Open Ended Lab for Artificial Intelligence Course

Time: 1 Hour

Tools: Python / Jupyter / Colab

☑ Scenario

You are a data analyst for a disaster management unit. You are given a dataset of shelters and their population capacity. Roads between shelters form a graph. In case of an emergency at any shelter, you must find the nearest alternate shelters using Breadth-First Search (BFS).

🗀 Provided Dataset

Filename: shelter_data.csv

◈ Part 1: Data Handling with Pandas

- Load the shelter data using Pandas.

- Print all shelters with capacity less than 200.

- Show the shelter with the highest capacity.

◈ Part 2: Graph Representation

Represent the road connections between shelters as a dictionary (adjacency list):

```
roads = {
   'S1': ['S2', 'S3'],
   'S2': ['S1', 'S4'],
   'S3': ['S1', 'S5'],
   'S4': ['S2'],
   'S5': ['S3']
}
```

Part 3: Implement BFS

Write a function find_reachable_shelters(roads, start) that performs BFS and returns shelter IDs reachable from the start shelter.

Bonus Task: Integrated Analysis

After BFS, display only those reachable shelters whose capacity is above 200.