Floyd-Warshall Algorithm Simulation

Input

- Number of vertices: 5
- Number of edges: 8
- Edges (source $\rightarrow$ destination : weight):
  - $3 \rightarrow 1 : 6$
  - $0 \rightarrow 1 : 18$
  - $0 \rightarrow 2$: -4
  - $0 \rightarrow 4 : 3$
  - $4 \rightarrow 3 : 5$
  - $2 \rightarrow 3 : 14$
  - $2 \rightarrow 1 : 16$
  - $2 \rightarrow 4$: -2

Initial Distance Matrix (Iteration 0)

$$\begin{bmatrix} 0 & 18 & -4 & \infty & 3 \\ \infty & 0 & \infty & \infty & \infty \\ \infty & 16 & 0 & 14 & -2 \\ \infty & 6 & \infty & 0 & \infty \\ \infty & \infty & \infty & 5 & 0 \end{bmatrix}$$

After Iteration 1 (via Vertex 0)

$$\begin{bmatrix} 0 & 18 & -4 & \infty & 3 \\ \infty & 0 & \infty & \infty & \infty \\ \infty & 16 & 0 & 14 & -2 \\ \infty & 6 & \infty & 0 & \infty \\ \infty & \infty & \infty & 5 & 0 \end{bmatrix}$$

After Iteration 2 (via Vertex 1)

$$\begin{bmatrix} 0 & 18 & -4 & \infty & 3 \\ \infty & 0 & \infty & \infty & \infty \\ \infty & 16 & 0 & 14 & -2 \\ \infty & 6 & \infty & 0 & \infty \\ \infty & \infty & \infty & 5 & 0 \end{bmatrix}$$

After Iteration 3 (via Vertex 2)

$$\begin{bmatrix} 0 & 12 & -4 & 10 & -6 \\ \infty & 0 & \infty & \infty & \infty \\ \infty & 16 & 0 & 14 & -2 \\ \infty & 6 & \infty & 0 & \infty \\ \infty & \infty & \infty & 5 & 0 \end{bmatrix}$$

After Iteration 4 (via Vertex 3)

$$\begin{bmatrix} 0 & 12 & -4 & 10 & -6 \\ \infty & 0 & \infty & \infty & \infty \\ \infty & 16 & 0 & 14 & -2 \\ \infty & 6 & \infty & 0 & \infty \\ \infty & 11 & \infty & 5 & 0 \end{bmatrix}$$

After Iteration 5 (via Vertex 4)

$$\begin{bmatrix} 0 & 5 & -4 & -1 & -6 \\ \infty & 0 & \infty & \infty & \infty \\ \infty & 9 & 0 & 3 & -2 \\ \infty & 6 & \infty & 0 & \infty \\ \infty & 11 & \infty & 5 & 0 \end{bmatrix}$$

Final Shortest Distance Matrix

$$\begin{bmatrix} 0 & 5 & -4 & -1 & -6 \\ \infty & 0 & \infty & \infty & \infty \\ \infty & 9 & 0 & 3 & -2 \\ \infty & 6 & \infty & 0 & \infty \\ \infty & 11 & \infty & 5 & 0 \end{bmatrix}$$