FIT2094 Tutorial 5

Question 5.1.1

Insertion anomalies: When adding a new dentist to the system, the new dentist cannot be added until they have an appointment scheduled with a patient.

Update anomalies: When updating the value for an attribute in the table, all entries related to that attribute must be updated as well.

Deletion anomalies: When an attribute is removed from the table, all data relating to that attribute must be removed as well.

Question 5.1.2

UNF:

APPOINTMENT(dentist_no, dentist_name, patient_no, patient_name, app_datetime, surgeryroom_no)

1NF:

APPOINTMENT(dentist_no, dentist_name, patient_no, patient_name, app_datetime, surgeryroom_no)

Partial Dependencies:

dentist_no -> dentist_name

patient_no -> patient_name

2NF:

APPOINTMENT(dentist_no, patient_no, app_datetime, surgeryroom_no)

DENTIST(dentist_no, dentist_name)

PATIENT(patient_no, patient_name)

3NF: No transitive dependencies so 2NF = 3NF

APPOINTMENT(dentist_no, patient_no, app_datetime, surgeryroom_no)

DENTIST(dentist_no, dentist_name)

PATIENT(patient_no, patient_name)

Full dependencies:

dentist_no -> dentist_name (partial)

patient_no -> patient_name (partial)

dentist_no, app_datetime -> patient_no, surgeryroom_no

Question 5.2

UNITS CURRENTLY APPROVED

UNF:

UNIT(unit_no, unit_name, unit_desc, unit_value)

1NF:

UNIT(unit_no, unit_name, unit_desc, unit_value)

2NF: No partial dependencies so 1NF = 2NF

UNIT(unit_no, unit_name, unit_desc, unit_value)

3NF: No transitive dependencies so 2NF = 3NF

UNIT(unit_no, unit_name, unit_desc, unit_value)

Full dependencies:

unit_no -> unit_name, unit_desc, unit_value

LECTURER DETAILS

UNF:

LECTURER(lect_no, lect_name, lect_officenum, lect_phonenum, (unit_no, unit_name))

1NF:

LECTURER(lect_no, lect_name, lect_officenum, lect_phonenum)

ADVICE(lect_no, unit_no, unit_name)

Partial Dependencies:

unit_no -> unit_name

2NF:

LECTURER(lect_no, lect_name, lect_officenum, lect_phonenum)

ADVICE(lect_no, unit_no)

UNIT(unit_no, unit_name)

3NF: No transitive dependencies so 2NF=3NF

LECTURER(lect_no, lect_name, lect_officenum, lect_phonenum)

ADVICE(lect_no, unit_no)

UNIT(unit_no, unit_name)

Full dependencies:

lect_no -> lect_name, lect_officenum, lect_phonenum

unit_no -> unit_name

STUDENT DETAILS

UNF:

STUDENT(stu_no, stu_name, stu_address, stu_course, stu_mode, lect_no, lect_name, (unit_no, unit_name, unit_year, unit_semester, unit_grade))

1NF:

STUDENT(stu_no, stu_name, stu_address, stu_course, stu_mode, lect_no, lect_name)

AC_REC(stu_no, unit_no, unit_year, unit_semester, unit_name, unit_grade)

Partial Dependencies:

unit_no -> unit_name

2NF:

STUDENT(stu_no, stu_name, stu_address, stu_course, stu_mode, lect_no, lect_name)

AC_REC(stu_no, unit_no, unit_year, unit_semester, unit_grade)

UNIT(unit_no, unit_name)

Transitive Dependencies:

lect_no -> lect_name

3NF:

STUDENT(stu_no, stu_name, stu_address, stu_course, stu_mode, lect_no)

LECTURER(lect_no, lect_name)

AC_REC(stu_no, unit_no, unit_year, unit_semester, unit_grade)

UNIT(unit_no, unit_name)

Full dependencies:

stu_no -> stu_name, stu_address, stu_course, stu_mode, lect_no

lect_no -> lect_name

stu_no, unit_no, unit_year, unit_semester -> unit_grade

unit_no -> unit_name

COLLECTED 3NF RELATIONS

1. UNIT(unit_no, unit_name, unit_desc, unit_value)
2. LECTURER(lect_no, lect_name, lect_officenum, lect_phonenum)
3. ADVICE(lect_no, unit_no)
4. UNIT(unit_no, unit_name)
5. STUDENT(stu_no, stu_name, stu_address, stu_course, stu_mode, lect_no)
6. LECTURER(lect_no, lect_name)
7. AC_REC(stu_no, unit_no, unit_year, unit_semester, unit_grade)
8. UNIT(unit_no, unit_name)

