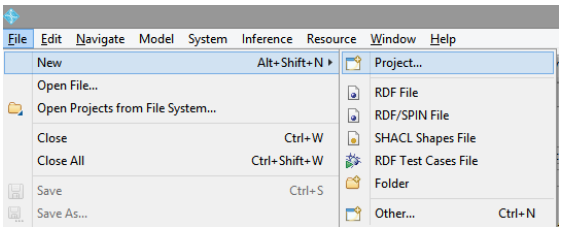
Data models - design and validation

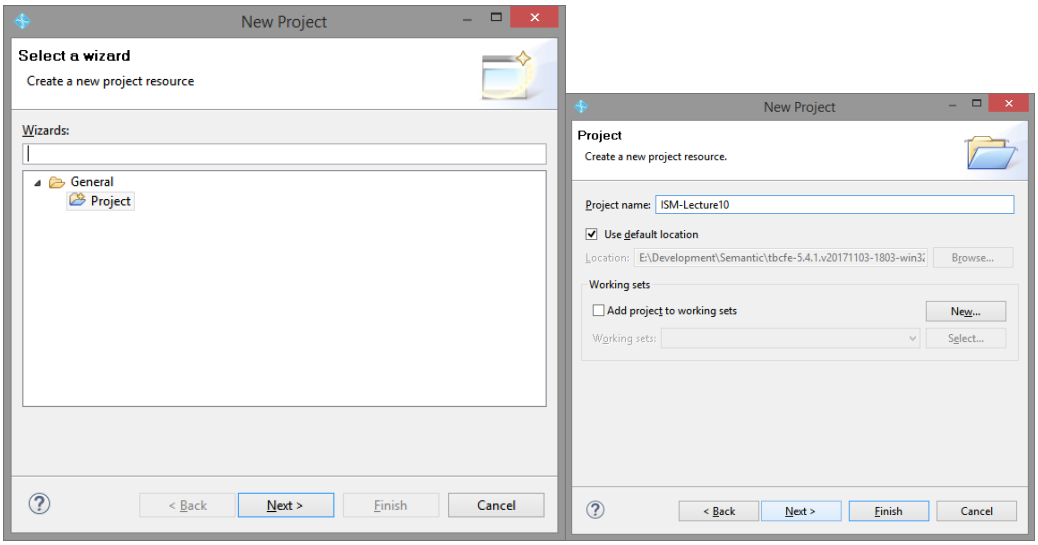
Introduction to SHACL

(based on https://www.topquadrant.com/technology/shacl/tutorial/).

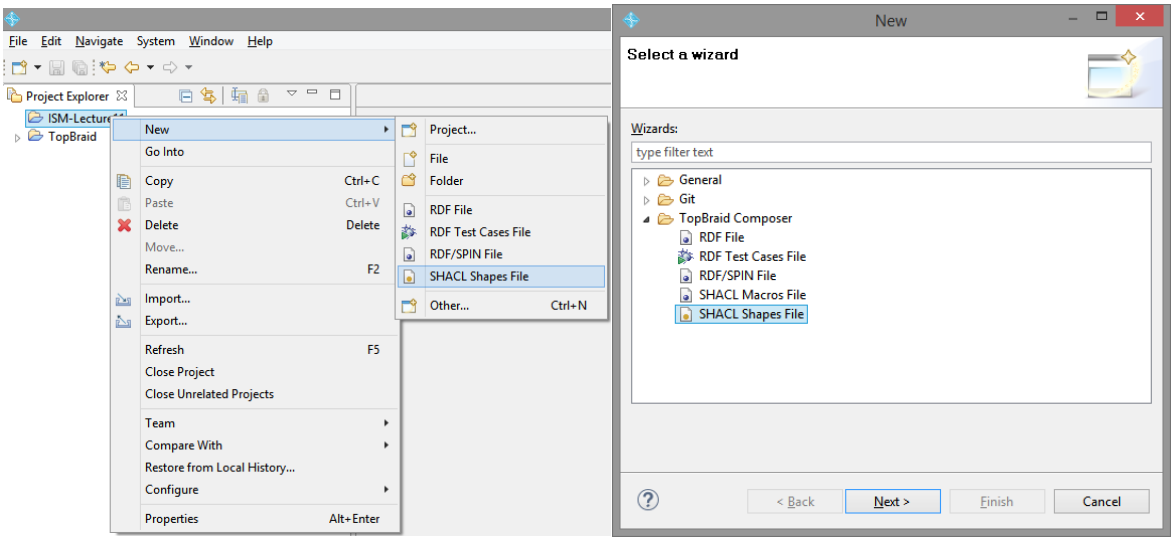
RDF graphs can be validated with the use of SHACL. This can be demonstrated in TopBraid Composer

