Database Table Diagram – Online Supermarket Chain

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1. country

Stores all countries where the company operates.

Attribute	Data Type	Constraints
country_id	INT	PRIMARY KEY, AUTO_INCREMENT
country_name	VARCHAR(100)	NOT NULL, UNIQUE
country_code	CHAR(3)	NOT NULL, UNIQUE

Relationships:

- country (1) — (M) city
- country (1) — (M) warehouse
- country (1) — (M) customer (via shipping_country_id)

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2. city

Contains all cities within each country.

Attribute	Data Type	Constraints
city_id	INT	PRIMARY KEY, AUTO_INCREMENT
city_name	VARCHAR(100)	NOT NULL
country_id	INT	FOREIGN KEY → country(country_id), NOT NULL

Relationships:

- city (1) — (M) warehouse
- city (1) — (M) customer

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3. warehouse

Stores information about each warehouse, including its location and capacity, and acts as a central hub for inventory, employees, and order fulfillment.

Attribute	Data Type	Constraints
warehouse_id	INT	PRIMARY KEY, AUTO_INCREMENT
warehouse_name	VARCHAR(150)	NOT NULL
city_id	INT	FOREIGN KEY → city(city_id), NOT NULL
country_id	INT	FOREIGN KEY → country(country_id), NOT NULL

address	VARCHAR(255)	NOT NULL
total_capacity	DECIMAL(10,2)	NULL

Relationships:

- warehouse (1) — (M) warehouse_section
- warehouse (1) — (M) employee
- warehouse (1) — (M) inventory_transaction
- warehouse (M) — (M) order (via order_warehouse)

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4. warehouse_section

Each warehouse is divided into sections (e.g., refrigerated, dry storage). This table defines those sections and their environmental capabilities.

Attribute	Data Type	Constraints
section_id	INT	PRIMARY KEY, AUTO_INCREMENT
warehouse_id	INT	FOREIGN KEY → warehouse(warehouse_id), NOT NULL
section_name	VARCHAR(100)	NOT NULL
section_type	VARCHAR(50)	NOT NULL
has_refrigeration	BOOLEAN	DEFAULT FALSE
has_climate_control	BOOLEAN	DEFAULT FALSE
temperature_min	DECIMAL(5,2)	NULL
temperature_max	DECIMAL(5,2)	NULL

Relationships:

- warehouse_section (1) — (M) section_inventory

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5. product

Stores all products in the catalog, including their category, base price, Stock-keeping Unit (SKU), and any special storage requirements.

Attribute	Data Type	Constraints
product_id	INT	PRIMARY KEY, AUTO_INCREMENT
product_name	VARCHAR(200)	NOT NULL
description	TEXT	NULL
category	VARCHAR(100)	NOT NULL
base_price	DECIMAL(10,2)	NOT NULL

sku	VARCHAR(50)	UNIQUE, NOT NULL
requires_refrigeration	BOOLEAN	DEFAULT FALSE
requires_climate_control	BOOLEAN	DEFAULT FALSE
required_temp_min	DECIMAL(5,2)	NULL
required_temp_max	DECIMAL(5,2)	NULL
reorder_threshold	INT	NOT NULL, DEFAULT 10

Relationships:

- product (1) — (M) section_inventory
- product (1) — (M) inventory_transaction
- product (1) — (M) order_item

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6. section_inventory

Tracks the quantity of each product stored in each warehouse section, representing the real-time inventory of the company.

Attribute	Data Type	Constraints
inventory_id	INT	PRIMARY KEY, AUTO_INCREMENT
section_id	INT	FOREIGN KEY → warehouse_section(section_id), NOT NULL
product_id	INT	FOREIGN KEY → product(product_id), NOT NULL
quantity_available	INT	NOT NULL, DEFAULT 0
last_updated	TIMESTAMP	NOT NULL

Unique: (section_id, product_id)

Relationships:

- section_inventory (M) → (1) product
- section_inventory (M) → (1) warehouse_section

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7. inventory_transaction

Records all product movement (inbound shipments and outbound usage), allowing the system to trackstock adjustments over time.