ATTRIBUTE SYNTHESIS

UNIT(unit_no, unit_name, unit_desc, unit_value)

LECTURER(lect_no, lect_name, lect_officenum, lect_phonenum)

ADVICE(lect_no, unit_no)

STUDENT(stu_no, stu_name, stu_address, stu_course, stu_mode, lect_no)

AC_REC(stu_no, unit_no, unit_year, unit_semester, unit_grade)

Question 5.3

PROPERTY MAINTENANCE REPORT

UNF:

PROPERTY(prop_no, prop_address, owner_no, owner_givname, owner_famname, owner_address, (maint_datetime, maint_desc, maint_cost))

1NF:

PROPERTY(prop_no, prop_address, owner_no, owner_givname, owner_famname, owner_address)

MAINTANENCE(prop_no, maint_datetime, maint_desc, maint_cost)

2NF: No partial dependencies so 1NF=2NF

PROPERTY(prop_no, prop_address, owner_no, owner_givname, owner_famname, owner_address)

MAINTANENCE(prop_no, maint_datetime, maint_desc, maint_cost)

Dependencies:

owner_no -> owner_givname, owner_famname, owner_address (transitive)

3NF:

OWNER(owner_no, owner_givname, owner_famname, owner_address)

PROPERTY(prop_no, prop_address, owner_no)

MAINTANENCE(prop_no, maint_datetime, maint_desc, maint_cost)

Full dependencies:

owner_no -> owner_givname, owner_famname, owner_address

prop_no -> prop_address, owner_no

prop_no, maint_datetime -> maint_desc, maint_cost

PROPERTY TENANT LEDGER

UNF:

RENT(prop_no, prop_address, rent_lease_startdate, rent_weekly_rate, rent_bond, tenant_no, tenant_givname, tenant_famname, (pay_no, pay_date, pay_type, pay_amount, pay_method)

1NF:

RENT(prop_no, prop_address, rent_lease_startdate, rent_weeklyrate, rent_bond, tenant_no, tenant_givname, tenant_famname)

PAYMENT(prop_no, rent_lease_startdate, pay_no, pay_date, pay_type, pay_amount, pay_method)

Dependencies:

prop_no -> prop_address

2NF:

PROPERTY(prop_no, prop_address)

RENT(prop_no , rent_lease_startdate, rent_weeklyrate, rent_bond, tenant_no, tenant_givname, tenant_famname)

PAYMENT(prop_no, rent_lease_startdate, pay_no, pay_date, pay_type, pay_amount, pay_method)

Dependencies:

tenant_no -> tenant_givname, tenant_famname (transitive)

3NF:

PROPERTY(prop_no, prop_address)

TENANT(tenant_no, tenant_givname, tenant_famname)

RENT(prop_no , rent_lease_startdate, rent_weeklyrate, rent_bond, tenant_no)

PAYMENT(prop_no, rent_lease_startdate, pay_no, pay_date, pay_type, pay_amount, pay_method)

Full dependencies:

prop_no -> prop_address

tenant_no -> tenant_givname, tenant_famname

prop_no, rent_lease_startdate -> rent_weeklyrate, rent_bond, tenant_no

pay_no -> prop_no, rent_lease_startdate, pay_date, pay_type, pay_amount, pay_method

COLLECTED 3NF RELATIONS

1. OWNER(owner_no, owner_givname, owner_famname, owner_address)
2. PROPERTY(prop_no, prop_address, owner_no)
3. MAINTANENCE(prop_no, maint_datetime, maint_desc, maint_cost)
4. PROPERTY(prop_no, prop_address)
5. TENANT(tenant_no, tenant_givname, tenant_famname)

6. RENT(prop_no , rent_lease_startdate, rent_weeklyrate, rent_bond, tenant_no)
7. PAYMENT(prop_no, rent_lease_startdate, pay_no, pay_date, pay_type, pay_amount, pay_method)

ATTRIBUTE SYNTHESIS

1

OWNER(owner_no, owner_givname, owner_famname, owner_address)

2&4

PROPERTY(prop_no, prop_address, owner_no)

3

MAINTANENCE(prop_no, maint_datetime, maint_desc, maint_cost)

5

TENANT(tenant_no, tenant_givname, tenant_famname)

6

RENT(prop_no , rent_lease_startdate, rent_weeklyrate, rent_bond, tenant_no)

7

PAYMENT(prop_no, rent_lease_startdate, payment_no, payment_date, payment_type, payment_amount, payment_method)