1. Open new Project

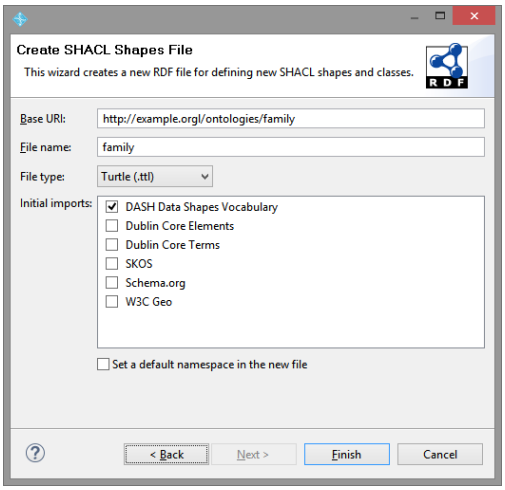




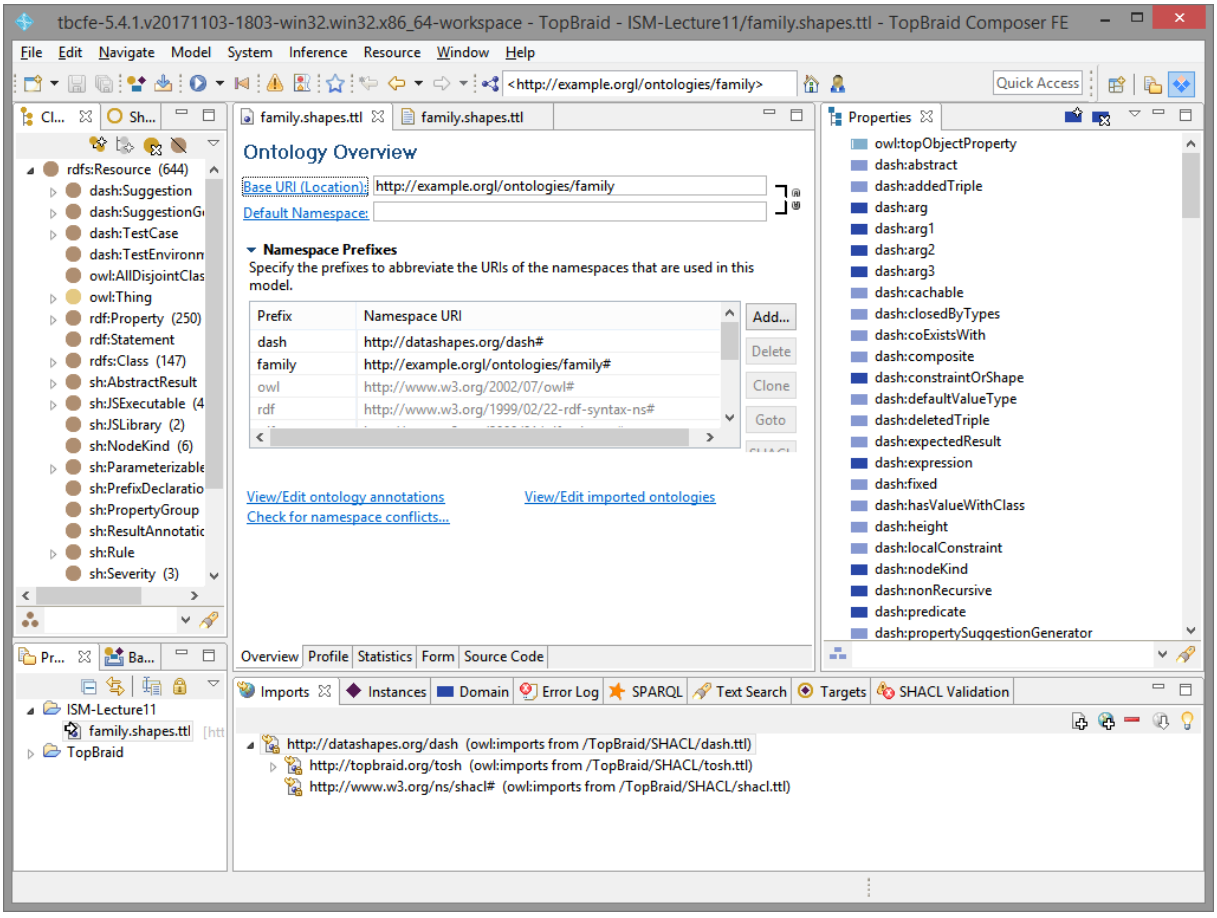
2. Create a new shape file in it (File->New->SHCL ShapeFile or File->New->Other...)



naming it correctly and, additionally, selecting DASH support (https://datashapes.org/dash):



After that you will get:

