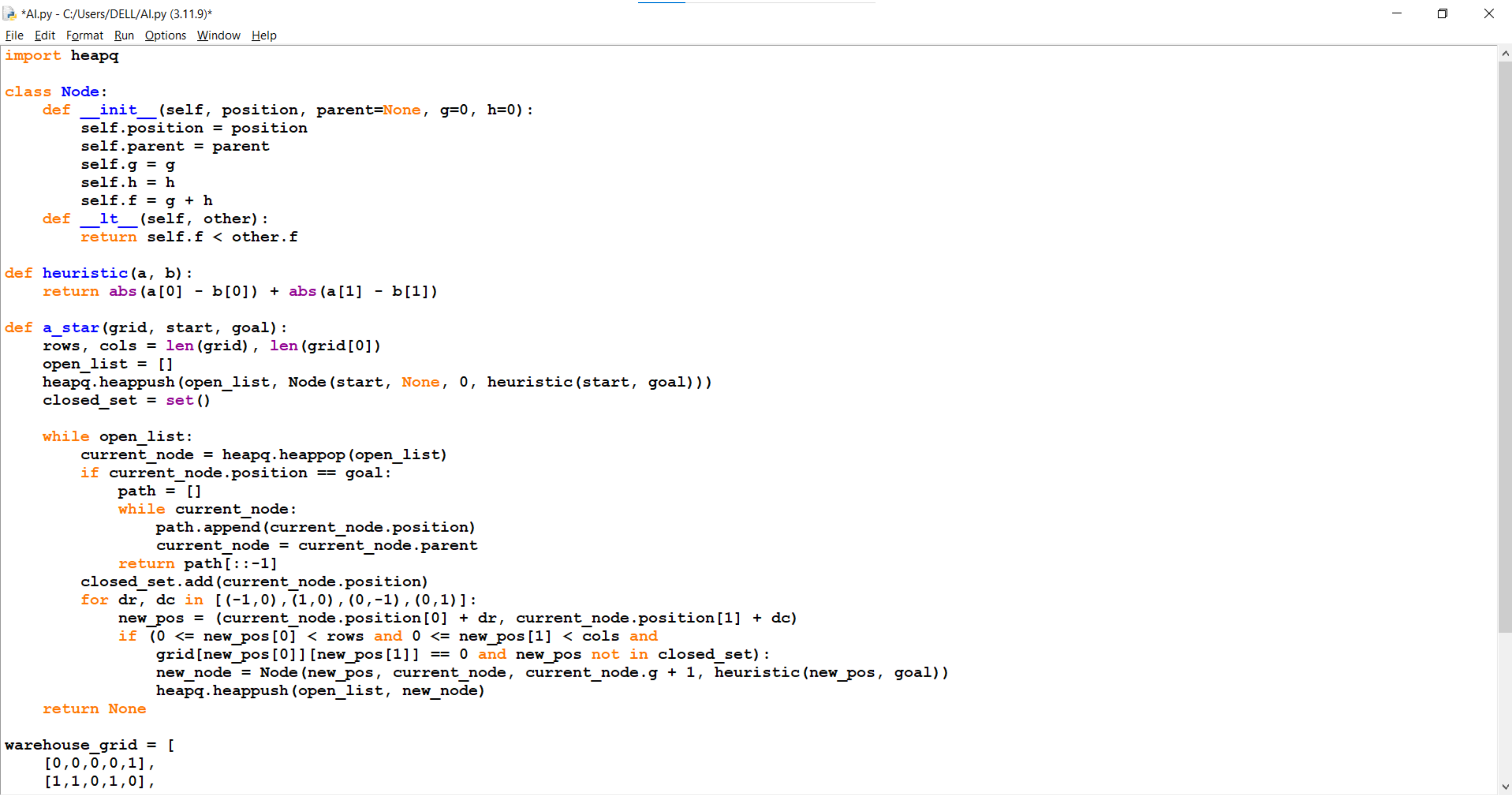
AI.py - C:/Users/DELL/AI.py (3.11.9)
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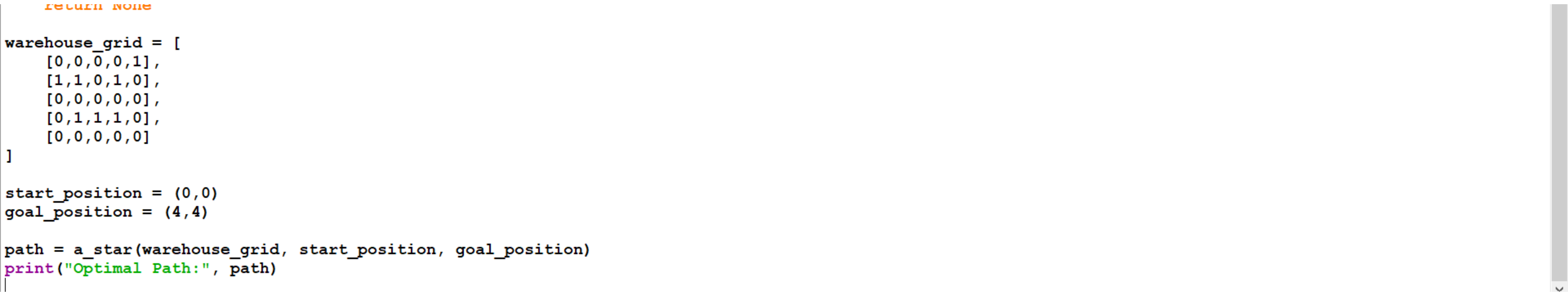
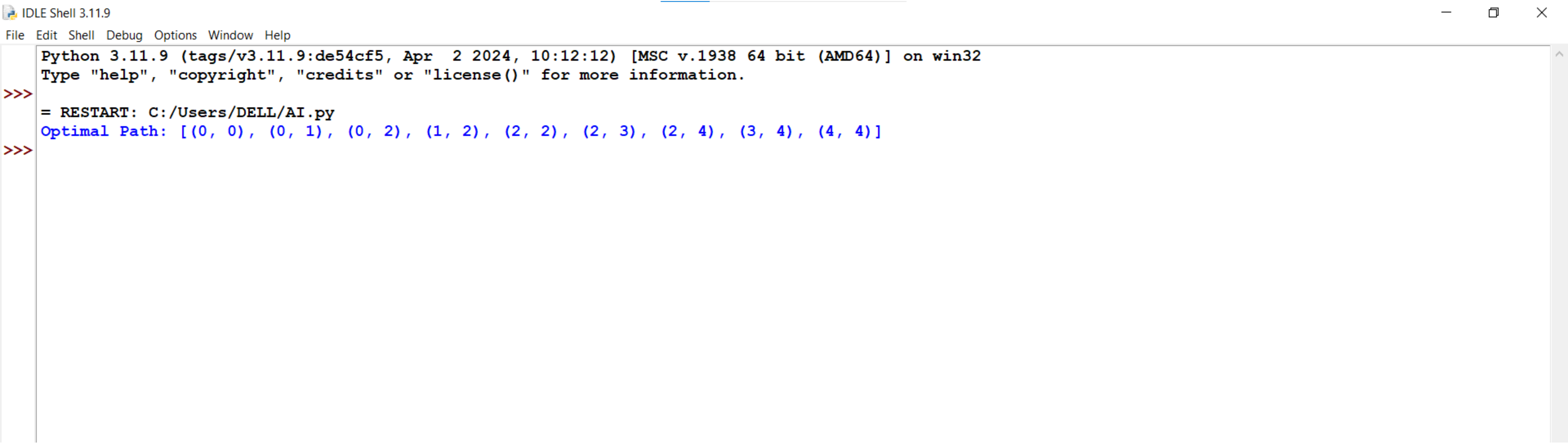
```python
import heapq

class Node:
    def __init__(self, position, parent=None, g=0, h=0):
        self.position = position
        self.parent = parent
        self.g = g
        self.h = h
        self.f = g + h
    def __lt__(self, other):
        return self.f < other.f

def heuristic(a, b):
    return abs(a[0] - b[0]) + abs(a[1] - b[1])

def a_star(grid, start, goal):
    rows, cols = len(grid), len(grid[0])
    open_list = []
    heapq.heappush(open_list, Node(start, None, 0, heuristic(start, goal)))
    closed_set = set()

    while open_list:
        current_node = heapq.heappop(open_list)
        if current_node.position == goal:
            path = []
            while current_node:
                path.append(current_node.position)
                current_node = current_node.parent
            return path[::-1]
