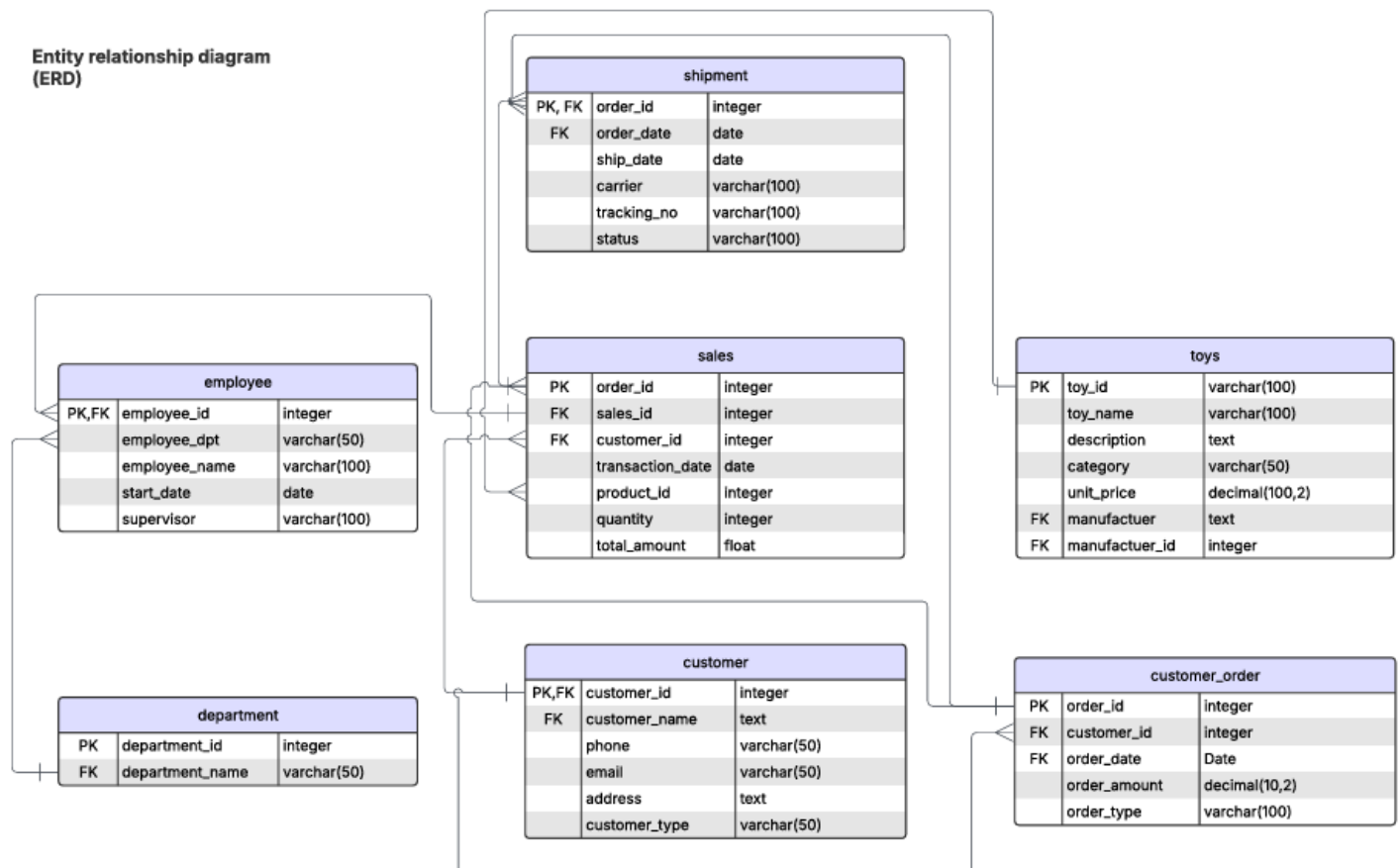# Design a Relational Database for Smart Toys Co.

This project consists of 3 parts, including:

Part I: Design the database schema that defines the key entities and their relationships.

Part II: Construct a relational database and tables.

Part III: Write queries to answer business questions.