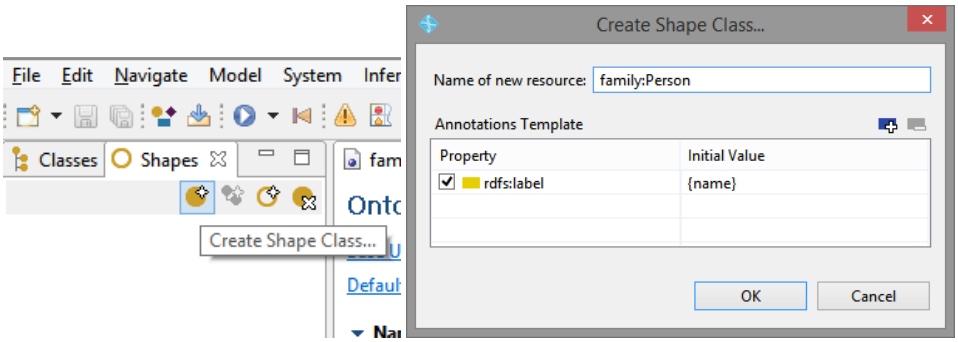



```
# baseURI: http://example.org/ontologies/family
# imports: http://datashapes.org/dash
# prefix: family

@prefix dash: <http://datashapes.org/dash#> .
@prefix family: <http://example.org/ontologies/family#> .
@prefix owl: <http://www.w3.org/2002/07/owl#> .
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .
@prefix sh: <http://www.w3.org/ns/shacl#> .
@prefix xsd: <http://www.w3.org/2001/XMLSchema#> .
```

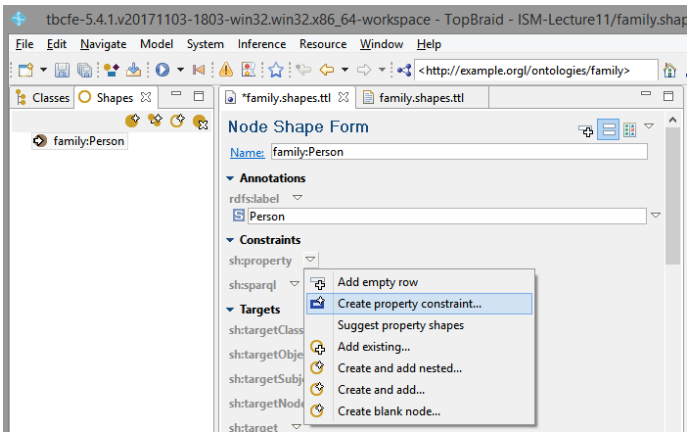
```
<http://example.orgl/ontologies/family>
  rdf:type owl:Ontology ;
  owl:imports <http://datashapes.org/dash> ;
  owl:versionInfo "Created with TopBraid Composer" ;
```

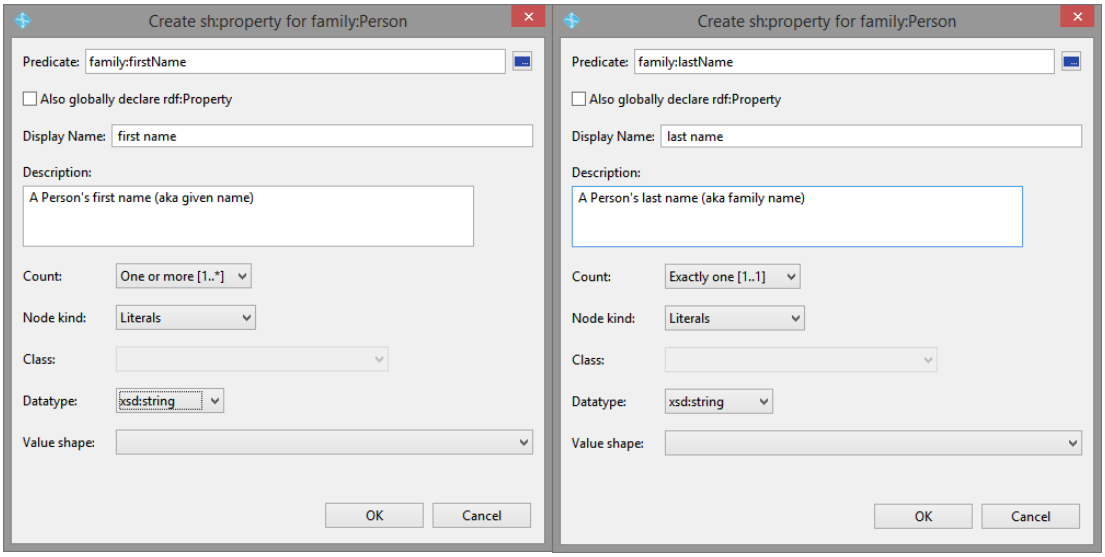
3. Create family:Person shape class:

