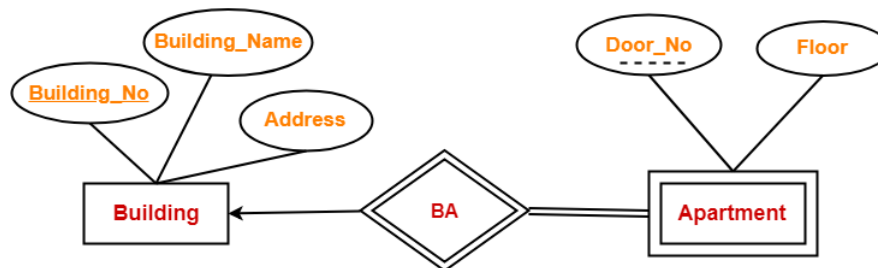


TUTORIAL 4.2 + 5 WITH ANSWERS

Exercise 1 Convert the following E/R diagram



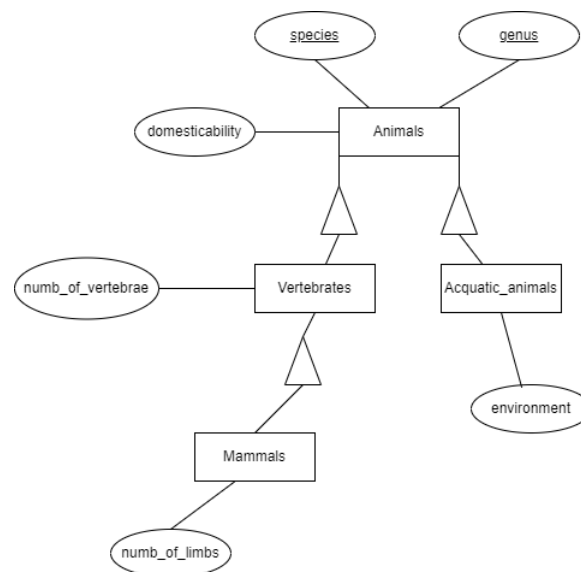
into a relational schema.

Answer.

Building(Building_No, Building_Name, Address)

Apartment(Door_No, Building_No, Floor)

Exercise 2 Convert the following subclass hierarchy into relations schemas using the three approaches illustrated in the lectures



Answer.

E/R-style conversion.*Animals(species, genus, domesticability)**Vertebrates(species, genus, numb_of_vertebrae)**Acquatic_animals(species, genus, environment)**Mammals(species, genus, numb_of_limbs)***Object oriented approach.***Animals(species, genus, domesticability)**Vertebrates(species, genus, domesticability, numb_of_vertebrae)**Acquatic_animals(species, genus, domesticability, environment)**Acquatic_vertebrates(species, genus, domesticability, numb_of_vertebrae, environment)**Mammals(species, genus, domesticability, numb_of_vertebrae, numb_of_limbs)**Acquatic_mammals(species, genus, domesticability, numb_of_vertebrae, numb_of_limbs, environment)***Null values approach.***Animals(species, genus, domesticability, numb_of_vertebrae, numb_of_limbs, environment)***Exercise 3** Let R and S be the following tablesTable 1: R

A	B	C
3	1	2
2	1	1
3	1	2
4	1	2
3	4	5
2	1	1
3	1	2

Table 2: S

B	C	D
4	5	4
1	1	3
3	2	2
1	4	3
4	5	4
0	1	0

Compute the following:

1. $\tau_A(\gamma_{A, \text{AVG}(B) \rightarrow X, \text{SUM}(C) \rightarrow Y}(R));$

Answer.

A	X	Y
2	1	2
3	1.75	11
4	1	2

2. $\pi_{B-C, C^2-D, D/2}(S);$

Answer.	$B - C$	$C^2 - D$	$D/2$
	-1	21	2
	0	-2	1.5
	1	2	1
	-3	13	1.5
	-1	21	2
	-1	1	0

3. $R \overline{\bowtie} S$;

Answer.	A	B	C	D
	3	1	2	\perp
	2	1	1	3
	3	1	2	\perp
	4	1	2	\perp
	3	4	5	4
	3	4	5	4
	2	1	1	3
	3	1	2	\perp
	\perp	3	2	2
	\perp	1	4	3
	\perp	0	1	0