Suggested Solution to Exercise 2: Modelling a Conceptual Model of a Zoo

Erik Perjons

DSV, Stockholm University

Domain Description

- Zoo International is a company with eight zoos in several European cities. Each zoo has a name, an address and a telephone number.
- For each animal, the company need to document name, species, gender and birth year. The animal is taken care of by animal keepers. An animal keeper has a name, a mobile phone number and an employee number.
- An animal can either be born at the zoo or be bought from outside. As soon as an animal is born or arrive at the zoo, the animal need to be registered by an adminstrator at the zoo. The date for the registration need to be documented. The adminstrator has a name, a mobile phone number and an employee number.
- Each animal has a animal keeper that is responsible for the animal. A animal keeper can be responsible for several animals, but an animal can only have one responsible animal keeper.
- The administrators and animal keepers are employed by one zoo, they cannot be employed by several zoos

Your Task

- Represent the concepts/terms in the domain description by creating a conceptual model using UML Class Diagram

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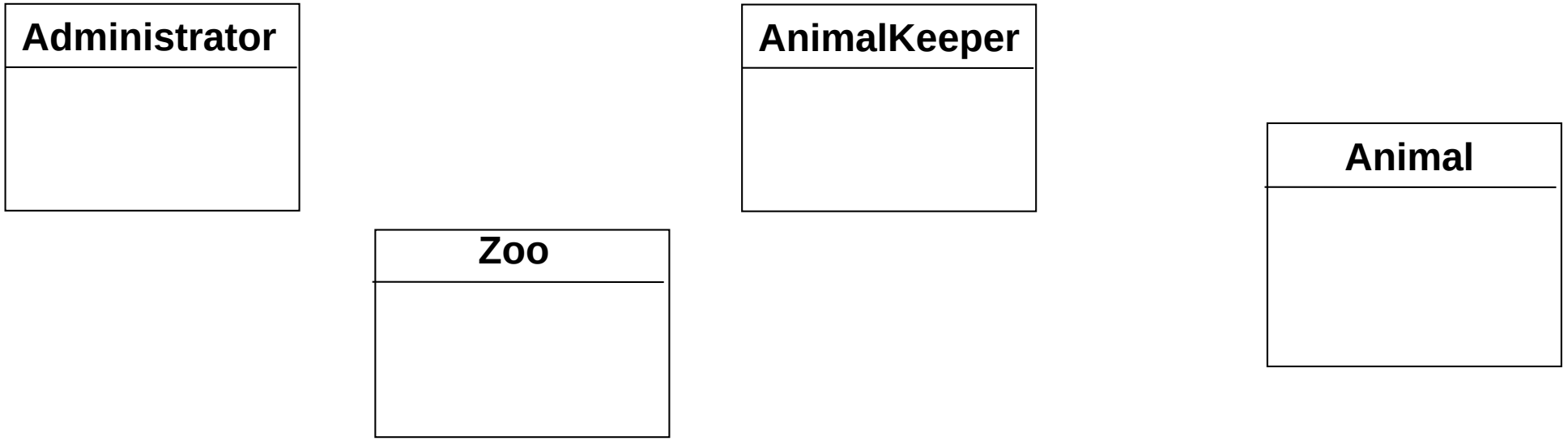
Administrator
AnimalKeeper
Animal
Zoo

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Administrator

name
employeeNo
mobilePhoneNo

Zoo

name
address
telephoneNumber

AnimalKeeper

name
employeeNo
mobilePhoneNo

Animal

name
species
gender
yearOfBirth
bornAtZoo (Y/N)

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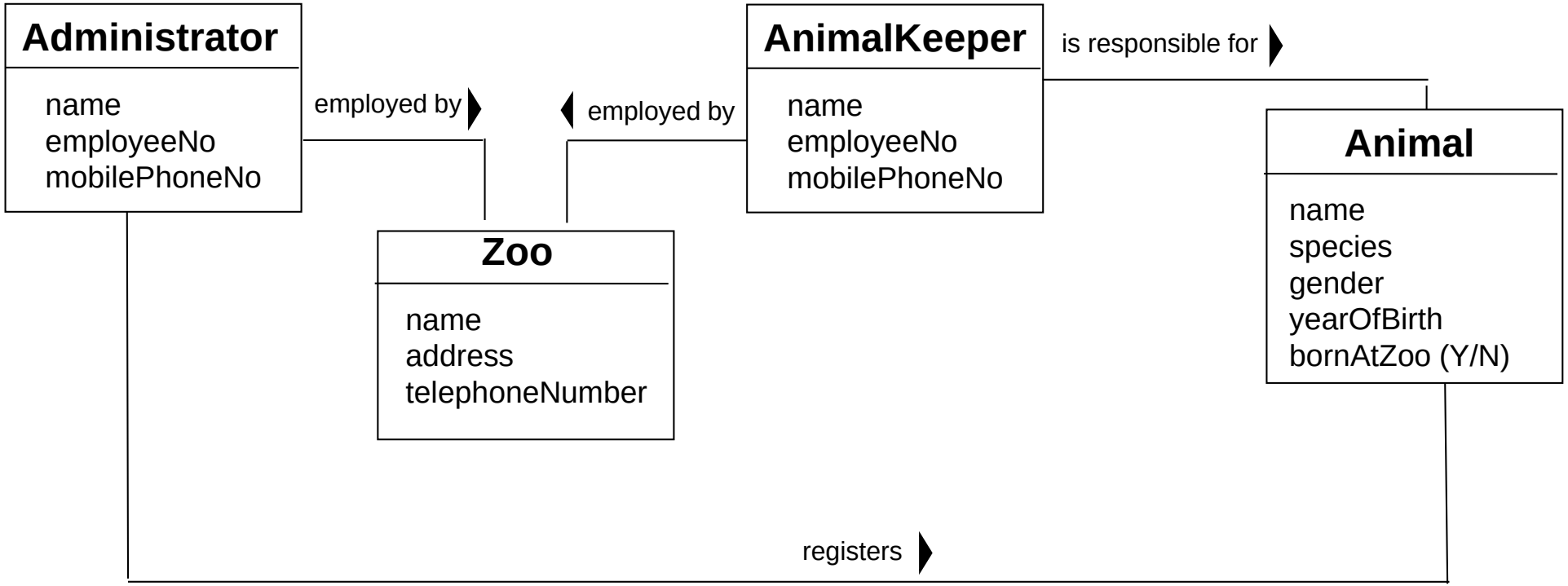
Administrator
name
employeeNo
mobilePhoneNo
employed by
employed by
AnimalKeeper
name
employeeNo
mobilePhoneNo
is responsible for
Animal
name
species
gender
yearOfBirth
bornAtZoo (Y/N)
Zoo
name
address
telephoneNumber
registers

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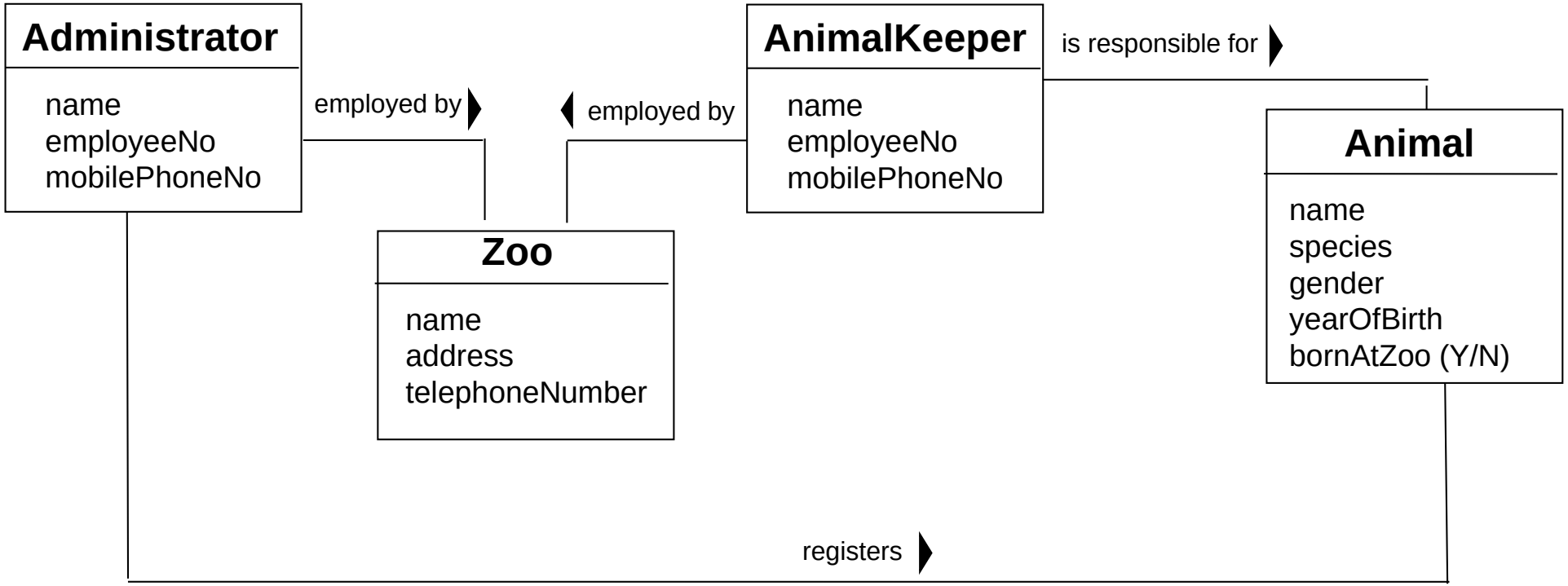
Administrator
name
employeeNo
mobilePhoneNo
employed by
employed by
AnimalKeeper
name
employeeNo
mobilePhoneNo
is responsible for
Animal
name
species
gender
yearOfBirth
bornAtZoo (Y/N)
Zoo
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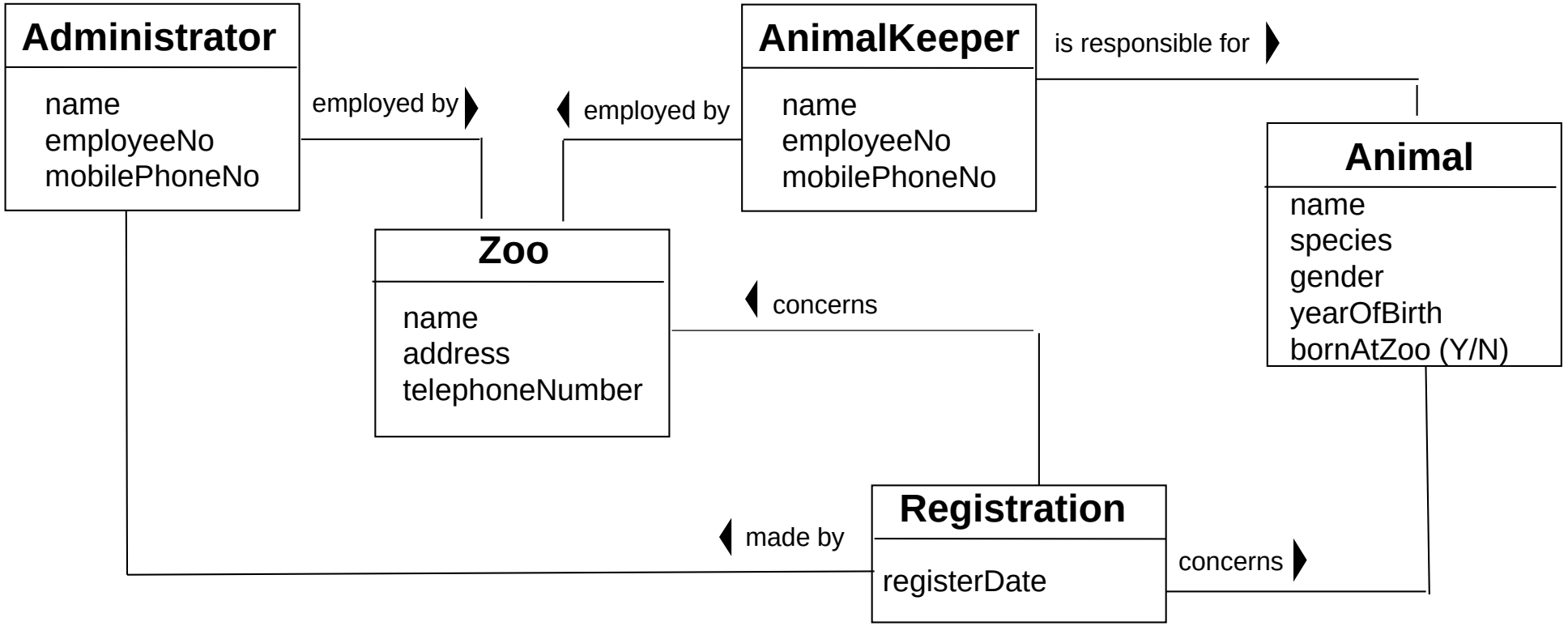
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name
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mobilePhoneNo
employed by
employed by
AnimalKeeper
name
employeeNo
mobilePhoneNo
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Animal
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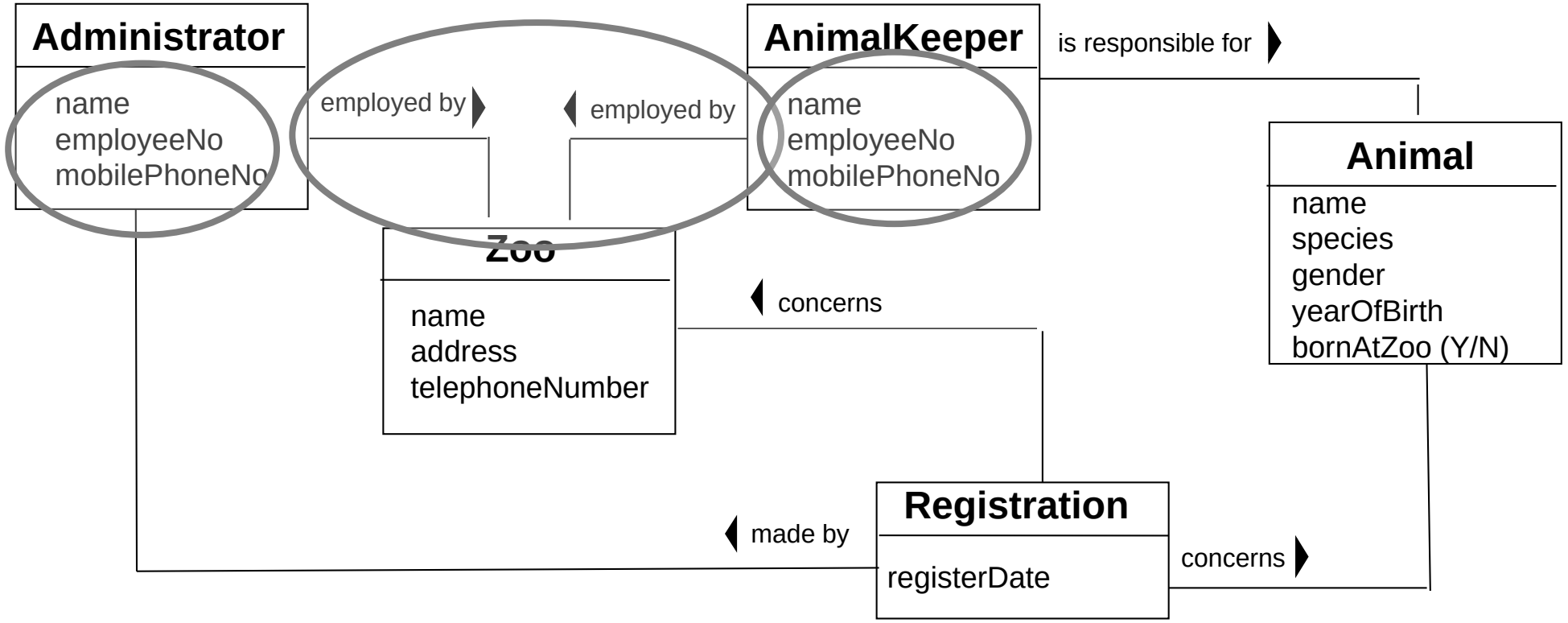
species
gender
yearOfBirth
bornAtZoo (Y/N)
Zoo
name
address
telephoneNumber
concerns
Registration
registerDate
made by
concerns


