```
In [ ]: # Weighted Graph
        import networkx as nx
        import matplotlib.pyplot as plt
        # Define the environment as a grid
        board = [
            ['A', 'D', 'D', 'D', 'D', 'D', 'D', 'D'],
            ['D', 'W', 'W', 'D', 'W', 'W', 'W', 'D'],
            ['D', 'w', 'D', 'D', 'D', 'D', 'W', 'D'],
            ['D', 'D', 'D', 'W', 'E', 'W', 'D', 'D', 'D'],
            ['D', 'W', 'D', 'W', 'G', 'W', 'D', 'W', 'D'],
            ['D', 'W', 'D', 'D', 'W', 'D', 'D', 'W', 'D'],
            ['D', 'D', 'D', 'D', 'D', 'D', 'D', 'D']
        # Create a weighted graph
        G = nx.Graph()
        # Add vertices (nodes) representing each cell in the grid
        for i in range(len(board)):
            for j in range(len(board[0])):
                G.add_node((i, j))
        # Define actions and their corresponding rewards
        actions = {
            (0, 1): 1, # Up
            (0, -1): -1, # Down
            (-1, 0): -1, # Left
            (1, 0): -1 # Right
        # Add edges representing actions with their corresponding rewards
        for i in range(len(board)):
            for j in range(len(board[0])):
                if board[i][j] != 'W': # Ignore walls
                    for action, reward in actions.items():
                        new_i, new_j = i + action[0], j + action[1]
                        if (0 <= new_i < len(board) and 0 <= new_j < len(board[0]) and</pre>
                                board[new_i][new_j] != 'W'): # Ensure not to go out of bounds or onto walls
                            G.add_edge((i, j), (new_i, new_j), weight=reward, action=action)
        # Draw the graph
        pos = {(i, j): (j, -i) for i in range(len(board)) for j in range(len(board[0]))} # Position vertices
        nx.draw(G, pos, with_labels=True, node_size=700, node_color='lightblue', font_size=8, font_weight='bold')
        edge_labels = {(u, v): f"{d['weight']} ({d['action']})" for u, v, d in G.edges(data=True)}
        nx.draw_networkx_edge_labels(G, pos, edge_labels=edge_labels)
        plt.title("Weighted Graph representing the Environment")
        plt.gca().invert_yaxis() # Invert y-axis to match grid coordinates
        plt.show()
                         Weighted Graph representing the Environment
             (6, 0) (0, -(6, 1) (0, -(6, 2) (0, -(6, 3) (0, -(6, 4) (0, -(6, 5) (0, -(6, 6) (0, -(6, 7) (0, -(6, 8)
                                                           (5, 5) ((0,
             (5, 0)
                                (5, 2) (0,
                                                                              (5, 7)
                                                                                       (5, 8)
                      (5, 1)
                                                                    (5, 6)
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(6,0)[(0,-6,1)](0,-6,2)[(0,-6,3)](0,-6,4)[(0,-6,5)](0,-6,6)[(0,-6,7)](0,-6,8)
(5,0) (5,1) (5,2)[(0,-6,3)] (5,4) (5,5)[(0,-6,6)] (5,7) (5,8)
(1,0) (4,1) (4,2) (4,3) (4,4) (4,5) (4,6) (4,7) (4,8)
(1,0) (0,-3,1)[(0,-3,2) (3,3) (3,4) (3,5) (3,6)[(0,-3,7)](0,-3,8)
(1,0) (0,-2,1)[(0,-2,2)[(0,-2,3)](0,-2,4)[(0,-2,5)](0,-2,5)[(0,-2,6)](0,-2,6)
(1,0) (1,1) (1,2) (1,3) (1,4) (1,5) (1,6) (1,7) (1,8)
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(1,0) (1,0,-2,1)[(0,-2,2)[(0,-2,3)](0,-2,4)[(0,-2,5)[(0,-2,6)](0,-2,6)[(0,-2,7)[(0,-2,8)](0,-2,8)]
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In [ ]: # Q-Table
       import numpy as np
       # Define the dimensions of the grid
       num rows = 7
       num_cols = 9
       num_actions = 4 # Up, Down, Left, Right
       # Initialize the Q-Table with zeros
       q_table = np.zeros((num_rows, num_cols, num_actions))
       # Display the Q-Table
       print("Q-Table:")
       print("State | Action: 0 (Up) | Action: 1 (Down) | Action: 2 (Left) | Action: 3 (Right)")
       print("-" * 81)
       for i in range(num_rows):
           for j in range(num_cols):
               row_str = f''(\{i\},\{j\}) |"
               for k in range(num_actions):
                  row_str += f'' q({i},{j},{k}): {q_table[i, j, k]:.2f} |"
               print(row_str)
      Q-Table:
      State | Action: 0 (Up) | Action: 1 (Down) | Action: 2 (Left) | Action: 3 (Right)
       _____
                                q(0,0,1): 0.00 |
               q(0,0,0): 0.00
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