PROJECT 2: REPORT

**FLOYD’S ALGORITHM**

**TIME PLOT-**

**A graph with a line

Description automatically generated**

Floyd’s Algorithm shows similar time performance for both data structures- this can be attributed to the fact that it is only dependent on the number of nodes in the graph and not on the data structure used to store the edges. The main performance bottleneck in the Floyd-Warshall Algorithm is the cubic iteration over the nodes as there are three nested loops that computes the shortest path. This process controls the execution time and since both the linked list and array representations produce the same adjacency matrix.

**MEMORY REPORT**

A graph with a line

Description automatically generated

Memory usage grows quadratically with the number of nodes in the array representation, which explains the steep trend as the graph size increases. This is due to the adjacency matrix needing to store entries for all node pairs, even those without an edge.

Memory usage grows slowly in the linked list representation because it only stores the actual edges, and the number of edges is typically much smaller than the number of possible edges in sparse graphs, leading to a relatively flat trend.

**2-D ARRAY**

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File1.csv ]

Memory used by Graph (Matrix): 325.05 KB

Memory used by Distance Matrix: 325.05 KB

Memory used by Next Node Matrix: 325.05 KB

Peak Memory Usage: 22096.00 MB

Overall Process Memory Usage: 21.58 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File2.csv ]

Memory used by Graph (Matrix): 693.98 KB

Memory used by Distance Matrix: 634.71 KB

Memory used by Next Node Matrix: 634.71 KB

Peak Memory Usage: 32544.00 MB

Overall Process Memory Usage: 31.78 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File3.csv ]

Memory used by Graph (Matrix): 1252.80 KB

Memory used by Distance Matrix: 1231.30 KB

Memory used by Next Node Matrix: 1231.30 KB

Peak Memory Usage: 51616.00 MB

Overall Process Memory Usage: 50.41 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File4.csv ]

Memory used by Graph (Matrix): 1980.37 KB

Memory used by Distance Matrix: 1830.37 KB

Memory used by Next Node Matrix: 1830.37 KB

Peak Memory Usage: 77808.00 MB

Overall Process Memory Usage: 58.84 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File5.csv ]

Memory used by Graph (Matrix): 2620.62 KB

Memory used by Distance Matrix: 2476.51 KB

Memory used by Next Node Matrix: 2476.51 KB

Peak Memory Usage: 93184.00 MB

Overall Process Memory Usage: 70.80 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File6.csv ]

Memory used by Graph (Matrix): 3437.44 KB

Memory used by Distance Matrix: 3311.07 KB

Memory used by Next Node Matrix: 3311.07 KB

Peak Memory Usage: 122000.00 MB

Overall Process Memory Usage: 77.12 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File7.csv ]

Memory used by Graph (Matrix): 4536.09 KB

Memory used by Distance Matrix: 4512.46 KB

Memory used by Next Node Matrix: 4512.46 KB

Peak Memory Usage: 148400.00 MB

Overall Process Memory Usage: 111.14 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File8.csv ]

Memory used by Graph (Matrix): 5730.33 KB

Memory used by Distance Matrix: 5631.30 KB

Memory used by Next Node Matrix: 5631.30 KB

Peak Memory Usage: 209776.00 MB

Overall Process Memory Usage: 117.34 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File9.csv ]

Memory used by Graph (Matrix): 7342.50 KB

Memory used by Distance Matrix: 7245.10 KB

Memory used by Next Node Matrix: 7245.10 KB

Peak Memory Usage: 232704.00 MB

Overall Process Memory Usage: 118.70 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File10.csv ]

Memory used by Graph (Matrix): 9513.28 KB

Memory used by Distance Matrix: 9504.70 KB

Memory used by Next Node Matrix: 9504.70 KB

Peak Memory Usage: 277264.00 MB

Overall Process Memory Usage: 218.84 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File11.csv ]

Memory used by Graph (Matrix): 11864.95 KB

Memory used by Distance Matrix: 11571.18 KB

Memory used by Next Node Matrix: 11571.18 KB

Peak Memory Usage: 417648.00 MB

Overall Process Memory Usage: 168.62 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File12.csv ]

