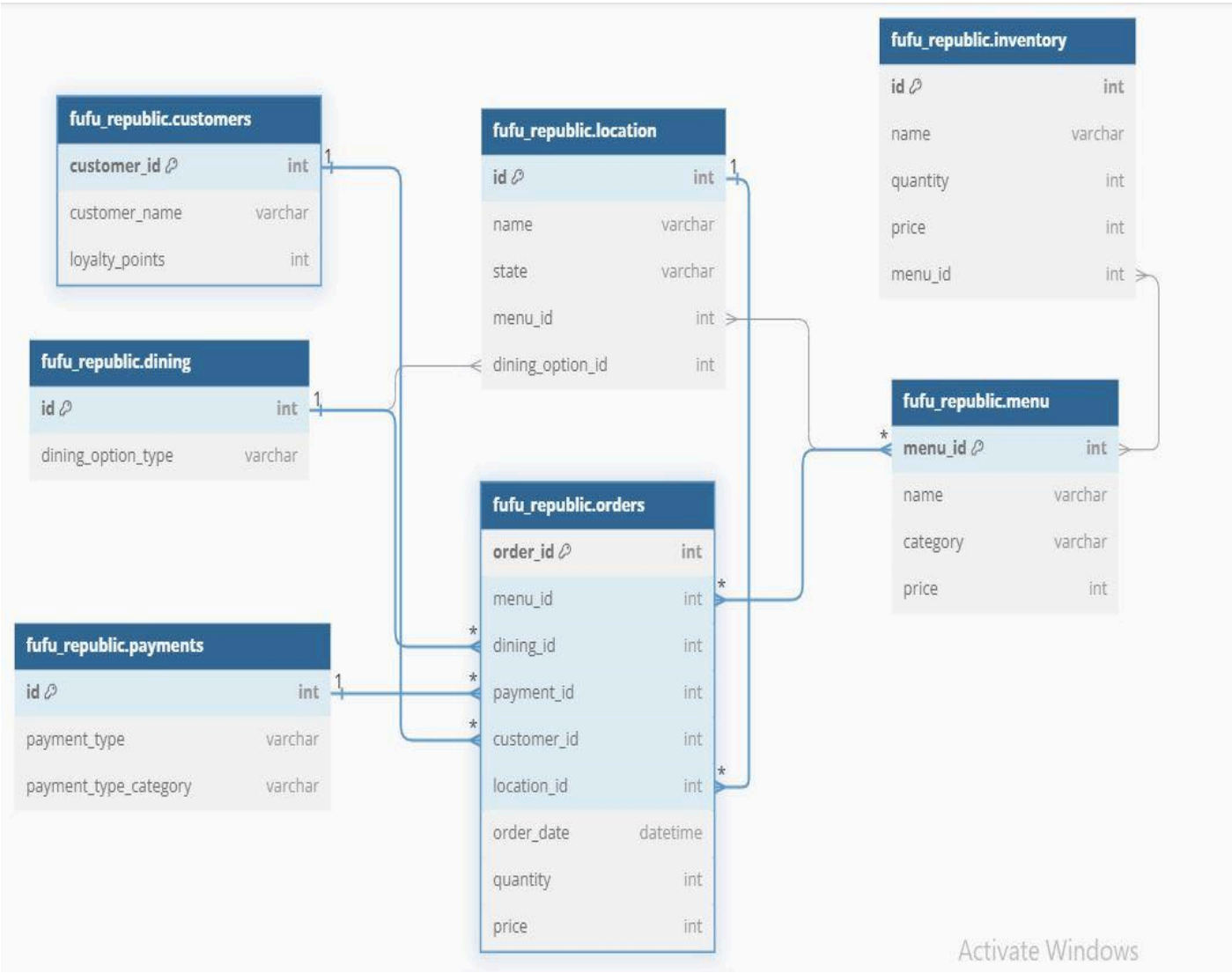
Data Modelling for Fufu Republic

As a recently hired data engineer at Fufu Republic, you have been tasked with developing a dimensional model to address the business's needs for data-driven decision-making.

1. Map out the necessary entities ,relationships and constraints: This should be a model (Any degree of abstraction is okay)

ERD Diagram View



Entities:

- **Locations**: Represents different restaurant outlets (e.g., Lekki, Agege, etc.)
- **Menu**: Represents food and beverage items sold at the restaurant (e.g., Chinese Rice, Fufu, etc.)
- **Customers**: Represents individuals who place orders either online or in-store.
- **Inventory:** Represents items used to prepare the menu at different locations.
- **Payments**: Represents payment details, including payment methods like cash, card, or online payment gateways.
- **Dining**: Represents if customer dined in or ordered take out
- **Orders**: Represents an individual transaction, linking to specific customers, menu items, locations, payment methods.

Relationships:

- **Location-Menu:** Many-to-many relationship.
- **Location-Dining:** Many-to-one relationship
- **Inventory-Menu**: Many-to-many relationship
- **Customer-Order**: One-to-many relationship (one customer can place multiple orders).
- **Order-Payment**: Many-to-one relationship (each order has a single payment).
- **Order-Menu**: Many-to-many relationship (an order can have multiple items, and each item can appear in multiple orders).
- **Order-Dining**: Many-to-one relationship
- **Order-Location:** Many-to-many relationship

Constraints:

- **Location Constraints**: Each branch can only offer menu items that are part of its localized menu.
- **Inventory Constraints**: Stock levels should be automatically updated after each order is placed.
- **Order Constraints**: An order can only be placed if there is sufficient stock in the corresponding branch's inventory.

2. Identify a business process of your choice

Business Process: Sales Tracking Across Locations

Business Questions:
What are the sales trends across branches for dine-in, take-out, and online orders?

Which menu items are most popular at each location?

What payment methods are most commonly used?

How does demand for specific items fluctuate across time periods (e.g., day, week, month)?

How can inventory management be optimized based on sales data?

Identify the grain, dimensions and fact

Grain:

Each individual order at a branch, containing one or more menu items, tied to a specific payment method and customer.

Dimensions:

Location: Attributes- id, name, city/area, menu_id, dining_option_id.
Menu: Attributes- menu_id, name, category (e.g., Fufu, Chinese Rice), price.
Customer: Attributes- customer_id, name, loyalty_points
Inventory: Attributes- id, name, quantity, price, menu_id
Payment: Attributes- id, payment_type, payment_type_category(cash, POS, online)
Dining: Attributes- id, dining_option_type (dine-in, take-out, online).

Facts:

Orders Table

- **Grain**: Each individual order placed, type of payment used, quantity ordered, total amount paid, and inventory depletion (used for managing stock)
- **Attributes:** order_id (PK), location_id (FK), menu_id (FK), customer_id (FK), payment_id (FK), location_id (FK), order_date, quantity, price

This dimensional model enables Fufu Republic to track and analyze its sales trends, payment methods, and customer behavior across multiple branches and payment platforms, thus optimizing inventory management and personalizing promotions.