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Task 1: ER Diagram

Assumptions and Relationship Explanation:

1. A package can be claimed by only one member, and not all members will have packages to claim.
2. A member can claim multiple packages and not all packages have been claimed.
3. Partial participation because there may be warehouses without any links.
4. There ay be new warehouses in the future which currently does not have any packages. Thus, there will be warehouses without packages and hence partial participation.
5. Assumption that some package that require express delivery will be shipped directly to the locker and won't be in any warehouse.
6. Some service areas will not have sub-areas.
7. Area names might not be unique.
8. One group order may require more than one locker cell, and some locker cells might be isolated/reserved.
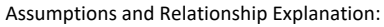9. Every locker delivery order must have locker_cell chosen

*Composite service area: A service area with sub-service area.

Task 2:
Relational Table Schema

Member(<u>memberID</u>, name, email, contactNumber)
        Foreign Keys: None
Package(<u>companyName, packageID</u>, memberID, houseID, orderID)
        Foreign Key: {memberID} referencing Member, {houseID} referencing Warehouse, {orderID} referencing Group_Order
Warehouse(<u>houseID</u>)
        Foreign Key: None
Warehouse_Transport_Links(<u>houseID, houseID</u>)   \\Note: the first houseID is in the "from" column, and the second is in the "to" column.
        Foreign Key: {houseID} referencing Warehouse
Package_Warehouse_Arrival(<u>packageID, houseID</u>, arrivalTime, arrivalDate)
        Foreign Key: {packageID} referencing Package, {houseID} referencing Warehouse
Group_Order(<u>orderID</u>, memberID)
        Foreign Key: {memberID} referencing Member
Home_Delivery_Order(<u>orderID</u>, address)
        Foreign Key: {orderID} referencing Group_Order
Locker_Delivery_Order(<u>orderID</u>)
        Foreign Key: {orderID} referencing Group_Order
Service_Area(<u>areaID</u>, areaName)
        Foreign Key: None
Sub_Area(<u>areaID, areaID</u>) \\Note: the first areaID is in the "composite-area" column, and the second is in the "sub-service-area" column.
        Foreign Key: {areaID} referencing Service_Area
Locker(<u>lockerID</u>, areaID)
        Foreign Key: {areaID} referencing Service_Area
Locker_Cell(<u>lockerID, locker_cell_id</u>, orderID)
        Foreign Key: {lockerID} referencing Locker, {orderID} referencing Locker_Delivery_Order