

Explanation

Encapsulation:

- All fields are private. Variables are only accessible through getter and setter methods.

Inheritance:

- Customer, Driver, and Admin extend User. to reuse (UUID id, String username)

Polymorphism:

- For our future CLI we will use different fields from the User class for each user type.

Abstraction:

- User class is abstract and has abstract methods for each user type.
- Orders exposes place/acceptNext/markStatus/get while hiding its Map and ArrayDeque

Data Structures:

byId: Map<UUID, Order> - to store orders by their ID and have O(1) lookup time.

intake: ArrayDeque<UUID> - to store orders in the order they were placed and have O(1) insertion and removal time. FIFO (First In, First Out)

List<OrderItem> (inside Order) - to store the items in the order.

UUID (User, Order, Driver, Customer, Admin) - to identify each object uniquely and control access to them in a secure way.

Overall Complexity:

Time Complexity: O(1) for all operations. (atm)

Space Complexity: O(n) for the map and queue.

Class Diagram