Part I: Design the Database Schema

Entity relationship diagram (ERD)

shipment

PK, FK	order_id	integer
FK	order_date	date
	ship_date	date
	carrier	varchar(100)
	tracking_no	varchar(100)
	status	varchar(100)

employee

PK,FK	employee_id	integer
	employee_dpt	varchar(50)
	employee_name	varchar(100)
	start_date	date
	supervisor	varchar(100)

sales

PK	order_id	integer
FK	sales_id	integer
FK	customer_id	integer
	transaction_date	date
	product_id	integer
	quantity	integer
	total_amount	float

toys

PK	toy_id	varchar(100)
	toy_name	varchar(100)
	description	text
	category	varchar(50)
	unit_price	decimal(100,2)
FK	manufactuer	text
FK	manufactuer_id	integer

department

PK	department_id	integer
FK	department_name	varchar(50)

customer

PK,FK	customer_id	integer
FK	customer_name	text
	phone	varchar(50)
	email	varchar(50)
	address	text
	customer_type	varchar(50)

customer_order

PK	order_id	integer
FK	customer_id	integer
FK	order_date	Date
	order_amount	decimal(10,2)
	order_type	varchar(100)

Part II: Create a Relational Database

```
CREATE TABLE `customer` (
  `customer_id` integer,
  `customer_name` text,
  `phone` varchar(50),
  `email` varchar(50),
  `address` text,
  `customer_type` varchar(50),
  PRIMARY KEY (`customer_id`)
);
```

```sql
CREATE TABLE `customer_order` (
 `order_id` integer,
 `customer_id` integer,
 `order_date` Date,
 `order_amount` decimal(10,2),
 `order_type` varchar(100),
 PRIMARY KEY (`order_id`),
 FOREIGN KEY (`customer_id`)
   REFERENCES `customer`(`customer_id`)
);

CREATE TABLE `toys` (
 `toy_id` varchar(100),
 `toy_name` varchar(100),
 `description` text,
 `category` varchar(50),
 `unit_price` decimal(100,2),
 `manufactuer` text,
 `manufactuer_id` integer,
 PRIMARY KEY (`toy_id`)
);

CREATE TABLE `sales` (
 `order_id` integer,
 `sales_id` integer,
 `customer_id` integer,
 `transaction_date` date,
 `product_id` integer,
 `quantity` integer,
 `total_amount` float,
 PRIMARY KEY (`order_id`),
 FOREIGN KEY (`product_id`)
   REFERENCES `toys`(`toy_id`),
 FOREIGN KEY (`customer_id`)
   REFERENCES `customer`(`customer_id`),
 FOREIGN KEY (`order_id`)
   REFERENCES `customer_order`(`order_id`)
);

CREATE TABLE `shipment` (
 `order_id` integer,
 `order_date` date,
 `ship_date` date,
 `carrier` varchar(100),
 `tracking_no` varchar(100),
 `status` varchar(100),
 PRIMARY KEY (`order_id`),
 FOREIGN KEY (`order_id`)
   REFERENCES `sales`(`order_id`),
 FOREIGN KEY (`order_id`)
```

```
    REFERENCES `customer_order`(`order_id`)
);

CREATE TABLE `department` (
 `department_id` integer,
 `department_name` varchar(50),
 PRIMARY KEY (`department_id`)
);

CREATE TABLE `employee` (
 `employee_id` integer,
 `employee_dpt` varchar(50),
 `employee_name` varchar(100),
 `start_date` date,
 `supervisor` varchar(100),
 PRIMARY KEY (`employee_id`),
 FOREIGN KEY (`employee_dpt`)
   REFERENCES `department`(`department_name`),
 FOREIGN KEY (`employee_id`)
   REFERENCES `sales`(`sales_id`)
);
```

Part III: Query Data

Question 1: Who are the top 3 salespersons? What are the total sales and corresponding sales rank for each salesperson?

Question 2: What are the top 3 bestselling toys, their categories, and the total sales amount?

```
12  --Question 2: Name the top 3 bestselling toys and list the total sales amount?
13
14  select
15  s.product_id,
16  t.category,
17  sum(s.total_amount) as total_sales
18  from `smart_toys.sales` as s
19  inner join `smart_toys.toys` as t
20  on s.product_id = t.toy_id
21  group by s.product_id, t.category
22  order by total_sales desc
23  limit 3;
24
```

✅ This script will process 2.79 KB when run.

Query results

Job information	Results	Chart	JSON	Execution details	Execution graph

Row	product_id ▼	category ▼	total_sales ▼	
1	gb010	STEM Toys	102523.24	
2	gb009	Creative Toys	94484.12	
3	gb007	Stuffed Animals	78344.07	

Question 3: What is the average shipping duration for each carrier and total shipment?

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```
25
26  -- Question 3: List of average shipping duration in days for all carriers with least days on top.
27  SELECT
28    carrier,
29    ROUND(AVG(DATETIME_DIFF(DATETIME(ship_date), DATETIME(order_date), DAY)), 1) AS avg_ship_duration,
30    COUNT(*) AS total_shipments
31  FROM `smart_toys.shipment`
32  GROUP BY carrier
33  ORDER BY avg_ship_duration;
34
35
```

✅ This script will process 2.79 KB when run.

Query results

Job information	Results	Chart	JSON	Execution details	Execution graph

Row	carrier ▼	avg_ship_duration ▼	total_shipments ▼	
1	DHL	2.9	10	
2	USPS	3.7	13	
3	UPS	4.2	11	
4	FedEx	4.6	16	