6/4/24

DBMS assignment -3

Q.1 R(project code, project name, proj manager, proj budget, emp no, emp name, dno, dname, hrly rate)

project code → proj name, proj manager, proj budget
emp no → emp name, dno, dname
project code, emp no → hrly rate
dno → dname

∴ Essential attributes = project code, emp no.

{project code, emp no}$^+$
= {project code, project name, proj manager, proj budget, emp no}

= {project code, project name, proj manager, proj budget, emp no, emp name, dno, dname, hrly rate}

∴ (project code, empno) is candidate key

To convert into 2NF, we remove partial dependency.

∴ R1 (proj code, proj name, proj manager, proj budget).
R2 (emp no, emp name, dno, dname)
R3 (dno, dname)
R4 (project code, emp no) → candidate key for joining.

There is no transitive relation so it is in 3NF form.

Q.2 (patient name, ward no, ward name, (drug no, drug name, description, dosage, method of admin, (start day, units per day, finish date)))

patient no → name
ward no → ward name
drug no → drug name, description, dosage, method of admin, patient no, drug no, start day
patient no, start day → units per day, finish date
drug no

Essential attributes: patient no., ward no, drug no, start day.

Candidate key: (patient no - ward no - drug no - start day)

For 2NF, remove partial dependency

R1 (patient no, name)
R2 (ward no, ward name)
R3 (drug name, description, dosage, method of admin)
R4 (patient no, start day, units per day, finish date), drug no)
R5 (patient no, ward no, drug no, start day)

There is no transitive dependency.
∴ They are in 3NF form.

Q.3 (Staff no, dentist name, patient no, patient name (appointment, date, (time, surgery no)))

staff no → dentist name
patient no → patient name, surgery no
staff no, appointment date → surgery no
staff no, appointment date, time → patient name, patient no.

appointment date, time, patient no → dentist name, staff no

essential attributes: staff no, patient no, appointment, time

∴ candidate key: staff no – patient no – appointment date, time.

For 2NF, we remove partial dependencies.

R1 (staff no, dentist name)
R2 (patient no, patient name, surgery no)
R3 (staff no, appointment date, time, patient name, patient no)
R4 (staff no, appointment date, surgery no)
R5 (staff no, patient no, appointment date, time)

For 3NF, we remove transitive dependency

∴ R1 (staff no, dentist name)
R2 (patient no, patient name, surgery no)
R3 (staff no, appointment date, time, patient no)
R4 (patient no, patient name)
R5 (staff no, appointment date, surgery no)
R6 (staff no, patient no, appointment date, time)

Q.4 R(p, q, r, s, t, u)

p → q
s, t → p, r
s → u

essential attribute = s, t

∴ {s, t}⁺ = {s, t, p, r}
= {s, t, p, r, q, u}
= {p, q, r, s, t, u}

∴ Candidate key = st

∴ For 2NF, remove partial dependency
R1 (s, u)
R2 (p, q, s, t, r)

For 3NF, remove transitive dependency
R1 (s, u)
R2 (s, t, r, p)
R3 (p, q)

Q.5 BRANCH & ~~BRANCH~~ (Branch #, Branch-addr (ISBN, title, Author, Publisher, Num-copies))

1NF

Branch (Branch #, Branch-addr)
& R2 (ISBN, title, Author, Publisher, Num-copies)

2NF

Branch (Branch #, Branch-addr)
R2 (Branch #, ISBN, Num-copies)
R3 (ISBN, Title, Author, Publisher)

It is already in 3NF.