Attribute	Data Type	Constraints
transaction_id	INT	PRIMARY KEY, AUTO_INCREMENT
warehouse_id	INT	FOREIGN KEY → warehouse(warehouse_id), NOT NULL
product_id	INT	FOREIGN KEY → product(product_id), NOT NULL

transaction_type	VARCHAR(20)	NOT NULL
quantity	INT	NOT NULL
transaction_date	TIMESTAMP	NOT NULL
notes	TEXT	NULL
employee_id	INT	FOREIGN KEY → employee(employee_id), NOT NULL

Relationships:

- inventory_transaction (M) → (1) product
- inventory_transaction (M) → (1) warehouse
- inventory_transaction (M) → (1) employee

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8. employee

Contains employee records, linking each worker to the warehouse where they are assigned.

Attribute	Data Type	Constraints
employee_id	INT	PRIMARY KEY, AUTO_INCREMENT
first_name	VARCHAR(50)	NOT NULL
last_name	VARCHAR(50)	NOT NULL
email	VARCHAR(100)	UNIQUE, NOT NULL
phone	VARCHAR(20)	NULL
warehouse_id	INT	FOREIGN KEY → warehouse(warehouse_id), NOT NULL
position	VARCHAR(100)	NOT NULL
hire_date	DATE	NOT NULL

Relationships:

- employee (M) → (1) warehouse

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9. customer

Stores customer profiles, including their contact information and shipping address for order delivery.

Attribute	Data Type	Constraints
customer_id	INT	PRIMARY KEY, AUTO_INCREMENT
first_name	VARCHAR(50)	NOT NULL
last_name	VARCHAR(50)	NOT NULL
email	VARCHAR(100)	UNIQUE, NOT NULL

phone	VARCHAR(20)	NULL
shipping_address	VARCHAR(255)	NOT NULL
shipping_city_id	INT	FOREIGN KEY → city(city_id), NOT NULL
shipping_country_id	INT	FOREIGN KEY → country(country_id), NOT NULL
registration_date	DATE	NOT NULL

Relationships:

- customer (1) — (M) order

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10. order

Contains all customer orders, including status, tracking information, and important timestamps such as shipping and delivery dates.

Attribute	Data Type	Constraints
order_id	INT	PRIMARY KEY, AUTO_INCREMENT
customer_id	INT	FOREIGN KEY → customer(customer_id), NOT NULL
order_date	TIMESTAMP	NOT NULL
total_amount	DECIMAL(12,2)	NOT NULL
order_status	VARCHAR(30)	NOT NULL
tracking_number	VARCHAR(100)	UNIQUE, NULL
shipped_date	TIMESTAMP	NULL
delivered_date	TIMESTAMP	NULL

Relationships:

- order (1) — (M) order_item
- order (M) — (M) warehouse via order_warehouse

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11. order_item

Stores the individual items within each order, including product, quantity, and price at the moment of purchase.

Attribute	Data Type	Constraints
order_item_id	INT	PRIMARY KEY, AUTO_INCREMENT
order_id	INT	FOREIGN KEY → order(order_id), NOT NULL
product_id	INT	FOREIGN KEY → product(product_id), NOT NULL

quantity	INT	NOT NULL
unit_price	DECIMAL(10,2)	NOT NULL
subtotal	DECIMAL(12,2)	NOT NULL

Relationships:

- order_item (M) → (1) order
- order_item (M) → (1) product

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12. order_warehouse

Links orders to the warehouses responsible for fulfilling them, enabling multi-warehouse fulfillment.

Attribute	Data Type	Constraints
order_warehouse_id	INT	PRIMARY KEY, AUTO_INCREMENT
order_id	INT	FOREIGN KEY → order(order_id), NOT NULL
warehouse_id	INT	FOREIGN KEY → warehouse(warehouse_id), NOT NULL
fulfillment_status	VARCHAR(30)	NOT NULL
assigned_date	TIMESTAMP	NOT NULL

Unique: (order_id, warehouse_id)

Relationships:

- order_warehouse (M) → (1) order
- order_warehouse (M) → (1) warehouse

Cardinalities

1. country (1) ↔ (M) city
2. country (1) ↔ (M) warehouse
3. city (1) ↔ (M) warehouse
4. city (1) ↔ (M) customer
5. warehouse (1) ↔ (M) warehouse_section
6. warehouse (1) ↔ (M) employee
7. warehouse (1) ↔ (M) inventory_transaction
8. warehouse_section (1) ↔ (M) section_inventory
9. product (1) ↔ (M) section_inventory
10. product (1) ↔ (M) inventory_transaction
11. product (1) ↔ (M) order_item
12. customer (1) ↔ (M) order
13. order (1) ↔ (M) order_item
14. order (M) ↔ (M) warehouse (via order_warehouse)

