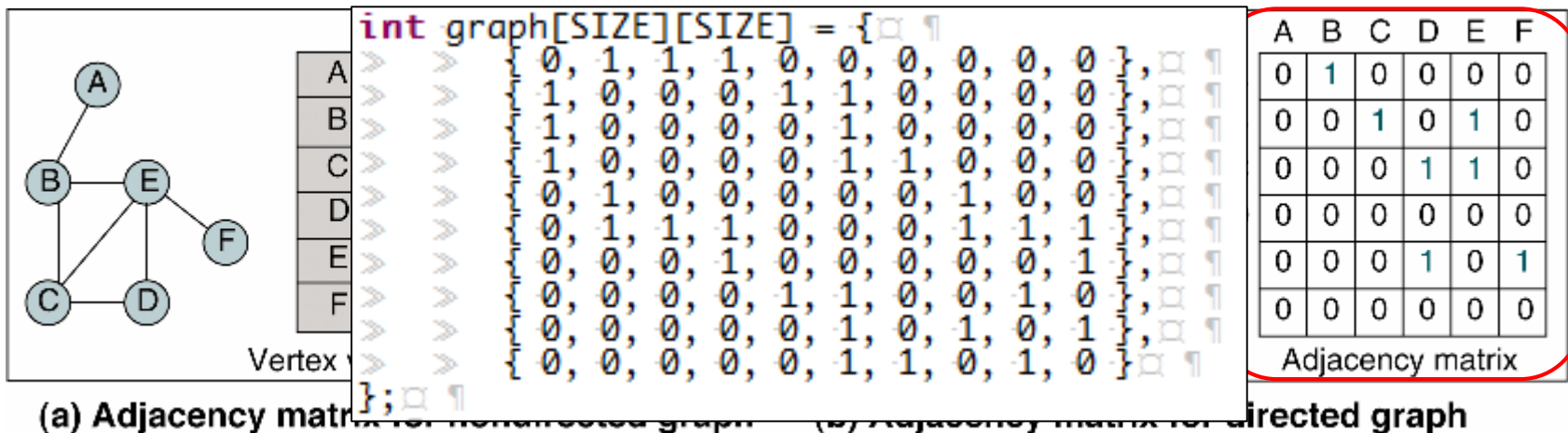


(a) Adjacency matrix for nondirected graph

(b) Adjacency matrix for directed graph

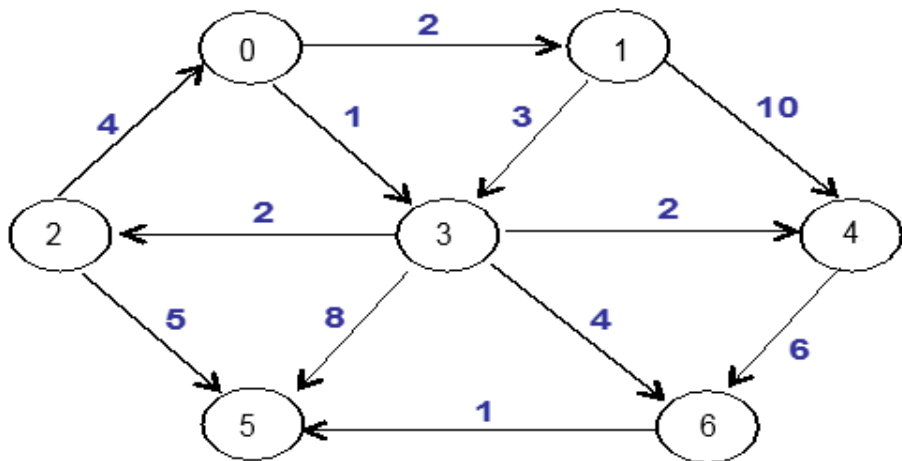
Graphs의 표현방법 (1)

- Adjacency Matrix



Graph의 표현방법 (2)

Inf : 이어지지 않은 node



	0	1	2	3	4	5	6
0	0	2	Inf	1	Inf	Inf	Inf
1	Inf	0	Inf	3	10	Inf	Inf
2	4	Inf	0	inf	Inf	5	Inf
3	Inf	inf	2	0	2	8	4
4	Inf	inf	Inf	Inf	0	inf	6
5	Inf	Inf	Inf	Inf	Inf	0	Inf
6	inf	Inf	inf	Inf	inf	1	0