

Simone Preite 3885035

Exercise 1:

```
PREFIX ex: <http://example.org/>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
CONSTRUCT {
  ?X rdf:type ?obj
}
WHERE{
  ?X ex:is_a ?obj
}
```

Exercise 2:

```
CONSTRUCT {
  ?X rdf:type ?obj
}
WHERE{
  ?A rdfs:domain ?obj
  ?X    ?A    ?Z
}
```

Exercise 3:

```
<http://example.org/director/ss>
<http://example.org/name>
  "Steven"
<http://example.org/surname>
  "Spielberg"
```

```
<http://example.org/director/gl>
<http://example.org/name>
  "/George"
<http://example.org/surname>
  "Lucas"
```

```
<http://example.org/Film/ijlc>
<http://www.w3.org/1999/02/22-rdf-syntax-ns#type>
  <http://example.org/Film>
<http://example.org/Title>
  "Indiana Jones and the Last Crusade"
<http://example.org/director>
  <http://example.org/director/ss>
```

```
<http://example.org/Film/rla>
<http://www.w3.org/1999/02/22-rdf-syntax-ns#type>
```

```
<http://example.org/Film>
<http://example.org/Title>
  "Raiders of the Lost Ark"
<http://example.org/director>
<http://example.org/director/ss>
```

```
<http://example.org/Film/swsc>
<http://www.w3.org/1999/02/22-rdf-syntax-ns#type>
  <http://example.org/Film>
<http://example.org/Title>
  "Star Wars: Episode II – Attack of the Clones"
<http://example.org/director>
  <http://example.org/director/gl>
```

```
<http://example.org/Film/swrm>
<http://www.w3.org/1999/02/22-rdf-syntax-ns#type>
  <http://example.org/Film>
<http://example.org/Title>
  "Star Wars: Episode I – The Phantom Menace"
<http://example.org/director>
  <http://example.org/director/gl>
```

```
<http://example.org/Film/sw>
<http://www.w3.org/1999/02/22-rdf-syntax-ns#type>
  <http://example.org/Film>
<http://example.org/Title>
  "Star Wars (film)"
<http://example.org/director>
  <http://example.org/director/gl>
```

```
PREFIX ex: <http://example.org/>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
select distinct ?director where {
  ?F rdf:type ex:Film.
  ?F dbo:director ?director.
}
```

```
PREFIX ex: <http://example.org/>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
select ?director where {
  ?F rdf:type ex:Film.
  ?F dbo:director ?director.
}
```

Exercise 4:

TASK 1:

$\Omega 1$ {
 $\mu 1 = \{(?x, \text{PANKOW})\}$
 $\mu 2 = \{(?x, \text{NEUKOLLN})\}$
}
 $P = \{?x : \text{borough} : \text{Berlin}\}$
 $\mu 1(?x) = \text{PANKOW}$ $\text{dom}(\mu 1) = \{?x\}$ $\text{var}(P) = \{?x\}$ $\sigma = 0$ OK
 $\mu 1(\sigma(P)) = : \text{PANKOW} : \text{BOROUGH} : \text{BERLIN}$

 $\mu 2(?x) = \text{NEUKOLLN}$ $\text{dom}(\mu 2) = \{?x\}$ $\text{var}(P) = \{?x\}$ $\sigma = 0$ OK
 $\mu 2(\sigma(P)) = : \text{NEUKOLLN} : \text{BOROUGH} : \text{BERLIN}$

$\Omega 2$ {
 $\mu 1 = \{(?x, \text{BERLIN})\}$
}
 $P = \{?x : \text{capital} : \text{Germany}\}$
 $\mu 1(?x) = \text{BERLIN}$ $\text{dom}(\mu 1) = \{?x\}$ $\text{var}(P) = \{?x\}$ $\sigma = 0$ OK
 $\mu 1(\sigma(P)) = : \text{BERLIN} : \text{CAPITAL} : \text{GERMANY}$

$\Omega 3$ {
 $\mu 1 = \{(?x, \text{BERLIN}), (?name, \text{"BERLIN"})\}$
 $\mu 2 = \{(?x, \text{NEUKOLLN}), (?name, \text{"NEUKOLLN"@en})\}$
 $\mu 3 = \{(?x, \text{NEUKOLLN}), (?name, \text{"NEUKÖLLN"@de})\}$
}
 $P = \{?x : \text{name} ?name\}$
 $\mu 1(?x) = \text{BERLIN}$ $\text{dom}(\mu 1) = \{?x, ?name\} = \{?x\}$ $\text{var}(P) = \{?x, ?name\}$ $\sigma = 0$ OK
 $\mu 1(\sigma(P)) = : \text{BERLIN} : \text{name} : \text{"BERLIN"}$
 $\mu 2(?x) = \text{NEUKOLLN}$ $\text{dom}(\mu 2) = \{?x, ?name\} = \{?x\}$ $\text{var}(P) = \{?x, ?name\}$ $\sigma = 0$ OK
 $\mu 2(\sigma(P)) = : \text{NEUKOLLN} : \text{name} : \text{"NEUKOLLN"@en}$
 $\mu 3(?x) = \text{NEUKOLLN}$ $\text{dom}(\mu 3) = \{?x, ?name\} = \{?x\}$ $\text{var}(P) = \{?x, ?name\}$ $\sigma = 0$ OK
 $\mu 3(\sigma(P)) = : \text{NEUKOLLN} : \text{name} : \text{"NEUKÖLLN"@de}$

TASK 2:

$\text{UNION}(\Omega 1, \Omega 2) = \{(: \text{PANKOW} : \text{BOROUGH} : \text{BERLIN}), (: \text{NEUKOLLN} : \text{BOROUGH} : \text{BERLIN}), (: \text{BERLIN} : \text{CAPITAL} : \text{GERMANY})\}$

$\text{JOIN}(\text{UNION}(\Omega 1, \Omega 2), \Omega 3) = \text{not compatible domain because we have only } \{?x\} \text{ in the domain of } \Omega 1, \Omega 2 \text{'s } \mu \text{ and } \{?x, ?name\} \text{ in the domain of } \Omega 3 \text{'s } \mu$