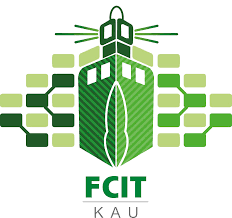
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**KING ABDUL AZIZ UNIVERSITY**

**COLLEGE OF COMPUTING AND INFORMATION**

**TECHNOLOGY DEPARTMENT OF INFORMATION SYSTEM**

**CPCS 324: Algorithms and Data Structures (II)**

**Spring 2021**

**Group Project**

**Students:**

|  |  |  |
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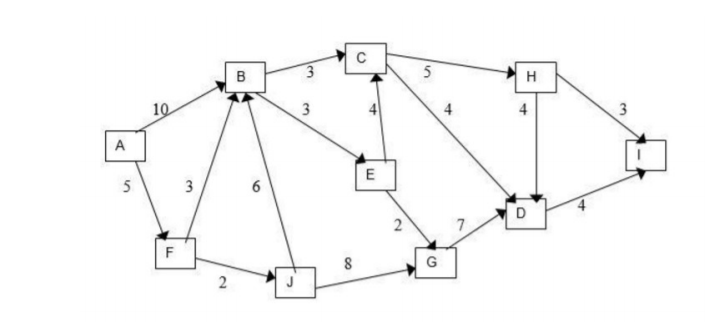
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# **Phase 1: Floyd’s algorithm**

## **Introduction**

Floyd’s Algorithm is used to find the all-pairs shortest paths in a weighted graph. This algorithm operates on both directed and non-directed weighted graphs. But it does not work with graphs with negative cycles, where the sum of the edges in a cycle is negative. The algorithm serves variant applications such communications, transportation networks and motion planning in computer games. The algorithm operates by generating n x n distance matrices D and starting from the weight matrix as the first distance matrix.

## **The problem in question**



## **Screenshots of the outputs**

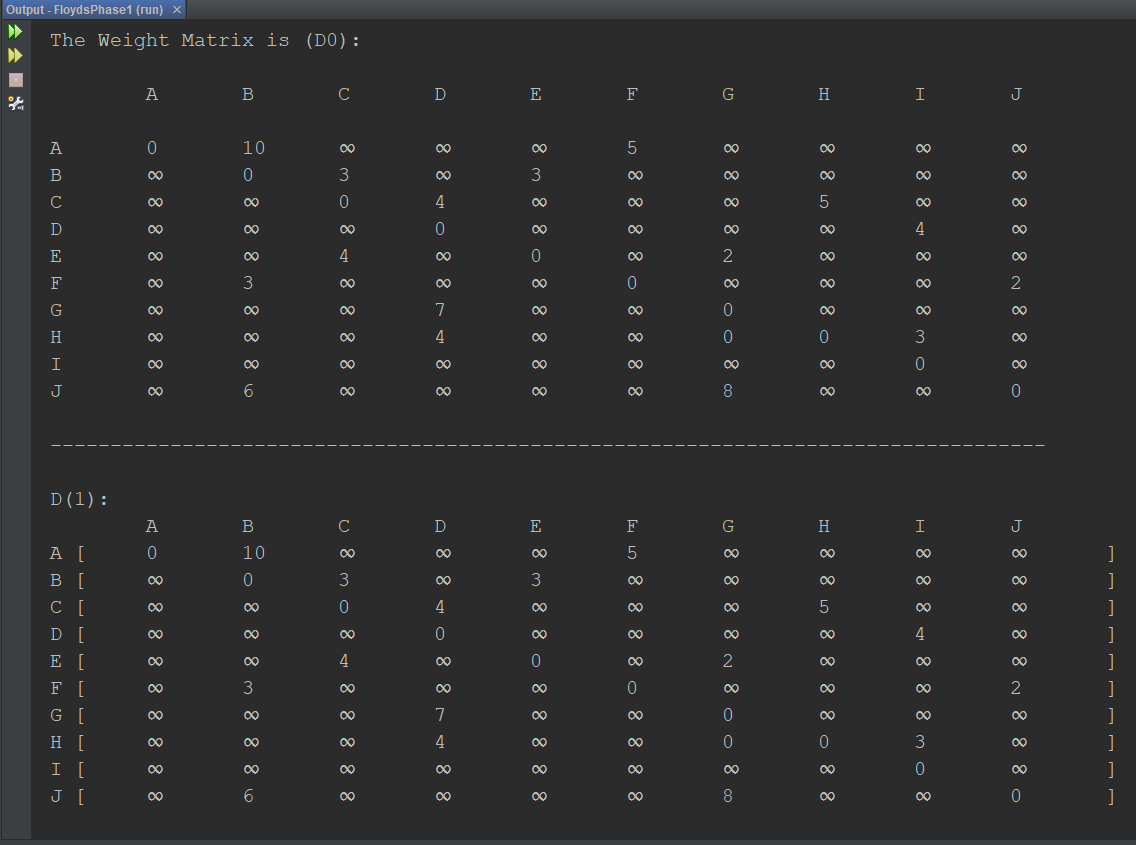


Figure 1: D(0) and D(1)

