



Ain Shams University  
Faculty of Engineering  
Computer Engineering and Software Systems

CSE 332: Design and Analysis of Algorithms – Spring 2022

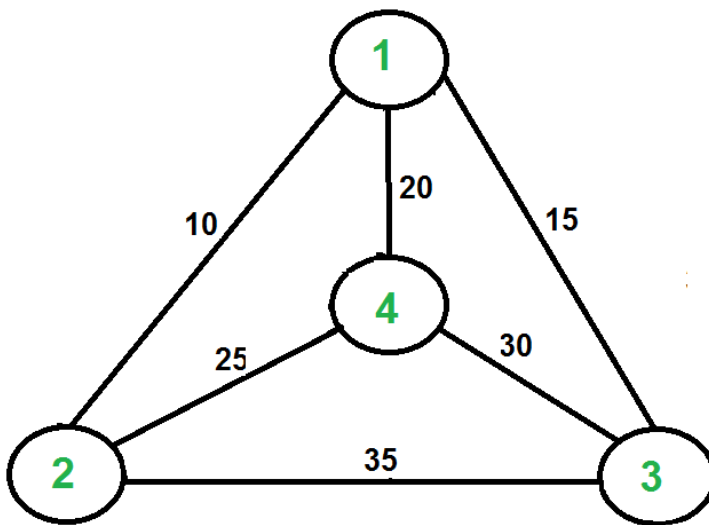
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1- Greedy Algorithms in Operating Systems:

- First Fit algorithm in Memory Management
- Best Fit algorithm in Memory Management
- Shortest Job First Scheduling

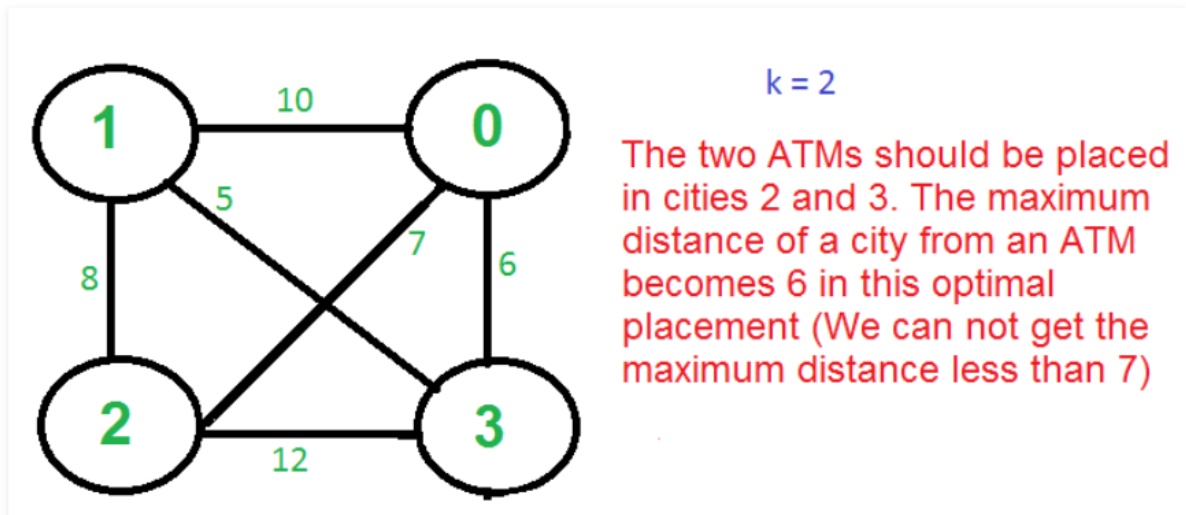
2- Travelling Salesman Problem (TSP): Given a set of cities and distance between every pair of cities, the problem is to find the shortest possible route that visits every city exactly once and returns to the starting point.



3- Given a value  $V$ , if we want to make a change for  $V$ , and we have an infinite supply of each of the denominations of currency, i.e., we have an infinite supply of  $\{ 1, 2, 5, 10, 20, 50, 100, 500, 1000 \}$  valued coins, what is the minimum number of coins and/or notes needed to make the change?

4- Given  $n$  cities and distances between every pair of cities, select  $k$  cities to place warehouses (or ATMs or Cloud Server) such that the maximum distance of a city to a warehouse (or ATM or Cloud Server) is minimized.

For example, consider the following four cities, 0, 1, 2 and 3 and distances between them, how do place 2 ATMs among these 4 cities so that the maximum distance of a city to an ATM is minimized.



- 5- Huffman coding is a lossless data compression algorithm. The idea is to assign variable-length codes to input characters, lengths of the assigned codes are based on the frequencies of corresponding characters. The most frequent character gets the smallest code and the least frequent character gets the largest code.