This project implements the A* (A-star) algorithm for pathfinding in various types of graphs. The A* algorithm is an informed search algorithm that finds the shortest path between two nodes in a graph, using a heuristic function to guide the search.

How it works:

1. Start at the initial node, setting its g-score (actual cost from start) to zero and calculating its f-score (estimated total cost) using a heuristic function.
2. Add the start node to an open set (priority queue) of nodes to be evaluated.
3. While the open set is not empty:
    - Select the node with the lowest f-score from the open set.
    - If this node is the goal, reconstruct and return the path.
    - Move the current node from the open set to a closed set.
    - For each neighbor of the current node:
        - If the neighbor is in the closed set, skip it.
        - Calculate a tentative g-score for the neighbor.
        - If this g-score is better than any previously known g-score, or if the neighbor is not in the open set:
            1. Update the neighbor's g-score and f-score.
            2. Set the current node as the neighbor's parent for path reconstruction.
            3. If the neighbor is not in the open set, add it.
4. If the open set is empty and the goal hasn't been reached, return null (no path exists).

Currently, the implementation of this feature contains a logic bug that causes the calculation of this algorithm to deviate from its intended functionality.

Algorithm expected outcomes:

- For the string graph provided in the code (A-B-E, A-C-D-E, and A-B-D-E paths), the optimal path from node A to node E should be [A, C, D, E], and its total distance should be 6.
- For the integer graph (1-2-4-5 and 1-3-4-5), the optimal path from node 1 to node 5 should be [1, 3, 4, 5], and its total distance should be 5.
- For the 5x5 grid graph, the optimal path from (0,0) to (4,4) should be a diagonal-like path with a total of 8 steps, avoiding any obstacles if present.

Algorithm actual outcomes:

- For the string graph provided in the code (A-B-E, A-C-D-E, and A-B-D-E paths), the path found from node A to node E is [A, B, E], and its total distance is 7.
- For the integer graph (1-2-4-5 and 1-3-4-5), the path found from node 1 to node 5 is [1, 3, 4, 5], and its total distance is 5.
- For the 5x5 grid graph, the path found from (0,0) to (4,4) is [(0,0), (1,0), (2,0), (3,0), (4,0), (4,1), (4,2), (4,3), (4,4)], with a total of 8 steps.