

Classes

1. **User** (Abstract Class):
 - a. **Attributes:**
 - i. **uniqueIdentifier**: String
 - ii. **name**: String
 - iii. **phoneNumber**: String
 - iv. **email**: String
 - b. **Methods:**
 - i. **createAccount()**: void
 - ii. **authenticate()**: void
2. **Restaurant** (subclass of User):
 - a. **Attributes:**
 - i. **location**: String (composite of address, city, state, postal code)
 - ii. **menu**: Menu
 - b. **Methods:**
 - i. **updateMenu(menuItem: MenuItem, operation: String)**: void
(handles CRUD operations)
 - ii. **receivePayment(payment: Payment)**: void
3. **Diner** (subclass of User):
 - a. **Attributes:**
 - i. **dietaryPreferences**: String
 - ii. **paymentMethods**: List<PaymentMethod> (complex type, not a class)
 - b. **Methods:**
 - i. **placeOrder(order: Order)**: void
 - ii. **browseMenu(restaurant: Restaurant)**: List<MenuItem>
4. **Menu**:
 - a. **Attributes:**
 - i. **items**: List<MenuItem>
 - b. **Methods:**
 - i. **addItem(item: MenuItem)**: void
 - ii. **removeItem(item: MenuItem)**: void
 - iii. **updateItem(item: MenuItem)**: void
 - iv. **getItem(id: String)**: MenuItem
 - v. **listAvailableItems()**: List<MenuItem>
5. **MenuItem**:
 - a. **Attributes:**
 - i. **uniqueIdentifier**: String

- ii. **name**: String
 - iii. **ingredients**: String (aggregated details)
 - iv. **dietarySpecifications**: String
 - v. **category**: Category (enumeration: APPETIZER, ENTREE, DESSERT)
 - vi. **price**: Double
 - vii. **isAvailable**: Boolean
 - b. **Methods**:
 - i. **markAvailability(status: Boolean)**: void
6. **Order**:
- a. **Attributes**:
 - i. **uniqueIdentifier**: String
 - ii. **items**: List<MenuItem>
 - iii. **timestamp**: DateTime
 - iv. **tableNumber**: String
 - v. **orderStatus**: OrderStatus (enumeration: PENDING, IN_PROGRESS, COMPLETED, CANCELED)
 - vi. **paymentStatus**: PaymentStatus (enumeration: UNPAID, PAID, REFUNDED)
 - b. **Methods**:
 - i. **updateOrderStatus(status: OrderStatus)**: void
 - ii. **updatePaymentStatus(status: PaymentStatus)**: void
7. **Payment**:
- a. **Attributes**:
 - i. **amount**: Double
 - ii. **paymentMethod**: PaymentMethod (enumeration: CARD, APPLE_PAY, GOOGLE_PAY)
 - iii. **transactionStatus**: TransactionStatus (enumeration: SUCCESSFUL, FAILED, PENDING)
 - b. **Methods**:
 - i. **processPayment()**: void
 - ii. **refundPayment()**: void

Relationships

1. Restaurant has a one-to-one relationship with Menu. Each restaurant has one menu, and each menu is associated with one restaurant.
2. Menu has a one-to-many relationship with MenuItem. A menu comprises multiple menu items.

3. Diner has a one-to-many relationship with Order. A diner can place multiple orders.
4. Order has a many-to-many relationship with MenuItem. An order can contain multiple menu items, and a menu item can be part of multiple orders.
5. Order has a one-to-one relationship with Payment. Each order initiates one payment process.
6. Restaurant and Diner are subclasses of User, indicating a generalization relationship where both restaurant and diner accounts share common attributes from the User class but also have unique features.

Enumerations

1. **OrderStatus**: PENDING, IN_PROGRESS, COMPLETED, CANCELED
2. **PaymentStatus**: UNPAID, PAID, REFUNDED
3. **TransactionStatus**: SUCCESSFUL, FAILED, PENDING
4. **PaymentMethod**: CARD, APPLE_PAY, GOOGLE_PAY