

### Question 1)

State any assumptions that you make about the data and the attributes shown.

- The partNumber is the unique identifier for a part
- The customerNumber is the unique identifier for a customer
- Different parts can have the same cageCode
- There can be only one employee per customer

Describe and illustrate the process of normalizing the attributes shown in this form.

— 1NF

The table is already in first normal form as each column contains atomic values and all the columns are nonrepeating.

order

customerName	customerNumber	customerType	date	time	employee	partNumber	name	type	cageCode	quantityOrdered	unitPrice
Jeff Peterson	HG54587	Consumer	45474	10:30am	D. Harrison	10654	Float Control	Plumbing	G413	4	12
Jeff Peterson	HG54587	Consumer	45474	10:30am	D. Harrison	10456	Modulator	Electrical	H433	3	7
Jeff Peterson	HG54587	Consumer	45474	10:30am	D. Harrison	10776	Hose Assembly	Plumbing	G413	7	9
Jeff Peterson	HG54587	Consumer	45474	10:30am	D. Harrison	10657	Float Assembly	Plumbing	G413	5	2

— 2NF

To normalize the table into second normal form we need to remove partial dependencies as non-key attributes should be dependent on the primary keys (customerNumber, date, time and partNumber).

We have to split the tables up into customer, parts, and an order table as there are partial dependencies. The name of the part, its type and unit price all depend on the part number. CustomerName and customerType depend on customerNumber. Additionally, the orders are made of a composite key, the customerNumber, date, time, and partNumber.

order-

customerNumber	date	time	partNumber	quantityOrdered	employee
HG54587	45474	10:30am	10654	4	D. Harrison
HG54587	45474	10:30am	10456	3	D. Harrison
HG54587	45474	10:30am	10776	7	D. Harrison
HG54587	45474	10:30am	10657	5	D. Harrison

customer-

customerName	customerNumber	customerType
Jeff Peterson	HG54587	Consumer
Jeff Peterson	HG54587	Consumer
Jeff Peterson	HG54587	Consumer
Jeff Peterson	HG54587	Consumer

part-

<u>partNumber PK</u>		name	type	cageCode	unitPrice
	10654	Float Control	Plumbing	G413	12
	10456	Modulator	Electrical	H433	7
	10776	Hose Assembly	Plumbing	G413	9
	10657	Float Assembly	Plumbing	G413	2

— 3NF

To normalize the table into third normal form we have to ensure there are no transitive dependencies.

customer

customerName	<u>customerNumber PK</u>	customerType
Jeff Peterson	HG54587	Consumer
Jeff Peterson	HG54587	Consumer
Jeff Peterson	HG54587	Consumer
Jeff Peterson	HG54587	Consumer

order

<u>customerNumber PK, FK</u>	<u>date PK, FK</u>	<u>time PK, FK</u>	<u>partNumber PK, FK</u>	quantityOrdered	employee
HG54587	45474	10:30am	10654	4	D. Harrison
HG54587	45474	10:30am	10456	3	D. Harrison
HG54587	45474	10:30am	10776	7	D. Harrison
HG54587	45474	10:30am	10657	5	D. Harrison

part

<u>partNumber PK</u>		name	type	cageCode	unitPrice
	10654	Float Control	Plumbing	G413	12
	10456	Modulator	Electrical	H433	7
	10776	Hose Assembly	Plumbing	G413	9
	10657	Float Assembly	Plumbing	G413	2

## Question 2)

State any assumptions you make about the data and the attributes shown in this table.

- A therapist may work at multiple branches
- Patient and therapist are assigned a unique patNo
- The same patient can have different therapists
- Patients can have multiple appointments per day

Describe and illustrate the process of normalizing the table to 3NF relations.

— 1NF

The table is already in first normal form as each column contains atomic values and all the columns are nonrepeating.

<u>staffNo PK</u>	therapistName	<u>patNo PK</u>	patName	appointment date 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

— 2NF

To normalize the table into second normal form we need to remove partial dependencies as non-key attributes should be dependent on the primary keys (StaffNo and patNo).

appointment

<u>staffNo PK</u>	<u>patNo PK</u>	appointment date time	branchNo
S1011	P100	9/12/2022 10:00	M15
S1011	P105	9/12/2022 12:00	M15

therapist

<u>staffNo PK</u>	therapistName
S1011	Fred Smith
S1011	Fred Smith

patient

<u>patNo PK</u>	patName
P100	Lily White
P105	Jill Baker

### — 3NF

To normalize the table into third normal form we have to ensure there are no transitive dependencies. However, this is already true with our tables so they are already in 3NF.

#### appointment

<b><u>staffNo PK, FK</u></b>	<b><u>patNo PK, FK</u></b>	appointment date time	branchNo
S1011	P100	9/12/2022 10:00	M15
S1011	P105	9/12/2022 12:00	M15

#### therapist

<b><u>staffNo PK</u></b>	therapistName
S1011	Fred Smith
S1011	Fred Smith

#### patient

<b><u>patNo PK</u></b>	patName
P100	Lily White
P105	Jill Baker

### Question 3)

State any assumptions you make about the data and the attributes shown in this table.

eNo is unique to each staff.

contractNo is unique to each event and multiple employees may be assigned that contract

Each eventNo is associated with a single eventLoc

Employees with the same contractNo can have different hours

Describe and illustrate the process of normalizing the table to 3NF relations.

— 1NF

The table is already in first normal form as each column contains atomic values and all the columns are nonrepeating.

contract

<u>eNo PK</u>	<u>contractNo PK</u>	hours	eName	eventNo	eventLoc
1135	C1024	16	Smith J	H25	Queens
1057	C1024	24	Hocine D	H25	Queens

— 2NF

To normalize the table into second normal form we need to remove partial dependencies as non-key attributes should be dependent on the primary keys (StaffNo and patNo).

contract

<u>eNo PK</u>	<u>contractNo PK</u>	hours
1135	C1024	16
1057	C1024	24

employee

<u>eNo PK</u>	eName
1135	Smith J
1057	Hocine D

event

<u>contractNo PK</u>	eventNo	eventLoc
C1024	H25	Queens
C1024	H25	Queens

— 3NF

To normalize the table into third normal form we have to ensure there are no transitive dependencies.

contract

<u>eNo PK, FK</u>	<u>contractNo PK</u>	hours
1135	C1024	16
1057	C1024	24

employee

<u>eNo PK</u>	eName
1135	Smith J
1057	Hocine D

location

<u>eventNo PK</u>	eventLoc
H25	Queens
H25	Queens

event

<u>contractNo PK</u>	eventNo FK
C1024	H25
C1024	H25