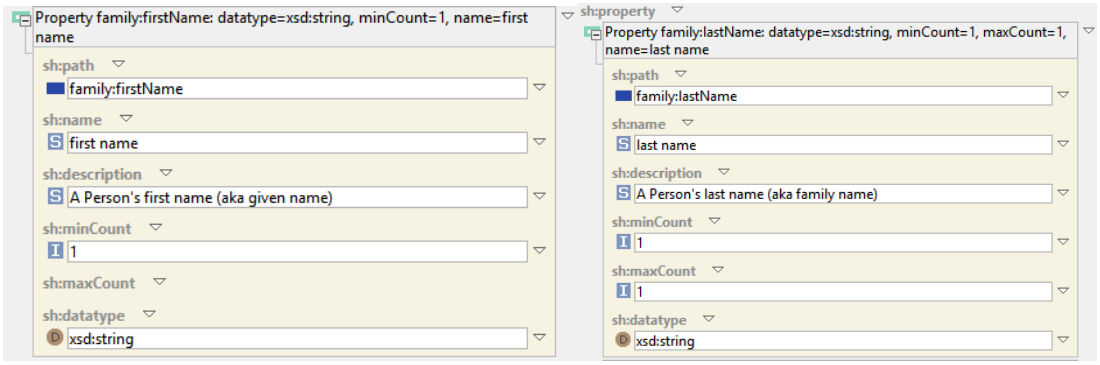



```
family:Person
  rdf:type rdfs:Class ;
  rdf:type sh:NodeShape ;
  rdfs:label "Person" ;
  rdfs:subClassOf rdfs:Resource ;
.
```

4. Create property constraint family:firstName and family:lastName (from the context of sh:property):

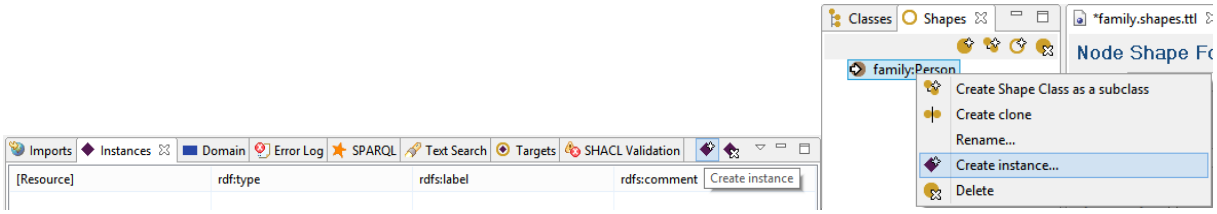


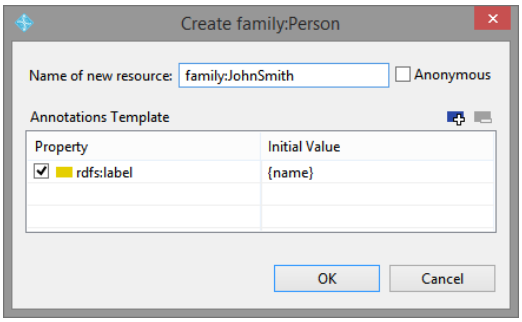




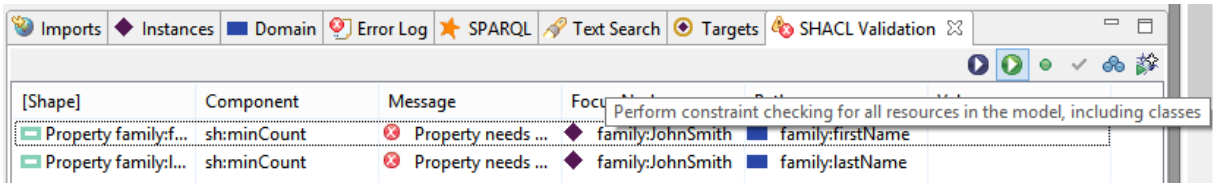
Note, that for “Also globally declare rdf:Property“

5. Now you may try to validate your triples. Thus create an instance of a Person class (you have two possibilities to start the wizzard).

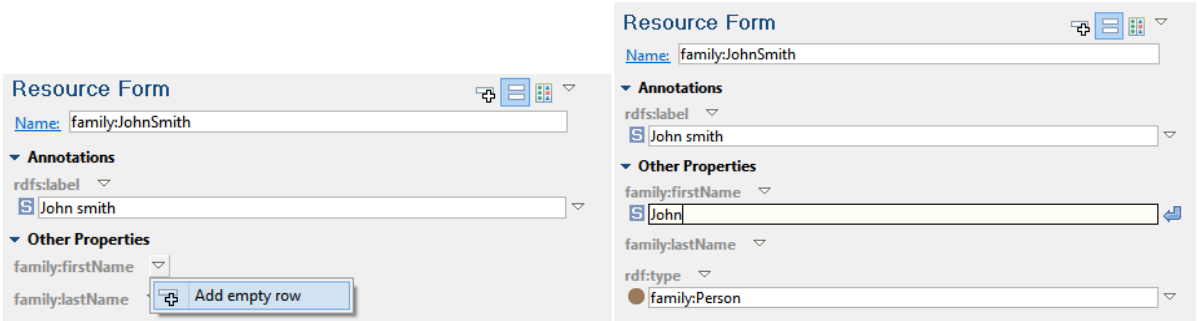




You can check, that without assigning first name and last name property to this instance the graph will not validate correctly