Queries

Query 1: Products running low on stock
→ `section_inventory.quantity_available` and `product.reorder_threshold`

Query 2: Warehouses receiving restocks
→ `inventory_transaction.transaction_type = 'INBOUND'`

Query 3: Orders shipped to specific country
→ Join order → customer → country

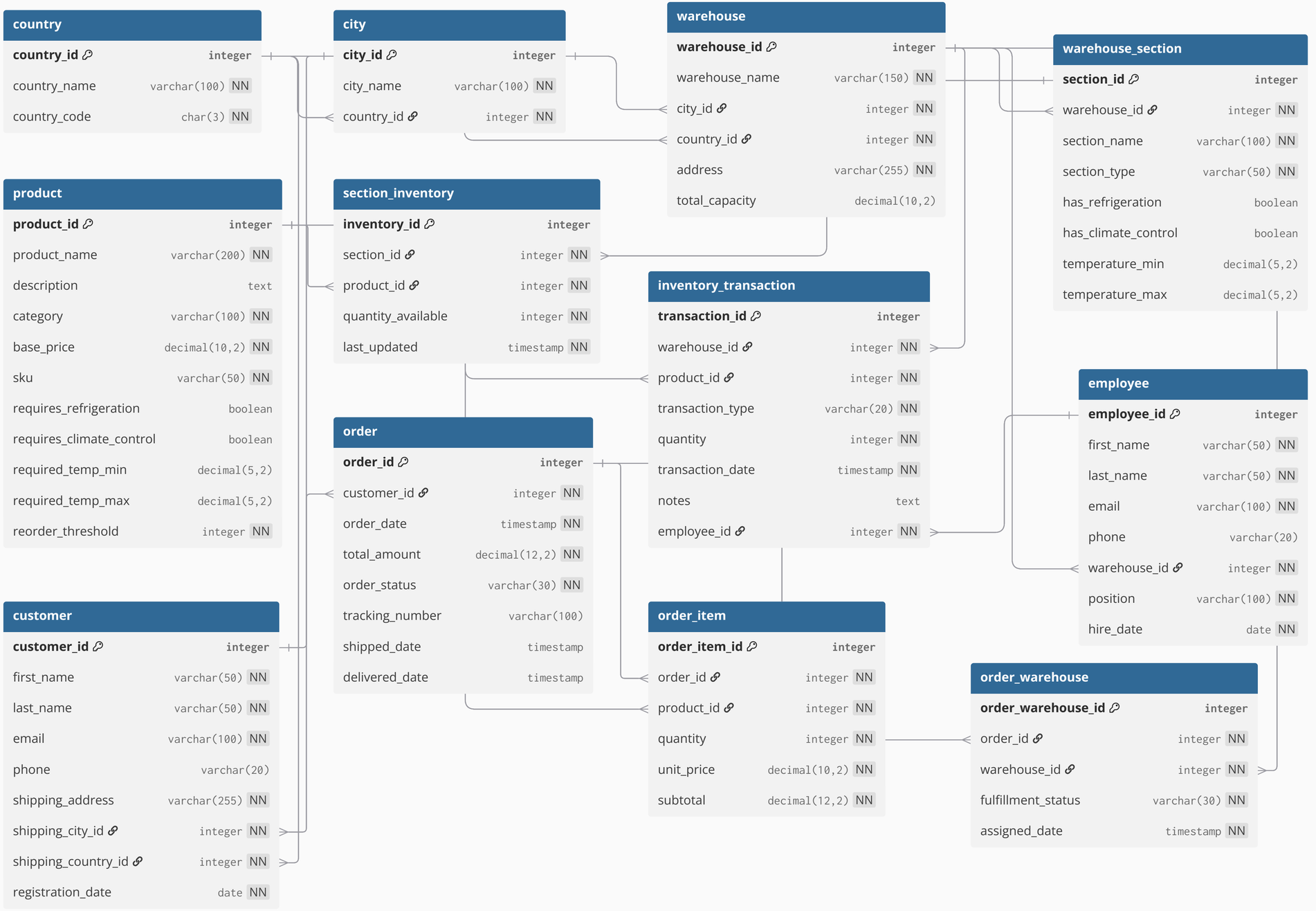
Query 4: Total inventory value per warehouse
→ Join warehouse → warehouse_section → section_inventory → product
→ `SUM(quantity * base_price)`

