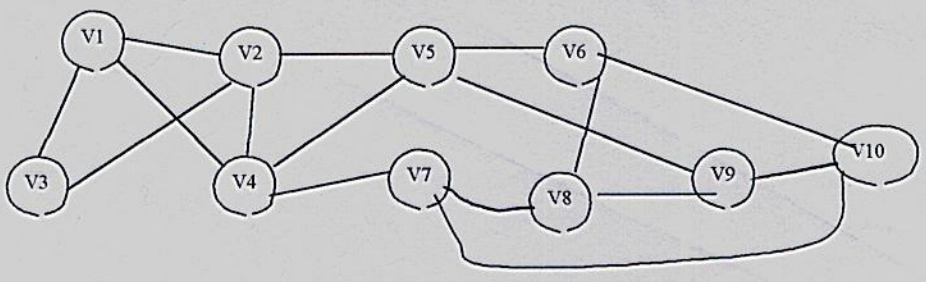
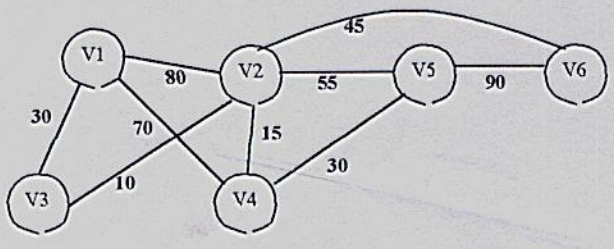
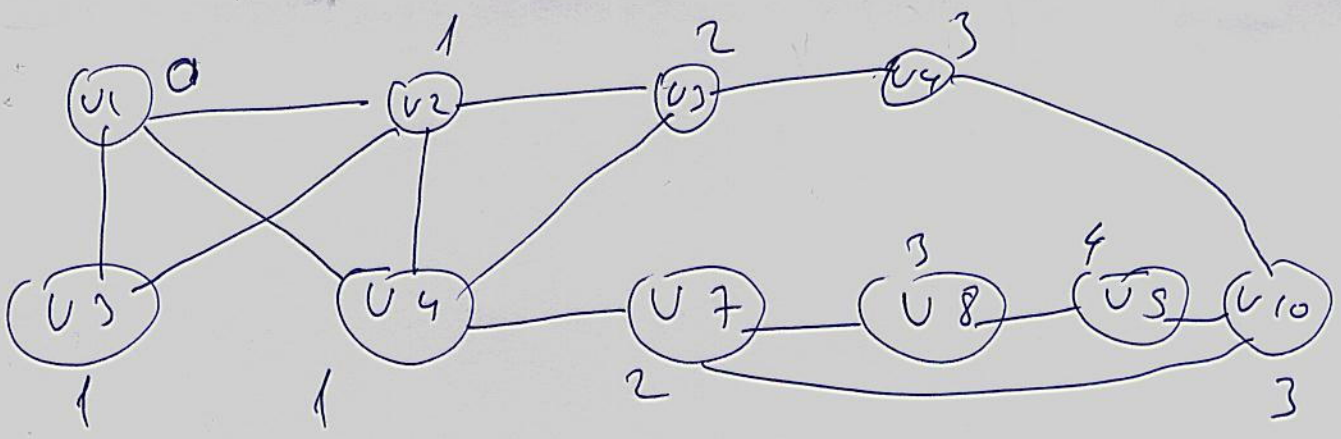
5)Find the shortest path from V1 to V10, in the following graph where all edges are of unit length. Show your procedures clearly.

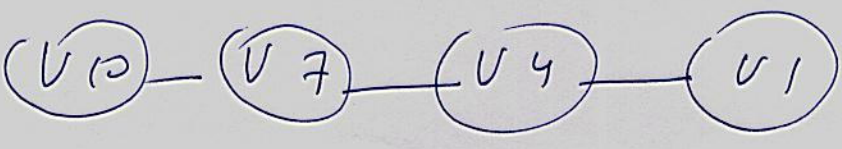


6)Find the shortest lengths from V1 to all other vertices in the following graph, using Dijkstra Algorithm. Show your procedures clearly.