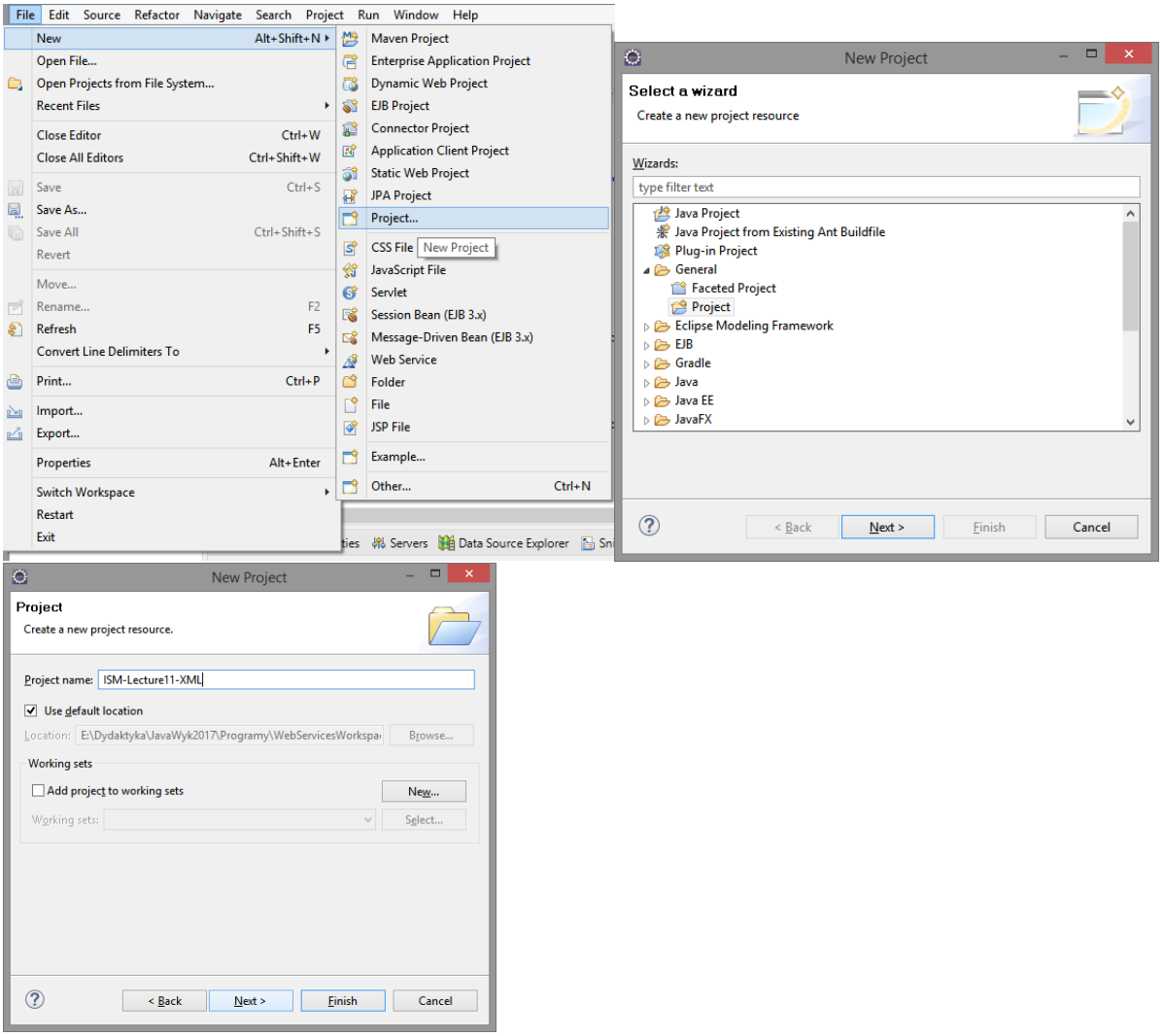
The errows will disappear after addition of missing properties



