

Exercise 1

Happy Supplies Parts Warehouse						
Customer Name:	Jeff Peterson	Date:	7/1/2024			
Customer Number:	HG54587	Time:	10:30am			
Employee:	D. Harrison					
Customer Type: Consumer						
Part Number	Name	Type	Cage Code	Quantity Ordered	Unit Price	
10654	Float Control	Plumbing	G413	4	12	
10456	Modulator	Electrical	H433	3	7	
10776	Hose Assembly	Plumbing	G413	7	9	
10657	Float Assembly	Plumbing	G413	5	10	

Assumptions:

- All employees can help any and all different customers and there is no special relationships that bond any pair of employees and customers.
- Each customer has a unique customer number, and each part has a unique part number.
- A customer can have many orders and an order can contain multiple parts, and one part only has one specific unit price.
- A part can be ordered in multiple orders.
- A cage code is the identifier of the cages (or shelves) that the inventory is stored in and multiple parts can belong to the same type and stored in the same cage and, thus, share the same cage code.

parts_order_line						
customerName	customerNumber	customerType	date (PK)	time (PK)	employee	partNumber
Jeff Peterson	HG54587	Consumer	7/1/2024	10:30am	D.Harrison	10654
Jeff Peterson	HG54587	Consumer	7/1/2024	10:30am	D.Harrison	10456
Jeff Peterson	HG54587	Consumer	7/1/2024	10:30am	D.Harrison	10776
Jeff Peterson	HG54587	Consumer	7/1/2024	10:30am	D.Harrison	10657

Normalizing Process: The table above is in 1NF because it has a primary key (composite PK, customerNumber+date+time+partNumber) and there are no repeating groups.

1NF TO 2NF
Problem: There are partial dependencies. customerName, customerType are only dependent on customerNumber; employee is only dependent on customerNumber, date, time; partNumber, partType, cageCode, unitPrice are only dependent on partNumber.
Thus, we separate them into four tables below:

customer		
customerNumber (PK)	customerName	customerType
HG54587	Jeff Peterson	Consumer

order			
customerNumber (PK)	date (PK)	time (PK)	employee
HG54587	7/1/2024	10:30am	D. Harrison

part			
partNumber (PK)	partName	partType	cageCode
10654	Float Control	Plumbing	G413
10456	Modulator	Electrical	H433
10776	HoseAssembly	Plumbing	G413
10657	Float Assembly	Plumbing	G413

order_part			
customerNumber (PK)	date (PK)	time (PK)	partNumber (PK)
HG54587	7/1/2024	10:30am	10654
HG54587	7/1/2024	10:30am	10456
HG54587	7/1/2024	10:30am	10776
HG54587	7/1/2024	10:30am	10657

2NF TO 3NF
Problem: There are transitive dependencies.
A transitive dependency exists here because cageCode depends on partType and not directly on partNumber.
Thus, we separate "part" table into 2 tables below:

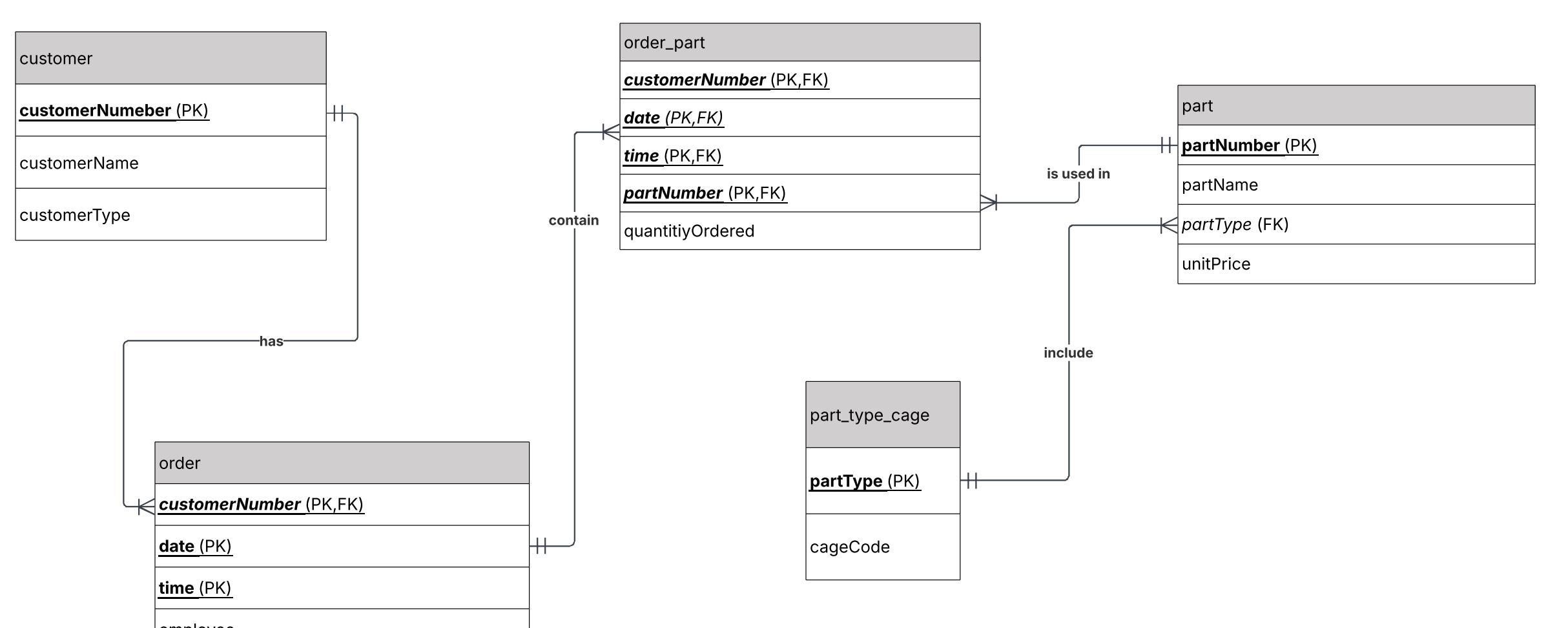
part			
partNumber (PK)	partName	partType (FK)	unitPrice
10654	Float Control	Plumbing	12
10456	Modulator	Electrical	7
10776	HoseAssembly	Plumbing	9
10657	Float Assembly	Plumbing	10

