

Exercise 1

1. Express in RDFS:
 - Mackenzie manages the New Business Development department
 - Mackenzie is a manager.
 - Departments are managed by managers.

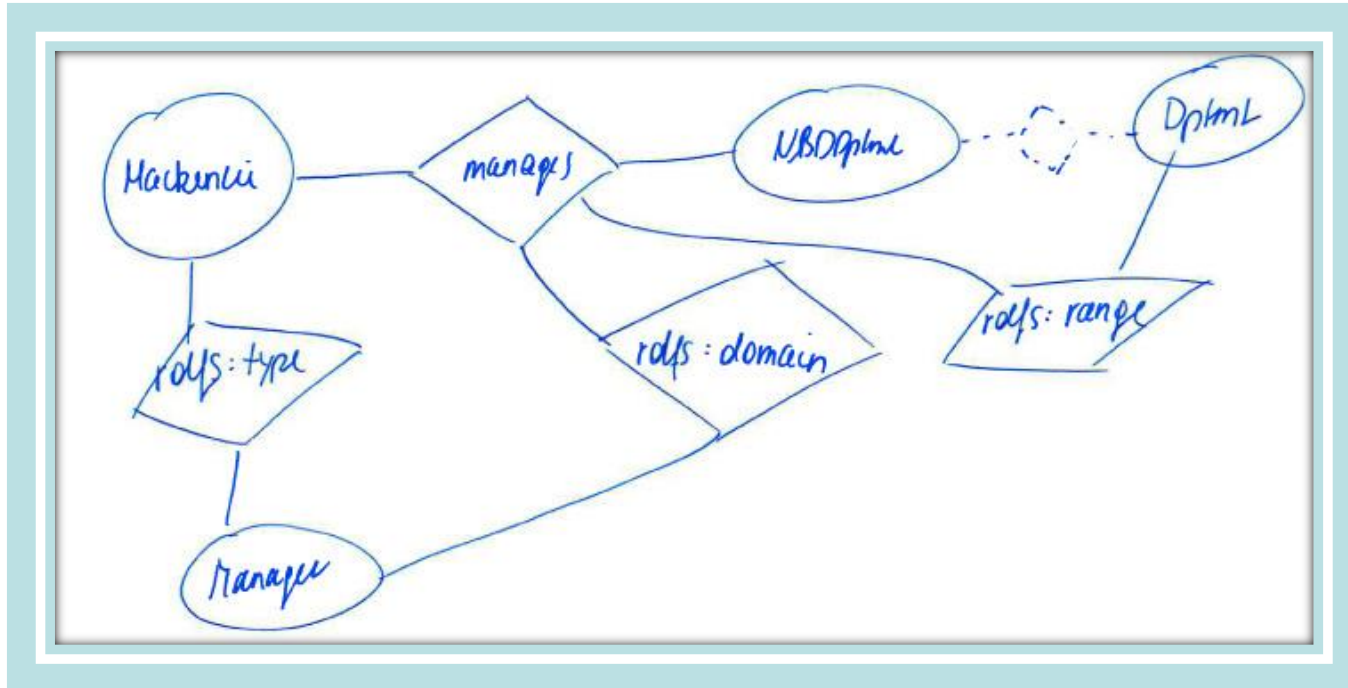
2. Does „ex:TextBook rdfs:SubClassOf ex:Publication“ follow from these 2 triples?

```
ex:TextBook rdfs:subClassOf ex:Book
ex:Book rdfs:subClassOf ex:Publication
```

3. Of what type(s) is „ex:Manager“ given the triple below?

```
ex:Mackenzie rdf:type ex:Manager
```

Solution 1.1



Solution 1.2 and 1.3

2. Does „ex:TextBook rdfs:SubClassOf ex:Publication“ follow from these 2 triples? **YES, rdfs:subClassOf is transitive**

ex:TextBook rdfs:subClassOf ex:Book

ex:Book rdfs:subClassOf ex:Publication

3. What is the type of „ex:Manager“ given the triple below?

ex:Mackenzie rdf:type ex:Manager

It is **rdfs:Class** because of the RDFS axiomatic triple „rdf:type rdfs:range rdfs:Class“ **and rdfs:Resource** because rdfs:Class is a subclass of rdfs:Resource.

Exercise 2

1. What is the type of „ex:Grings“ according to the following 3 triples?
ex:companyStrange ex:produces ex:Grings
ex:produces rdfs:range ex:SpaceSuit
ex:produces rdfs:range ex:SpaceAccessory
2. How could we express, in RDFS, that „ex:Grings“ is an ex:SpaceSuit or an ex:SpaceAccessory but not necessarily both?
3. Is it a problem to say the following? What does it mean? What was intended?
ex:produces rdfs:domain ex:Company
ex:NBDDepartment ex:produces ex:Grings

Solutions 2.1 – 2.3

1. What is the type of „ex:Grings“ according to the following 3 triples?

ex:companyStrange ex:produces ex:Grings
ex:produces rdfs:range ex:SpaceSuit
ex:produces rdfs:range ex:SpaceAccessory

Ex:Grings is of the type SpaceSuit AND SpaceAccessory

2. How could we express, in RDFS, that „ex:Grings“ is an ex:SpaceSuit or an ex:SpaceAccessory but not necessarily both?

Ex:produces rdfs:range ex:Product
Ex:SpaceSuit rdfs:subClassOf ex:Product
Ex:SpaceAccessory rdfs:subClassOf ex:Product

3. Is it a problem to say the following? What does it mean? What was intended?

ex:produces rdfs:domain ex:Company
ex:NBDDepartment ex:produces ex:Grings

Problem – NO, it just means that the NBDDepartment is a company. This is (probably) not intended!

Exercise 3

Express in OWL 2 (use Protege 4.1)

- Mackenzie manages the New Business Development department
- Mackenzie is a manager.
- Departments are managed by managers (use domain and range restrictions)
 - A Department is managed by at least one and at most two managers (Use ObjectMin/MaxCardinality to express this)
- Managers work in some Department (use ObjectSomeValuesFrom to express this)
- strangeCompany is a Company
- strangeCompany produces SpaceSuits and SpaceAccessories
 - use a range restriction on „produces“ and think how to phrase the class that contains both SpaceSuits and SpaceAccessories (restricts the property „produces“ globally)
 - or define a type for strangeCompany that expresses the above