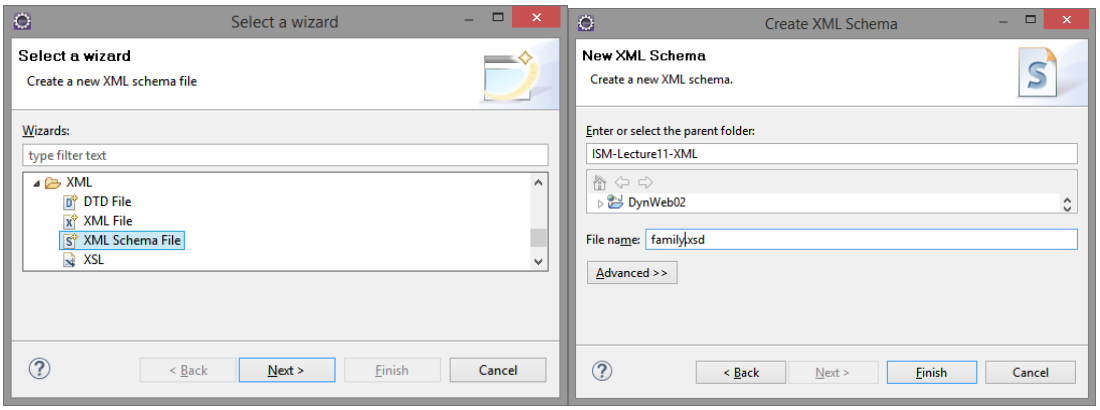
Introduction XML Schema

XML data can be validated with the use of XML Schema. This can be demonstrated with the use of eclipse (with proper plug-ins).

