Q1.)

Attributes:

customerName
customerNumber
customerType
date
time
employee
partNumber
name
cageCode
quantityOrdered
unitPrice

a. Assumptions:

- One form is one order event taken by one employee for customer at a unique date and time.
- Therefore, the combination of customerNumber, date, time, and employeeName uniquely identify the data for the order.
- For the sake of reducing the number of PKs I have combined date and time into one attribute (dateTime).
- Each part appears at most once per order (no parts are duplicated per order).
- cageCode and partName and type are related to the part, not the order.
- unitPrice is consistent based on only the partNumber.
- All parts of the same type have a cage code that corresponds with all that type of part. (All same types of parts have the same cage code.) But, two different types of parts could have the same cageCode.

1NF

order

customerNumber	customerName	customerType	**dateTime**	**employee**	partNumber	name	type	cageCode	quantityOrdered	unitPrice
HG54587	Jeff Peterson	Consumer	2024-01-07-10:30	D. Harrison	10654	Float Control	Plumbing	G413	4	12
HG54587	Jeff Peterson	Consumer	2024-01-07-10:30	D. Harrison	10456	Modulator	Electrical	H433	3	7
HG54587	Jeff Peterson	Consumer	2024-01-07-10:30	D. Harrison	10776	Hose Assembly	Plumbling	G413	7	9
HG54587	Jeff Peterson	Consumer	2024-01-07-10:30	D. Harrison	10657	Float Assembly	Plumbing	G413	5	10

DB is in 1NF.

- There is a primary key (composite key made up of customerNumber, dateTIme, and employee that are unique identifiers of the order.
- No repreating groups.

1NF --> 2NF:

- In the 1NF table, some attributes depend on only part of the composite PK.
- customerName, customerType depend on customerNumber.
- partName, type, cageCode, and unitPrice depend on partNumber.
- quantityOrdered depends on the whole composite key.

2NF

customer

customerNumber	customerName	customerType
HG54587	Jeff Peterson	Consumer

part

partNumber	name	type	cageCode	unitPrice
10654	Float Control	Plumbing	G413	12
10456	Modulator	Electrical	H433	7
10776	Hose Assembly	Plumbling	G413	9
10657	Float Assembly	Plumbing	G413	10

order

customerNumber	**dateTime**	**employee**	*partNumber*	quantityOrdered
HG54587	2024-01-07-10:30	D. Harrison	10654	4
HG54587	2024-01-07-10:30	D. Harrison	10456	3
HG54587	2024-01-07-10:30	D. Harrison	10776	7
HG54587	2024-01-07-10:30	D. Harrison	10657	5

DB is in 2NF.

- in part table there is only one PK.
- In order table all the non-PKs are depedent on the full composite PK. unitPrice depends on the order, quantity order depends on the order, and partNumber depends on the order.
- In customer table only one PK.

2NF --> 3NF:

- No transative depedencies.
  - cageCode is dependent on type which is dependent on partNumber.
  - Split into a table for organization by type where type is the PK and cageCode is dependent on type.
- This way, if Plumbing type parts were to be moved to a different area in inventory and therefore change their cageCode we would only have to update the organization table.

3NF

Parts Warehouse Orders

inventory

partNumber	name	*type*
10654	Float Control	Plumbing
10456	Modulator	Electrical
10776	Hose Assembly	Plumbling
10657	Float Assembly	Plumbing

type of part stored

organization

type	cageCode
Plumbing	G413
Electrical	H433

part ordered

customer

purchases

customerNumber	customerName	customerType
HG54587	Jeff Peterson	Consumer

transaction

customerNumber	**dateTime**	**employee**	partNumber	quantityOrdered	unitPrice
HG54587	2024-01-07-10:30	D. Harrison	10654	4	12
HG54587	2024-01-07-10:30	D. Harrison	10456	3	7
HG54587	2024-01-07-10:30	D. Harrison	10776	7	9
HG54587	2024-01-07-10:30	D. Harrison	10657	5	10

DB is now in 3NF.

- Table is in 1NF and 2NF. No transative depedencies. Every non-PK is directly related the PK or full composite PK.
- None of the fields are depedent on any of the non-PK fields.

Q2.)