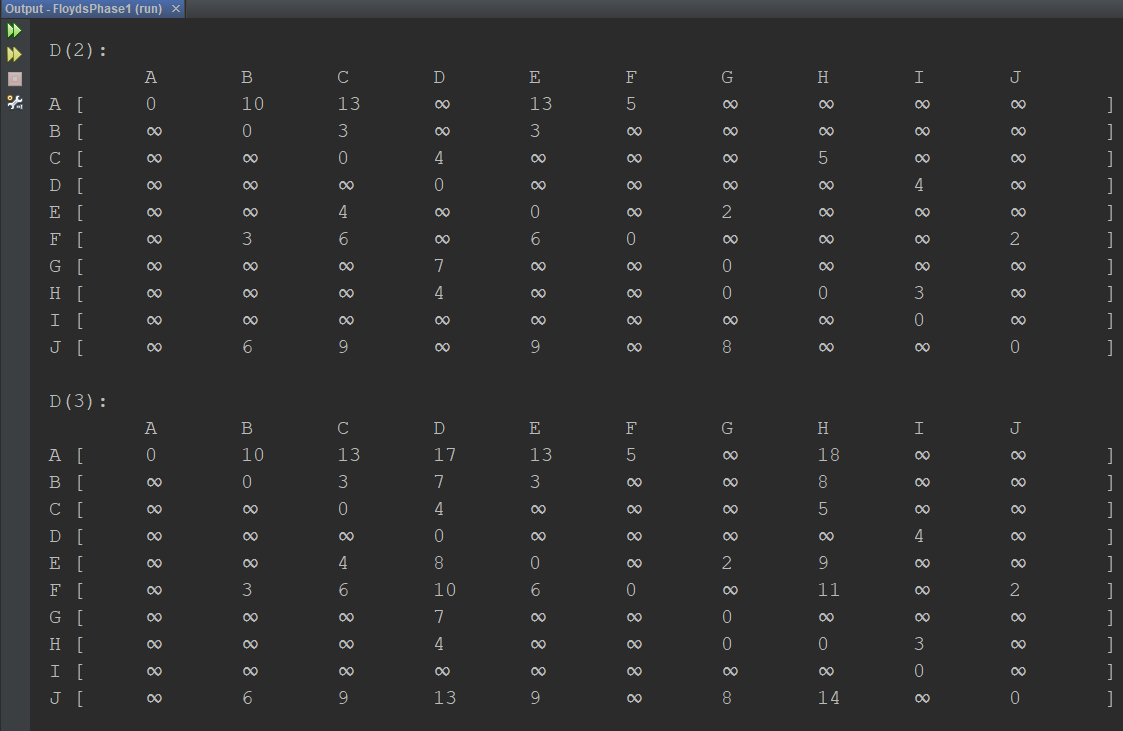


Figure 2: D(2) and D(3)

