Walkthrough on ontology-based modelling in AOAME

- Create a new process model called Order processing
    - https://aoame.herokuapp.com/
- After creating the model, show that the model "Order processing" can be retrieved from the Triplestore:
    - https://aoame-fuseki.herokuapp.com/

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX rdfs:  <http://www.w3.org/2000/01/rdf-schema#>
PREFIX bpaas: <http://ikm-group.ch/archimeo/bpaas#>
prefix mod: <http://fhnw.ch/modelingEnvironment/ModelOntology#>

SELECT ?model ?label
WHERE {
?model rdf:type mod:Model .
?model rdfs:label ?label.
}
```

```
1  PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
2  PREFIX rdfs:  <http://www.w3.org/2000/01/rdf-schema#>
3  PREFIX bpaas: <http://ikm-group.ch/archimeo/bpaas#>
4  prefix mod: <http://fhnw.ch/modelingEnvironment/ModelOntology#>
5
6  SELECT ?model ?label
7  WHERE {
8  ?model rdf:type mod:Model .
9  ?model rdfs:label ?label.
10 }
11
12
13
14
```

QUERY RESULTS

Table | Raw Response

Showing 1 to 1 of 1 entries

Search: _____ Show 50 ∨ entries

model	label
1 mod:Model_f297e209-81df-499e-80ed-168ad9f40ad3	"Order Processing"

Showing 1 to 1 of 1 entries

- Let's retrieve all the triples associated to the model "Order processing" -> at the moment it retrieves that the model is an instance of model.

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX rdfs:  <http://www.w3.org/2000/01/rdf-schema#>
PREFIX bpaas: <http://ikm-group.ch/archimeo/bpaas#>
prefix mod: <http://fhnw.ch/modelingEnvironment/ModelOntology#>

SELECT *
WHERE {
?subject ?relation ?object .
?subject rdfs:label "Order processing".
}
```

```
1   PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
2   PREFIX rdfs:  <http://www.w3.org/2000/01/rdf-schema#>
3   PREFIX bpaas: <http://ikm-group.ch/archimeo/bpaas#>
4   prefix mod: <http://fhnw.ch/modelingEnvironment/ModelOntology#>
5
6   SELECT *
7   WHERE {
8   ?subject ?relation ?object .
9   ?subject rdfs:label "Order Processing".
10  }
11
12
13
14
```
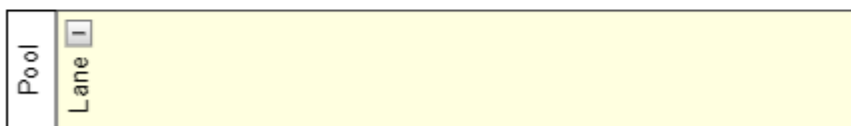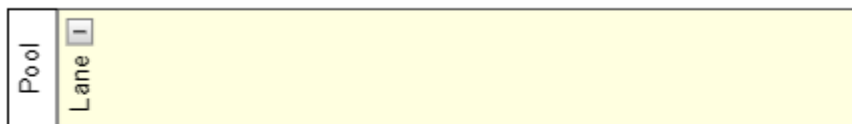
QUERY RESULTS

Table | Raw Response

Showing 1 to 3 of 3 entries   Search: [ ]   Show 50 ⌄ entries

	subject	relation	object
1	mod:Model_f297e209-81df-499e-80ed-168ad9f40ad3	rdf:type	mod:Model
2	mod:Model_f297e209-81df-499e-80ed-168ad9f40ad3	mod:modelHasShape	mod:Task_Shape_7705e7db-7b61-1130-759d-dfd996e911cf
3	mod:Model_f297e209-81df-499e-80ed-168ad9f40ad3	rdfs:label	"Order Processing"

