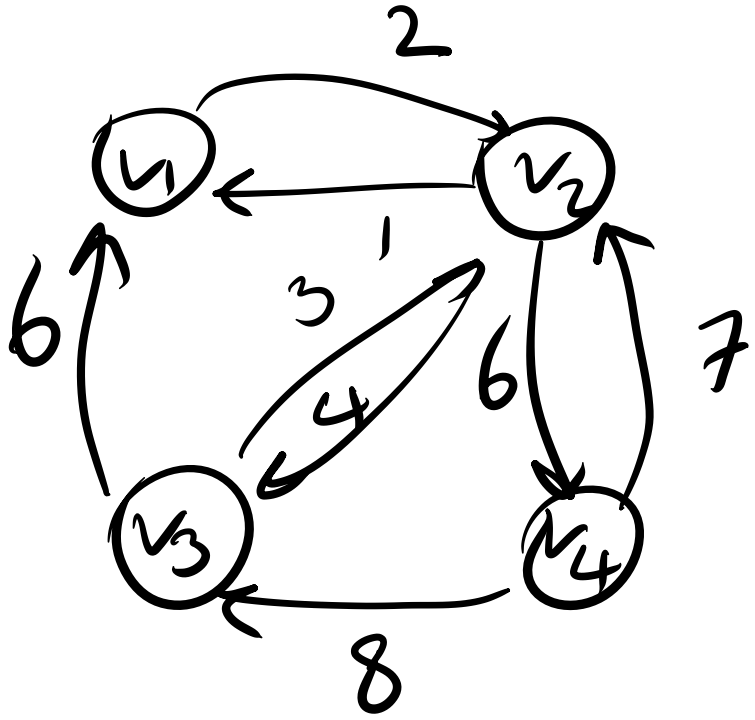
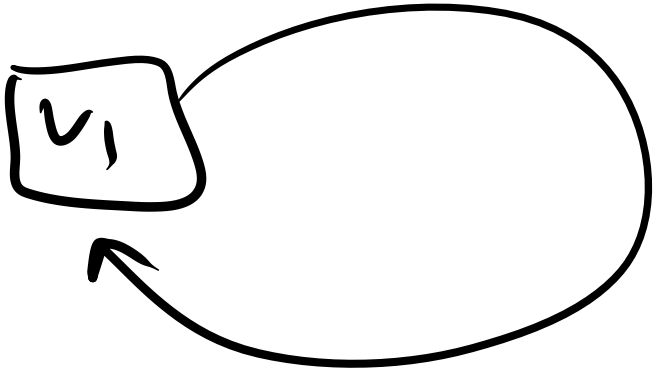
TSP