Administrator
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employeeNo
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AnimalKeeper
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employeeNo
mobilePhoneNo
is responsible for
Animal
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yearOfBirth
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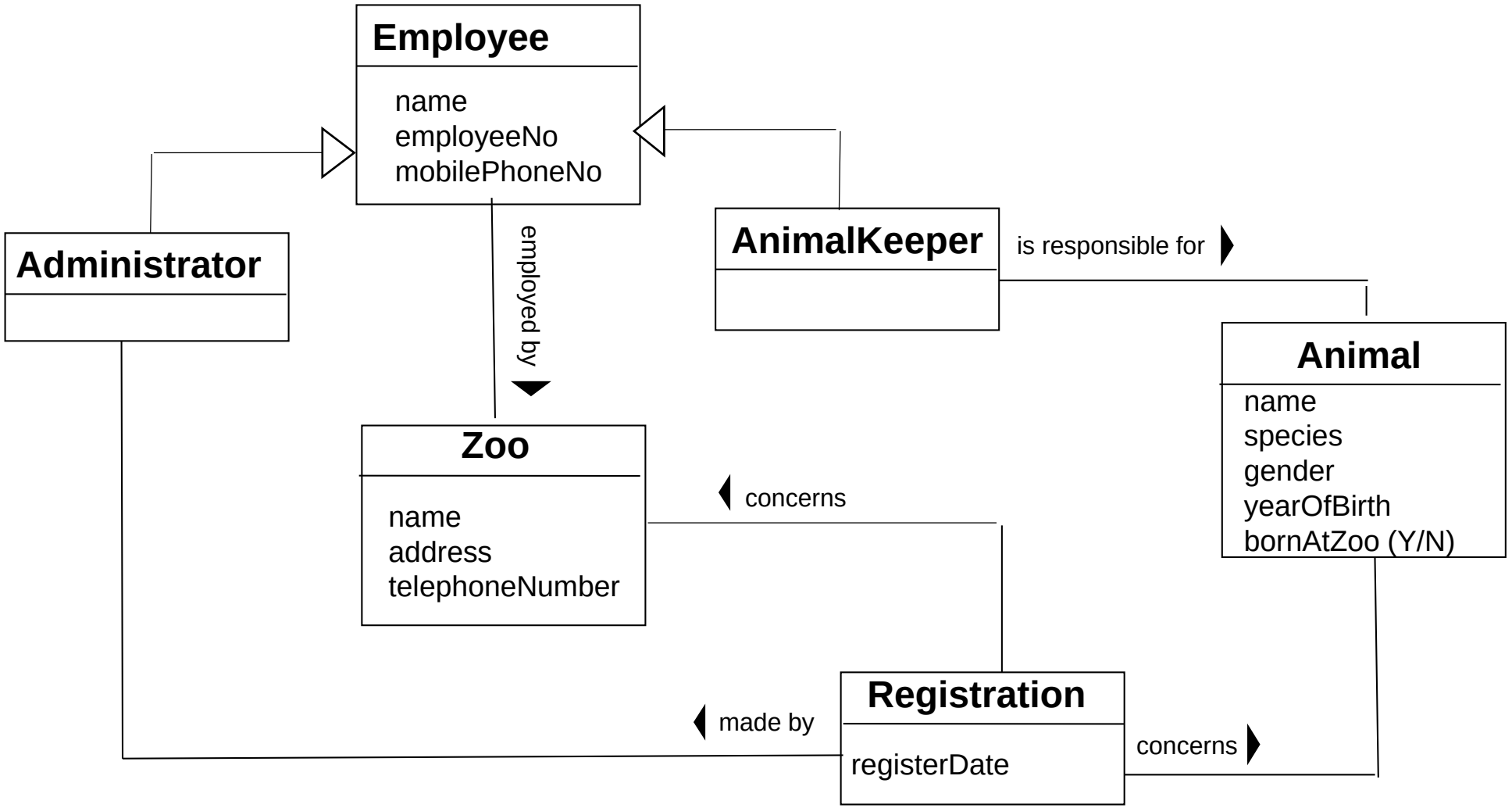
Zoo
name
address
telephoneNumber
concerns
Registration
registerDate
made by
concerns


Employee
name
employeeNo
mobilePhoneNo
Administrator
employed by
AnimalKeeper
is responsible for
Animal
name
species
gender
yearOfBirth
bornAtZoo (Y/N)
Zoo
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Registration
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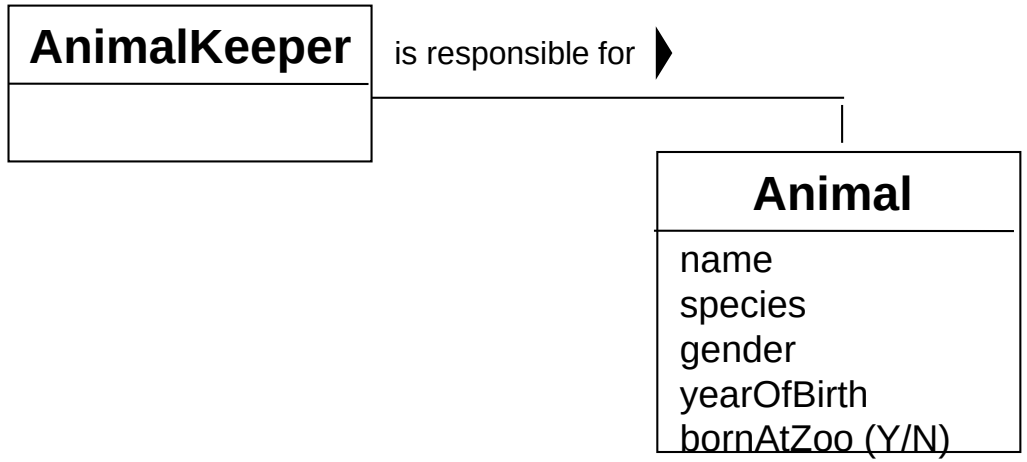
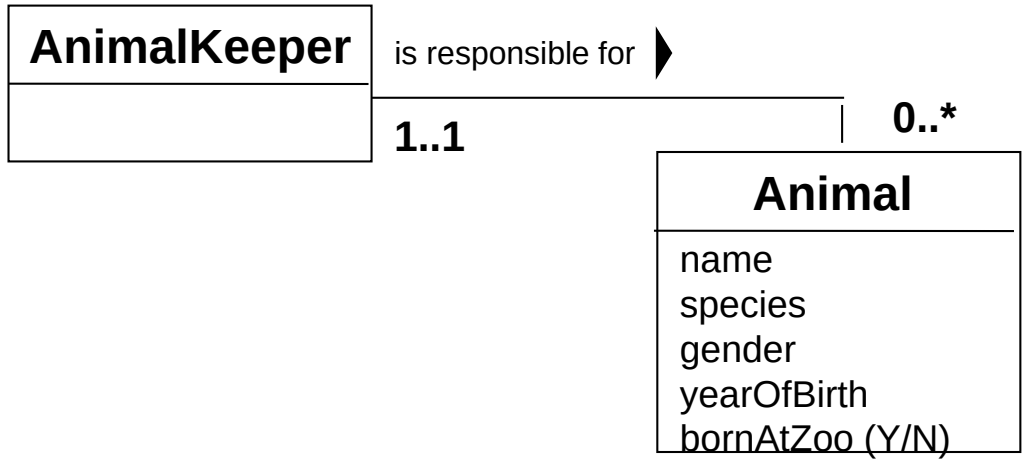

AnimalKeeper
is responsible for
Animal
name
species
gender
yearOfBirth
bornAtZoo (Y/N)


AnimalKeeper
is responsible for
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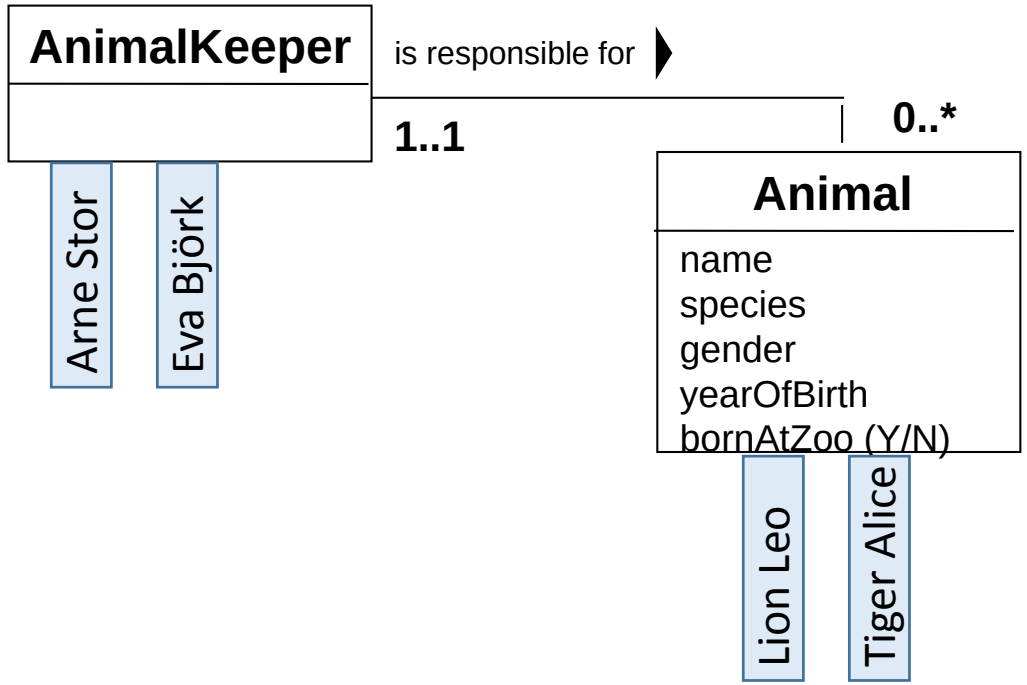
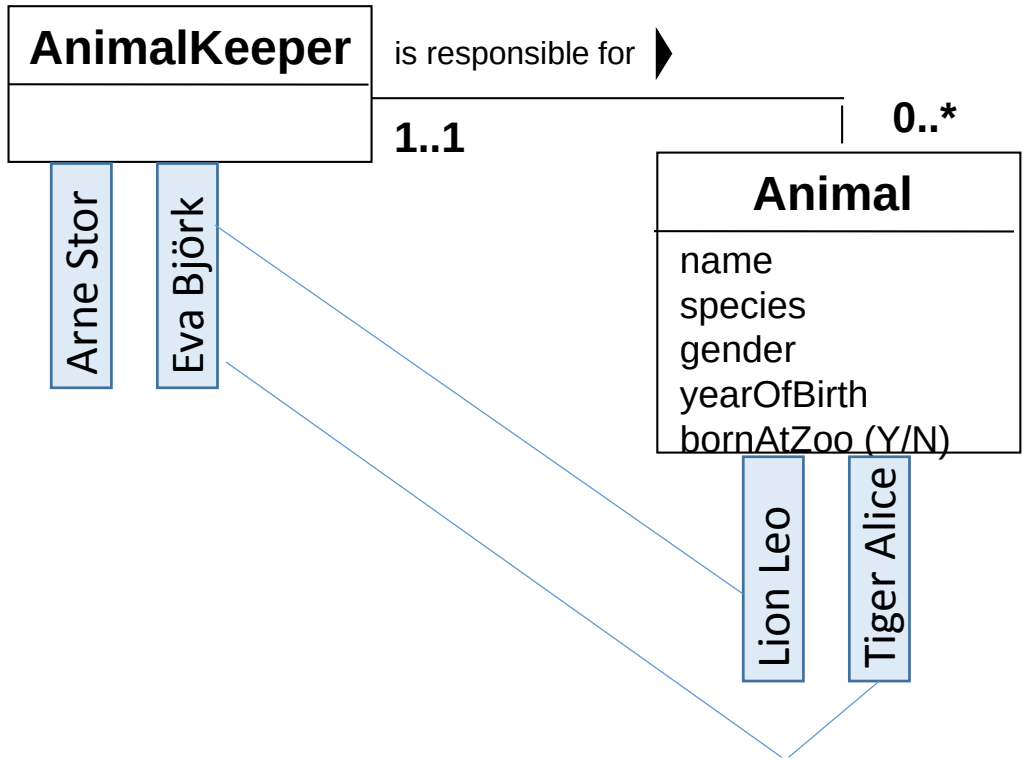
0..*
Animal
name
species
gender
yearOfBirth
bornAtZoo (Y/N)


