<Discrete Mathematics>

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작성일_05_30

-Floyd-

: all pairs shortest paths (single source shortest paths)

-> distance matrix로 표현하자

(S, +, •, 0, 1) -> $(R^{+} \cup \{0\}, \min, +, +\infty, 0)$

R^{0} <- adjacency matrix of the input directed graph

for k = 1 to n

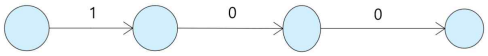
  for i = 1 to n

    for j = 1 to n

      $D[k][i] = \min(D[k][i], +(D[k][j], C[j, i]))$

Definition

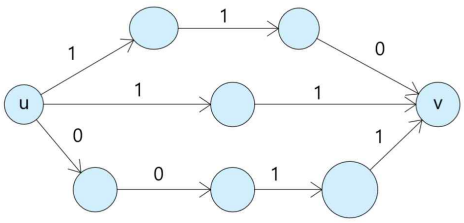
1. the label of an edge (label comes from S where (S, +, •, 0, 1))
2. the label of a path



->path is 1 • 0 • 0

3. the label of a path of length zero => 1 where (S, +, •, 0, 1)
4. c(u, v) for each pair of node (u, v)

=> the sum of all labels



c(u, v) = +(1 • 1 • 0, 1 • 1, 0 • 0 • 1 • 1)=1

no path->0

$C_{ij}^{k} \leftarrow C_{ij}^{k-1} + C_{ik}^{k-1} \bullet (\ )^{*} C \bullet C_{kj}^{k-1}$의 상위 형식이 있다. (괄호 “( )”은 자세히 알필요 없다.)

Floyd, Dijkstra, Warshall이 전부 위의 것으로 reduce 가능하다.

-P, NP-
P: polynomial time
NP: nonpolynomial time
NPC: NP + Complete
-> 전부 problem들의 집합이다.