فروشنده دوره‌گرد





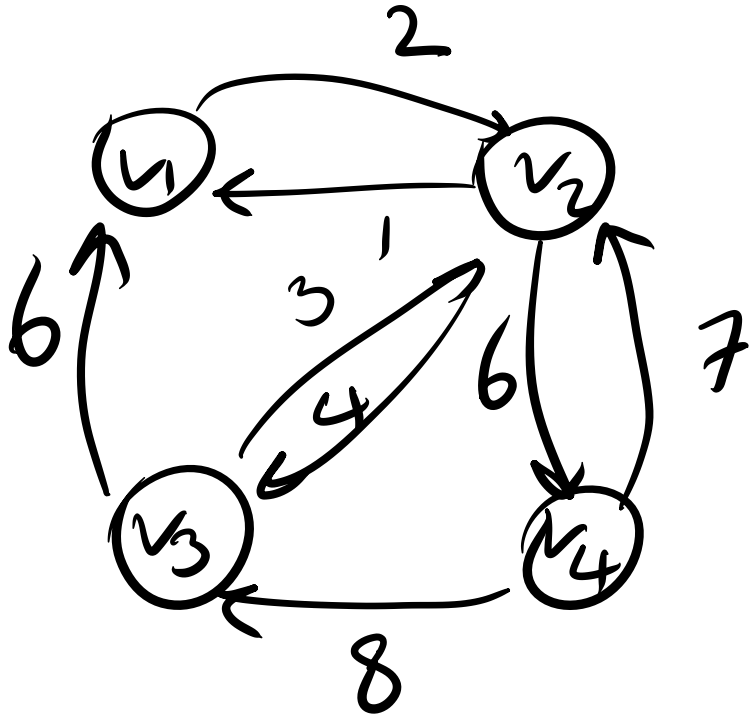
$D[v_i][A]$

زیرمجموعه محکی از رئوس

= دور همیلتونی بهینه

$\frac{1}{2}(n-1)!$

TSP



$D[v_j][A]$

مسیر بهینه از رأس j ام به رأس v_1 ، عبور از همه رئوس مجموعه A

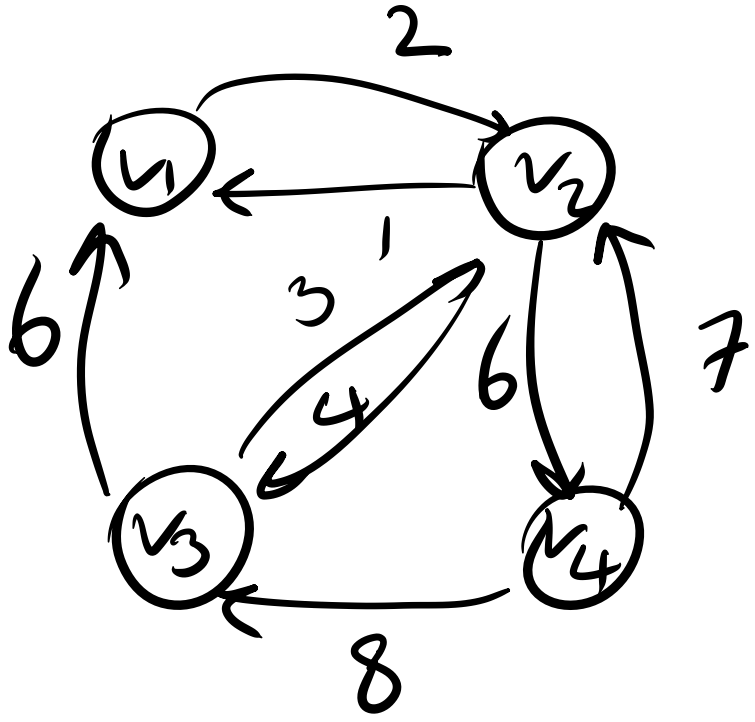
$A = \{\ \}$

$D[v_2][A] = 1$

$D[v_3][A] = 6$

$D[v_4][A] = \infty$

TSP



$D[v_j][A]$

کمترین هزینه از رأس اول به رأس v_j عبور از همه رئوس مجموعه A

