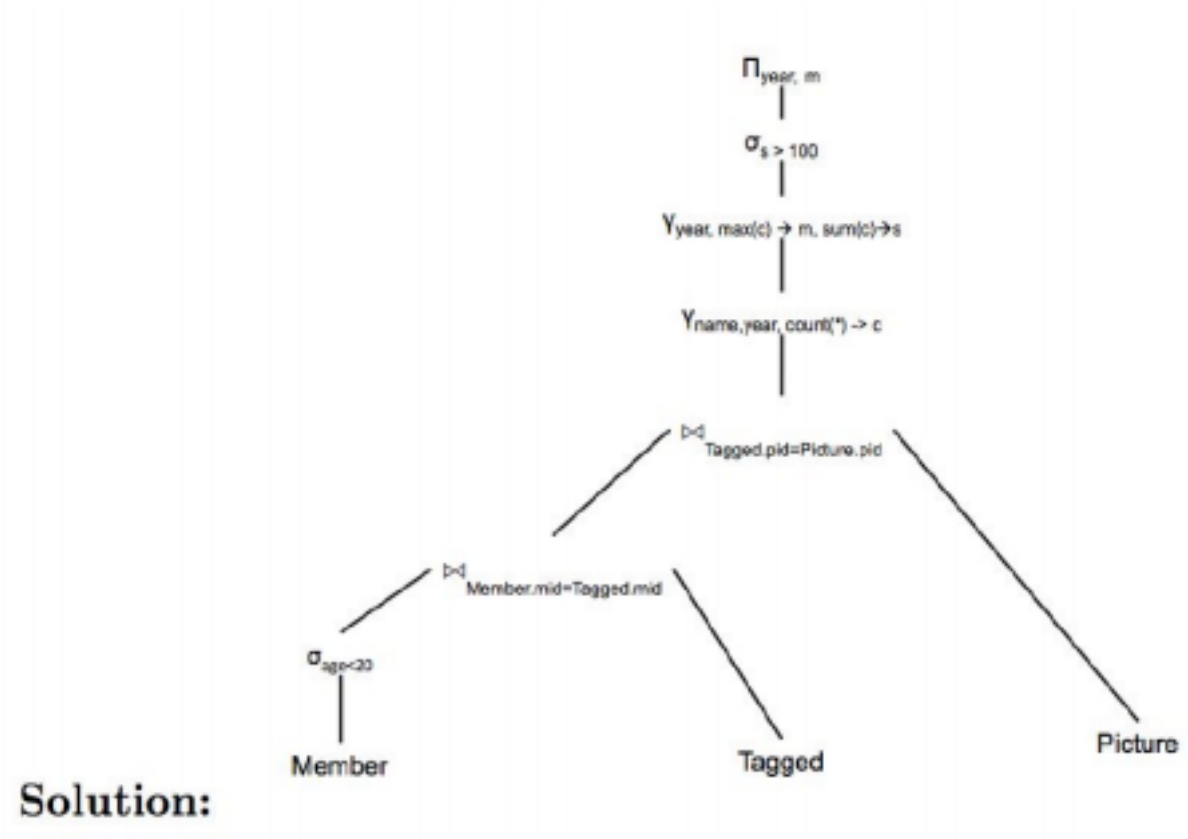


Given R(A, B, C, D, E, F), and functional dependencies: B → A; E → B; D → C; A → C

a) Decompose R into BCNF. In each step, explain which functional dependency you used to decompose and explain why further decomposition is needed. Your answer should consist of a list of table names and attributes. Make sure you indicate the keys for each relation.

One possible decomposition:

1. Use B → A, A → C (closure of B is A, B, C):

Decompose R into R1(A, B, C) and R2(B, D, E, F)

R1 violates A → C, so

Decompose T1 into R11(A, B) and R12(A, C)

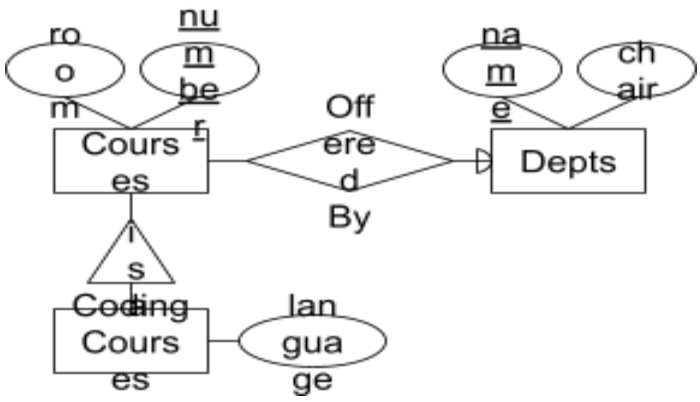
R2 violates E → B, so we need to further decompose R2

Decompose R2 into R21(B, E) and R22(E, D, F)

Final relations: R11(A, B), R12(A, C), R21(B, E) and R22(D, E, F)

b) Convert the E/R diagram below to relations in BCNF form. Assume no values are `NULL`, and the arrow between `OfferedBy` and `Depts` is a round one. Include all keys and foreign keys. Use the following notation and explicitly state foreign key relationships. For instance:

```
R(a, b)
S(c, d) -- c is a foreign key to R
```




```
Courses(number, room, name) -- name is foreign key to Depts

CodingCourses(language, number) -- number is foreign key to Courses

Depts(name, chair)
```