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CS 143 HW 4

1) Yes, decomposition is lossless. A is the shared unique key and able to get (A,D,E) from R1(A,D,E)
2) (C → A) and (A → B)
3)
   a) One to many: sid-> dept,cnum; dept,cnum -> sid
   b) Many to one: sid -> dept,cnum
4)
   a) Yes, {A}+ = R
   b) Yes, {BC}+ = R
5) No not in BCNF
   {A}+ = {A,B,C,D,E}
   {C}+ = {C,E}
   {B}+ = {B,D}
   All of the above violate BCNF

   Key for relation: A,F
   R(A,B,C,D,E,F) → using (C→ E)
   R1(C,E)
   R2(A,B,C,D,F) → using (B→D)
   R3(B,D)
   R4(A,B,C,F) → using A→ BC
   R5(A,B,C)
   R6(A,F)
   Final BCNF tables:
   R1(C,E), R3(B,D), R5(A,B,C), R6(A,F)
6)
   a) CHECK(weight <= S AND weight > 0)
   b) CREATE TRIGGER check
   BEFORE INSERT ON Laptop
   REFERENCING NEW ROW AS new_laptop FOR EACH ROW
   WHEN (weight > S AND weight <= 0)
   BEGIN
   INSERT INTO Laptop VALUES(
   new_laptop.model,
   new_laptop.speed,
   new_laptop.ram,
   new_laptop.hdd,
   NULL)
   END

7)
   Employee(<u>eid</u>, name, salary)
   LeavingTime(<u>eid</u>, <u>date</u>, time)
   a) CREATE TABLE Employee(eid PRIMARY KEY, name, salary);
   CREATE TABLE LeavingTime(eid PRIMARY KEY, date PRIMARY KEY, time, FOREIGN KEY(eid),
   REFERENCES Employee(eid))
   b) INSERT INTO TABLE LeavingTIme VALUES(143, “04-01-2015”,”16:00”);

c) There is a referential integrity violation because there is a tuple with the same eid that already exists in LeavingTime and there is a one-to-one.

d) DELETE FROM LeavingTime WHERE * NOT IN
(SELECT * FROM LeavingTime GROUP BY eid, date
FETCH FIRST 1 Rows ONLY);

8) R = A | B
1 9
100 0