(5)





$V1 \rightarrow V4 \rightarrow V7 \rightarrow V10$

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(6)

$\bar{L}_2 = 80$

$\bar{L}_3 = 30$

$\bar{L}_4 = 70$

$\bar{L}_5 = \infty$

$\bar{L}_6 = \infty$

$PL = \{1\}$

$K = 3$

$\min\{\bar{L}_2, \bar{L}_3 \dots \bar{L}_6\} = 30$

$L_2 = \min(\bar{L}_2, L_3 + L_{32}) = 40$

$\bar{L}_4 = 70$

$\bar{L}_5 = \infty$

$\bar{L}_6 = \infty$

$L_1 = 0 \quad L_2 = 40 \quad L_3 = 30 \quad L_4 = 55 \quad L_5 = 85 \quad L_6 = 85$

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(6)

$\bar{L}_2 = 80 \quad \bar{L}_3 = 30 \quad \bar{L}_4 = 15 \quad \bar{L}_5 = \infty \quad \bar{L}_6 = \infty$

$PL = \{1\} \qquad TL = \{2, 3, 4, 5, 6\}$

$\min\{\bar{L}_2, \bar{L}_3, \bar{L}_4, \bar{L}_5, \bar{L}_6\} = \min\{80, 30, 15, \infty, \infty\} = 15$

$\bar{L}_4 \longrightarrow L_4 = 15$

$PL = \{1, 4\} \qquad TL = \{2, 3, 5, 6\}$

$\bar{L}_2 = \min(L_2, L_4 + L_{42}) = \min(80, 15+35) = 50$

$FV2 = 4$ (AAA)

$\bar{L}_3 = \min(\bar{L}_3, L_4 + L_{42}) = \min(30, 15+\infty) = 30$

$\bar{L}_5 = \min(\bar{L}_5, L_4 + L_{42}) = \min(\infty, 15+20) = 35$

$FV5 = 4$ (BBB)

$\bar{L}_6 = \min(\bar{L}_6, L_4 + L_{46}) = \min(\infty, 15+\infty) = \infty$

$\min(\bar{L}_2, \bar{L}_3, \bar{L}_5, \bar{L}_6) = \min(50, 30, 35, \infty) = 30$

$\bar{L}_3 \longrightarrow L_3 = 30$

$PL = \{1, 4, 3\} \qquad TL = \{2, 5, 6\}$

$\bar{L}_2 = \min\{\bar{L}_2, L_3 + L_{32}\} = \min(50, 30+18) = 48$

$fv2 = 3$ (CCC)

$\bar{L}_5 = \min\{\bar{L}_5, L_3 + L_{35}\} = \min(35, 30+\infty) = 35$

$\bar{L}_6 = \min\{\bar{L}_6, L_3 + L_{36}\} = \min(\infty, 30+\infty) = \infty$

$\min(\bar{L}_2, \bar{L}_5, \bar{L}_6) = \min(48, 35, \infty) = 35$

$\bar{L}_5 \rightarrow L_5 = 35$

$PL = \{1, 4, 3, 5\}$ $TL = \{2, 6\}$

$\bar{L}_2 = \min\{\bar{L}_2, L_5 + L_{52}\} = \min\{48, 35 + 5\} = 40$

$FV2 = 5$ (DDD)

$\bar{L}_6 = \min(\bar{L}_6, L_5 + L_{56}) = \min(\infty, 35 + 90) = 125$

$FV6 = 5$

$\min(\bar{L}_2, \bar{L}_6) = \min(40, 125) = 40$

$\bar{L}_2 \rightarrow L_2 = 40$

$PL = \{1, 4, 3, 5, 2\}$ $TL = \{6\}$

$\bar{L}_6 = \min(\bar{L}_6, L_2 + L_{26}) = \min(125, 40 + 45)$

$= 85$

$FV6 = 2$ (EEE)

Result $L_1 = 0$ $L_2 = 40$ $L_3 = 30$ $L_4 = 15$

$L_5 = 35$ $L_6 = 85$

Shortest paths

initial Paths

$fv2=1$ $fv3=1$ $fv4=1$ $fv5=1$ $fv6=1$

write all the changes

$fv2=4$ (AAA)

$fv5=4$ (BBB)

$fv2=3$ (CCC)

$fv2=5$ (DDD)

$fv6=2$ (EEE)

The Latest values are accounted.

i.e. $fv2=4$ $fv2=3$ $fv2=5$

The Latest value is $fv2=5$

$fv2=5$ $fv3=1$ $fv4=1$ $fv5=4$ $fv6=2$

$1 \rightarrow 3$ ⟶ $L_3 = 30$

$1 \rightarrow 4$ ⟶ $L_4 = 15$

$1 \rightarrow 4 \rightarrow 5$ ⟶ $L_5 = L_4 + L_{45} = 15+20 = 35$

$1 \rightarrow 4 \rightarrow 5 \rightarrow 2$ ⟶ $L_2 = L_5 + L_{52} = 35+5 = 40$

$1 \rightarrow 4 \rightarrow 5 \rightarrow 2 \rightarrow 6$ ⟶ $L_6 = L_2 + L_{26} = 40+45 = 85$