

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		
<u>customerNumber</u>	customerName	customerType
<u>HG5487</u>	Jeff Peterson	Consumer

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

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

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

order			
<u>customerNumber</u>	<u>orderDate</u>	<u>orderTime</u>	employeeName
<u>HG5487</u>	<u>7/1/2024</u>	<u>10:30am</u>	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
<u>customerNumber</u>	customerName	customerType	
<u>HG5487</u>	Jeff Peterson	Consumer	

FK: *customerNumber* references Customer

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

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

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

part_type	
<u>partTypes</u>	cageCode
<u>Plumbing</u>	G413
<u>Electrical</u>	H433

- 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)

First step: 1NF

Seperate appointmentDate and appointmentTime to make it 1NF

Panacea Mental Health Corporation						
<u>staffNo</u>	therapistName	<u>patNo</u>	patName	<u>appointmentDate</u>	<u>appointmentTime</u>	branchNo
<u>S1011</u>	Fredd Smith	<u>P100</u>	Lily White	<u>9/12/2022</u>	<u>10:00</u>	M15
<u>S1011</u>	Fredd Smith	<u>P105</u>	Jill Baker	<u>9/12/2022</u>	<u>12:00</u>	M15
<u>S1024</u>	Heidi Pierce	<u>P108</u>	Andy Mckee	<u>9/12/2022</u>	<u>10:00</u>	Q10
<u>S1024</u>	Heidi Pierce	<u>P108</u>	Andy Mckee	<u>9/14/2022</u>	<u>14:00</u>	Q10
<u>S1032</u>	Richard Levin	<u>P105</u>	Jill Baker	<u>9/14/2022</u>	<u>16:30</u>	M15
<u>S1032</u>	Richard Levin	<u>P110</u>	Jimmy Winter	<u>9/15/2022</u>	<u>18:00</u>	B13

Final step: 3NF

therapist	
<u>staffNo</u>	therapistName
<u>S1011</u>	Fredd Smith
<u>S1024</u>	Heidi Pierce
<u>S1032</u>	Richard Levin

patient	
<u>patNo</u>	patName
<u>P100</u>	Fredd Smith
<u>P105</u>	Jill Baker
<u>P108</u>	Andy Mckee
<u>P110</u>	Jimmy Winter

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

FK: *staffNo* references Therapist

Second step: 2NF

therapist	
<u>staffNo</u>	therapistName
<u>S1011</u>	Fredd Smith
<u>S1024</u>	Heidi Pierce
<u>S1032</u>	Richard Levin

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

patient	
<u>patNo</u>	patName
<u>P100</u>	Fredd Smith
<u>P105</u>	Jill Baker
<u>P108</u>	Andy Mckee
<u>P110</u>	Jimmy Winter

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

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

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

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

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

Table is already in 1NF

Second step: Second Normal Form(2NF)

employee	
<u>eNo</u>	eName
<u>1135</u>	Smith J
<u>1057</u>	Hocine D
<u>1068</u>	White T

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

employee_contract		
<u>eNo</u>	<u>contractNo</u>	hours
<u>1135</u>	<u>C1024</u>	16
<u>1057</u>	<u>C1024</u>	24
<u>1068</u>	<u>C1025</u>	28
<u>1135</u>	<u>C1025</u>	15
<u>1135</u>	<u>C1026</u>	10

contract		
<u>contractNo</u>	eventNo	eventLoc
<u>C1024</u>	H25	Queens
<u>C1025</u>	H4	Yonkers
<u>C1026</u>	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	
<u>eNo</u>	eName
<u>1135</u>	Smith J
<u>1057</u>	Hocine D
<u>1068</u>	White T

- PK: eNo
- No changes from 2NF

contract	
<u>contractNo</u>	eventNo
<u>C1024</u>	H25
<u>C1025</u>	H4
<u>C1026</u>	H25

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

EX2

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

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