Databases PAPER COMP70040=COMP97078=COMP97079 2021-2022

1a.

1. SELECT s.name, c.cust\_name

FROM SalesPeople s, Customer c, Orders o

WHERE o.customer\_id = c.customer\_id AND o.salesperson\_id = s.salesperson\_id

1. SELECT ord\_no

FROM Orders

WHERE salesperson\_id IN

(SELECT salesperson\_id FROM salespeople WHERE city = ‘London’ )

1. SELECT ord\_no, purch\_amt, ord\_date, customer\_id, salesperson\_id

FROM Orders

WHERE purch\_amt > (SELECT AVG(purch\_amt)

FROM Orders

WHERE ord\_date = ‘2012-10-10’

GROUP BY ord\_date)

1. SELECT c.cust\_name, c.city, s.name, s.city, s.commission

FROM Customer c, salespeople s

WHERE c.salesperson\_id = s.salesperson\_id

AND s.city <> c.city

AND s.commission > 12%

1. SELECT s.salesperson\_id, s.name, o.ord\_no, 'highest' as type, o.ord\_date

FROM orders o, salespeople s, (SELECT MAX(purch\_amt) as max\_purch, ord\_no FROM orders GROUP BY ord\_date) AS o2

WHERE s.salesoerson\_id = o.salesoerson\_id

AND o2.ord\_no = o.ord\_no

AND o2.max\_purch = o.purch\_amt

ORDER BY ord\_date

UNION

SELECT s.salesperson\_id, s.name, o.ord\_no, 'highest' as type, o.ord\_date

FROM orders o, salespeople s, (SELECT MIN(purch\_amt) as min\_purch, ord\_no FROM orders GROUP BY ord\_date) AS o2

WHERE s.salesoerson\_id = o.salesoerson\_id

AND o2.ord\_no = o.ord\_no

AND o2.min\_purch = o.purch\_amt

ORDER BY ord\_date

1b.

Person (PK: Name, PK: Date of birth, Age)

Phone (PK: Name, PK: Date of birth, PK: phoneNumber)

Student (PK: StudentName, PK: Date of birth, Hobbies)

StudentName references Person.Name on delete cascade

Date of birth references Person.Date of birth on delete cascade

TA (PK: TAName, PK: Date of birth)

TAName references Person.Name on delete cascade

Date of birth references Person.Date of birth on delete cascade

Instructor (PK: InstructorName, PK: Date of birth, Workload)

InstructorName references Person.Name on delete cascade

Date of birth references Person.Date of birth on delete cascade

Lecture (~~PK: StudentName~~, PK: Title, PK: Time, PK RoomNo)

~~StudentName references Person.Name~~

Time references TimeSlot.Time

RoomNo references Room.RoomNo

Room (PK: RoomNo)

TimeSlot (PK: Time)

RoomLayout (PK: Layout, RoomNo, Capacity)

Relations:

takes (PK: StudentName, PK: Date of birth, PK: Title)

StudentName references Person.Name on delete cascade

Date of birth references Person.Date of birth on delete cascade

Title references Lecture.Title on delete cascade

Teaches (PK: TAName, PK: InstructorName, PK: TADateofBirth, PK: InstructorDateofBirth, PK: Title)

TAName references Person.Name on delete cascade

Date of birth references Person.Date of birth on delete cascade

InstructorName references Person.Name on delete cascade

Date of birth references Person.Date of birth on delete cascade

Title references Lecture.Title on delete cascade

(do they all need on delete cascade?)

Has (PK: RoomNo, PK: Layout, Capacity)

RoomNo references Room.RoomNo on delete cascade

Layout references RoomLayout.Layout on delete cascade

2abc (included in 2020-2021 file, same question)

d. r1(A); w1(B);r2(B); w2(C);r3(C); w3(A)

1. <- (1) -> (3)

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Conflict serializable

e. r1(A);r2(A); w1(B); w2(B);r1(B);r2(B); w2(C); w1(D);

(1) --> (2)

<--

Cyclic, not conflict serializable. w2(B) and r1(B) have conflict on the value of B.

Possible why of changing it:

r1(A); r2(A); r1(B); w1(B); r2(B); w2(B); w2(C); w1(D);

f. r1(A);r2(A);r1(B);r2(B);r3(A);r4(B); w1(A); w2(B)

Cyclic, not conflict serializable. There’s a cycle between T1, T2, T3 and another cycle between T2 and T4.

Possible why of changing it:

r1(A); w1(A); r2(A); w2(B); r1(B);r2(B);r3(A);r4(B);