FACULTY OF COMPUTING

SEMESTER 1 2024/2025

SECP2523 DATABASE (WBL)

SECTION 01

Assignment 1 - Normalization

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GROUP 9

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Question 1

(a) FD1: medID, patientID, date → refillAllowed, PatientName, dosage, medName, shelfLife, doctorID, doctorName

FD2: patientID → PatientName

FD3: doctorID → doctorName

FD4: medID → medName, shelfLife

(b) PATIENT(<u>medID</u>, <u>patientID</u>, <u>date</u>, refillAllowed, dosage, <u>doctorID</u>, doctorName)

PK: {medID, patientID, date}

FK: medID references MEDICINE(medID)

FK: patientID references PATIENTDETAILS(patientID)

PATIENTDETAILS(<u>patientID</u>, PatientName)

PK: patientID

MEDICINE(<u>medID</u>, medName, shelfLife)

PK: medID

(c) PATIENT(<u>medID</u>, <u>patientID</u>, <u>date</u>, refillAllowed, dosage, <u>doctorID</u>)

PK: {medID, patientID, date}

FK: medID references MEDICINE(medID)

FK: patientID references PATIENTDETAILS(patientID)

FK: doctorID references DOCTOR(doctorID)

PATIENTDETAILS(<u>patientID</u>, PatientName)

PK: patientID

MEDICINE(<u>medID</u>, medName, shelfLife)

PK: medID

DOCTOR(<u>doctorID</u>, doctorName)

PK: doctorID

Question 2

(a) FD1: $A, B, C \rightarrow D, E, F, G, H, I$

  FD2: $A \rightarrow E, F, G$

  FD3: $C \rightarrow D$

(b) R1 ($\underline{A}$, E, F, G)

  Pk: A

  R2 ($\underline{C}$, D)

  Pk: C

  R($\underline{A}, \underline{B}, \underline{C}$, H, I)

  Pk: {A, B, C}

  Fk: A references R1(A)

    C references R2(C)

(c) R1 ($\underline{A}$, E, F, G)

  Pk: A

  R2($\underline{C}$, D)

  Pk: C

  R($\underline{A}, \underline{B}, \underline{C}$, H, I)

  Pk: {A, B, C}

  Fk: A references R1(A)

    C references R2(C)

Question 3

(a) FD1: M,N → O, P, Q, R, S, T, U

   FD2: N → Q

   FD3: O → P

   FD4: U → T

(b) R (M, N, O, P, R, S, T, U)

   PK: {M, N}

   FK: N references R1(CN)

   R1 (CN, Q)

   PK: N

(c) R (M, N, O, R, S, U)

   PK: {M, N}

   FK: N references R1(CN)

   FK: O references R2(CO)

   FK: U references R3(CU)

   R1 (CN, Q)

   PK: N

   R2 (CO, P)

   PK: O

   R3 (CU, T)

   PK: U

Question 4

(a) FD1: Property ID $\rightarrow$ County, LotNo, Area, Price, Tax Rate

FD2: County, LotNo $\rightarrow$ Area, Price, TaxRate

FD3: County, Area $\rightarrow$ Price

FD4: County $\rightarrow$ TaxRate

(b) Second Normal Form (2NF), because it has only one single attribute primary key and contain transitive dependency

(c) 2NF

LOTS (PropertyID , County, LotNo, Area, Price, TaxRate)
PK: Property ID

3NF

COUNTYDETAILS (County , TaxRate)
PK: County

LOTDETAILS (County , LotNo , Area, Price, Tax Rate)
PK: {County , LotNo}

LOTS (PropertyID , County , LotNo)
PK : Property ID
FK : {County, LotNo} references LOTDETAILS ({County, LotNo})
County references COUNTYDETAILS (County)