AnimalKeeper
is responsible for
1..1
0..*
Arne Stor
Eva Björk
Animal
name
species
gender
yearOfBirth
bornAtZoo (Y/N)
Lion Leo
Tiger Alice


AnimalKeeper
is responsible for
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Animal
name
species
gender
yearOfBirth
bornAtZoo (Y/N)
Arne Stor
Eva Björk
Lion Leo
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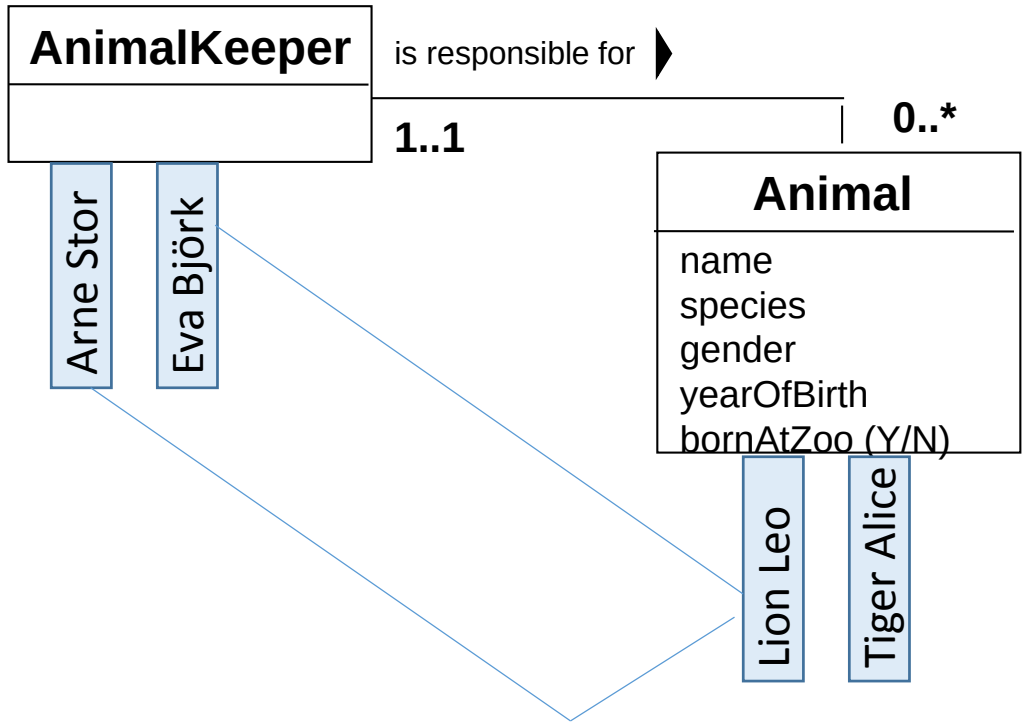
AnimalKeeper
is responsible for
1..1
0..*
Animal
name
species
gender
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bornAtZoo (Y/N)
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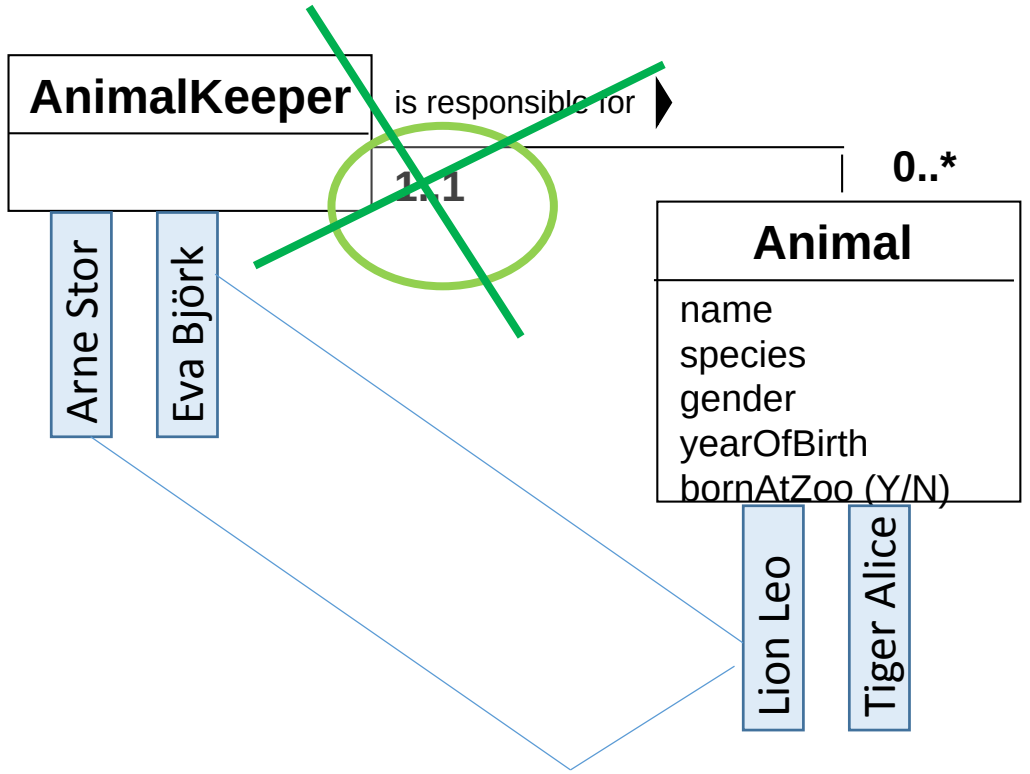