Memory used by Graph (Matrix): 14572.98 KB

Memory used by Distance Matrix: 13716.40 KB

Memory used by Next Node Matrix: 13716.40 KB

Peak Memory Usage: 433952.00 MB

Overall Process Memory Usage: 198.70 MB (Resident Set Size)

**Linked List:**

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File1.csv ]

Memory used by Nodes: 9.38 KB

Memory used by Edges: 24.94 KB

Memory used by Distance Matrix: 325.05 KB

Memory used by Next Node Matrix: 325.05 KB

Peak Memory Usage: 21840.00 MB

Overall Process Memory Usage: 21.33 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File2.csv ]

Memory used by Nodes: 13.17 KB

Memory used by Edges: 34.97 KB

Memory used by Distance Matrix: 634.71 KB

Memory used by Next Node Matrix: 634.71 KB

Peak Memory Usage: 33376.00 MB

Overall Process Memory Usage: 32.59 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File3.csv ]

Memory used by Nodes: 18.42 KB

Memory used by Edges: 51.00 KB

Memory used by Distance Matrix: 1231.30 KB

Memory used by Next Node Matrix: 1231.30 KB

Peak Memory Usage: 49600.00 MB

Overall Process Memory Usage: 48.44 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File4.csv ]

Memory used by Nodes: 22.50 KB

Memory used by Edges: 64.03 KB

Memory used by Distance Matrix: 1830.37 KB

Memory used by Next Node Matrix: 1830.37 KB

Peak Memory Usage: 74816.00 MB

Overall Process Memory Usage: 66.95 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File5.csv ]

Memory used by Nodes: 26.20 KB

Memory used by Edges: 75.56 KB

Memory used by Distance Matrix: 2476.51 KB

Memory used by Next Node Matrix: 2476.51 KB

Peak Memory Usage: 103680.00 MB

Overall Process Memory Usage: 64.91 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File6.csv ]

Memory used by Nodes: 30.33 KB

Memory used by Edges: 87.84 KB

Memory used by Distance Matrix: 3311.07 KB

Memory used by Next Node Matrix: 3311.07 KB

Peak Memory Usage: 120432.00 MB

Overall Process Memory Usage: 81.92 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File7.csv ]

Memory used by Nodes: 35.44 KB

Memory used by Edges: 104.06 KB

Memory used by Distance Matrix: 4512.46 KB

Memory used by Next Node Matrix: 4512.46 KB

Peak Memory Usage: 151232.00 MB

Overall Process Memory Usage: 111.59 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File8.csv ]

Memory used by Nodes: 39.61 KB

Memory used by Edges: 117.00 KB

Memory used by Distance Matrix: 5631.30 KB

Memory used by Next Node Matrix: 5631.30 KB

Peak Memory Usage: 208144.00 MB

Overall Process Memory Usage: 118.88 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File9.csv ]

Memory used by Nodes: 44.95 KB

Memory used by Edges: 134.06 KB

Memory used by Distance Matrix: 7245.10 KB

Memory used by Next Node Matrix: 7245.10 KB

Peak Memory Usage: 231376.00 MB

Overall Process Memory Usage: 108.00 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File10.csv ]

Memory used by Nodes: 51.52 KB

Memory used by Edges: 152.72 KB

Memory used by Distance Matrix: 9504.70 KB

Memory used by Next Node Matrix: 9504.70 KB

Peak Memory Usage: 274128.00 MB

Overall Process Memory Usage: 150.59 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File11.csv ]

Memory used by Nodes: 56.86 KB

Memory used by Edges: 169.31 KB

Memory used by Distance Matrix: 11571.18 KB

Memory used by Next Node Matrix: 11571.18 KB

Peak Memory Usage: 377680.00 MB

Overall Process Memory Usage: 185.80 MB (Resident Set Size)

**DIJKSTRA’S ALGORITHM**

**TIME PLOT**

A graph with blue and green lines

Description automatically generated

The time plot shows that Dijkstra's algorithm runs more efficiently when implemented using a linked list compared to a matrix, especially as input size increases. While both implementations see rising computation time with larger inputs, the matrix implementation's time grows significantly faster than the linked list's. This suggests that the linked list scales better and is more optimal for larger datasets, likely due to reduced overhead in scanning nodes.