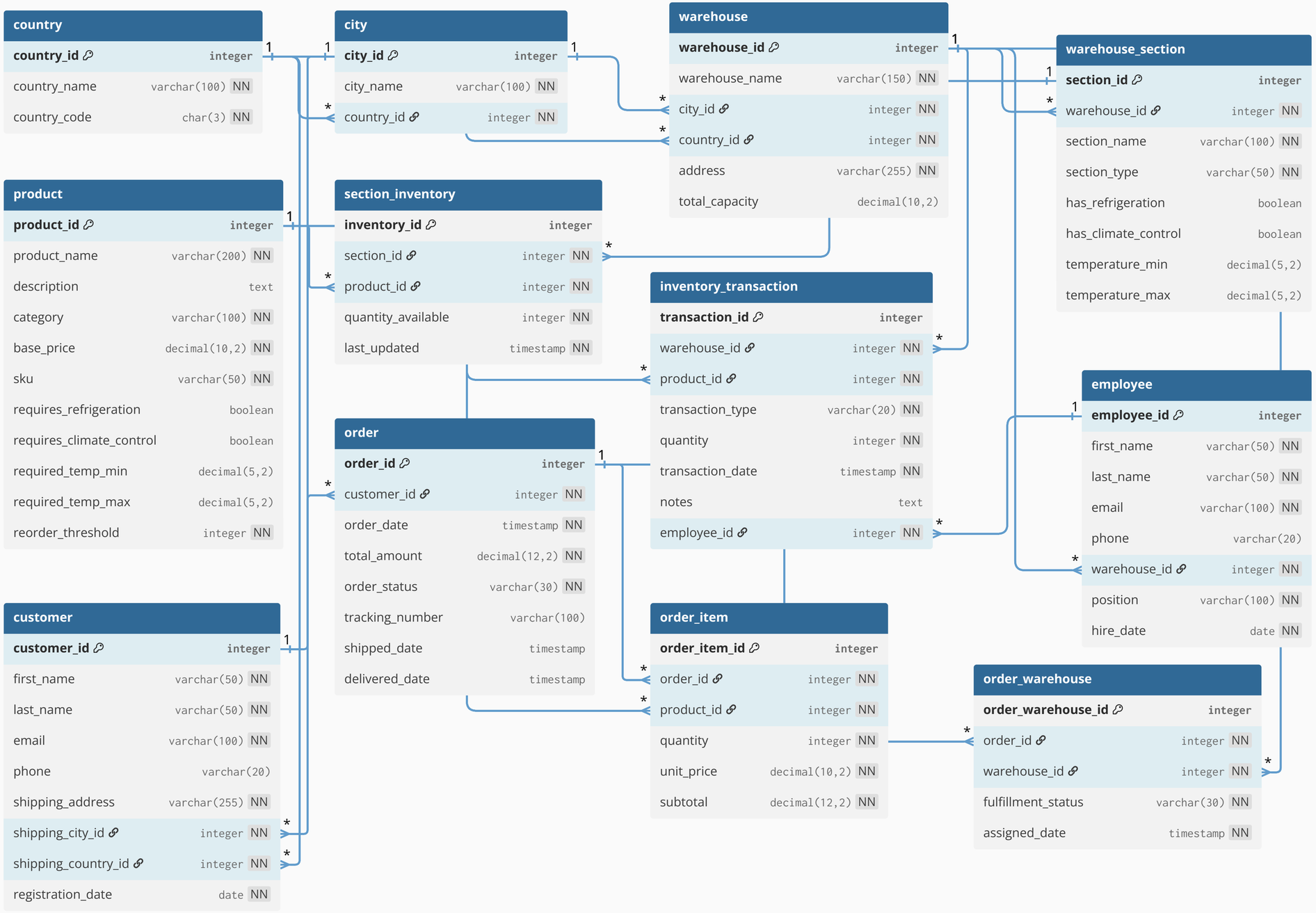
Query 5: Employees per warehouse
→ `employee.warehouse_id`