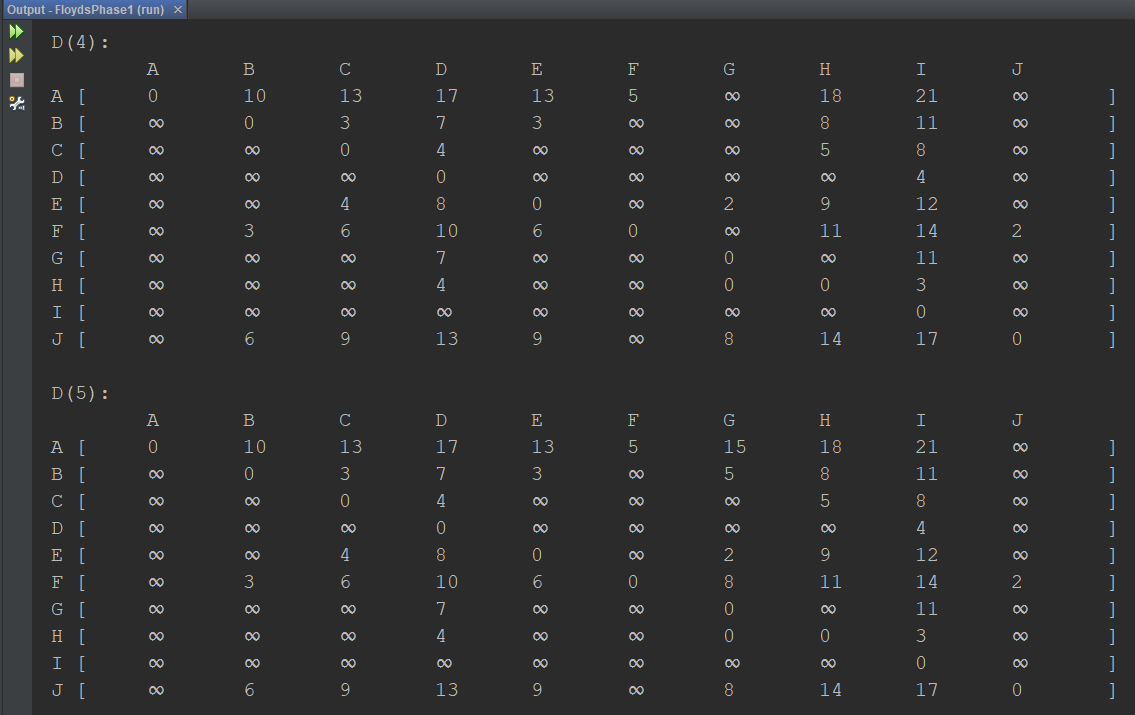


Figure 3: D(4) and D(5)

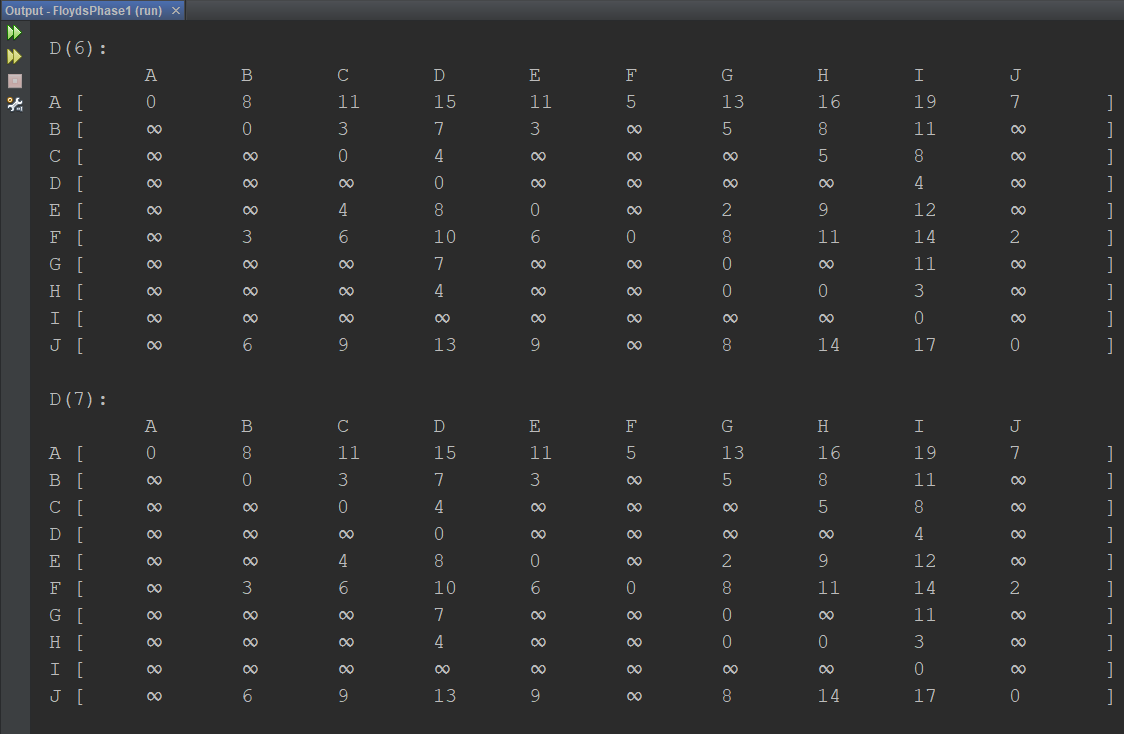


Figure 4: D(6) and D(7)

