# oblig 5

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## 1 Question 1.2

3. Food is the range of :favouriteFood

$\Gamma \models$ :favouriteFood rdfs:subPropertyOf :eats
$\Gamma \models$ :eats rdfs:range :Food
$\models$ Food(eats, favouriteFood)
iff
$eats^I, favouriteFood^I \in Food^I$

Thus, We have favouriteFood in range of Food.

4. Bruce has some :favouriteFood.

$\Gamma \models$ :Bruce rdf:type :Fish
$\Gamma \models$ :Fish rdfs:subClassOf :Animal
$\Gamma \models$ :favouriteFood rdfs:subPropertyOf :eats
$\Gamma \models$ :eats rdfs:domain :Animal
$\models$ Animal($eats^I, favouriteFood^I$)
iff
$(eats^I, favouriteFood^I) \in$ Animal
$favouriteFood^I \in$ Animal $\models$ Animal($fish^I, Bruce^I$)

And
$(fish^I, Bruce^I) \in$ Animal
Bruce $\in$ Animal
$\models$ Animal($favouriteFood^I, Bruce^I$)
:favouriteFood $\subseteq$ :Animal
and
:Bruce$\subseteq$ :Animal

Thus, :Bruce $\subseteq$ :Fish$\subseteq$ :Animal $\subseteq$ :eats $\subseteq$ :favouriteFood

5. :Bruce is a vegetable,

$\Gamma \models$ :Bruce $\subseteq$ :Fish
$\Gamma \models$ :Fish $\subseteq$ :Animal, :Food
$\Gamma \models$ :Vegetable $\subseteq$ :Food
Thus, $\models$ :Bruce $\subseteq$ :Fish $\subseteq$ :Food
and
$\models$ :Vegetable $\subseteq$ :Food
iff
: $Bruce^I \subseteq$: $Fish^I \subseteq$: $Food^I$
Also
: $Vegetables^I \subseteq$: $Food^I$
Since, Both belongs to Food, We can say both interconnect each other. Hence, it is proved.

6. Bruce ia a horse.

$\Gamma \models$ :Bruce $\subseteq$ :Fish
$\Gamma \models$ :Fish $\subseteq$ :Animal, :Food
$\Gamma \models$ :Horse $\subseteq$ :Animal
Thus, $\models$ :Bruce $\subseteq$ :Fish $\subseteq$ :Animal
and :Horse$\subseteq$ :Animal iff
: $Bruce^I \subseteq$: $Fish^I \subseteq Animal^I$
Also,
: $Horse^I \subseteq Animal^I$
Hence, statement is proved.

7. Bruce is a Fish.

$\Gamma \models$ :Bruce $\subseteq$ :Fish
iff : $Bruce^I \subseteq$: $Fish^I$
Hence, it it proved that Bruce is a Fish.