AnimalKeeper
is responsible for
1..1
0..*
Animal
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species
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yearOfBirth
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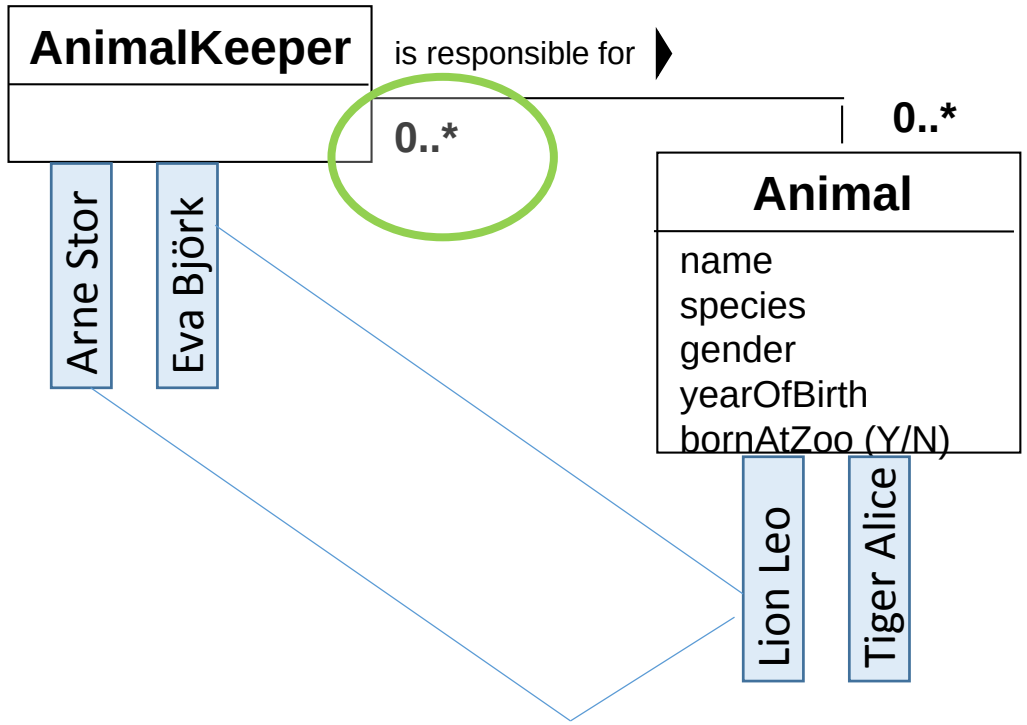
AnimalKeeper
is responsible for
0..*
0..*
Animal
name
species
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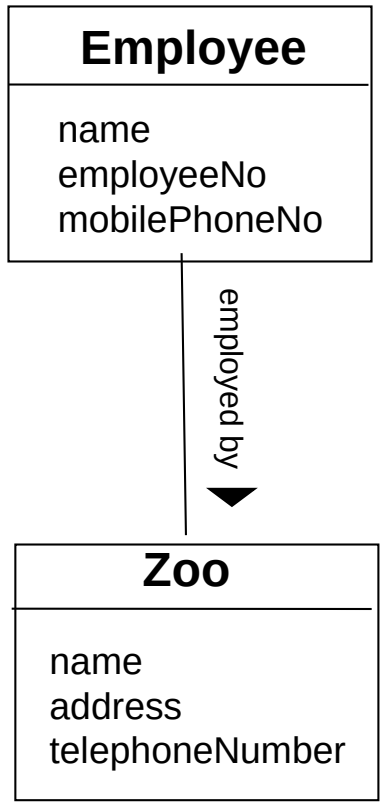
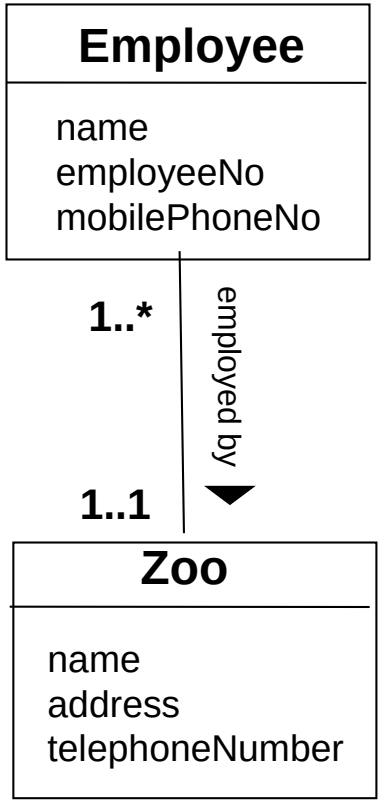
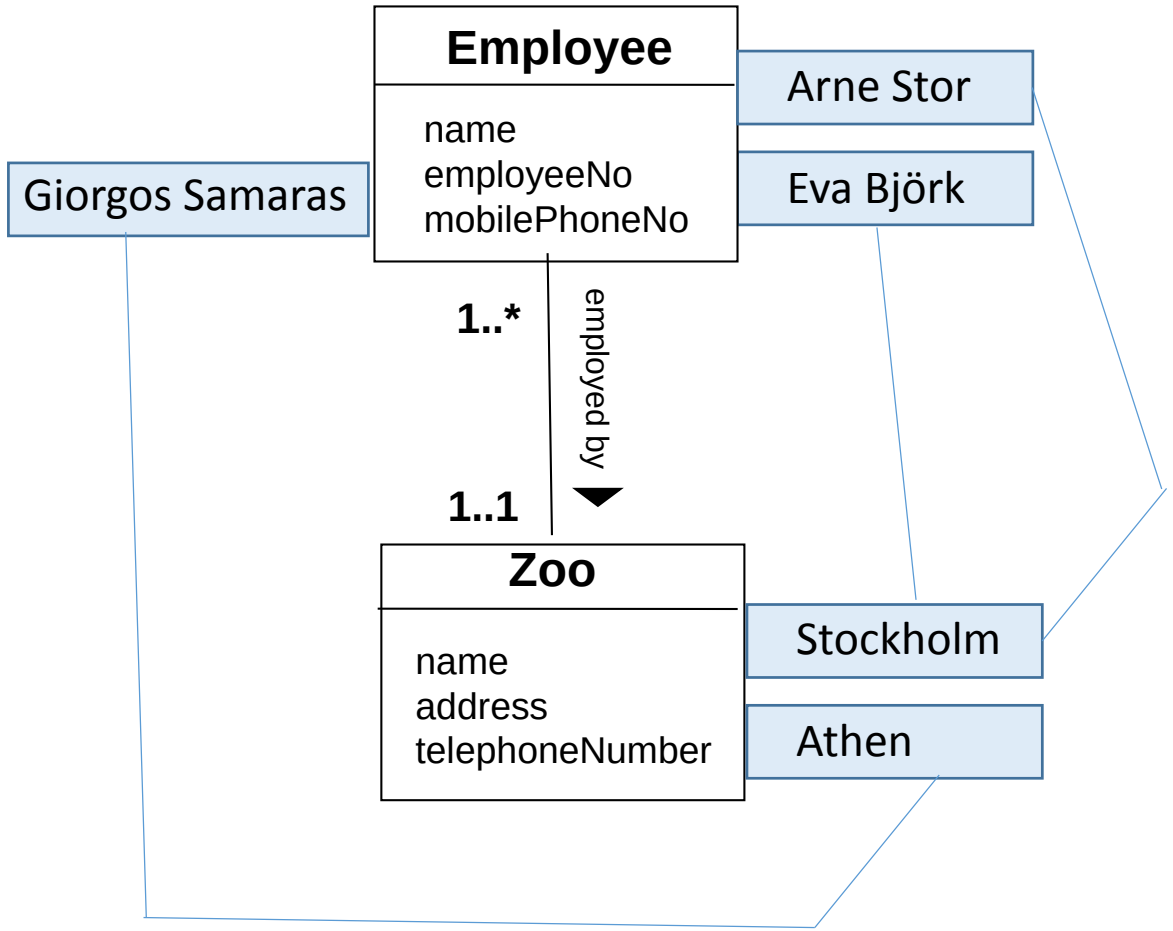
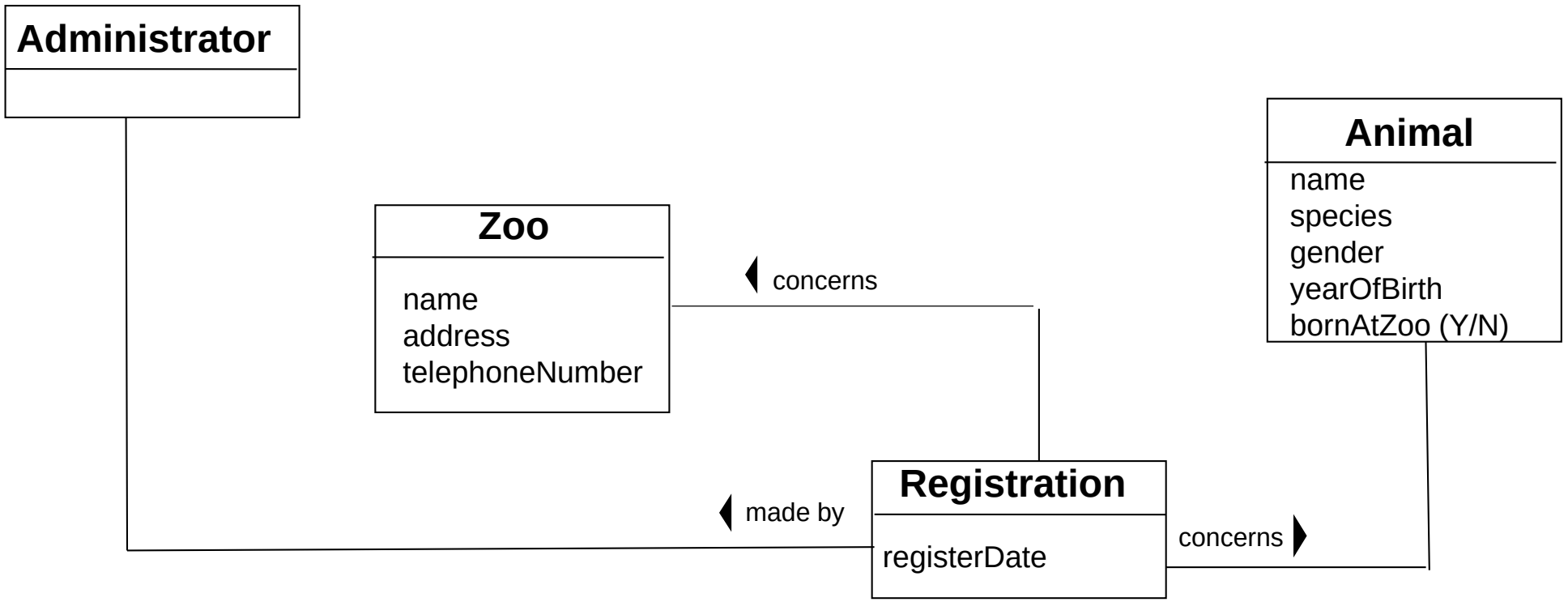
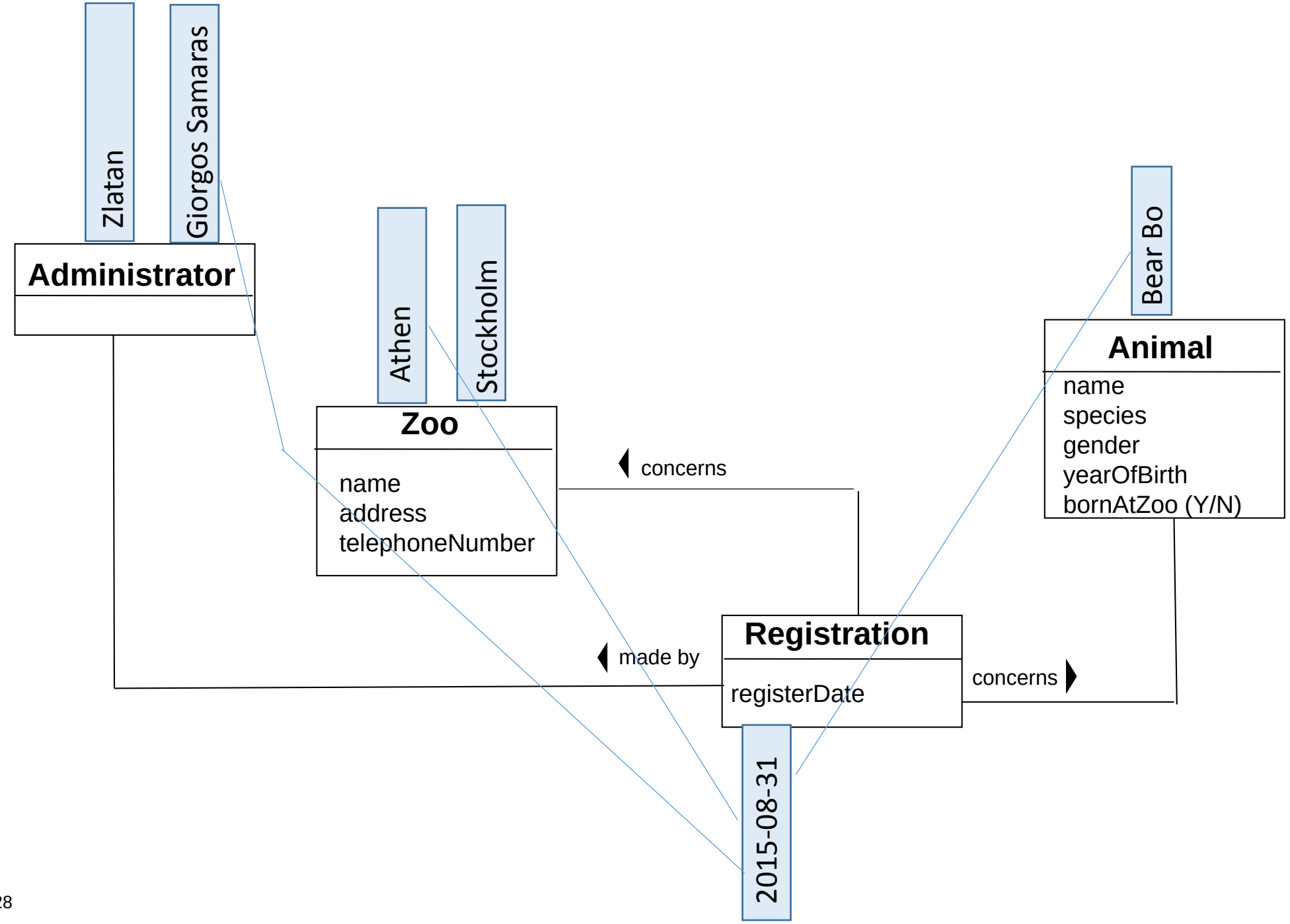
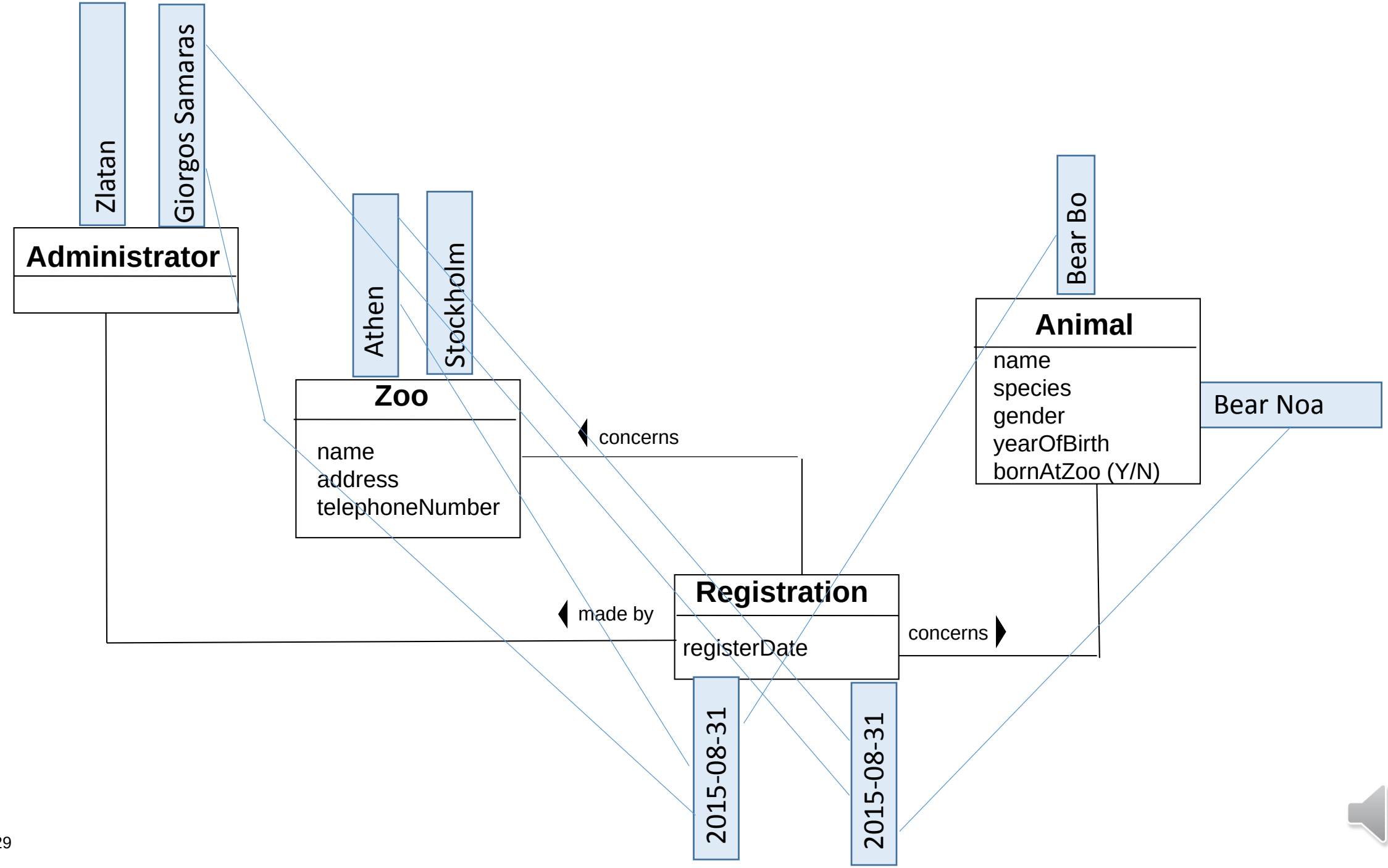

