

Existentials & Universals  
All & Only  
someValuesFrom & allValuesFrom

Supplementary lab exercise  
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1

Closure Restrictions  
A standard pattern

- aProperty *someValuesFrom* Class<sub>1</sub> and  
aProperty *someValuesFrom* Class<sub>2</sub> and  
aProperty *someValuesFrom* Class<sub>3</sub> and  
...  
aProperty *someValuesFrom* Class<sub>n</sub> and  
aProperty *allValuesFrom*  
(Class<sub>1</sub> or Class<sub>2</sub> or Class<sub>3</sub> or ... or Class<sub>n</sub>) } closure  
restriction
- disjoint (Class<sub>1</sub> Class<sub>2</sub> Class<sub>3</sub> ... Class<sub>n</sub>)

2

Create an new ontology with the  
following definitions

- Primitive Concepts
  - Family
  - Child
  - Girl
  - Boy
- Properties
  - has\_children
- Defined concepts
  - All\_girl\_family  $\equiv$   
Family & (restriction **has\_children** *allValuesFrom* Girl)
  - No\_child\_family  $\equiv$   
Family & not (restriction **has\_children** *someValuesFrom* Top)
  - Zero\_child\_family  $\equiv$   
Family & (restriction **has\_children** *max-cardinality=0*)

3

Classify it and examine the result

- What does this tell you about the use of  
*allValuesFrom* (Universal qualification)
- Why do we say that most ontologies are based on  
*someValuesFrom* (Existential qualification)
- Repair the definition of “All\_girl\_family” so that  
it behaves as expected

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