

Edmonds–Karp

The Ford–Fulkerson method using a **DFS** to find augmenting paths takes $O(Ef)$ where E is the number of edges and f is the max flow.

The Edmonds–Karp algorithm uses a **Breadth First Search (BFS)** to find augmenting paths which yields an arguably better time complexity of $O(VE^2)$. The major difference in this approach is that the time complexity no longer depends on the

Shortest augmenting path

The **Edmonds–Karp algorithm** can also be thought of as a method of augmentation which repeatedly **finds the shortest augmenting path** from $s \rightarrow t$ in terms of the number of edges used each iteration.

Using a BFS to find augmenting paths ensures that the shortest path from $s \rightarrow t$ is found every iteration.

Bipartite Graph

A **bipartite graph** is one whose *vertices* can be split into two independent groups U , V such that every edge connects between U and V .

Other definitions exist such as: The graph is two colourable or there is no cycle with an odd length.



