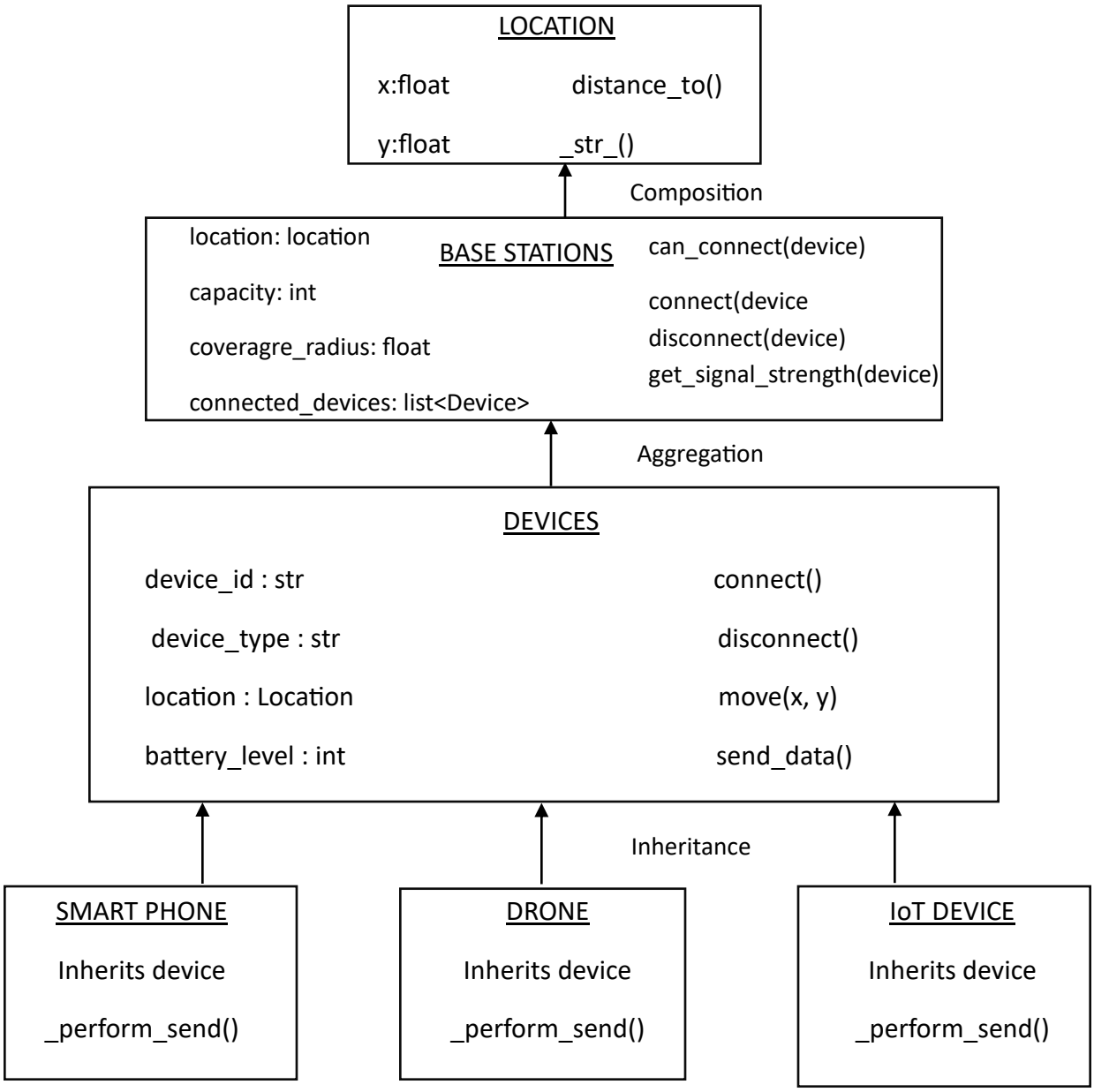
TIE OOP- GROUP 4 : CLASS FLOW DIAGRAM



- Base station contains location(composition) and manages multiple devices (aggregation)

GUI INSTRUCTION MANUAL

1. System Requirements

Install Python 3.8 or higher

Works on Windows, Linux, or macOS

No internet connection required

2. Setup Instructions

Open Notepad and paste the simulator Python code

Save the file as: mini_5g_simulation.py

Set Save as type → All Files

3. Running the Simulation

Open Command Prompt ,navigate to the file location: cd Desktop\mini_5g_simulation

Run the program: python mini_5g_simulation.py

4. Simulation Walkthrough

The simulation code: creates base stations with fixed coverage and capacity, registers different device types (SmartPhone, IoTDevice, Drone), automatically connects devices to available base stations, calculates signal strength based on distance and load, simulates data transmission using polymorphism, demonstrates mobility and automatic handover and shows encapsulated device information

5. Using the Simulatoion

The simulation runs automatically. nThe user only observes output at the console and modifies device locations or add devices/base stations to test different scenarios

6. Key Features Demonstrated

Object-Oriented Programming principles

Device mobility and handover

Signal strength management

Error handling for out-of-range and capacity limits

Encapsulation and polymorphism

7. Ending the Program

The program ends automatically after completing the demo

ASSUMPTIONS AND LIMITATIONS OF THE SIMULATION

Assumptions

- Flat 2D environment
- Circular base station coverage
- Instant handover
- No packet loss modeling
- Constant battery level

Limitations

- No real 5G protocol stack
- No interference modeling
- Console-only output
- No real-time simulation

DEMO OUTPUT