**MEMORY REPORT-**

**A graph with a line

Description automatically generated**

Dijkstra’s Algorithm shows significantly different memory performance between the two data structures—this can be attributed to the fact that the matrix stores information for all possible node pairs, while the linked list only stores actual edges. The main memory bottleneck in the matrix implementation comes from the need to allocate space for every possible connection, even if no edge exists between nodes. This leads to much higher memory consumption as input size grows, while the linked list remains highly efficient, only storing necessary edges and keeping memory usage nearly constant.

**2-D ARRAY**

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File1.csv ]

Memory used by Graph (Matrix): 325.05 KB

Memory used by Distance Array: 1.62 KB

Memory used by Previous Array: 1.62 KB

Memory used by Visited Array: 1.62 KB

Peak Memory Usage: 16352.00 MB

Overall Process Memory Usage: 15.97 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File2.csv ]

Memory used by Graph (Matrix): 693.98 KB

Memory used by Distance Array: 2.25 KB

Memory used by Previous Array: 2.25 KB

Memory used by Visited Array: 2.25 KB

Peak Memory Usage: 17280.00 MB

Overall Process Memory Usage: 16.88 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File3.csv ]

Memory used by Graph (Matrix): 1252.80 KB

Memory used by Distance Array: 3.12 KB

Memory used by Previous Array: 3.12 KB

Memory used by Visited Array: 3.12 KB

Peak Memory Usage: 18368.00 MB

Overall Process Memory Usage: 17.94 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File4.csv ]

Memory used by Graph (Matrix): 1980.37 KB

Memory used by Distance Array: 3.80 KB

Memory used by Previous Array: 3.80 KB

Memory used by Visited Array: 3.80 KB

Peak Memory Usage: 19504.00 MB

Overall Process Memory Usage: 19.05 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File5.csv ]

Memory used by Graph (Matrix): 2620.62 KB

Memory used by Distance Array: 4.42 KB

Memory used by Previous Array: 4.42 KB

Memory used by Visited Array: 4.42 KB

Peak Memory Usage: 21504.00 MB

Overall Process Memory Usage: 21.00 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File6.csv ]

Memory used by Graph (Matrix): 3437.44 KB

Memory used by Distance Array: 5.11 KB

Memory used by Previous Array: 5.11 KB

Memory used by Visited Array: 5.11 KB

Peak Memory Usage: 22816.00 MB

Overall Process Memory Usage: 22.28 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File7.csv ]

Memory used by Graph (Matrix): 4536.09 KB

Memory used by Distance Array: 5.96 KB

Memory used by Previous Array: 5.96 KB

Memory used by Visited Array: 5.96 KB

Peak Memory Usage: 24832.00 MB

Overall Process Memory Usage: 24.25 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File8.csv ]

Memory used by Graph (Matrix): 5730.33 KB

Memory used by Distance Array: 6.66 KB

Memory used by Previous Array: 6.66 KB

Memory used by Visited Array: 6.66 KB

Peak Memory Usage: 27760.00 MB

Overall Process Memory Usage: 27.11 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File9.csv ]

Memory used by Graph (Matrix): 7342.50 KB

Memory used by Distance Array: 7.55 KB

Memory used by Previous Array: 7.55 KB

Memory used by Visited Array: 7.55 KB

Peak Memory Usage: 32352.00 MB

Overall Process Memory Usage: 31.59 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File10.csv ]

Memory used by Graph (Matrix): 9513.28 KB

Memory used by Distance Array: 8.64 KB

Memory used by Previous Array: 8.64 KB

Memory used by Visited Array: 8.64 KB

Peak Memory Usage: 34976.00 MB

Overall Process Memory Usage: 34.16 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File11.csv ]

Memory used by Graph (Matrix): 11864.95 KB

Memory used by Distance Array: 9.53 KB

Memory used by Previous Array: 9.53 KB

Memory used by Visited Array: 9.53 KB

Peak Memory Usage: 40576.00 MB

Overall Process Memory Usage: 39.62 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File12.csv ]