Original data is not in 1NF because there are multiple values in the appointment field.

staffNo	therapistName	patNo	patName	appointment		branchNo
				date	time	
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

a. Assumptions:
- Each row represents one appontment.
- A therapist may work at multiple branches, but on a given day they only work at one branch.
- A therapist sees one patient at a time, so appointmentDate, staffNo, and appointmentTime uniquely identifies an appointment.
- Therapist name depends on staffNo and patName depeneds on PatNo.

staffNo	therapistName	patNo	patName	**date**	**time**	branchNo
S1011	Fred Smith	P100	Lily White	2022-09-12	10:00	M15
S1011	Fred Smith	P105	Jill Baker	2022-09-12	12:00	M15
S1024	Heidi Pierce	P108	Andy McKee	2022-09-12	10:00	Q10
S1024	Heidi Pierce	P108	Andy Mckee	2022-09-14	14:00	Q10
S1032	Richard Levin	P105	Jill Baker	2022-09-14	16:30	M15
S1032	Richard Levin	P110	Jimmy Winter	2022-09-15	18:00	B13

DB is in 1NF.
- There is a primary key (composite key made up of staffNo, date, and time) which uniquely identify each appointment.
- No repreating groups.

1NF --> 2NF:
- In the 1NF table, some attributes depend on only part of the composite PK.
- patName depends only on patNo.
- branchNo is partially dependent on date and staffNo because a therapist is assumed to only work at one branch per day, therefore the time does not affect the branchNo.

2NF --> 3NF:
- No transative depedencies.

DB is now in 3NF.
- Table is in 1NF and 2NF. No transative depedencies. Every non-PK is directly related the PK or full composite PK.
- None of the fields are depedent on any of the non-PK fields.

3NF

Assumption:
This relationship ensures that a therapist works at only one branch on a given day. It is assumed that a for a given day, a therapist may be assigned zero to one branch and will take zero to many appointments at that branch.

Therapist Appointments

therapist takes apointment on given day

works

patient attends

therapist

staffNo	therapistName
S1011	Fred Smith
S1024	Heidi Pierce
S1032	Richard Levin

apointment

staffNo	***date***	**time**	*patNo*
S1011	2022-09-12	10:00	P100
S1011	2022-09-12	12:00	P105
S1024	2022-09-12	10:00	P108
S1024	2022-09-14	14:00	P108
S1032	2022-09-14	16:30	P105
S1032	2022-09-15	18:00	P110

patient

patNo	patName
P100	Lily White
P105	Jill Baker
P108	Andy Mckee
P110	Jimmy Winter

therapist_branch_assingment

staffNo	**date**	branchNo
S1011	2022-09-12	M15
S1024	2022-09-12	Q10
S1024	2022-09-14	Q10
S1032	2022-09-14	M15
S1032	2022-09-15	B13

Q3.)

a. Assumptions:

- eNo uniquely identifies an employee and eName is a property of eNo.
- eventNo uniquely identifies an event and eventLoc is a property of eventNo.
- Each contract applies to exactly one event. So, each contractNo has a unique eventNo and therefore each contractNo has a unique eventLoc given an event has one location.
- One event can have multiple different contracts, but a contract can only have one event.
- An event may have many contracts.
- A contract may have many employees working on it but the combination of employee and contract is unique.

Text

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

This table is already in 1NF.

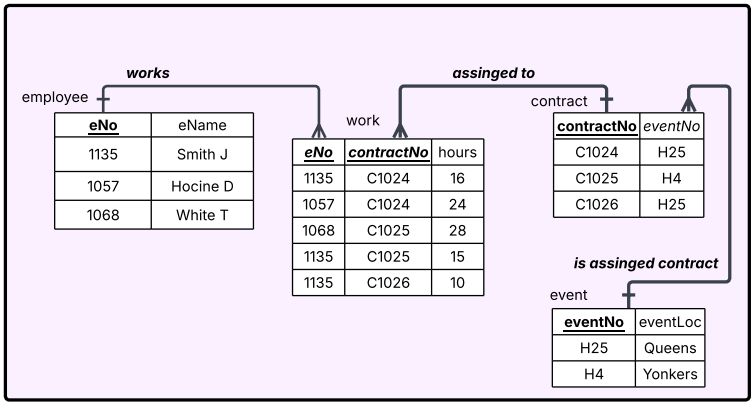
- eNo and contractNo are make up the composite PK for the table and uniquely identify each record.
- There are no repeating groups.

1NF --> 3NF:

- Remove partial dependencies.
- Remove Transative dependencies.
- eName depends only on eNo.
- eventNo depends only on contractNo.
- eventLoc depends on
- eventNo which depends on contractNo - transative dependency.

3NF

Maid Better Temp Agency Event Management



eNo	eName
1135	Smith J
1057	Hocine D
1068	White T

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

contractNo	eventNo
C1024	H25
C1025	H4
C1026	H25

eventNo	eventLoc
H25	Queens
H4	Yonkers

DB is now in 3NF.

- Table is in 1NF and 2NF. No transative depedencies. Every non-PK is directly related the PK or full composite PK.
- None of the fields are depedent on any of the non-PK fields.