        closed_set.add(current_node.position)
        for dr, dc in [(-1,0),(1,0),(0,-1),(0,1)]:
            new_pos = (current_node.position[0] + dr, current_node.position[1] + dc)
            if (0 <= new_pos[0] < rows and 0 <= new_pos[1] < cols and
                grid[new_pos[0]][new_pos[1]] == 0 and new_pos not in closed_set):
                new_node = Node(new_pos, current_node, current_node.g + 1, heuristic(new_pos, goal))
                heapq.heappush(open_list, new_node)
    return None

warehouse_grid = [
    [0,0,0,0,1],
    [1,1,0,1,0],
```



```
    return None

warehouse_grid = [
    [0,0,0,0,1],
    [1,1,0,1,0],
    [0,0,0,0,0],
    [0,1,1,1,0],
    [0,0,0,0,0]
]

start_position = (0,0)
goal_position = (4,4)

path = a_star(warehouse_grid, start_position, goal_position)
print("Optimal Path:", path)
```



```
Python 3.11.9 (tags/v3.11.9:de54cf5, Apr  2 2024, 10:12:12) [MSC v.1938 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:/Users/DELL/AI.py
Optimal Path: [(0, 0), (0, 1), (0, 2), (1, 2), (2, 2), (2, 3), (2, 4), (3, 4), (4, 4)]
>>>
```