Employee
name
employeeNo
mobilePhoneNo
employed by
Zoo
name
address
telephoneNumber


Employee
name
employeeNo
mobilePhoneNo
1..*
employed by
1..1
Zoo
name
address
telephoneNumber


Employee
name
employeeNo
mobilePhoneNo
Arne Stor
Eva Björk
Giorgos Samaras
1..*
employed by
1..1
Zoo
name
address
telephoneNumber
Stockholm
Athen


Administrator
Zoo
name
address
telephoneNumber
concerns
Animal
name
species
gender
yearOfBirth
bornAtZoo (Y/N)
made by
Registration
registerDate
concerns


Zlatan
Giorgos Samaras
Administrator
Athen
Stockholm
Zoo
name
address
telephoneNumber
concerns
Bear Bo
Animal
name
species
gender
yearOfBirth
bornAtZoo (Y/N)
made by
Registration
registerDate
concerns
2015-08-31


Zlatan
Giorgos Samaras
Administrator
Athen
Stockholm
Zoo
name
address
telephoneNumber
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Bear Bo
Animal
name
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gender
yearOfBirth
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Bear Noa
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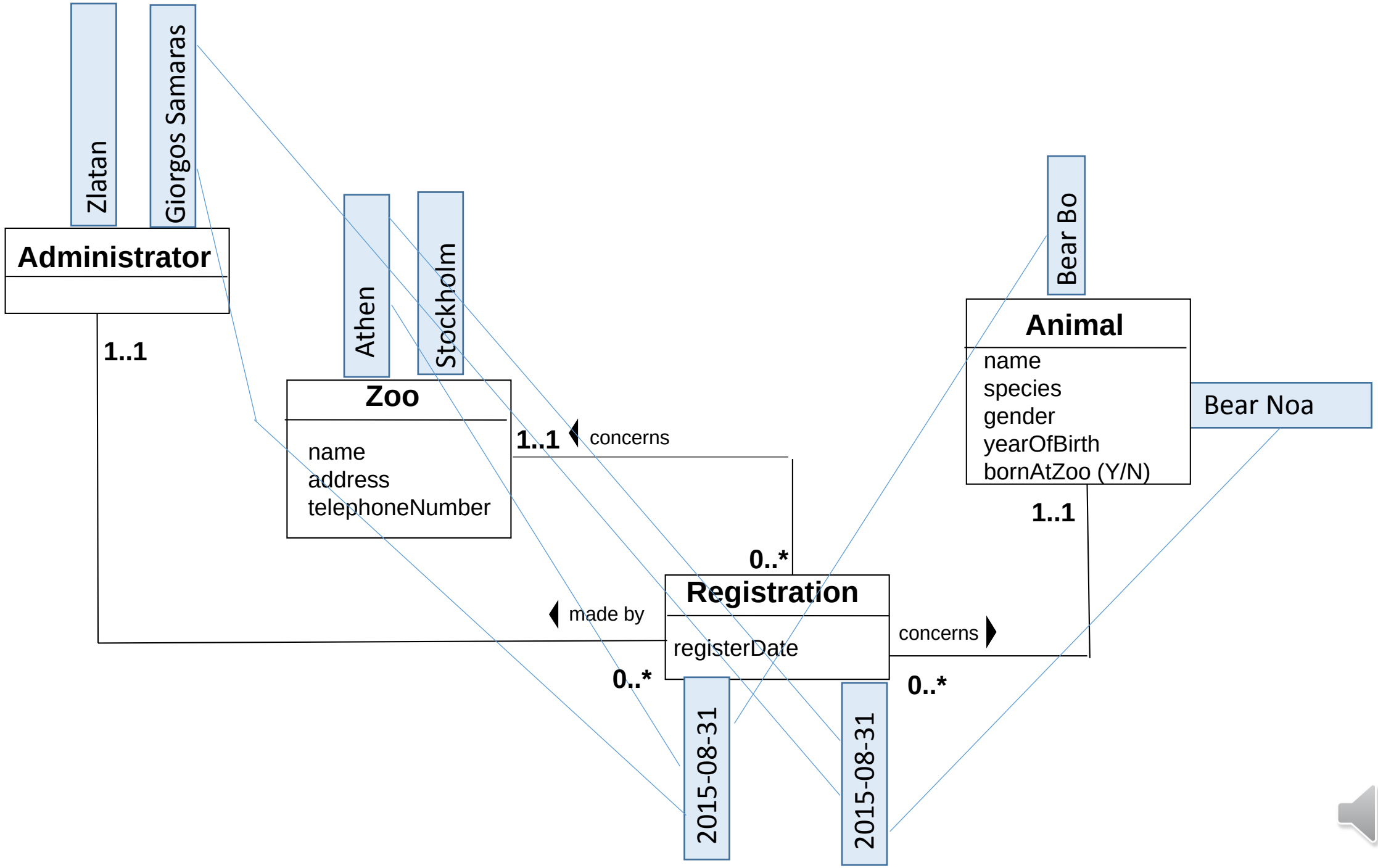
concerns
2015-08-31
2015-08-31


Zlatan
Giorgos Samaras
Administrator
1..1
Athen
Stockholm
Zoo
name
address
telephoneNumber
1..1
concerns
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made by
Registration
registerDate
0..*
concerns
0..*
2015-08-31
2015-08-31
Bear Bo
Animal
name
species
gender
yearOfBirth
bornAtZoo (Y/N)
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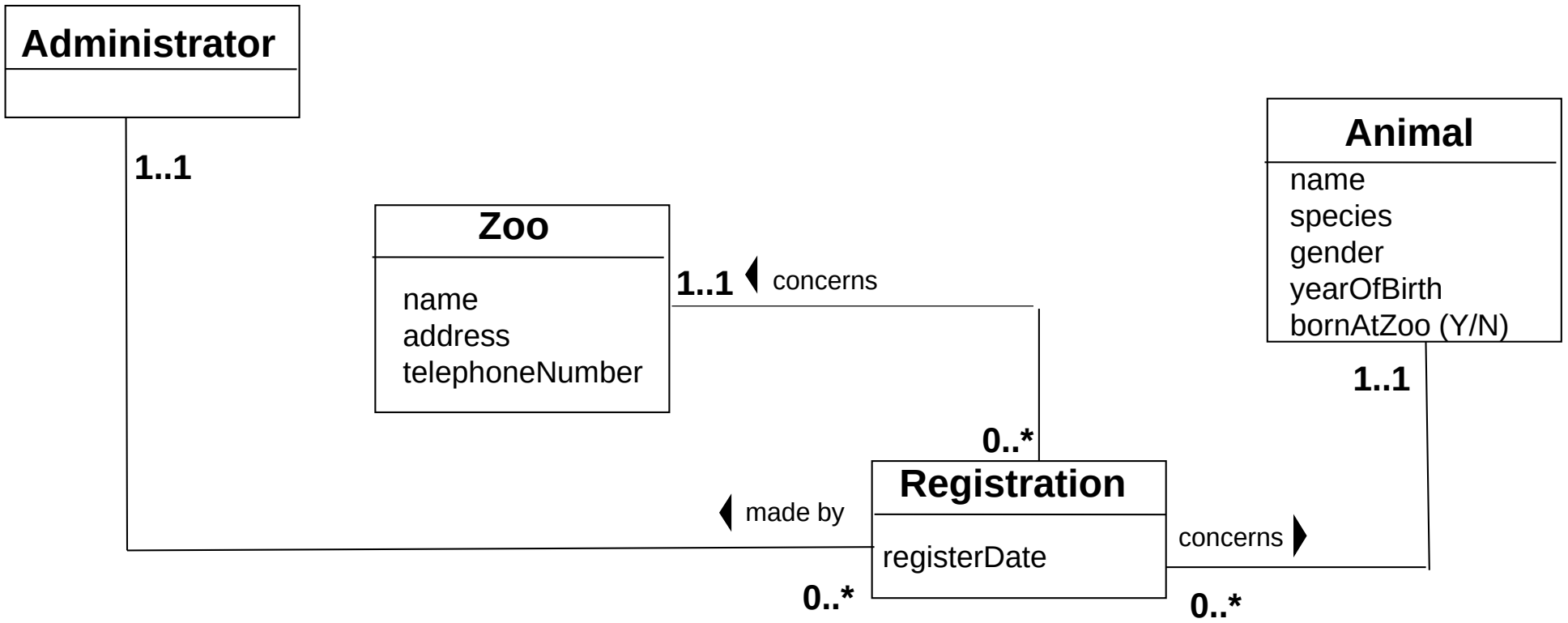
Bear Noa


Administrator
1..1
Zoo
name
address
telephoneNumber
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concerns
0..*
Animal
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species
gender
yearOfBirth
bornAtZoo (Y/N)
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registerDate
made by
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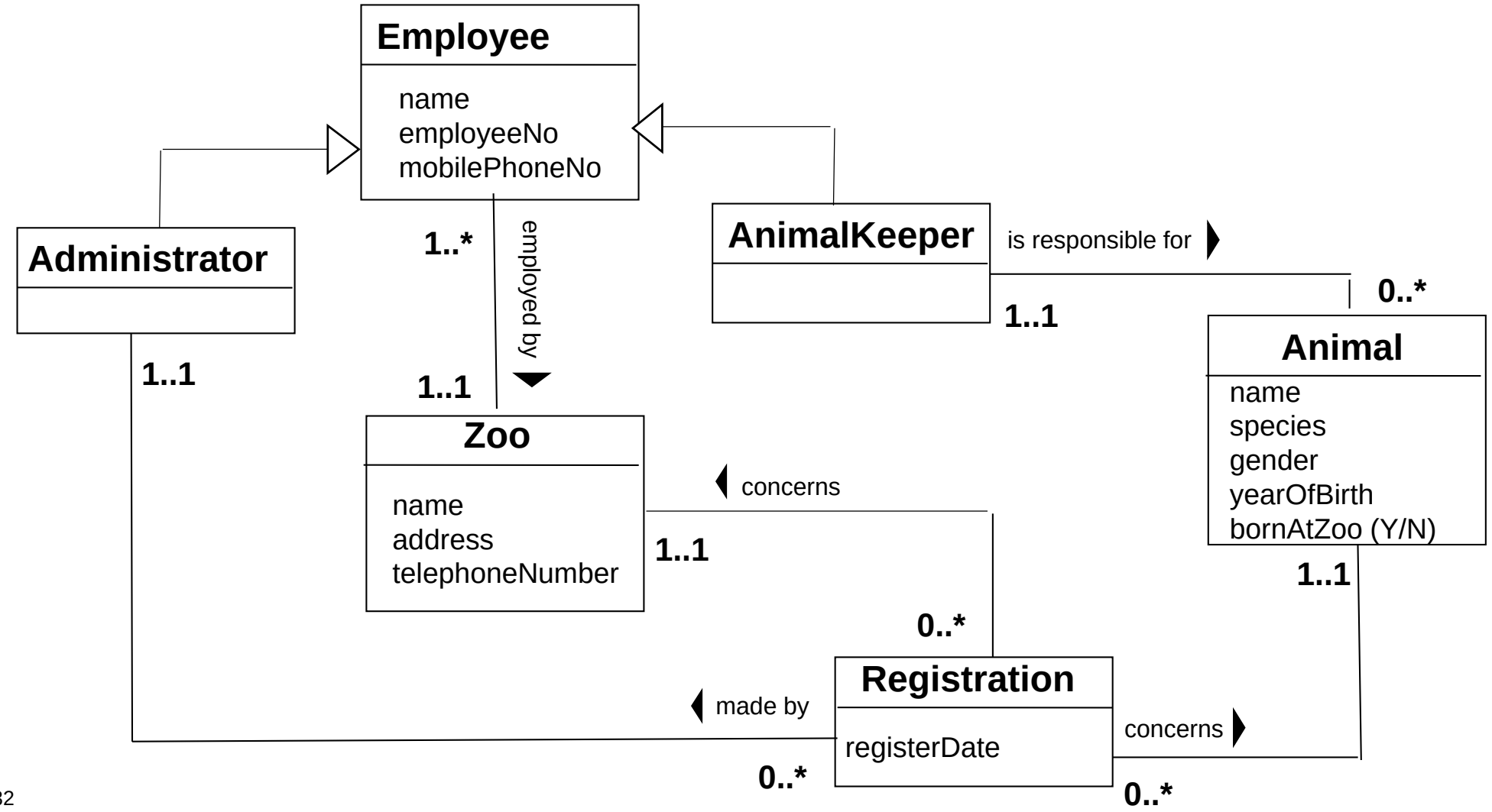
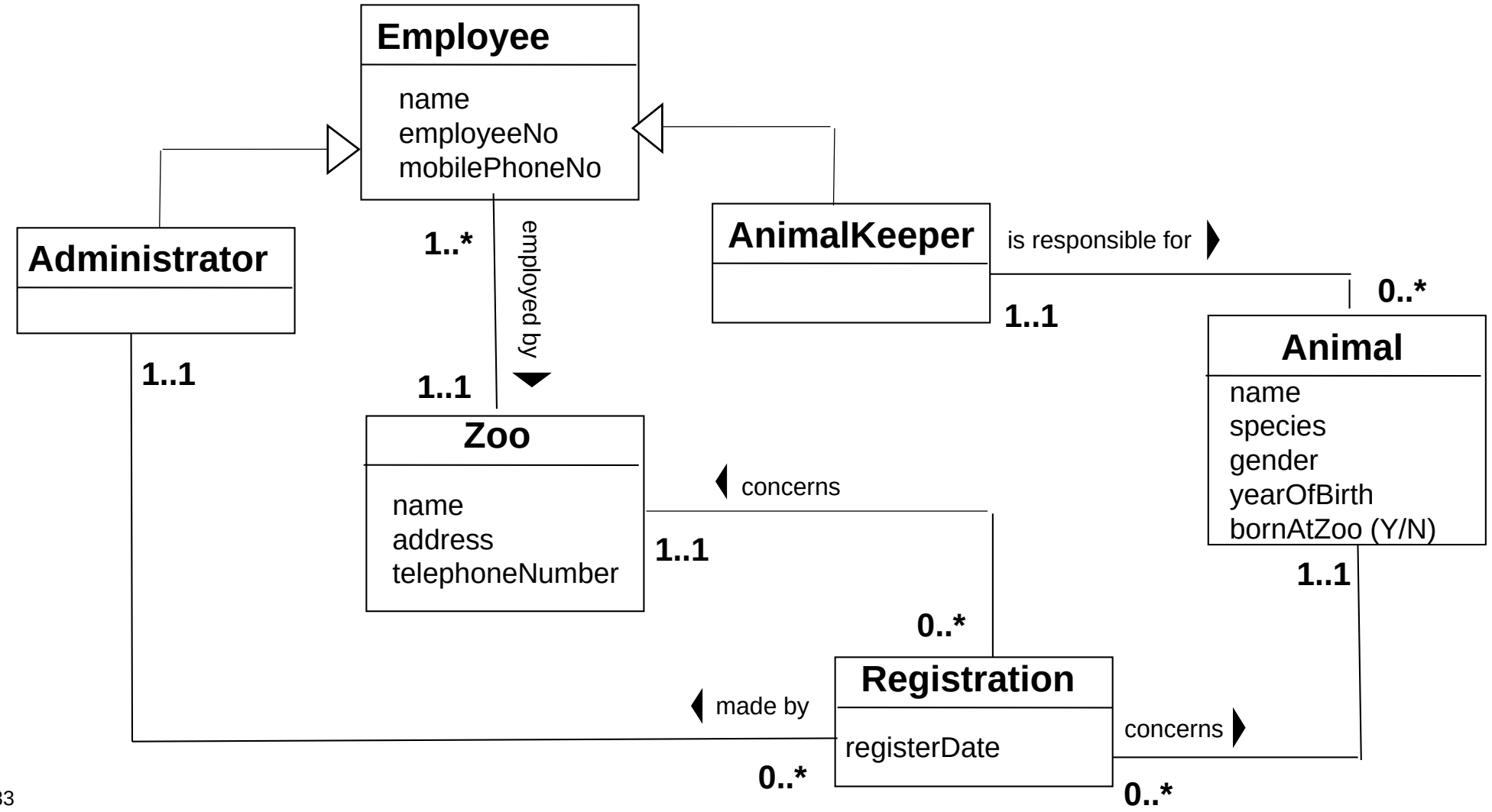

