IIW HW 5 - OWL

1. What’s the definition of mad\_cow? Give both the formal definition and an explanation in your own words.  
   Formal Definition:

Mad cow ≡ cow ⨅ ∃eats.brain ⨅ ∃part\_of.sheep

Definition in own word:

Mad cow is a subclass of cow (which is a subclass of vegetarian -> Animal ). It has two properties eats which should have at least one brain and part\_of which should have at least one sheep.

1. What constraints does mad\_cow inherit from its superclasses?  
   cow subclass constraint: It is a subclass of animal and eats everything but animal or part\_of animal.

Cow subclassOf Vegetarian

Vegetarian equivalentTo Animal and (eats only (not (animal))) and (eats only (not (part\_of some animal)))

In other words mad\_cow inherits being a Vegeterian from the superclasses.

1. Do you see any problem with that definition? Why?

The mad cow becomes subclass of owl:Nothing  
mad cow EquivalentTo cow and (eats some (brain and (part\_of some sheep)))

Cow subclassOf Vegetarian

Vegetarian equivalentTo Animal and (eats only (not (animal))) and (eats only (not (part\_of some animal)))

Sheep Subclass animal.

Hence this contradicts where mad cow cannot eat Animal (since it is subclass of Vegetarian which cannot eat Animal) and the definition of mad cow says it eats sheep (which is sublass of animal)

1. What happened to the definition of mad\_cow?

The definition of mad\_cow now includes owl:nothing. This is because the initial definition of mad cow and constraints of its subclass contradicts allowing it to become a subclass of Vegetarian and cow.

1. What happened to the giraffe class? Why?  
   Giraffe become equivalent to a Vegetarian.

Definition of Vegetarian: subclass of animal

Eats anything but animal or part\_of animal

Definition of giraffe: subclass of animal

Eats only leaf

Subclass of vegetarian.

Clearly Giraffe can be seen to become equivalent subclass of giraffe.

1. List all the dog and cat owners.  
   has\_pet some cat or has\_pet some dog

Owners of dog and cat are:

Fred

Joe

Mick

Minnie  
If this is consider to be “List all owners having both cat and dog” then the result is an empty set.

1. Give a complete description of the instance Mick.  
   Description of Mick:
   1. Male
   2. Dog owner
   3. White van man
2. List all the subclasses of grownup.  
   These are subclasses with hierarchy.  
   driver  
    bus driver  
    haulage truck driver  
    lorry driver  
    van driver   
    white van drive  
   man  
    white van man  
   woman  
    old lady
3. The Daily Mirror is inferred to be a tabloid. Why?  
   Mick has “reads” property with value as “Daily Mirror”. Mick has “drives property as “Q1223 ABC” which is a white van and since he is also “man” it can be inferred that Mick is type of “white van man”.

By definition, “white van man” is a subclass of a set having “reads” property with range of values of type “tabloid” only.

Hence, “Daily Mirror” can be inferred to be of type “tabloid”.

1. Do all the “pets” of animal-lover need to be animals?

Yes.

Animal-lover equivalent is person intersect has\_pet min 3 owl:things.

Now has\_pet has domain of person and range of animal and if animal-lover has a pet it can only be animals.