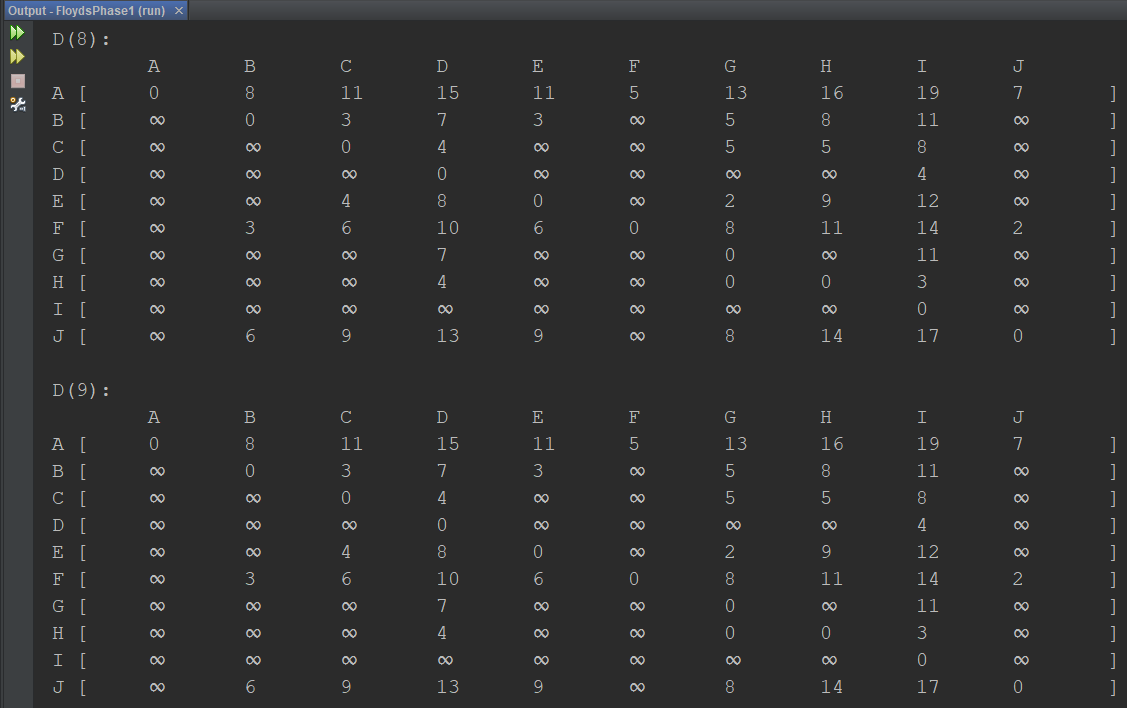


Figure 5: D(8) and D(9)

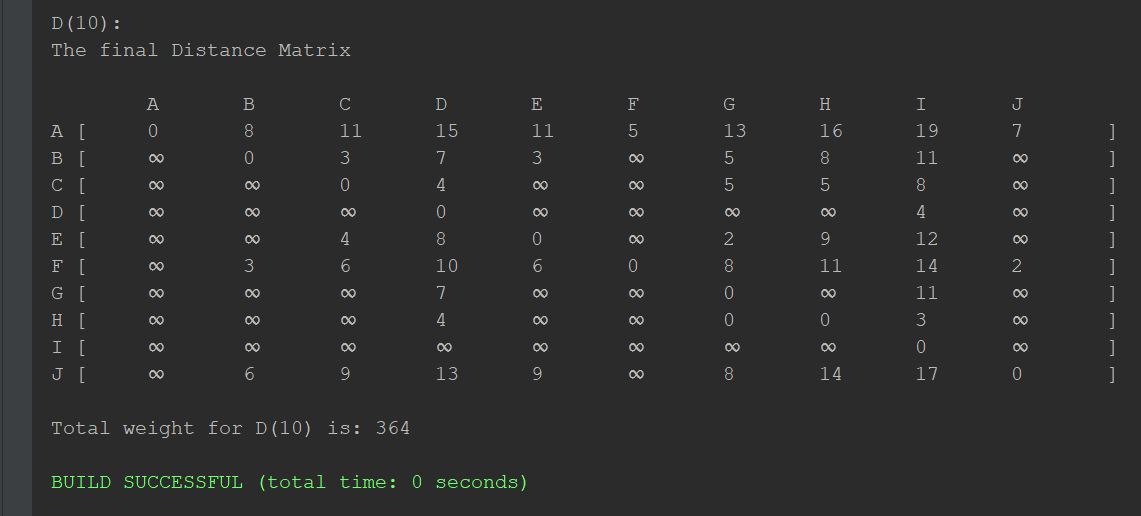


Figure 6: D(10) the final distance matrix

## **Difficulties faced during the phase design**

The algorithm was straightforward and easy to implement, and no complications were run into.

## **Conclusion**

The Floyd-Warshall algorithm depends on the number of vertices and does not depend on the number of edges. The algorithm will generate n matrices for n vertices. The Algorithm’s main operation is in its most nested loop and has a complexity of O(n3).