Employee
name
employeeNo
mobilePhoneNo
Administrator
AnimalKeeper
is responsible for
1..*
employed by
1..1
1..1
0..*
1..1
Animal
name
species
gender
yearOfBirth
bornAtZoo (Y/N)
Zoo
name
address
telephoneNumber
concerns
1..1
1..1
0..*
Registration
registerDate
made by
concerns
0..*
0..*

- Question: If you have access to a registration object can you find the the animal keeper that is responsible for the animal registered



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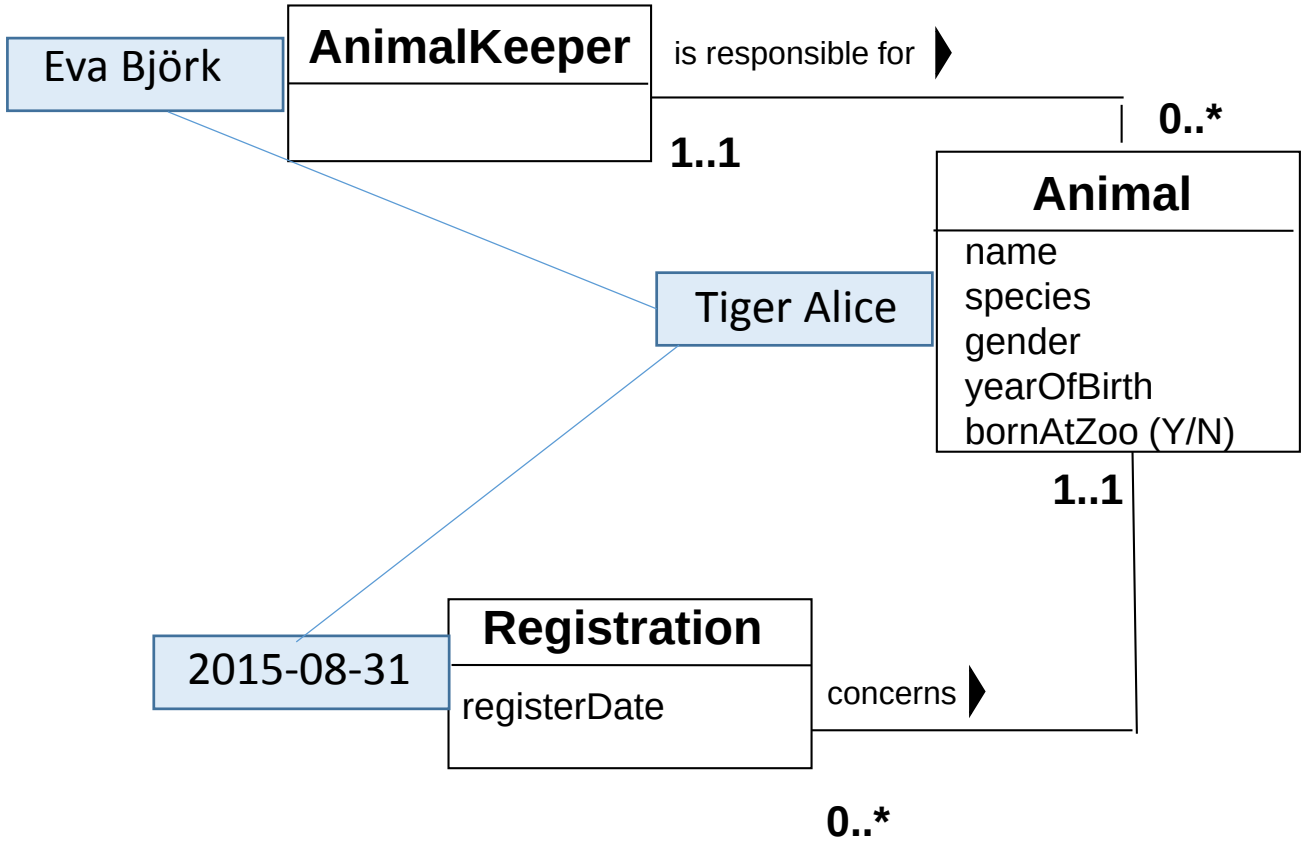

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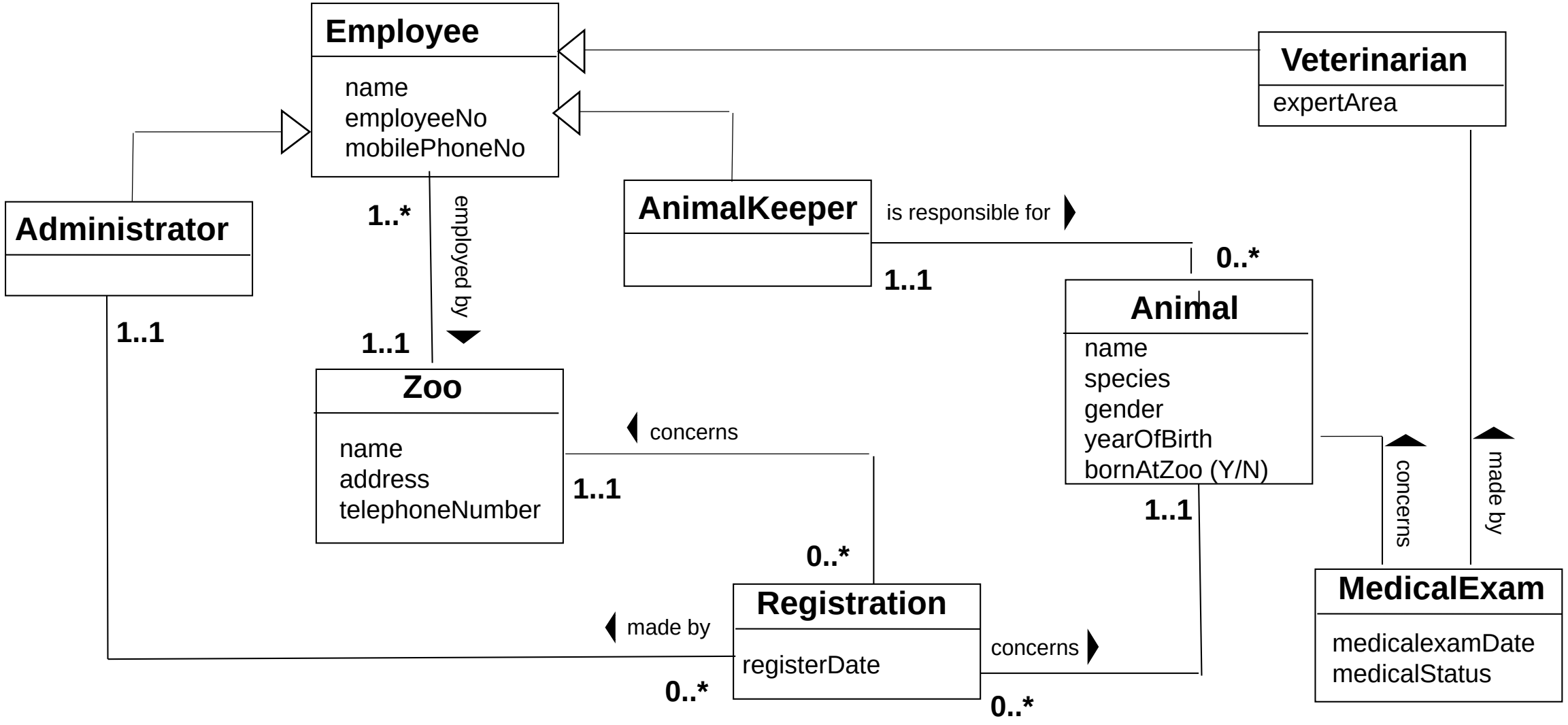
- During the introduction of an animal arriving at the zoo, a veterinarian needs to carry out a medical investigation, documenting the medical status, and the date for the investigation. The veterinarian has a name, a mobile phone number and an employee number as well as an expert area.


Employee
name
employeeNo
mobilePhoneNo
Veterinarian
expertArea
Administrator
AnimalKeeper
is responsible for
1..*
employed by
1..1
1..1
0..*
1..1
Animal
name
species
gender
yearOfBirth
bornAtZoo (Y/N)
Zoo
name
address
telephoneNumber
concerns
1..1
1..1
concerns
made by
0..*
Registration
registerDate
made by
concerns
MedicalExam
medicalexamDate
medicalStatus
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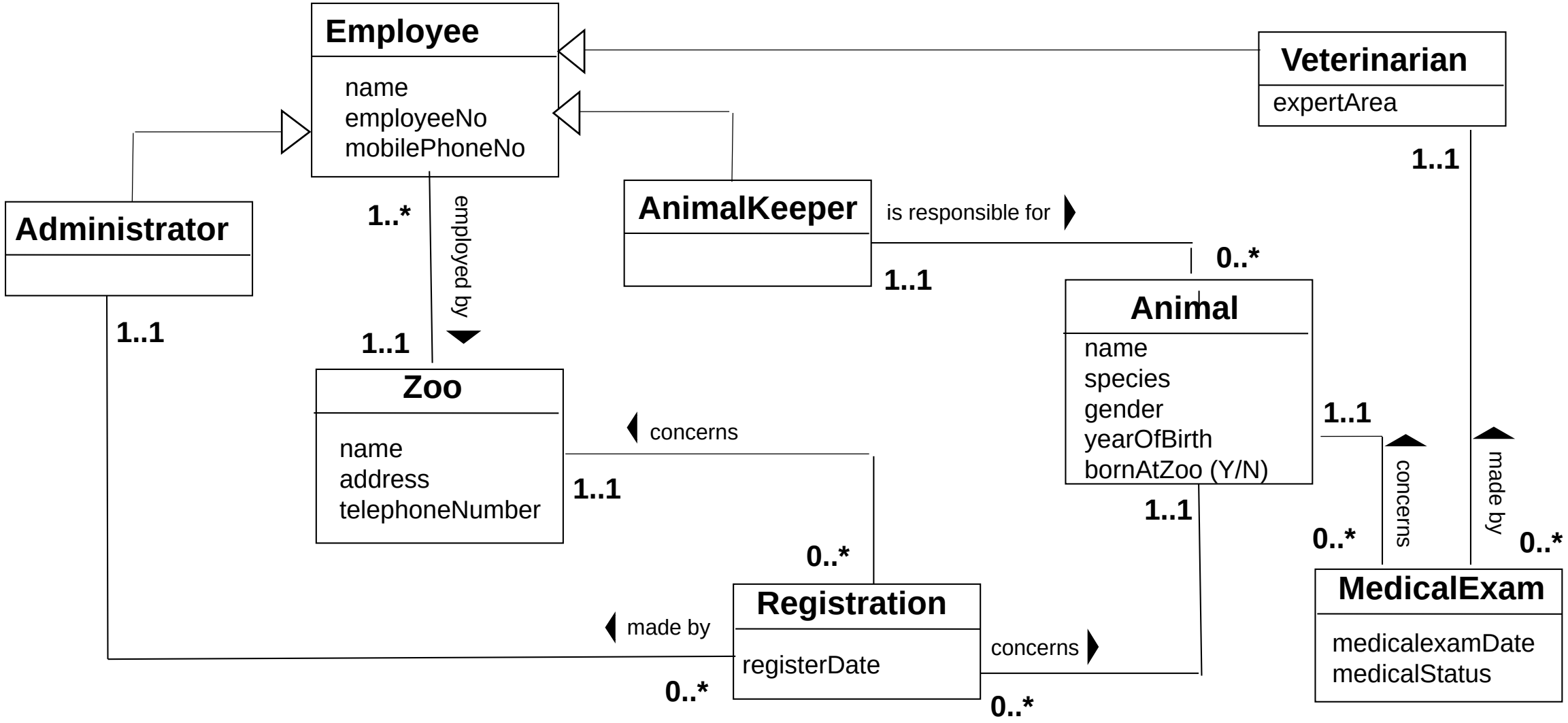
0..*


