Exercise1

Assumption:
- Same Type is storaged in the same cage
- Each customer can take orders of different parts supplies at the same time.
- Each partNumber is unique for each parts supply.

customerName	customerNumber	customerType	date	time	employee	partNumber	name	type	cageCode	quantityOrdered	unitPrice
Jeff Peterson	HG54587	Consumer	7/1/2024	10:30 AM	D. Harrison	10654	Float Control	Plumbing	G413	4	12
Jeff Peterson	HG54587	Consumer	7/1/2024	10:30 AM	D. Harrison	10456	Modulator	Electrical	H433	3	7
Jeff Peterson	HG54587	Consumer	7/1/2024	10:30 AM	D. Harrison	10776	HoseAssembly	Plumbing	G413	7	9
Jeff Peterson	HG54587	Consumer	7/1/2024	10:30 AM	D. Harrison	10657	FloatAssembly	Plumbing	G413	5	10

1. initial_table :It is in 1NF, there is no repeating group and all have atomic values. PKs are customerNumber, date, time, and partNumber.

2. This table is not in 2 NF, customer type not depend on any PK, can be deleted. customerName depend only on customer Number.
   In addition, name, type and unit price are to describe the part, we should put them into seperate table. cageCode depends on type only.

order_infor

customerNumber	date	time	employee	partNumber	quantityOrdered
HG54587	7/1/2024	10:30 AM	D. Harrison	10654	4
HG54587	7/1/2024	10:30 AM	D. Harrison	10456	3
HG54587	7/1/2024	10:30 AM	D. Harrison	10776	7
HG54587	7/1/2024	10:30 AM	D. Harrison	10657	5

part

partNumber	name	type (FK)	unitPrice	type	cageCode
10654	Float Control	Plumbing	12	Plumbing	G413
10456	Modulator	Electrical	7	Electrical	H433
10776	HoseAssembly	Plumbing	9	Plumbing	G413
10657	FloatAssembly	Plumbing	10	Plumbing	G413

customer_infor

customerName	customerNumber	customerType
Jeff Peterson	HG54587	Consumer

3. 3NF: This is not yet in 3NF, because after examination, the cageCode is used to sort types of parts, there is a transitory relationship.

order_infor

customerNumber	date	time	employee	partNumber	quantityOrdered
HG54587	7/1/2024	10:30 AM	D. Harrison	10654	4
HG54587	7/1/2024	10:30 AM	D. Harrison	10456	3
HG54587	7/1/2024	10:30 AM	D. Harrison	10776	7
HG54587	7/1/2024	10:30 AM	D. Harrison	10657	5

part

partNumber	name	type (FK)	unitPrice
10654	Float Control	Plumbing	12
10456	Modulator	Electrical	7
10776	HoseAssembly	Plumbing	9
10657	FloatAssembly	Plumbing	10

customer_infor

customerName	customerNumber	customerType
Jeff Peterson	HG54587	Consumer

inventory

type	cageCode
Plumbing	G413
Electrical	H433

This is the finalized version

Exercise2

Assumption:
Each therapist is assigned to one branch on a certain day
In each appointment, the therapist meets only one patient

1. The original table is not in 1NF because 1. the appointment date_time are non atomic values, they need to be seperated;

staffNo	therapistName	patNo	patName	appointmentDate	appointmentTime	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 Pierœe	P108	Andy McKee	9/12/2022	10:00	Q10
S1024	Heidi Pieroe	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	Ummy Winter	9/15/2022	18:00	B13

2NF: therapistName depends only on StaffNo, patientName depends only on patNo (PK), move them to seperated tables. branchNo depends only on apoointmentDate and staffNo
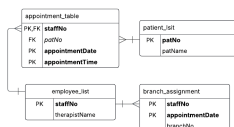
appointment_table

staffNo	patNo	appointmentDate	appointmentTime
S1011	P100	9/12/2022	10:00
S1011	P105	9/12/2022	12:00
S1024	P108	9/12/2022	10:00
S1024	P108	9/14/2022	14:00
S1032	P105	9/14/2022	16:30
S1032	P110	9/15/2022	18:00

employee_list

staffNo	therapistName
S1011	Fred Smith
S1024	Heidi Pierœe
S1032	Richard Levin

patient_lsit

patNo	patName
P100	Lily White
P105	Jill Baker
P108	Andy McKee
P110	Ummy Winter

branch_assignment

staffNo	appointmentDate	branchNo
S1011	9/12/2022	M15
S1024	9/12/2022	Q10
S1032	9/14/2022	M15
S1032	9/15/2022	B13

check3NF:all attributes are either primary keys or dependent on the whole primary key, and there are no transitive dependencies

Exercise3

Assumption:
- Each contract (contractNo) is associated with a single event (eventNo), and an employee (eNo) can only be assigned to one contract within the same event.
- For one contract, there could have one or several employees.

1. the table is in 1NF.
   it has atomic fields and no repeating fields. Now identify eNo and contractNo as PK

event_organization

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

2. the table is not in 2NF, because eName is only dependent on eNo and not dependent on contractNo. eventNo depends not on eNo, but on contract No.

employee_contract

eNo	contractNo	hours
1135	C1024	16
1057	C1024	24
1068	C1025	28
1135	C1025	15
1135	C1026	10

contract_organization

contractNo	eventNo	eventLoc
C1024	H25	Queens
C1024	H25	Queens
C1025	H4	Yonkers
C1025	H4	Yonkers
C1026	H25	Queens

employee

eNo	eName
1135	Smith J
1057	Hocine D
1068	White T

3. It is not yet in 3NF, because there is a transitory relation between eventLoc and eventNo. Seperate them to a new table

employee_contract

eNo	contractNo	hours
1135	C1024	16
1057	C1024	24
1068	C1025	28
1135	C1025	15
1135	C1026	10

contract_organization

contractNo	eventNo(FK)
C1024	H25
C1025	H4
C1026	H25

employee

eNo	eName
1135	Smith J
1057	Hocine D
1068	White T

event_location

eventNo	eventLoc
H25	Queens
H4	Yonkers