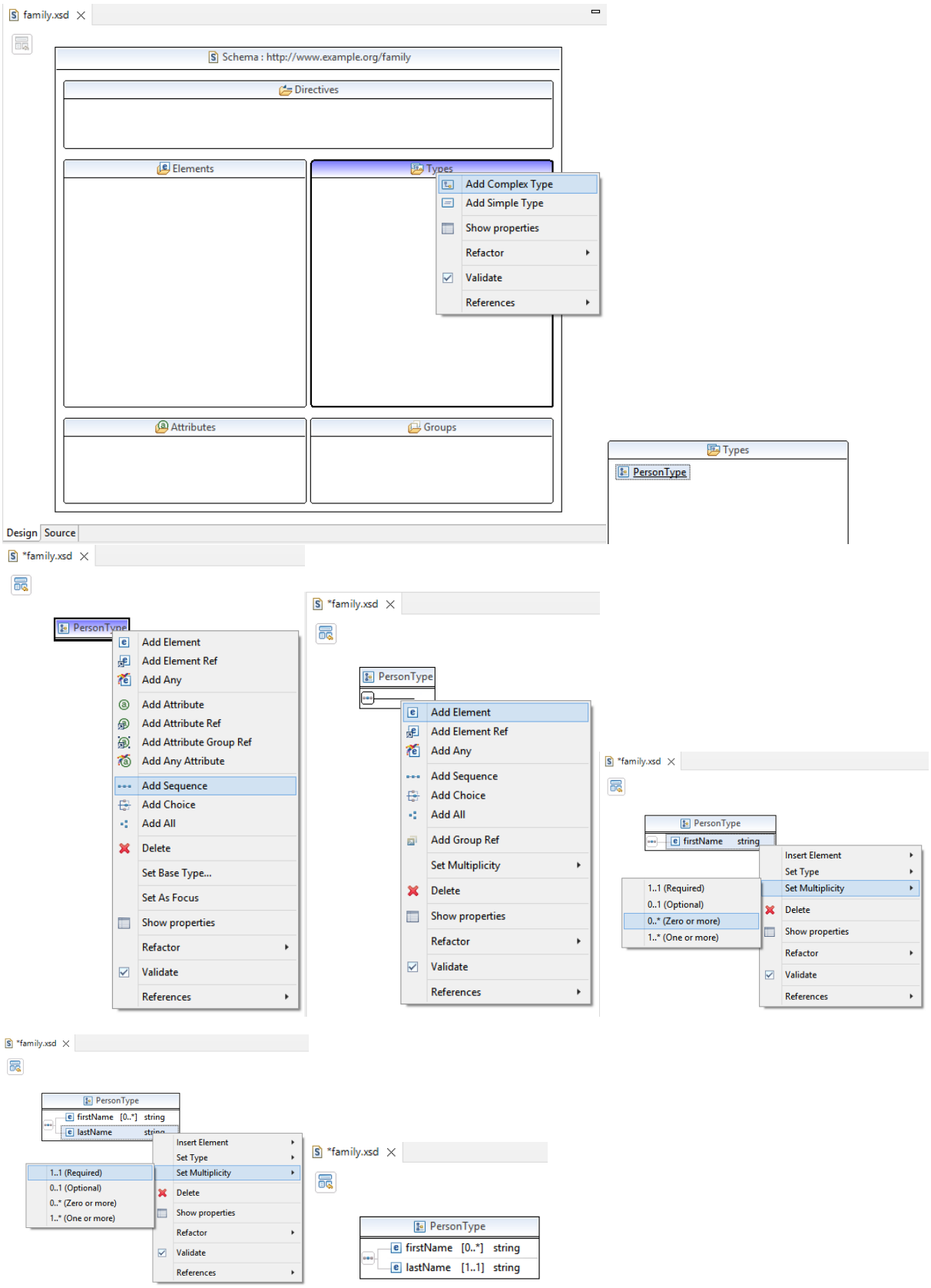
1. Create general project



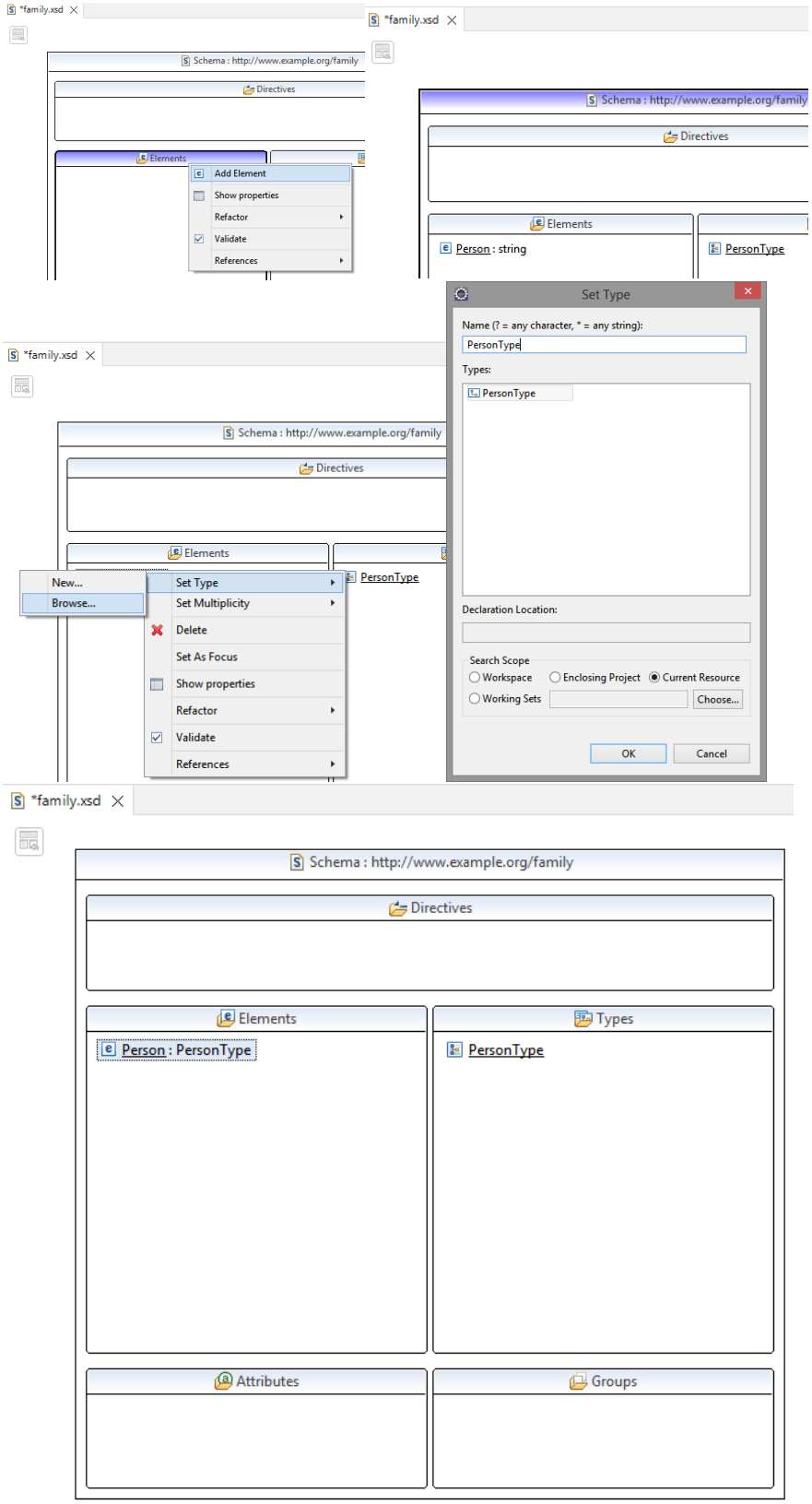
2. Add XML Schema file (File->New->Other...)



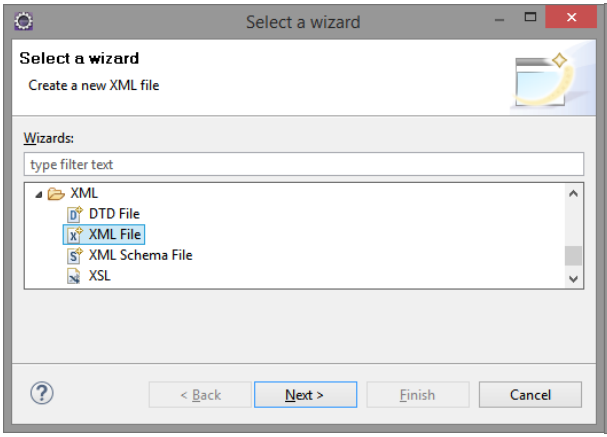
2. Declare schema, starting from adding complex type