Memory used by Graph (Matrix): 14572.98 KB

Memory used by Distance Array: 10.38 KB

Memory used by Previous Array: 10.38 KB

Memory used by Visited Array: 10.38 KB

Peak Memory Usage: 43552.00 MB

Overall Process Memory Usage: 42.53 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File13.csv ]

Memory used by Graph (Matrix): 17973.33 KB

Memory used by Distance Array: 11.34 KB

Memory used by Previous Array: 11.34 KB

Memory used by Visited Array: 11.34 KB

Peak Memory Usage: 48560.00 MB

Overall Process Memory Usage: 47.42 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File14.csv ]

Memory used by Graph (Matrix): 19489.75 KB

Memory used by Distance Array: 12.30 KB

Memory used by Previous Array: 12.30 KB

Memory used by Visited Array: 12.30 KB

Peak Memory Usage: 56064.00 MB

Overall Process Memory Usage: 54.75 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File15.csv ]

Memory used by Graph (Matrix): 24092.27 KB

Memory used by Distance Array: 13.47 KB

Memory used by Previous Array: 13.47 KB

Memory used by Visited Array: 13.47 KB

Peak Memory Usage: 60128.00 MB

Overall Process Memory Usage: 58.72 MB (Resident Set Size)

**[ Average Memory Usage Across All Files ]**

**Average Memory used by Graph (Matrix): 8361.72 KB**

**Average Memory used by Distance Array: 7.08 KB**

**Average Memory used by Previous Array: 7.08 KB**

**Average Memory used by Visited Array: 7.08 KB**

**LINKED LIST:**

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File1.csv ]

Memory used by Nodes: 9.38 KB

Memory used by Edges: 24.94 KB

Memory used by Distance Array: 1.62 KB

Memory used by Previous Array: 1.62 KB

Memory used by Visited Array: 1.62 KB

Peak Memory Usage: 16064.00 MB

Overall Process Memory Usage: 15.69 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File2.csv ]

Memory used by Nodes: 13.17 KB

Memory used by Edges: 34.97 KB

Memory used by Distance Array: 2.25 KB

Memory used by Previous Array: 2.25 KB

Memory used by Visited Array: 2.25 KB

Peak Memory Usage: 16912.00 MB

Overall Process Memory Usage: 16.52 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File3.csv ]

Memory used by Nodes: 18.42 KB

Memory used by Edges: 51.00 KB

Memory used by Distance Array: 3.12 KB

Memory used by Previous Array: 3.12 KB

Memory used by Visited Array: 3.12 KB

Peak Memory Usage: 17616.00 MB

Overall Process Memory Usage: 17.20 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File4.csv ]

Memory used by Nodes: 22.50 KB

Memory used by Edges: 64.03 KB

Memory used by Distance Array: 3.80 KB

Memory used by Previous Array: 3.80 KB

Memory used by Visited Array: 3.80 KB

Peak Memory Usage: 18800.00 MB

Overall Process Memory Usage: 18.36 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File5.csv ]

Memory used by Nodes: 26.20 KB

Memory used by Edges: 75.56 KB

Memory used by Distance Array: 4.42 KB

Memory used by Previous Array: 4.42 KB

Memory used by Visited Array: 4.42 KB

Peak Memory Usage: 20304.00 MB

Overall Process Memory Usage: 19.83 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File6.csv ]

Memory used by Nodes: 30.33 KB

Memory used by Edges: 87.84 KB

Memory used by Distance Array: 5.11 KB

Memory used by Previous Array: 5.11 KB

Memory used by Visited Array: 5.11 KB

Peak Memory Usage: 20896.00 MB

Overall Process Memory Usage: 20.41 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File7.csv ]

Memory used by Nodes: 35.44 KB

Memory used by Edges: 104.06 KB

Memory used by Distance Array: 5.96 KB

Memory used by Previous Array: 5.96 KB

Memory used by Visited Array: 5.96 KB

Peak Memory Usage: 22208.00 MB

Overall Process Memory Usage: 21.69 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File8.csv ]

Memory used by Nodes: 39.61 KB

Memory used by Edges: 117.00 KB

Memory used by Distance Array: 6.66 KB

Memory used by Previous Array: 6.66 KB

Memory used by Visited Array: 6.66 KB

Peak Memory Usage: 23744.00 MB

Overall Process Memory Usage: 23.19 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File9.csv ]