$A=\{v_2\}$

$D[v_3][A]=4$

$D[v_4][A]=8$

$A=\{v_3\}$

$D[v_2][A]=10$

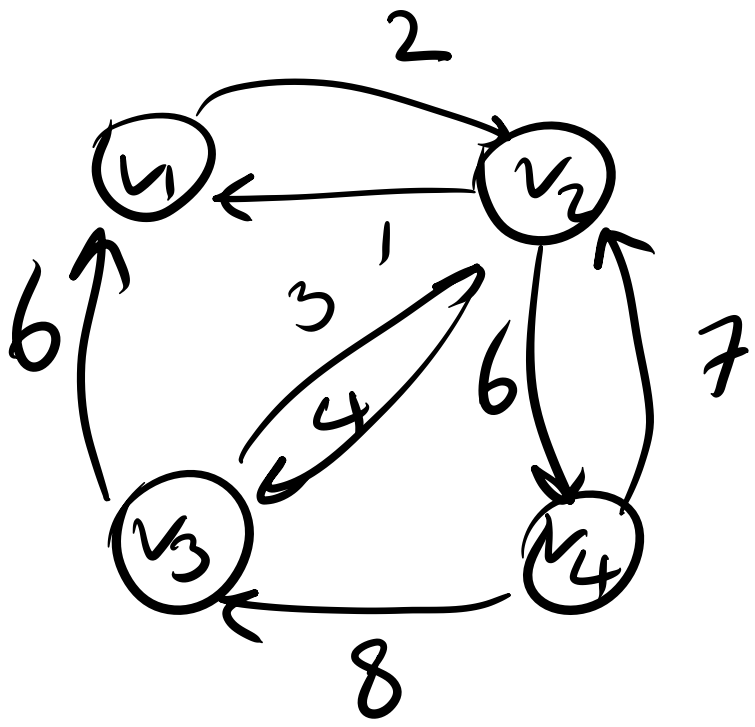
$D[v_4][A]=14$

$A=\{v_4\}$

$D[v_2][A]=\infty$

$D[v_3][A]=\infty$

TSP



L_{ij}

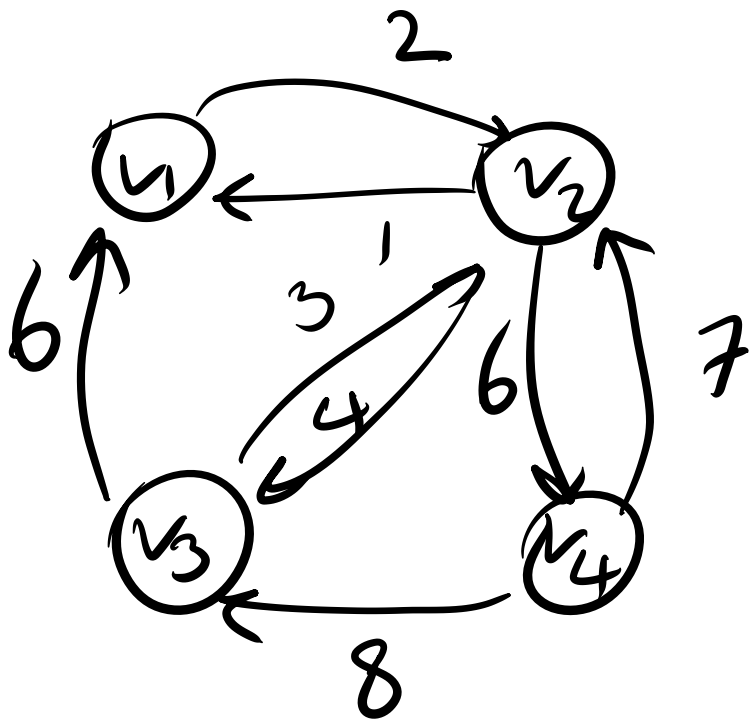
$A = \{v_2, v_3\}$

$D[v_4][A]$ = 12

$D[v_4][A] = L[v_4][v_2] + D[v_2][A - v_2]$ (7 + 10 = 17)

$D[v_4][A] = L[v_4][v_3] + D[v_3][A - v_3]$ (8 + 4 = 12)