- Create a BPMN Pool called "FHNW"
  Fire the same query as above and now we see that also the pool has been entered
        ID of the model and the ID of the Pool are connected with a relation *hasShape*.
  The term "Shape" is the name of a class, which visualizes a conceptual element. That's because several graphical notations might refer to the same conceptual elements. For example, we might have 2 BPMN Pools, which refers to the FHNW Organization.
- Create a duplicate of the Pool FHNW.

```
1   PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
2   PREFIX rdfs:  <http://www.w3.org/2000/01/rdf-schema#>
3   PREFIX bpaas: <http://ikm-group.ch/archimeo/bpaas#>
4   prefix mod: <http://fhnw.ch/modelingEnvironment/ModelOntology#>
5
6   SELECT *
7   WHERE {
8   ?subject ?relation ?object .
9   ?subject rdfs:label "Order Processing".
10  }
11
12
13
14
```

QUERY RESULTS

[ ] Table Raw Response [ ]

Showing 1 to 6 of 6 entries   Search: [   ]   Show 50 ▾ entries

	subject	relation	object
1	mod:Model_f297e209-81df-499e-80ed-168ad9f40ad3	rdf:type	mod:Model
2	mod:Model_f297e209-81df-499e-80ed-168ad9f40ad3	mod:modelHasShape	mod:Pool_Shape_aaf1ce54-a2ef-71d9-3e16-593890fb7f2b
3	mod:Model_f297e209-81df-499e-80ed-168ad9f40ad3	mod:modelHasShape	mod:Lane_4DSML4PTM_Shape_42249631-c80d-679d-6071-80d610afdda8
4	mod:Model_f297e209-81df-499e-80ed-168ad9f40ad3	mod:modelHasShape	mod:Lane_4DSML4PTM_Shape_de840532-8400-345d-70ec-6ce2fd3d5400
5	mod:Model_f297e209-81df-499e-80ed-168ad9f40ad3	mod:modelHasShape	mod:Pool_Shape_8fb79dc0-7978-bda7-6001-a6602e86cfbc
6	mod:Model_f297e209-81df-499e-80ed-168ad9f40ad3	rdfs:label	"Order Processing"

Showing 1 to 6 of 6 entries

- Let's run the below query to show all the properties of the two pools, including the two shapes for the conceptual model Pool:

PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX bpaas: <http://ikm-group.ch/archimeo/bpaas#>
prefix mod: <http://fhnw.ch/modelingEnvironment/ModelOntology#>

SELECT *
WHERE {
?subject ?relation ?object .
?subject rdfs:label "FHNW".
}

- Show the result in the triple store, the first 8 rows are properties of the first pool, whereas from raw 9 to raw 16 we have the second pool.
    o There are the X and Y coordinates of the two pools in the canvas, their height and width
    o The two different shapes point to the same conceptual element Pool (see rows 4 and 12).
    o Both graphical elements are instances of the class shape.
    o The shape instantiates the instance *Pool* from the Palette (this allows to hinerit the property of the graphical notation Pool).
    o The label FHNW

	subject	relation	object
1	mod:Pool_Shape_6c0ffb17-272b-b1f2-81c3-d9f755838084	mod:shapePositionsOnCoordinateY	"-750"^^xsd:integer
2	mod:Pool_Shape_6c0ffb17-272b-b1f2-81c3-d9f755838084	mod:shapePositionsOnCoordinateX	"120"^^xsd:integer
3	mod:Pool_Shape_6c0ffb17-272b-b1f2-81c3-d9f755838084	mod:shapeHasWidth	"1165"^^xsd:integer
4	mod:Pool_Shape_6c0ffb17-272b-b1f2-81c3-d9f755838084	mod:shapeVisualisesConceptualElement	mod:Pool_491ea2e2-f166-42d8-961d-d3cff962a7cf
5	mod:Pool_Shape_6c0ffb17-272b-b1f2-81c3-d9f755838084	rdf:type	mod:Shape
6	mod:Pool_Shape_6c0ffb17-272b-b1f2-81c3-d9f755838084	mod:shapeHasHeight	"465"^^xsd:integer
7	mod:Pool_Shape_6c0ffb17-272b-b1f2-81c3-d9f755838084	mod:shapeInstantiatesPaletteConstruct	<http://fhnw.ch/modelingEnvironment/PaletteOntology#Pool>
8	mod:Pool_Shape_6c0ffb17-272b-b1f2-81c3-d9f755838084	rdfs:label	"FHNW"
9	mod:Pool_Shape_f7ef4568-dd9c-1881-3a44-5a58b7603b90	mod:shapePositionsOnCoordinateY	"-260"^^xsd:integer
10	mod:Pool_Shape_f7ef4568-dd9c-1881-3a44-5a58b7603b90	mod:shapePositionsOnCoordinateX	"120"^^xsd:integer

- Cancel one Pool, refresh and re-select the model Order processing.