Memory used by Nodes: 44.95 KB

Memory used by Edges: 134.06 KB

Memory used by Distance Array: 7.55 KB

Memory used by Previous Array: 7.55 KB

Memory used by Visited Array: 7.55 KB

Peak Memory Usage: 24336.00 MB

Overall Process Memory Usage: 23.77 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File10.csv ]

Memory used by Nodes: 51.52 KB

Memory used by Edges: 152.72 KB

Memory used by Distance Array: 8.64 KB

Memory used by Previous Array: 8.64 KB

Memory used by Visited Array: 8.64 KB

Peak Memory Usage: 25808.00 MB

Overall Process Memory Usage: 25.20 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File11.csv ]

Memory used by Nodes: 56.86 KB

Memory used by Edges: 169.31 KB

Memory used by Distance Array: 9.53 KB

Memory used by Previous Array: 9.53 KB

Memory used by Visited Array: 9.53 KB

Peak Memory Usage: 27520.00 MB

Overall Process Memory Usage: 26.88 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File12.csv ]

Memory used by Nodes: 61.92 KB

Memory used by Edges: 186.56 KB

Memory used by Distance Array: 10.38 KB

Memory used by Previous Array: 10.38 KB

Memory used by Visited Array: 10.38 KB

Peak Memory Usage: 27712.00 MB

Overall Process Memory Usage: 27.06 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File13.csv ]

Memory used by Nodes: 67.73 KB

Memory used by Edges: 204.94 KB

Memory used by Distance Array: 11.34 KB

Memory used by Previous Array: 11.34 KB

Memory used by Visited Array: 11.34 KB

Peak Memory Usage: 30608.00 MB

Overall Process Memory Usage: 29.89 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File14.csv ]

Memory used by Nodes: 73.45 KB

Memory used by Edges: 223.78 KB

Memory used by Distance Array: 12.30 KB

Memory used by Previous Array: 12.30 KB

Memory used by Visited Array: 12.30 KB

Peak Memory Usage: 32912.00 MB

Overall Process Memory Usage: 30.67 MB (Resident Set Size)

[ Memory Usage Report for Project2\_Input\_File/Project2\_Input\_File15.csv ]

Memory used by Nodes: 80.48 KB

Memory used by Edges: 246.00 KB

Memory used by Distance Array: 13.47 KB

Memory used by Previous Array: 13.47 KB

Memory used by Visited Array: 13.47 KB

Peak Memory Usage: 32992.00 MB

Overall Process Memory Usage: 31.92 MB (Resident Set Size)

**[ Average Memory Usage Across All Files ]**

**Average Memory used by Nodes: 42.13 KB**

**Average Memory used by Edges: 125.12 KB**

**Average Memory used by Distance Array: 7.08 KB**

**Average Memory used by Previous Array: 7.08 KB**

**Average Memory used by Visited Array: 7.08 KB**

**TEST CASE OUTPUTS**

**TEST CASE 1:**

**Dijkstra’s 2D Array:**

A screenshot of a computer program

Description automatically generated

**Dijkstra’s Linked List:**

**A screenshot of a computer program

Description automatically generatedFloyd’s 2D Array:**

A screenshot of a computer

Description automatically generated

**Floyd’s Linked List:**

A screenshot of a computer

Description automatically generated

**TEST CASE 2:**

**Dijkstra’s 2D Array:**

A screenshot of a computer program

Description automatically generated

**Dijkstra’s Linked List:**

A screenshot of a computer program

Description automatically generated

**Floyd’s 2D Array:**

A screenshot of a computer

Description automatically generated

**Floyd’s Linked List:**

A screenshot of a computer

Description automatically generated

**TEST CASE 3:**

**Dijkstra’s 2D Array:**

A screenshot of a computer screen

Description automatically generated

**Dijkstra’s Linked List:**

A screenshot of a computer

Description automatically generated

**Floyd’s 2D Array:**

A screenshot of a computer

Description automatically generated  
**Floyd’s Linked List:** A screenshot of a computer program

Description automatically generated