import matplotlib.pyplot as plt﻿import numpy as np﻿import random﻿# Grid size﻿rows, cols = 10, 10﻿# Define zoning types﻿zones = {﻿    0: 'Residential',﻿    1: 'Commercial',﻿    2: 'Industrial',﻿    3: 'Park'﻿}﻿# Generate random zoning map﻿def generate\_zoning\_map(rows, cols):﻿    return np.random.choice(list(zones.keys()), size=(rows, cols))﻿# Visualize the zoning map﻿def plot\_city(zoning\_map):﻿    color\_map = {﻿        0: 'lightblue',   # Residential﻿        1: 'orange',      # Commercial﻿        2: 'gray',        # Industrial﻿        3: 'green'        # Park﻿    }﻿    fig, ax = plt.subplots(figsize=(8, 8))﻿    for i in range(zoning\_map.shape[0]):﻿        for j in range(zoning\_map.shape[1]):﻿            zone = zoning\_map[i, j]﻿            ax.add\_patch(plt.Rectangle((j, rows - i - 1), 1, 1, color=color\_map[zone], edgecolor='black'))﻿            ax.text(j + 0.5, rows - i - 0.5, zones[zone], ha='center', va='center', fontsize=8)﻿    ax.set\_xlim(0, cols)﻿    ax.set\_ylim(0, rows)﻿    ax.set\_xticks([])﻿    ax.set\_yticks([])﻿    ax.set\_title("Simple Urban Zoning Layout")﻿    plt.grid(True)﻿    plt.show()﻿# Run the simulation﻿zoning\_map = generate\_zoning\_map(rows, cols)﻿plot\_city(zoning\_map)