part_type_cage	
partType (PK)	cageCode
10654	G413
10456	H433
10776	G413
10657	G413

customer		
customerNumber (PK)	customerName	customerType
HG54587	Jeff Peterson	Consumer

order_part			
customerNumber (PK,FK)	date (PK,FK)	time (PK,FK)	partNumber (PK,FK)
HG54587	7/1/2024	10:30am	10654
HG54587	7/1/2024	10:30am	10456
HG54587	7/1/2024	10:30am	10776
HG54587	7/1/2024	10:30am	10657

order			
customerNumber (PK,FK)	date (PK)	time (PK)	employee
HG54587	7/1/2024	10:30am	D. Harrison



Exercise 2

2. The data shown below is used by the Panacea Mental Health Corporation to track its therapists. Therapists may work at a number of different branches, but they only see patients at one specific branch on any given day. A patient is given an appointment at a specific time and date at a particular branch with one therapist. Patients may have multiple appointments in any given day and with multiple different therapists.

staffNo	therapistName	patNo	patName	appointment date	appointment time	branchNo
S1011	Fred Smith	P100	Lily White	9/12/2022	10:00	M15
S1011	Fred Smith	P105	Jill Baker	9/12/2022	12:00	M15
S1024	Heidi Pierce	P108	Andy McKee	9/12/2022	10:00	Q10
S1024	Heidi Pierce	P108	Andy McKee	9/14/2022	14:00	Q10
S1032	Richard Levin	P105	Jill Baker	9/14/2022	16:30	M15
S1032	Richard Levin	P110	Jimmy Winter	9/15/2022	18:00	B13

Assumptions:
 1. Therapists may work at a number of different branches, but they only see patients at one specific branch on any given day and they can only see one patient at any given appointment time.
 2. A patient is given an appointment at a specific appointment time and date with only one branch and only one therapist.
 3. Patients may have multiple appointments, each with a possibly different therapist.
 4. Each therapist has a unique staffNo, each patient has a unique patNo and each branch has a unique branchNo and it is defined by staffNo and appointmentDate.

3. The Maid Better temp agency supplies help to Event Management companies within the New York area. Below is the data that the company uses to track employee hours against different contracts. The Employee Number (eNo) is unique for each member of staff. Each contract only applies to one event. There may be different contracts for an event depending upon different service needs.

eNo	contractNo	hours	eName	eventNo	eventLoc
1135	C1024	16	Smith J	H25	Queens
1057	C1024	24	Hocine D	H25	Queens
1068	C1025	28	White T	H4	Yonkers
1135	C1025	15	Smith J	H4	Yonkers
1135	C1026	10	Smith J	H25	Queens

Assumptions:
 1. The Employee Number (eNo) is unique for each member of staff
 2. Each contract only applies to one event and represented by one contractNo
 3. There may be different contracts for an event and one event has only one unique eventNo and eventLoc
 4. Each contract only applies to one event, and can be handled by multiple staff members, and one staff can work on multiple contracts.