- Now, let's have a look at the properties of the conceptual element Pool

–

- Fire the below query

PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX bpaas: <http://ikm-group.ch/archimeo/bpaas#>
prefix mod: <http://fhnw.ch/modelingEnvironment/ModelOntology#>

SELECT *
WHERE {
mod:Pool_491ea2e2-f166-42d8-961d-d3cff962a7cf ?relation ?object.
}

- Show that the conceptual element is instance of two classes: the conceptual model and the modelling construct of BPMN Pool. The latter indicates the relation of the conceptual model with the ontology-based meta-model of BPMN.

	relation	object
1	rdf:type	mod:ConceptualElement
2	rdf:type	<http://ikm-group.ch/archiMEO/BPMN#Pool>

- Let's have a look at the class Pool in the ontology-based meta-model by firing the following query:

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX rdfs:  <http://www.w3.org/2000/01/rdf-schema#>
PREFIX bpaas: <http://ikm-group.ch/archimeo/bpaas#>
prefix mod: <http://fhnw.ch/modelingEnvironment/ModelOntology#>

SELECT *
WHERE {
  <http://ikm-group.ch/archiMEO/BPMN#Pool>  ?relation  ?object.
}
```

- We can see that the class BPMN Pool has three properties:
  - A comment that comes from the specification of BPMN
  - the relation rdfs:subClassOf formally declares that the language construct Pool specifies the class Swimlane. This relation subclassOf indicates a taxonomy. And has the benefit of adding semantics. Also, the properties specified in the super-class are inheritated by the subclass, but not viceversa.

	relation	object
1	rdfs:comment	"Pool is the graphical representation of a Participant in a Collaboration"
2	rdfs:subClassOf	<http://ikm-group.ch/archiMEO/BPMN#Swimlane>
3	rdf:type	<http://www.w3.org/2002/07/owl#Class>

- Let's add a start event in the Pool FHWN.
- We run the below query and show that "start event" has been added.

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX rdfs:  <http://www.w3.org/2000/01/rdf-schema#>
PREFIX bpaas: <http://ikm-group.ch/archimeo/bpaas#>
prefix mod: <http://fhnw.ch/modelingEnvironment/ModelOntology#>

SELECT *
WHERE {
?subject ?relation ?object .
?subject rdfs:label "Order processing".
}
```

	subject	relation	object
1	mod:Model_e15129ba-10e1-4407-9288-a3121e28470c	rdf:type	mod:Model
2	mod:Model_e15129ba-10e1-4407-9288-a3121e28470c	mod:modelHasShape	mod:Pool_Shape_6c0ffb17-272b-b1f2-81c3-d9f755838084
3	mod:Model_e15129ba-10e1-4407-9288-a3121e28470c	mod:modelHasShape	mod:StartEvent_Shape_026f5ed9-9fc6-64b9-ce27-4b09ad287bd3
4	mod:Model_e15129ba-10e1-4407-9288-a3121e28470c	rdfs:label	"Digital Invoice"

- The Pool should contain the new model element Start Event now.
- Let's test it with the following query:

```
PREFIX rdfs:  <http://www.w3.org/2000/01/rdf-schema#>
PREFIX bpaas: <http://ikm-group.ch/archimeo/bpaas#>
prefix mod: <http://fhnw.ch/modelingEnvironment/ModelOntology#>
prefix lo:    <http://fhnw.ch/modelingEnvironment/LanguageOntology#>

SELECT ?elementContainedByPool
WHERE {
    mod:Pool_ea06e37c-fe91-4fba-ab78-2ed6a879993c lo:modelingContainerContainsModel-
ingLanguageConstruct ?elementContainedByPool .
 }
```

- Continue modelling the process.