

Expressing conditional validity of statements

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Motivation

How to speak about

- Scenarios
- Theories
- Simulations
- Simplifications
- Believes
- ...

in RDF(S) and OWL?

A true information

```
MyClaim a rdf:Statement ;
    subject      SnowWhite ;
    predicate     livesAt ;
    object        HouseOfDwarfs ;
    new:validIn   URLEpisode02 .
```

Tracking trust

```
MyClaimAct a new:ClaimAct ;
    new:claims      MyClaim ;
    new:claimedBy    PosterAuthor ;
    new:claimedAtTime 28.04.2026 ;
    new:certificate   ABCDE123 .
```

```
InferredClaim a rdf:Statement ;
    subject      SnowWhite ;
    predicate     a ;
    object        Human ;
    new:validIn   URLEpisode01 .
```

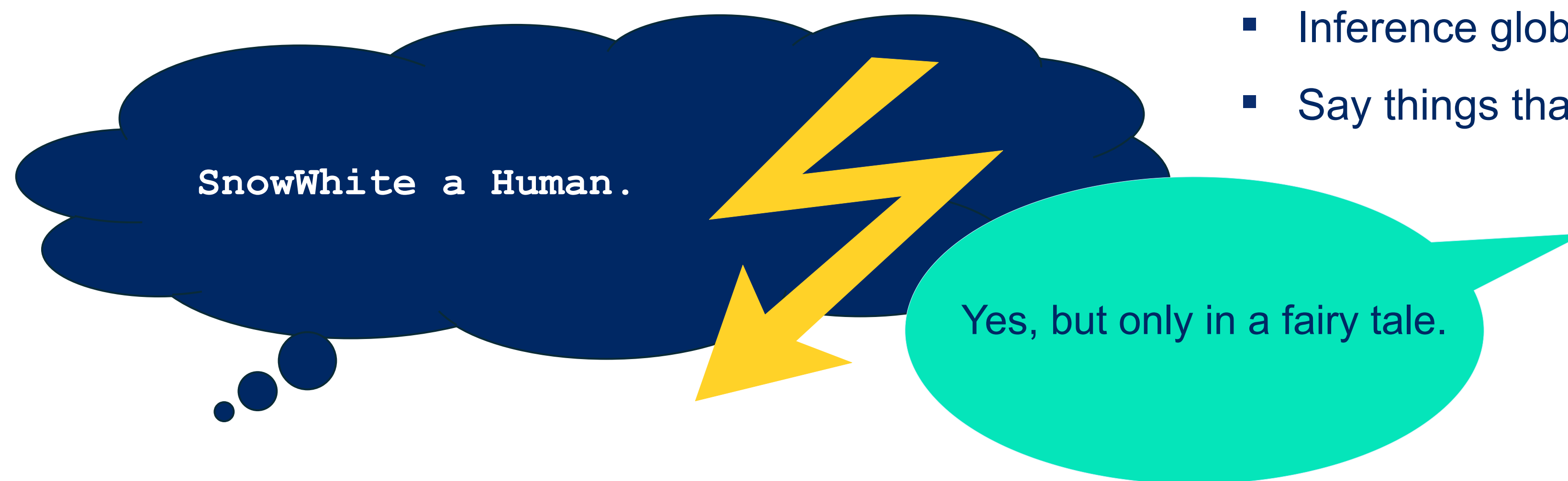
```
MyProveAct a new:ClaimAct ;
    new:needsTrust PosterAuthor ;
    new:claims      InferredClaim .
```

Rules of inference

- Claims can be proven for the intersection of their validity domains.
- Claims can be given relative to trust domains.
- Use set relations for time, space and world domains.
- Are any additional rules needed? E.g. staying a human?

State of the art

```
Princess subClassOf Human .
```



```
SnowWhite livesAt HouseOfDwarfs ;
    a      Princess .
```



```
SnowWhite livesAt Castle ;
    a      Queen .
```

```
CONSTRUCT ?s ?p ?o
WHERE {
    << ?s ?p ?o >> new:validIn ?d .
    ?d new:subDomainOf SWFairyTale .
}
```

Competency requirements

- Information globally valid
- Inference globally valid
- Say things that require context.

Intersection of domains of validity

```
URLEpisode02 a new:ValidityDomain ;
    new:subDomainOf    SWFairyTale ;
    new:subDomainOf    DwarfStay .
```

Temporal limitations (qualitative, nonlinear, ...)

```
DwarfStay a new:TemporalDomain ;
    new:subDomainOf    SWFairyTale ;
    startsWith          SWFlight ;
    endsWith             SWEatsApple .
```

Context limitations (model, simulation, scenario, ...)

```
SWFairyTale new:subDomainOf FairyTales ;
    new:subDomainOf RoyalLogic .
```

Conclusions

A semantic reasoning addressing

- Adverbials (time, space, context)
- Indirect speech

could make RDF(S) databases even more powerful.