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Assign 2
CSCI 466-PE01
Due: 01/29/2021

1A) Not a relation in 1NF because there is no identified primary key and (ProjID, ProjName, MgrID, MgrName, HoursWorked) is a repeating group, meaning it isn't necessarily atomic.

Solution: Making EmpID and ProjID a composite primary key to eliminate non-atomic behavior.

- Company(EmpID, EmpName, EmpAddr, ProjID, ProjName, MgrID, MgrName, Hours Worked)

1B) Not a relation in 2NF because EmpID ⟶ EmpName, EmpAddr & ProjID ⟶ ProjName, MgrID, MgrName are partial dependencies.

Solution: Making a new relation for each partial dependency.

- TimeManagement(EmpID, ProjID, Hours Worked)
- Employee(EmpID, EmpAddr)
- Project(ProjID, ProjName, MgrID, MgrName)

1C) Not a relation in 3NF because MgrName is a transitive dependency on the non-attribute MgrID.

Solution: Making MgrID a primary key in new relation.

- TimeManagement(EmpID, ProjID, Hours Worked)
- Employee(EmpID, EmpAddr)
- Project(ProjID, ProjName, MgrID)
- Manager(MgrID, MgrName)

2A) Not a relation in 1NF because the primary key has not been identified.

Solution: Making both Symbol & Date the composite primary key.

- StockExchange(Company, Symbol, HQ, Date, ClosePrice)

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2B) Not a relation in 2NF because Symbol ⟶ Company, HQ is a partial dependency.

Solution: Making a new relation.

- StockExchange(Symbol, Date, ClosePrice)
- Corporation(Symbol, Company, HQ)

2C) Yes, this is a relation in 3NF.

3A) Not a relation in 1NF because no primary key was listed and (datePaid, amount) is a Is a repeating group meaning it isn't necessarily atomic.

Solution: Making id and datePaid a composite primary key.

- Property(id, county, lotNum, lotArea, price, taxRate, datePaid, amount)

3B) Not a relation in 2NF because id ⟶ county, lotNum, lotArea, price, taxRate is a partial dependency.

Solution: Make a new relation.

- Purchase(id, datePaid, amount)
- CostOfPlace(id, county, lotNum, lotArea, price, taxRate)

3C) Not a relation in 3NF because taxRate & price are both transitive dependencies.

Solution: Make county & lotArea foreign keys.

- Purchase(id, datePaid, amount)
- Place(id, county, lotNum, lotArea)
- TaxOfCounty(county, taxRate)
- PriceOfProperty(lotArea, price)

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4A) Not a relation in 1NF because no primary key was identified and (Rx_num, trademark_name, generic_name, (filldate, num_refills_left), num_refills)) is a repeating group meaning it isn't necessarily atomic.

Solution: Make patient_id, Rx_num, and filldate the composite primary key.

- Pharmacy(patient_id, patient_name, address, Rx_num, trademark_name, generic_name, filldate, num_refills_left, num_refills)

4B) Not a relation in 2NF because partial dependencies at all listed Functional Dependencies.

Solution: Make new relations.

- PharmacyPrescription(patient_id, Rx_num, filldate)
- Patient (patient_id, patient_name, address)
- MedicineSuppliedBy (patient_id, Rx_num, trademark_name, generic_name)
- TotalPrescription(Rx_num, num_refills)
- PrescriptionLeft(Rx_num, filldate, num_refills_left)

4C) Yes it is a relation in 3NF