Employee
name
employeeNo
mobilePhoneNo
Veterinarian
expertArea
1..1
Administrator
1..*
employed by
AnimalKeeper
is responsible for
0..*
1..1
1..1
Animal
name
species
gender
yearOfBirth
bornAtZoo (Y/N)
Zoo
name
address
telephoneNumber
concerns
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1..1
1..1
0..*
0..*
concerns
made by
0..*
MedicalExam
medicalexamDate
medicalStatus
Registration
made by
registerDate
concerns
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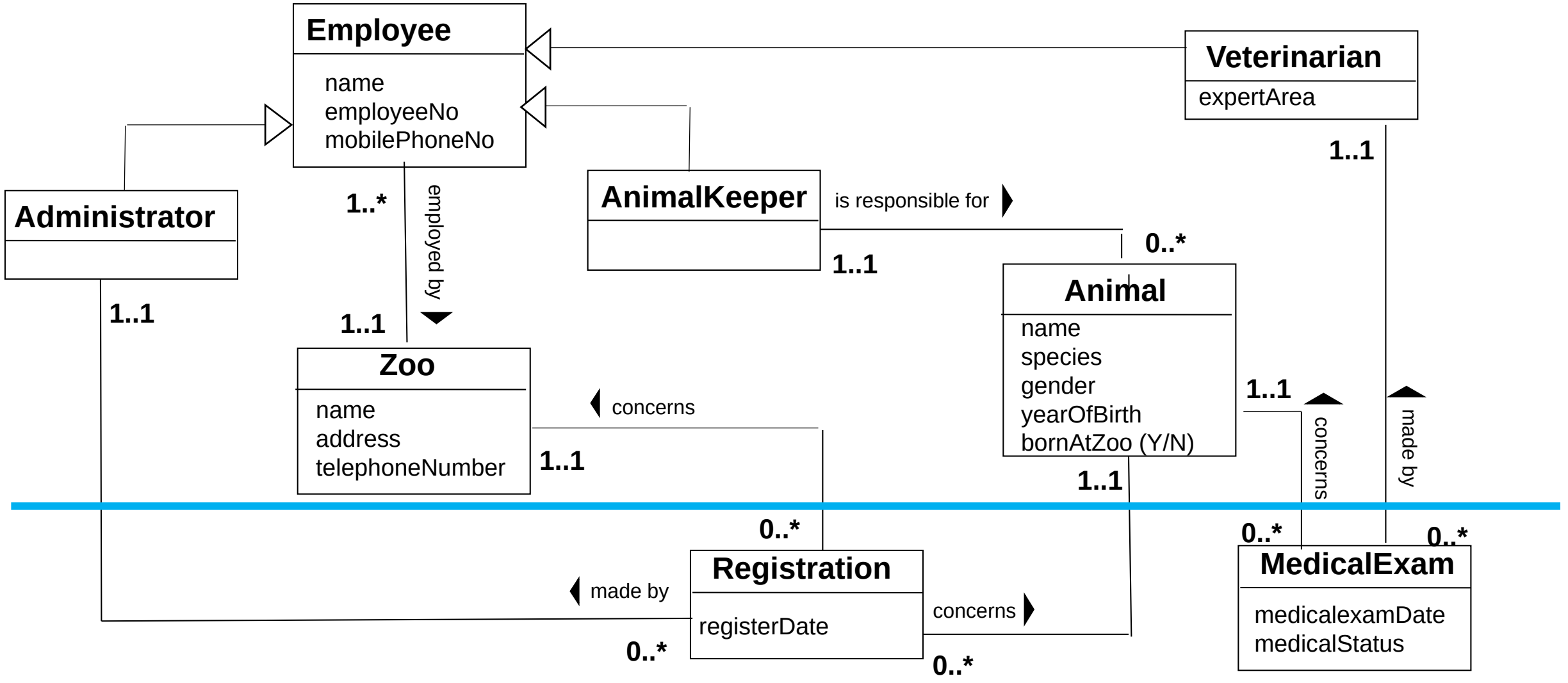
Employee
name
employeeNo
mobilePhoneNo
Veterinarian
expertArea
Administrator
AnimalKeeper
is responsible for
1..*
employed by
1..1
1..1
0..*
1..1
1..1
Animal
name
species
gender
yearOfBirth
bornAtZoo (Y/N)
Zoo
name
address
telephoneNumber
concerns
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made by
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Registration
registerDate
made by
concerns
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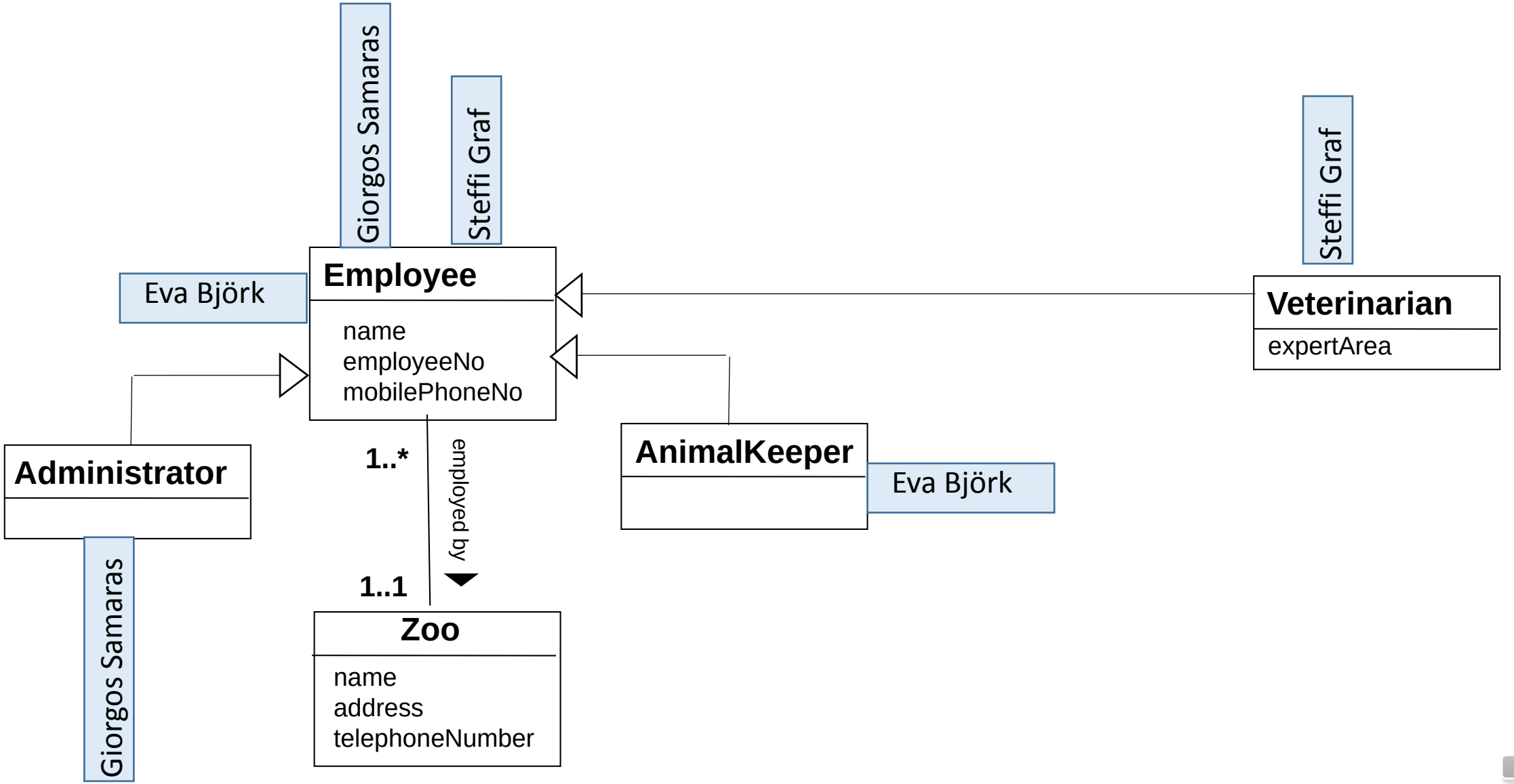
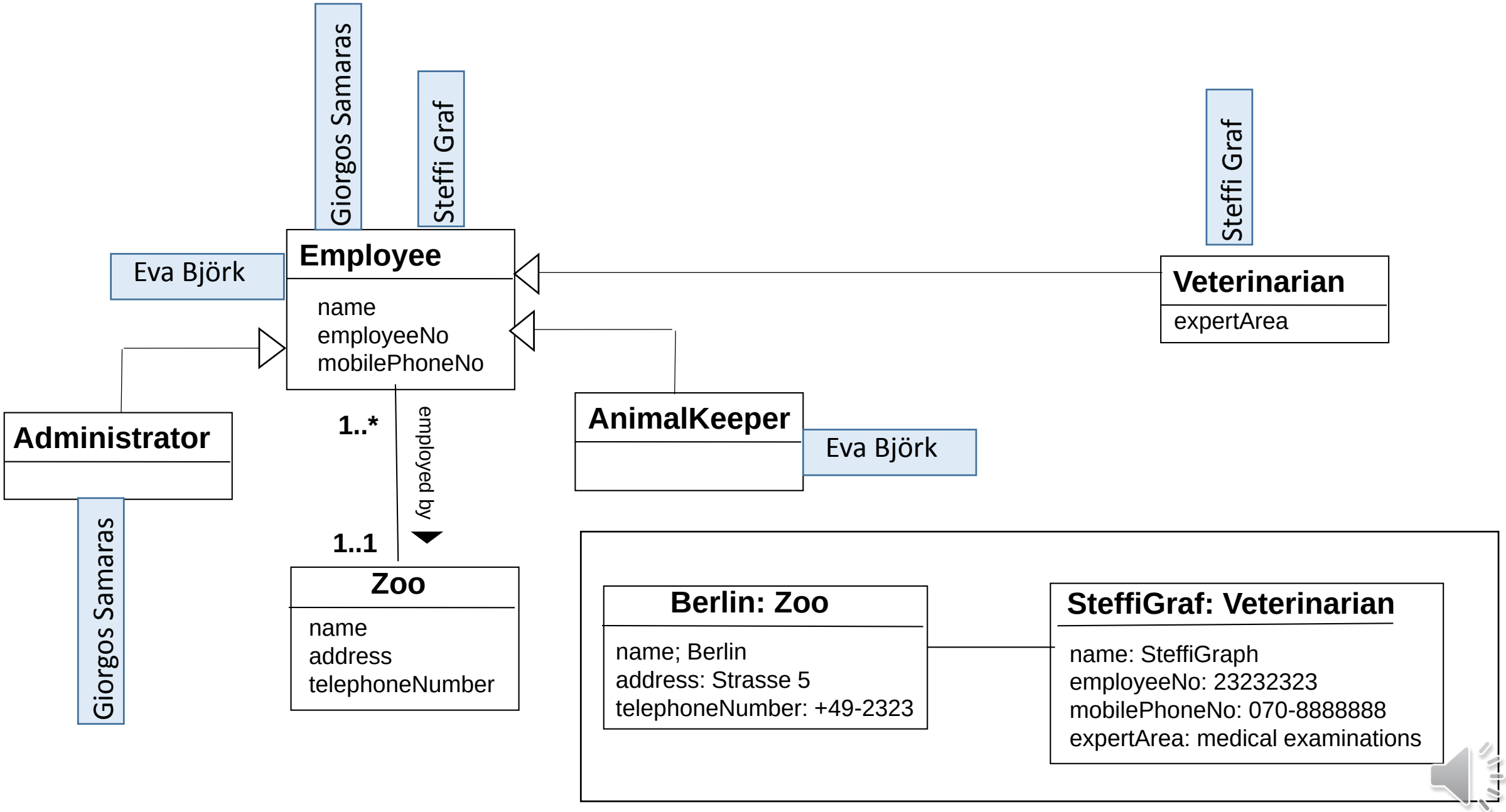
MedicalExam
medicalexamDate
medicalStatus


Giorgos Samaras
Steffi Graf
Steffi Graf
Eva Björk
Employee
name
employeeNo
mobilePhoneNo
Veterinarian
expertArea
Administrator
1..*
employed by
AnimalKeeper
Eva Björk
1..1
Zoo
name
address
telephoneNumber
Giorgos Samaras


Giorgos Samaras
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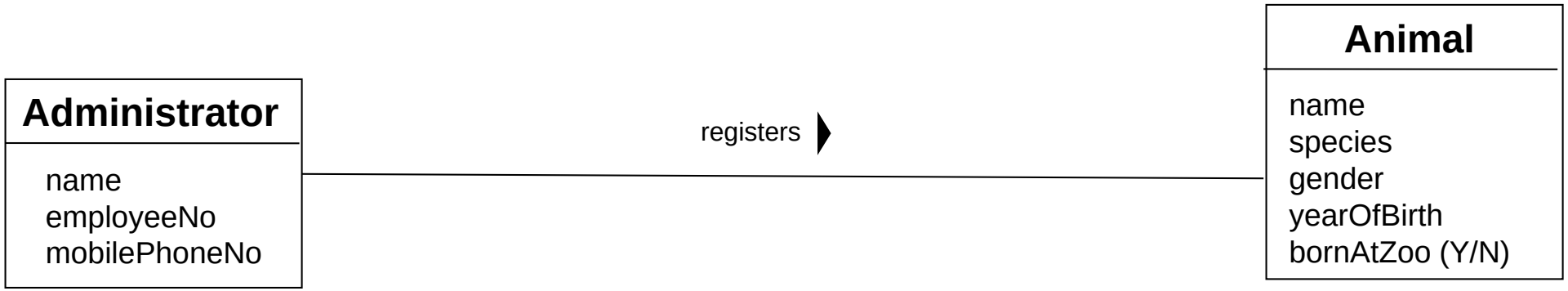
AnimalKeeper
Eva Björk
1..*
employed by
1..1
Zoo
name
address
telephoneNumber
Giorgos Samaras
Berlin: Zoo
name; Berlin
address: Strasse 5
telephoneNumber: +49-2323
SteffiGraf: Veterinarian
name: SteffiGraph
employeeNo: 23232323
mobilePhoneNo: 070-8888888
expertArea: medical examinations

