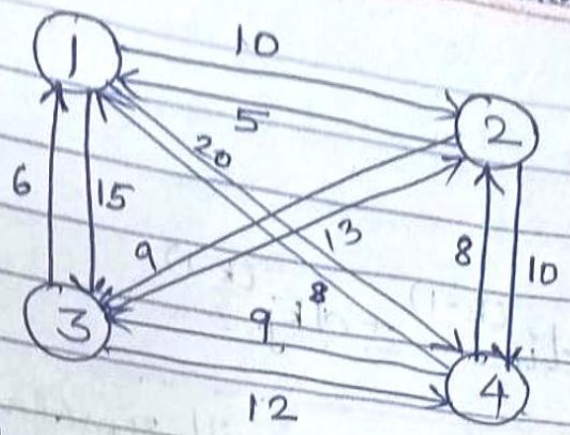
11/9/11

TRAVELLING SALESPERSON PROBLEM USING DYNAMIC PROGRAMMING



Step 1:- Distance matrix

	1	2	3	4
1	0	10	15	20
2	5	0	9	10
3	6	13	0	12
4	8	8	9	0

$$g(i, \{S\}) = \min_{k \in S} [C_{ik} + g(k, S - \{k\})]$$

$g(2, \phi) = C_{21} = 5$
$g(3, \phi) = C_{31} = 6$
$g(4, \phi) = C_{41} = 8$

$g(2, \{4\}) = g(24 + g(4, 4 - \{4\})$
$= 10 + g(4, \phi)$
$= 10 + 8$
$= 18$

$g($

$g(2, \{3\}) = C_{23} + g(3, 3 - \{3\})$
$= 9 + g(3, \phi)$
$= 9 + 6$
$= 15$

$g(3, \{2\}) = C_{32} + g(2, 2 - \{2\})$
$= 13 + g(2, \phi)$
$= 13 + 5$
$= 18$

$g(3, \{4\}) = C_{34} + g(3, 4 - \{4\})$
$= 12 + g(4, \phi)$
$= 12 + 8$
$= 20$

$g(4, \{2\}) = C_{42} + g(4, 2, 2 - \{2\})$
$= 8 + g(2, \phi)$
$= 8 + 5$
$= 13$

$$g(4, \{3\}) = C_{43} + g(3, 3 - \{3\})$$
$$= 9 + g(3, \phi)$$
$$= 9 + 6$$
$$= 15$$

$g(3, \{2,4\}) = \min\{[C_{32} + g(2, \{2,4\} - \{2\})], [C_{34} + g(4, \{2,4\} - \{4\})]\}$

$= \min\{(13 + g(2, \{4\})), (12 + g(4, \{2\}))\}$

$= \min\{13 + 18, 12 + 13\}$

$= \min\{31, 25\}$

$= 25$

$g(2, \{3,4\}) = \min\{[C_{23} + g(3, \{3,4\} - \{3\})], [C_{24} + g(4, \{3,4\} - \{4\})]\}$

$= \min\{9 + g(3, \{4\}), 10 + g(4, \{3\})\}$

$= \min\{9 + 20, 10 + 15\}$

$= \min\{29, 25\}$

$= 25$

$g(4, \{2,3\}) = \min\{[C_{42} + g(2, (\{2,3\} - \{2\})], [C_{43} + g(3, (\{2,3\} - \{3\}))]\}$

$= \min\{8 + g(2, \{3\}), 9 + g(3, \{2\})\}$

$= \min\{8 + 15, 9 + 18\}$

$= \min\{23, 27\}$

$= 23$

$g(1, \{2,3,4\}) = \min\{[C_{12} + g(2, \{2,3,4\} - \{2\})], C_{13} + g(3, \{2,3,4\} - \{3\})], C_{14} + g(4, \{2,3,4\} - \{4\})]\}$

$= \min\{10 + g(2, \{3,4\}), 15 + g(3, \{2,4\}), 20 + g(4, \{2,3\})\}$

$= \min\{10 + 25, 15 + 25, 20 + 23\}$

$= \min\{35, 40, 43\}$

$= 35$

Path:

1 - 2 - 4 - 3 - 1.