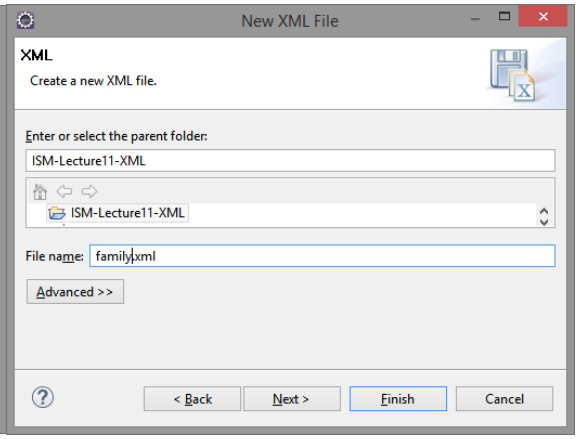


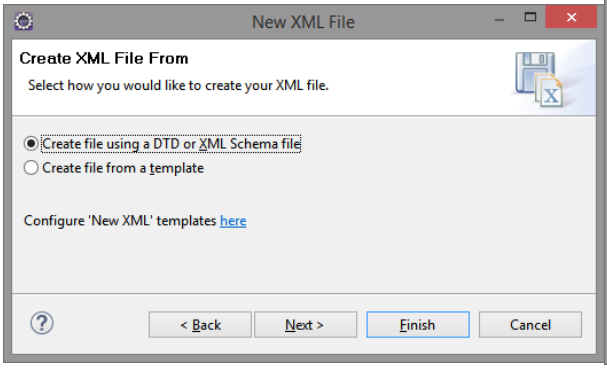
and then adding an element

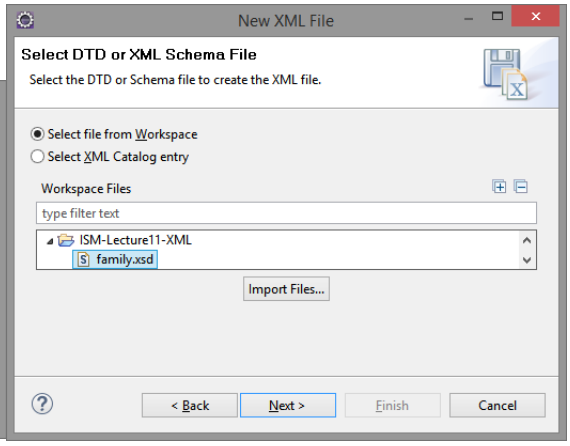


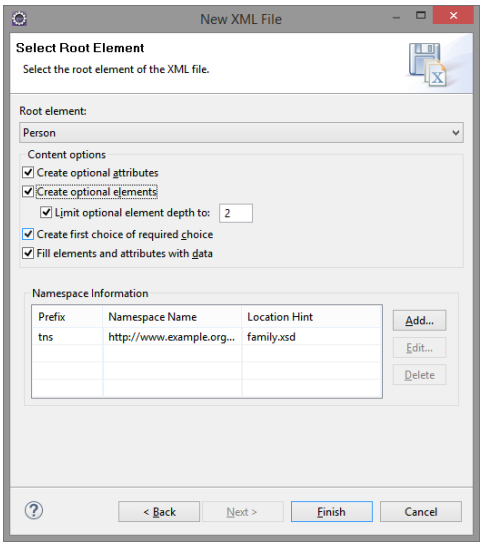
2. Declare xml data file (based on designed schema). Start with File->New->Other ...



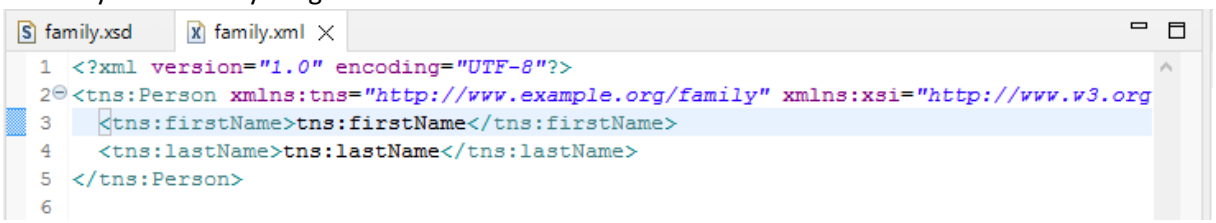




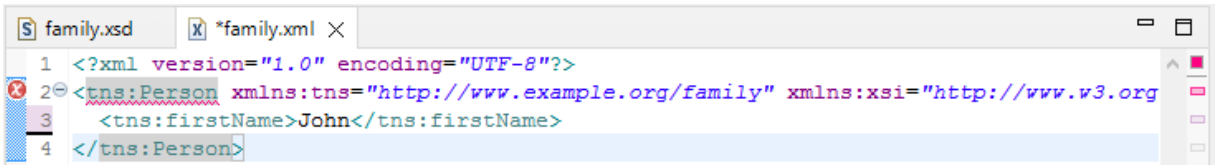




2. Now you can edit your generated xml data file.



After removing required elements



you will be warn about data inconsistency