

Assignment 9

Question 1

patientMedForm(patientNo, pName, wNo, bedNo, wName, drugNo, dName, description, dosage, method, units, startDate, finishDate)

PK: (patientNo, wNo, bedNo, drugNo)

Functional Dependencies:

patientNo, wNo, bedNo, drugNo → pName, wName, dName, description, dosage, method, units, startDate, finishDate

patientNo → pName

wNo → wName

wNo, bedNo → wName

drugNo → dName, description, dosage, method

drugNo, startDate → dName, description, dosage, method, endDate

patientNo, wNo → wName, pName

patientNo, wNo, bedNo → wName, pName

patientNo, wNo, drugNo → pName, wName, dName, description, dosage, method

patientNo, bedNo → pName

patientNo, drugNo → pName, dName, description, dosage, method

patientNo, drugNo, bedNo → pName, dName, description, dosage, method

patientNo, drugNo, wNo → pName, dName, description, dosage, method, wName

wNo, drugNo -> wName, dName, description, dosage, method

bedNo, drugNo -> dName, description, dosage, method

1NF:

Repeating group: patientNo, pName, wNo, bedNo, wName

To remove the repeating group:

PatientInfo(patientNo, pName, wNo, bedNo, wName)

DrugInfo(patientNo, wNo, bedNo, drugNo, dName, description, dosage, method, units, startDate, finishDate)

PK for PatientInfo is (patientNo, wNo, bedNo)

PK for DrugInfo is (patientNo, wNo, bedNo, drugNo)

Functional Dependencies:

patientNo, wNo, bedNo -> pName, wName

patientNo -> pName

wNo -> wName

patientNo, wNo -> pName, wName

patientNo, bedNo -> pName

wNo, bedNo -> wName

drugNo -> dName, description, dosage, method

drugNo, startDate -> dName, description, dosage, method, endDate

patientNo, wNo, drugNo -> pName, wName, dName, description, dosage, method

patientNo, drugNo -> pName, dName, description, dosage, method

patientNo, drugNo, bedNo -> pName, dName, description, dosage, method

patientNo, drugNo, wNo -> pName, dName, description, dosage, method, wName

wNo, drugNo -> wName, dName, description, dosage, method

bedNo, drugNo -> dName, description, dosage, method

2NF:

The partial dependencies are the following:

- patientNo, wNo, bedNo -> pName, wName
patientNo, wNo -> pName, wName
- patientNo, bedNo -> pName
patientNo -> pName
- wNo -> wName
wNo, bedNo -> wName

To remove the functional dependencies:

Patient(patientNo, pName)

Ward(wNo, wName)

PatientRecord(patientNo, wNo, bedNo)

DrugInfo(patientNo, wNo, bedNo, drugNo, dName, description, dosage, method, units, startDate, finishDate)

3NF:

PK for Patient is patientNo

PK for Ward is wNo

PK for PatientRecord is (patientNo, wNo, bedNo)

PK for DrugInfo is (patientNo, wNo, bedNo, drugNo)

Functional Dependencies:

patientNo -> pName

wNo -> wName

drugNo -> dName, description, dosage, method

drugNo, startDate -> dName, description, dosage, method, endDate

patientNo, wNo, drugNo -> pName, wName, dName, description, dosage, method

patientNo, drugNo -> pName, dName, description, dosage, method

patientNo, drugNo, bedNo -> pName, dName, description, dosage, method

patientNo, drugNo, wNo -> pName, dName, description, dosage, method, wName

wNo, drugNo -> wName, dName, description, dosage, method

bedNo, drugNo -> dName, description, dosage, method

patientNo, pName, drugNo -> dName, description, dosage, method

patientNo, wName, drugNo -> pName, dName, description, dosage, method

To remove transitivity:

Patient(patientNo, pName)

Ward(wNo, wName)

PatientRecord(patientNo, wNo, bedNo)

Drug(drugNo, dName, description, dosage, method)

Prescription(patientNo, wNo, bedNo, drugNo, startDate, finishDate, units)

Question 2

appointmentInfo(staffNo, dentistName, patNo, patName, appointmentDate, appointmentTime, surgeryNo)

PK is (staffNo, patNo, surgeryNo, appointmentDate, appointmentTime)

Functional Dependencies:

staffNo, patNo, surgeryNo, appointmentDate, appointmentTime -> dentistName, patName

staffNo, patNo -> surgeryNo, dentistName, paName

staffNo -> dentistName

patNo -> paName

staffNo, patNo, surgeryNo -> dentistName, paName

staffNo, patNo, appointmentDate -> appointmentTime, surgeryNo, dentistName, paName

staffNo, patNo, surgeryNo, appointmentDate -> appointmentTime, dentistName, paName

1NF:

The Repeating group is (staffNo, dentistName)

To remove the repeating group:

Dentist(staffNo, dentistName)

appointmentInfo(staffNo, patNo, patName, appointmentDate, appointmentTime, surgeryNo)

2NF:

PK for Dentist is staffNo

PK for appointmentInfo is (staffNo, patNo, appointmentDate, appointmentTime, surgeryNo)

Functional Dependencies:

staffNo -> dentistName

staffNo, patNo, surgeryNo, appointmentDate, appointmentTime -> patName

staffNo, patNo -> surgeryNo, paName

patNo -> paName

staffNo, patNo, surgeryNo -> paName

staffNo, patNo, appointmentDate -> appointmentTime, surgeryNo, paName

staffNo, patNo, surgeryNo, appointmentDate -> appointmentTime, paName

The partial dependencies:

- staffNo, patNo, surgeryNo -> paName
patNo -> paName
- staffNo, patNo, appointmentDate -> appointmentTime, surgeryNo, paName
staffNo, patNo, surgeryNo, appointmentDate -> appointmentTime, paName

To remove the partial dependencies:

Dentist(staffNo, dentistName)

Patient(patNo, patName)

Appointment(staffNo, patNo, appointmentDate, appointmentTime, surgeryNo)

It is also in the 3NF.

Question 3:

staffWorkSchedule(nin, contractNo, hours, eName, hNo, hLoc)

PK is (nin, contractNo, hNo)

Functional Dependencies:

nin, contractNo, hNo -> hours, eName, hLoc

nin -> eName

hNo -> hLoc

nin, contractNo -> hNo, eName, hLoc, hours

nin, hNo -> hLoc, eName

contractNo, hNo -> hLoc

1NF:

The repeating group: (nin, eName)

To remove the repeating group:

Employee(nin, eName)

staffWorkSchedule(nin, contractNo, hours, hNo, hLoc)

2NF:

PK for Employee is nin

PK for staffWorkSchedule is (nin, contractNo, hNo)

Functional Dependencies:

nin, contractNo, hNo \rightarrow hours, hLoc

nin \rightarrow eName

hNo \rightarrow hLoc

nin, contractNo \rightarrow hNo, hLoc, hours

nin, hNo \rightarrow hLoc

contractNo, hNo \rightarrow hLoc

The partial dependencies:

- hNo \rightarrow hLoc
- nin, hNo \rightarrow hLoc
- contractNo, hNo \rightarrow hLoc

To remove the partial dependencies:

Employee(nin, eName)

Hotel(hNo, hLoc)

Contract(nin, contractNo, hours, hNo)

It is in the 3NF