

EX1

First step: Put everything on a table. It is already an 1NF.

Happy Supplies Parts Warehouse											
customerNumber	customerName	customerType	partNumber	employeeName	partName	partType	cageCode	quantityOrdered	unitPrice	orderDate	orderTime
HG5487	Jeff Peterson	Consumer	10654	D.Harrison	Float Control	Plumbing	G413	4	12	7/1/2024	10:30am
HG5487	Jeff Peterson	Consumer	10456	D.Harrison	Modulator	Electrical	H433	3	7	7/1/2024	10:30am
HG5487	Jeff Peterson	Consumer	10776	D.Harrison	Hose assembly	Plumbing	G413	7	9	7/1/2024	10:30am
HG5487	Jeff Peterson	Consumer	10657	D.Harrison	Float assembly	Plumbing	G413	5	10	7/1/2024	10:30am

Second step: Second Normal Form(2NF)

customer		
customerNumber	customerName	customerType
HG5487	Jeff Peterson	Consumer

- Customer (customerNumber, customerName, customerType)
- PK: customerNumber
 - Resolves: customerName and customerType depend only on customerNumber

part				
partNumber	partName	partType	cageCode	unitPrice
10654	Float Control	Plumbing	G413	12
10456	Modulator	Electrical	H433	7
10776	Hose	Plumbing	G413	9
10657	Float	Plumbing	G413	10

- Part (partNumber, partName, partType, cageCode, unitPrice)
- PK: partNumber
 - Resolves: Part attributes depend only on partNumber

order			
customerNumber	orderDate	orderTime	employeeName
HG5487	7/1/2024	10:30am	D.Harrison

- Order (customerNumber, orderDate, orderTime, employeeName)
- PK: customerNumber + orderDate + orderTime
 - Resolves: employeeName depends on the order, not individual parts

- OrderLine (customerNumber, orderDate, orderTime, partNumber, quantityOrdered)
- PK: customerNumber + orderDate + orderTime + partNumber
 - Contains only attributes dependent on full composite key

Final step: Third Normal Form(3NF)

customer			Not transitive
customerNumber	customerName	customerType	
HG5487	Jeff Peterson	Consumer	

FK: customerNumber references Customer

order				Not transitive
customerNumber	orderDate	orderTime	employeeName	
HG5487	7/1/2024	10:30am	D.Harrison	

order_line					Not transitive
customerNumber	orderDate	orderTime	partNumber	quantityOrdered	
HG5487	7/1/2024	10:30am	10654	4	
HG5487	7/1/2024	10:30am	10456	3	
HG5487	7/1/2024	10:30am	10776	7	
HG5487	7/1/2024	10:30am	10657	5	

- FK: customerNumber, orderDate, orderTime references Order (composite FK)
- FK: partNumber references Part

part			
partNumber	partName	partType	unitPrice
10654	Float Control	Plumbing	12
10456	Modulator	Electrical	7
10776	Hose	Plumbing	9
10657	Float	Plumbing	10

- Part (partNumber, partName, partType, unitPrice)
- PK: partNumber
 - FK: partType references PartType
 - Resolves: Removed cageCode since it depends on partType, not partNumber

Part_Type (partType, cageCode)

- PK: partType
- New table created to store the relationship between part types and their cage locations
- Resolves: cageCode now depends directly on its primary key (partType)

part_type	
partType	cageCode
Plumbing	G413
Electrical	H433

First step: 1NF

Panacea Mental Health Corporation						
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 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

Final step: 3NF

therapist	
staffNo	therapistName
S1011	Fred Smith
S1024	Heidi Pierce
S1032	Richard Levin

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

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

FK: staffNo references Therapist

Second step: 2NF

therapist	
staffNo	therapistName
S1011	Fred Smith
S1024	Heidi Pierce
S1032	Richard Levin

- PK: staffNo
- Resolves: therapistName now
- depends on the complete primary key

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

- PK: patNo
- Resolves: patName now depends on the complete primary key

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

- PK: staffNo, appointmentDate
- Resolves: branchNo now depends on the complete primary key (tracks which branch a therapist works at on each day)

appointment			
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

- PK: staffNo, patNo, appointmentDate, appointmentTime
- Resolves: No non-key attributes remain; this table represents the many-to-many relationship between therapists and patients at specific times

EX3

First step: 1NF

Maid Better temp agency					
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

Table is already in 1NF

Second step: Second Normal Form(2NF)

employee	
eNo	eName
1135	Smith J
1057	Hocine D
1068	White T

- PK: eNo
- Resolves: eName now depends on the complete primary key

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

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

- PK: contractNo
- Resolves: eventNo and eventLoc now depend on the complete primary key

- PK: eNo, contractNo
- Resolves: hours depends on the complete primary key (tracks hours worked by each employee on each contract)

Final step: Third Normal Form(3NF)

employee	
eNo	eName
1135	Smith J
1057	Hocine D
1068	White T

- PK: eNo
- No changes from 2NF

event	
eventNo	eventLoc
H25	Queens
H4	Yonkers

- PK: eventNo
- New table created to eliminate transitive dependency
- Resolves: eventLoc now depends directly on its primary key (eventNo)

contract	
contractNo	eventNo
C1024	H25
C1025	H4
C1026	H25

- PK: contractNo
- FK: eventNo references Event
- Resolves: Removed eventLoc; now only contains contractNo and its associated eventNo

Assumptions

- Each therapist is uniquely identified by staffNo
- Each patient is uniquely identified by patNo
- Each branch is uniquely identified by branchNo
- An appointment is uniquely identified by the combination of staffNo, patNo, appointmentDate, and appointmentTime

- FK: staffNo references Therapist
- FK: patNo references Patient
- FK: (staffNo, appointmentDate) references TherapistSchedule