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CSCI 466

Section 1

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Assignment 2

Normalization

100 points

For each question, part b refers to the results of part a, part c refers to

the results of part b. You may add additional fields, like making up a key

when there is no good existing field. Put your answers in a pdf with your

name and section at the top of each page and turn the pdf in on Blackboard.

Each question is worth 25 points.

1. Pharmacy(patient\_id, patient\_name, address, (Rx\_num, trademark\_name, generic\_name,(date\_filled, number\_refills\_left), number\_of\_refills))

Functional Dependencies

patient\_id → patient\_name, address

patient\_id, Rx\_num → trademark\_name, generic\_name

Rx\_num → number\_of\_refills

Rx\_num, date\_filled → number\_refills\_left

1. is this relation in 1NF? If not, why not? And if not, put it in 1NF

No, the relation is not in 1NF because there are repeating groups.

Pharmacy(patient\_id, patient\_name, address, Rx\_num, trademark\_name, generic\_name, date-filled, number\_refills\_left, number\_of\_refills)

1. is this relation in 2NF? If not, why not? And if not, put it in 2NF.

No, the relation is not in 2NF because there are attributes which are only reliant on only one of the primary keys.

Pharmacy(patient\_id, patient\_name, address, Rx\_num)

Medication(Rx\_num,trademark\_name, generic\_name)

Prescription(patient\_id, Rx\_num, date\_filled, number\_of\_refills, number\_refills\_left)

1. is this relation in 3NF? If not, why not? And if not, put it in 3NF.

Yes

2. Company(Emp\_id, Emp\_name, Emp\_address,(Project\_id, Project\_name,

Manager\_id, Manager\_name, hours\_worked))

Funcitonal Dependencies

Emp\_id → Emp\_name, Emp\_address, Project\_id

Project\_id → Project\_name, Manager\_id, Manager\_name

Emp\_id, Project\_id → hours

Manager\_id → Manager\_name

1. is this relation in 1NF? If not, why not? And if not, put it in 1NF

No, this relation is not in 1NF because there are repeating groups.

Company(Emp\_id, Emp\_name, Emp\_address, Project\_id, Project\_name, Manager\_id, Manager\_name, hours\_worked)

1. is this relation in 2NF? If not, why not? And if not, put it in 2NF.

No, because there are some fields which are not directly related to the pk’s.

Company(Emp\_id, Project\_id)

Employee(Emp\_id, Emp\_name, Emp\_address, Project\_id)

Project(Project\_id, Project\_name, Manager\_id, Manager\_name)

Pay(Emp\_id, Project\_id, hours\_worked)

1. is this relation in 3NF? If not, why not? And if not, put it in 3NF.

No, because there is still a transitive dependency within the relation.

Company(Emp\_id, Project\_id)

Employee(Emp\_id, Emp\_name, Emp\_address, Project\_id)

Project(Project\_id, Project\_name, Manager\_id)

Manager(Manager\_id, Manager\_name)

Pay(Emp\_id, Project\_id, hours\_worked)

3. Property(Property\_id, county, lot\_num, lot\_area, price, tax\_rate,

(date\_paid, amount) )

Functional Dependencies

Property\_id → county, lot\_num, lot\_area, price, tax\_rate, date\_paid,amount

lot\_area → price

county → tax\_rate

date\_paid → amount

1. is this relation in 1NF? If not, why not? And if not, put it in 1NF

No, because there are repeating groups in the relation.

Property(Property\_id, county, lot\_num, lot\_area, price, tax\_rate, date\_paid, amount)

1. is this relation in 2NF? If not, why not? And if not, put it in 2NF.

Yes

1. is this relation in 3NF? If not, why not? And if not, put it in 3NF.

No, because there are transitive dependencies present in the relation.

Property(Property\_id, lot\_num)

Location(lot\_num, lot\_area, county)

Cost(lot\_area, price, date\_paid)

TaxRate(county, tax\_rate)

Payment(date\_paid, amount)

4. invoice (invoice\_no, invoice\_date, cust\_name, cust\_addr, (pet\_name, procedure, amount ))

Functional Dependencies

invoice\_no → invoice\_date, cust\_name, cust\_addr, pet\_name

invoice\_no, pet\_name → procedure

cust\_name → cust\_addr

procedure → amount

1. is this relation in 1NF? If not, why not? And if not, put it in 1NF

No, because there are repeating groups.

Invoice(invoice\_no, invoice\_date, cust\_name, cust\_addr, pet\_name, procedure, amount)

1. is this relation in 2NF? If not, why not? And if not, put it in 2NF.

No, because there are attributes which are not associated with a primary key.

Invoice(invoice\_no, invoice\_date, cust\_name)

Customer(cust\_name, cust\_addr, pet\_name)

Treatment(pet\_name, invoice\_no, procedure)

Cost(procedure, amount)

1. is this relation in 3NF? If not, why not? And if not, put it in 3NF.

Yes