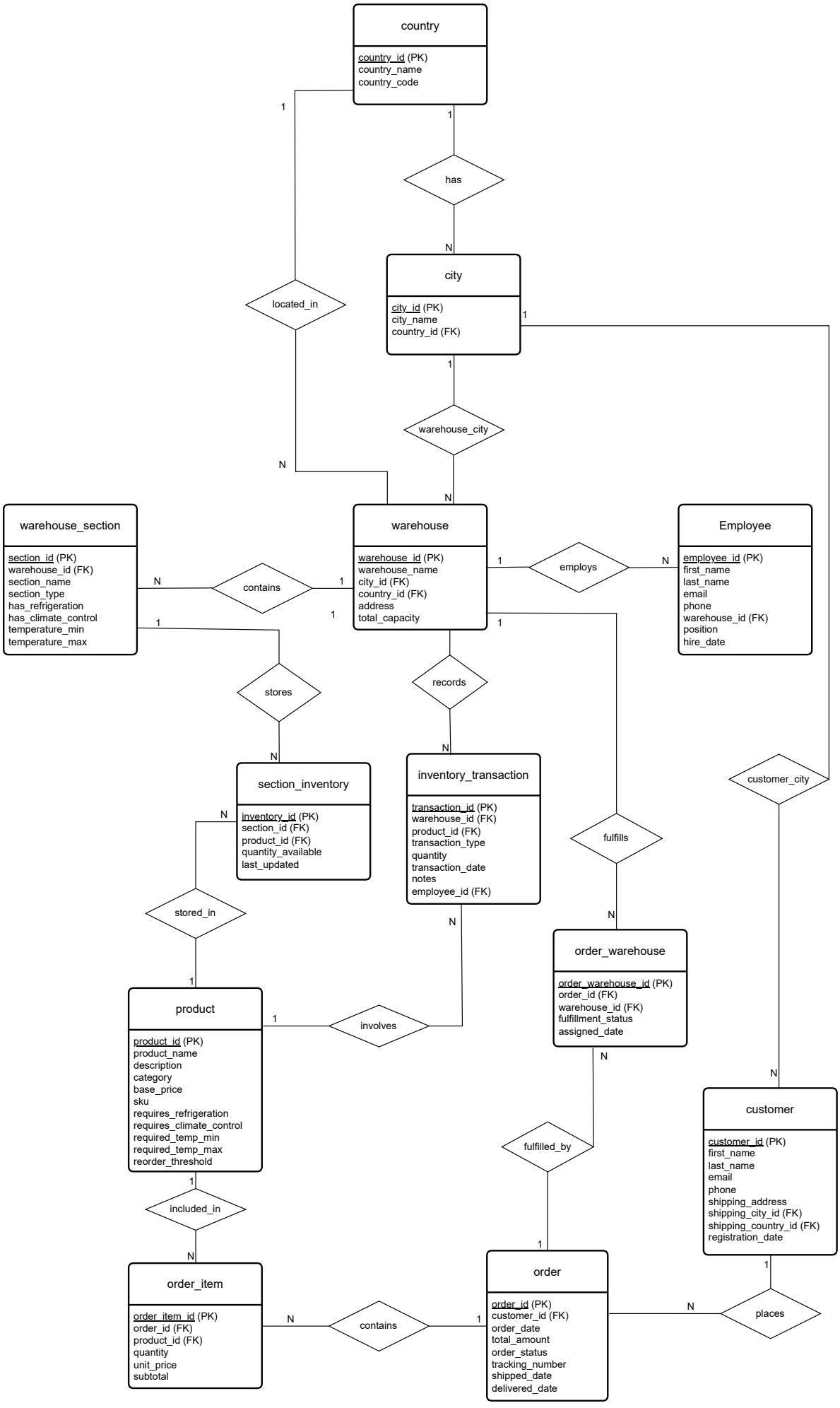
Query 6: Check special storage compliance
→ Compare product storage requirements vs. warehouse_section capabilities

Query 7: Orders not shipped
→ `order.order_status = 'PENDING'` or `shipped_date IS NULL`

Query 8: Warehouses supplying an order
→ `order_warehouse.warehouse_id`






country
country_id (PK)
country_name
country_code
has
city
city_id (PK)
city_name
country_id (FK)
located_in
warehouse_city
warehouse_section
section_id (PK)
warehouse_id (FK)
section_name
section_type
has_refrigeration
has_climate_control
temperature_min
temperature_max
contains
warehouse
warehouse_id (PK)
warehouse_name
city_id (FK)
country_id (FK)
address
total_capacity
employs
Employee
employee_id (PK)
first_name
last_name
email
phone
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position
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stores
records
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transaction_date
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employee_id (FK)
customer_city
fulfills
stored_in
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category
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required_temp_min
required_temp_max
reorder_threshold
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warehouse_id (FK)
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shipping_country_id (FK)
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shipped_date
delivered_date
places