Guidelines

Guidelines

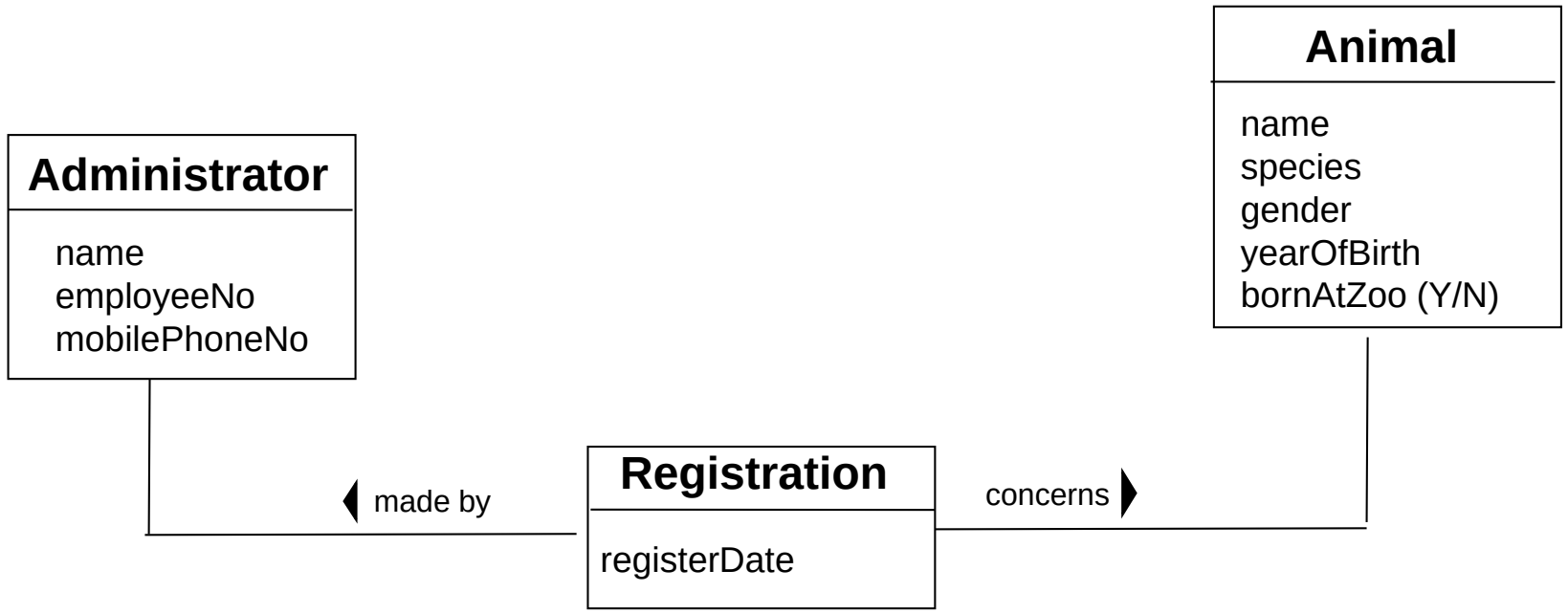
Nouns and verbs



Guideline:

As a starting point: Nouns are modelled as *classes (or attributes)* and *verbs* as *associations*

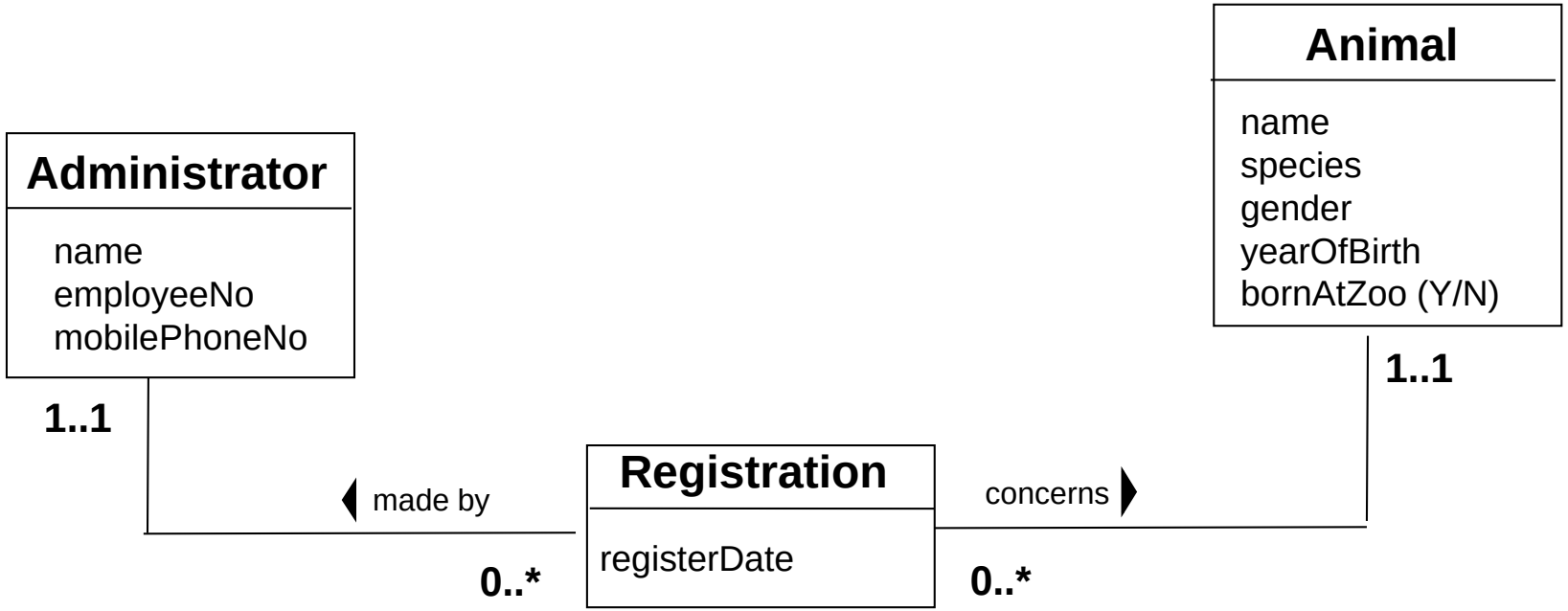
Some associations shall be classes



Guideline:

Associations that need to have a date (or some other attribute), shall be transformed to classes

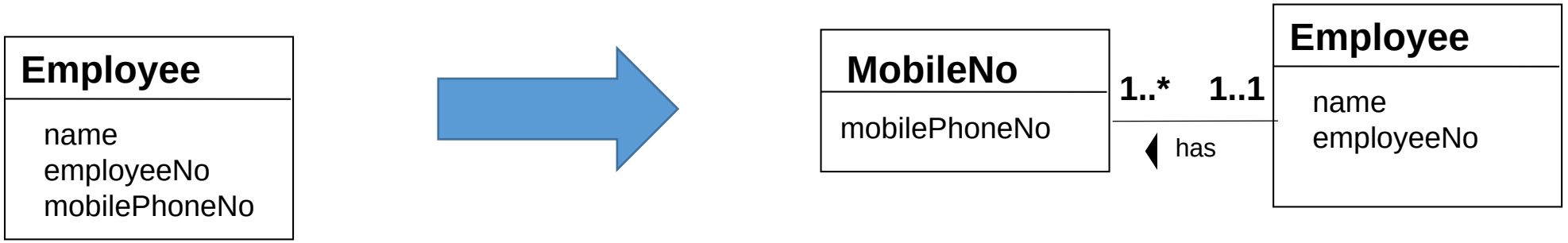
Identify action/event classes – and note the multiplicity



Guideline:

It simplifý modelling to early find the action/event classes - and note the common multiplcity from and towards these type of classes

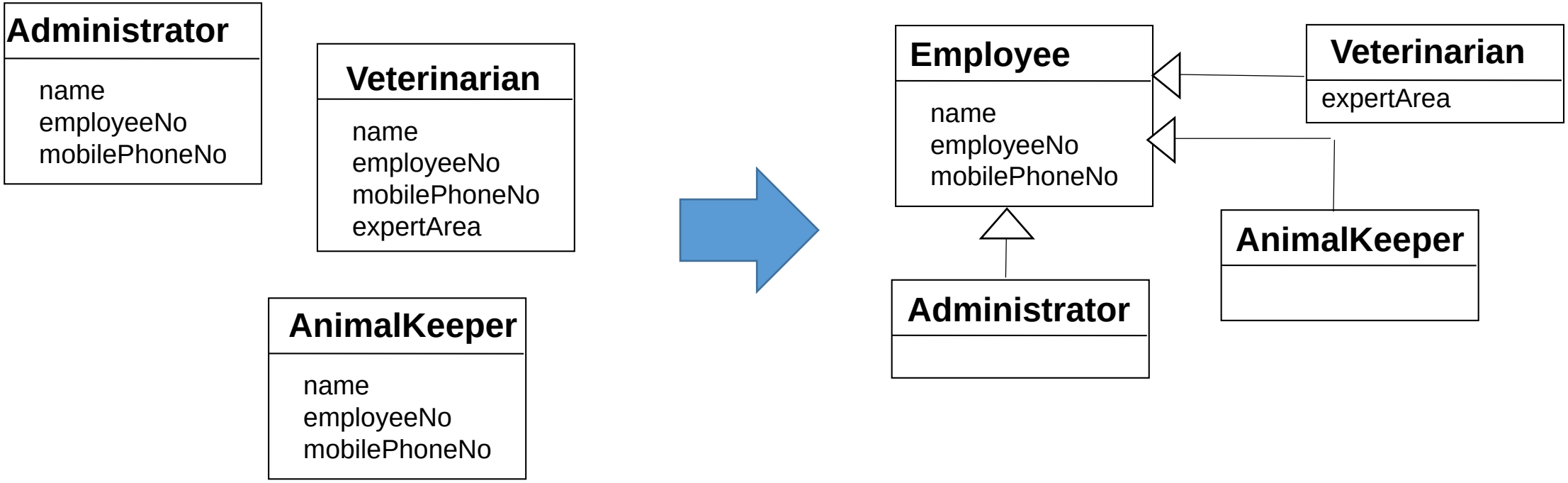
Some attribute shall be classes



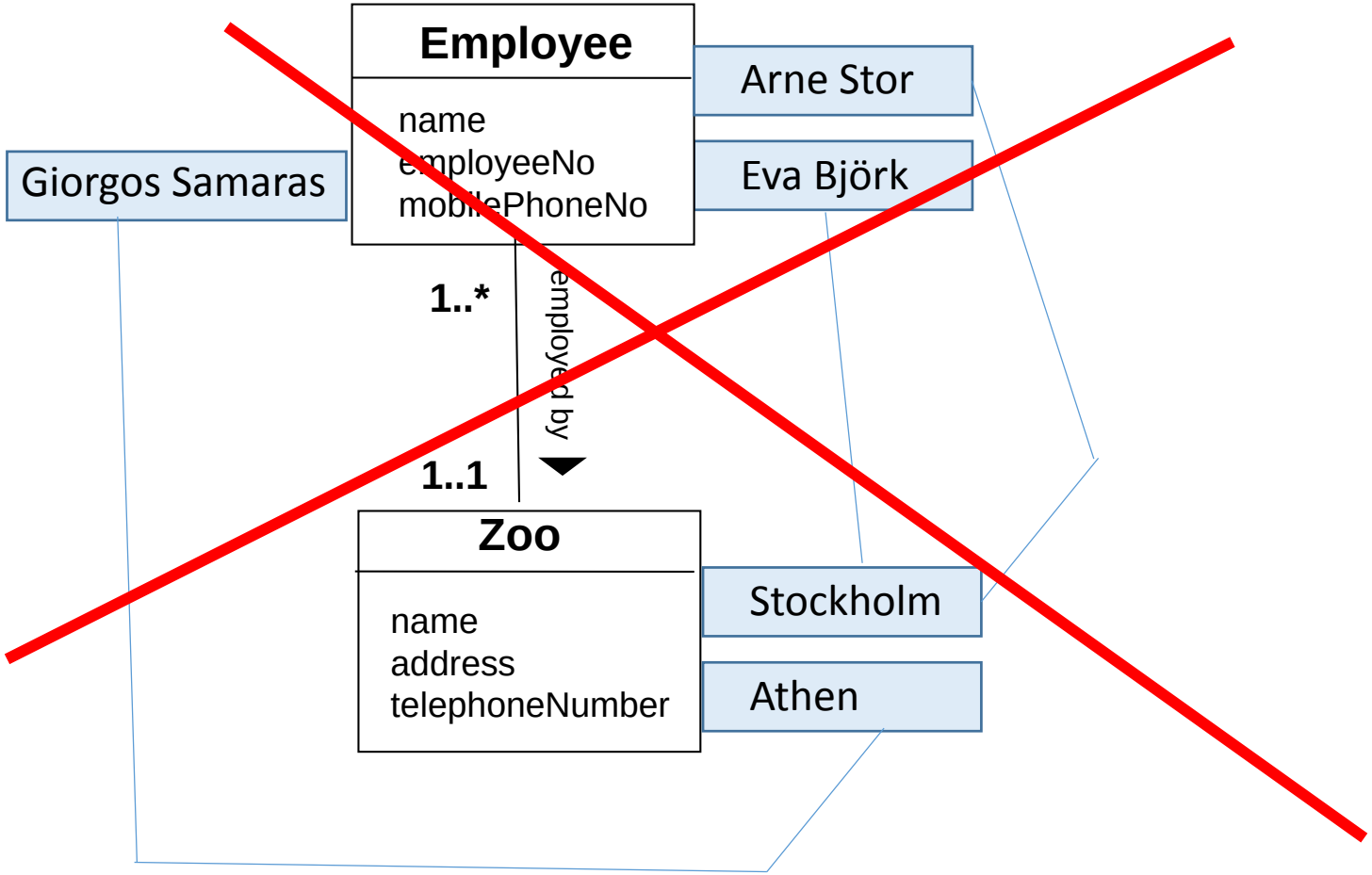
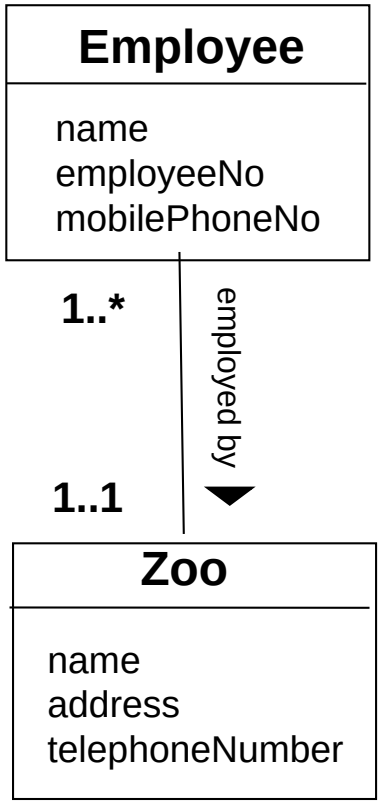
Guideline:

Attribute that can have several values shold be transformed to classes, That is alttribute should have the multiplicity 1..1, if not, create a new class for the attribute

Make use of generalizations



Guideline:

Make use of generalizations if possible. It makes the conceptual model easier to interpret

DO NOT MODEL OBJECTS