TSP



L_{ij}

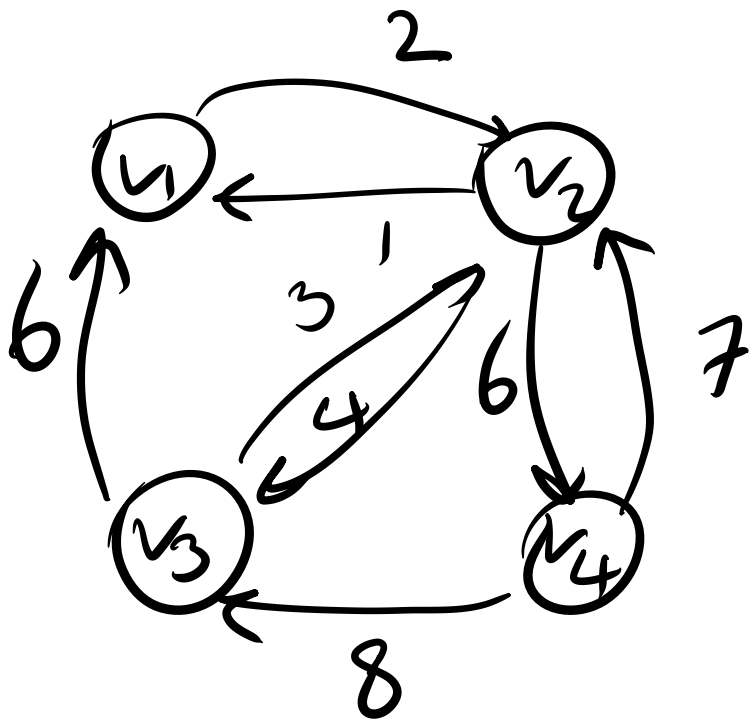
$A = \{v_2, v_4\}$

$D[v_3][A] = \infty$

$L[3]\cancel{[2]}^{3} + D[2]\cancel{[\{v_4\}]}^{\infty}$

$L[3]\cancel{[4]}^{\infty} + D[4][\{2\}] = \infty$

TSP



L_{ij}

$A = \{v_3, v_4\}$

$$D[v_2][A] \begin{cases} L[2][3] + D[3][\{4\}] \\ L[2][4] + D[4][\{3\}] \end{cases}$$

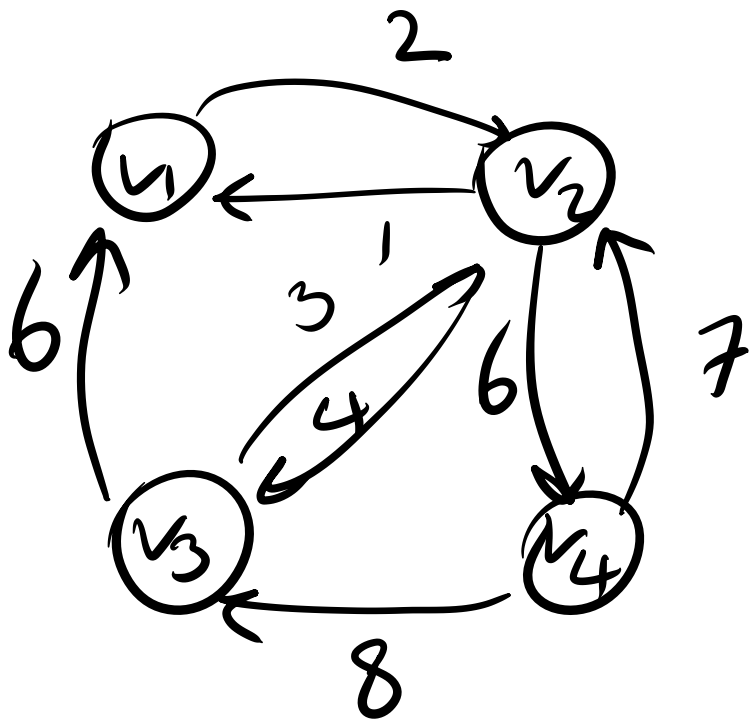
∞

6

14

$= 20$

TSP



L_{ij}

$A = \{v_2, v_3, v_4\}$

$D[v_1][A]$

22

$v_1 \to v_2$

$v_3 \leftarrow v_4$

$L[1][\{2,3,4\}] = \min(L[1][2] + D[2][\{3,4\}],\ L[1][3] + D[3][\{2,4\}],\ L[1][4] + D[4][\{2,3\}])$

$L[1][2] + D[2][\{3,4\}]$: 2 + 20 = 22

$L[1][3] + D[3][\{2,4\}]$: ∞

$L[1][4] + D[4][\{2,3\}]$: ∞

TSP $(L_{n \times n})$

$O(n^2 2^n)$

for $i=1 \rightarrow n$

$D[v_i][\{\}] = L[i][1]$

for $S=1 \rightarrow n-2$

for $A \subset V - \{v_1\}, |A| = S$

for $v_i \in V - A, i \neq 1$

$D[v_i][A] = \min_{j \in A} (L[i][j] + D[j][A - \{v_j\}])$

$$A = V - \{v_1\}$$

$$D[v_1][A] = \min_{j \in A} \left(L[1][j] + D[v_j][A - \{v_j\}] \right)$$