# A\* Algorithm Explanation

This document explains the working of the A\* (A-star) pathfinding algorithm in a simple and student-friendly way. The A\* algorithm is used to find the shortest path between a start node and a goal node in a weighted graph. It combines the advantages of Dijkstra’s algorithm and Greedy Best-First Search by using a heuristic function (h) to estimate the cost from a node to the goal.

In this version of the code:  
- The graph is represented using an adjacency list.  
- Each node has neighbors with edge weights.  
- The algorithm maintains two sets: open\_list (nodes to explore) and closed\_list (nodes already explored).  
- It keeps track of the actual cost (g) and heuristic estimate (h) to calculate f = g + h.  
- The node with the lowest f value is expanded next.  
- Once the goal node is reached, the algorithm reconstructs the shortest path using parent pointers.

