

Competency Questions

The following ontology competency questions¹ have been defined and answered through SPARQL queries for the Mapping Quality Improvement Ontology (MQIO).

#	Question	SPARQL Query	Result
1	Who created the mapping?	<pre>SELECT ?creator WHERE { ?mapping a mqio:MappingArtefact; mqio:wasCreatedBy ?creator . }</pre>	mqio:wasCreatedBy foaf:Agent ex:user-1
2	What was the rationale for creating the mapping?	<pre>SELECT ?purpose WHERE { ?mapping a mqio:MappingArtefact; mqio:hasPurpose ?purpose . }</pre>	mqio:hasPurpose xsd:string "Research Project"
3	What instruments were utilized to define the mapping?	<pre>SELECT ?tool WHERE { ?mapping a mqio:MappingArtefact; mqio:usedTool ?tool . }</pre>	mqio:usedTool xsd:string "RML Editor"
4	When was the mapping defined?	<pre>SELECT ?time WHERE { ?mapping a mqio:MappingArtefact; prov:generatedAtTime ?time . }</pre>	prov:generatedAtTime xsd:dateTime "2023-01-22T18:05:07+00:00 2023-01-22T18:05:07+00:00"
5	Who performed the quality assessment of the mapping?	<pre>SELECT ?agent WHERE { ?assessment a mqio:MappingAssessment; prov:wasAssociatedWith ?agent . }</pre>	prov:wasAssociatedWith prov:Agent ex:user-1
6	What mapping is associated with the assessment?	<pre>SELECT ?mapping WHERE { ?assessment a mqio:MappingAssessment; mqio:assessedMapping ?mapping . }</pre>	mqio:assessedMapping mqio:MappingArtefact <mapping.ttl>
7	What quality metrics were executed during the assessment process?	<pre>SELECT ?metric WHERE { ?assessment a mqio:MappingAssessment; mqio:wasExecuted ?metric . }</pre>	mqio:wasExecuted dqv:Metric ... mqio:Metric-VOC1 mqio:Metric-VOC2 mqio:Metric-VOC3 ...
8	What quality measurements resulted from the assessment?	<pre>SELECT ?measurement WHERE { ?assessment a mqio:MappingAssessment ; prov:generated ?measurement . ?measurement a dqv:QualityMeasurement . }</pre>	prov:generated dqv:QualityMeasurement ex:qualityMeasurement-1 ex:qualityMeasurement-2
9	What quality issues were detected?	<pre>SELECT ?violation WHERE { ?report a mqio:MappingValidationReport; mqio:hasViolation ?violation. }</pre>	mqio:hasViolation mqio:MappingViolation ex:violation-1

¹ C. Bezerra, F. Freitas and F. Santana, "Evaluating Ontologies with Competency Questions," 2013 IEEE/WIC/ACM International Joint Conferences on Web Intelligence (WI) and Intelligent Agent Technologies (IAT), 2013, pp. 284-285, doi: 10.1109/WI-IAT.2013.199.

10	What value is associated with the violation?	<pre>SELECT ?value WHERE { ?assessment a mqio:MappingValidationReport; mqio:hasViolation ?violation. ?violation mqio:hasLiteralValue mqio:hasObjectValue ?value . }</pre>	mqio:hasValue rdfs:Resource ex:value-1
11	How are the quality issues described?	<pre>SELECT ?message WHERE { ?assessment a mqio:MappingValidationReport; mqio:hasViolation ?violation. ?violation mqio:hasResultMessage ?message . }</pre>	mqio:hasResultMessage xsd:string "Usage of undefined property."
12	When were the quality issues detected?	<pre>SELECT ?time WHERE { ?assessment a mqio:MappingAssessment; prov:endedAtTime ?time . }</pre>	prov:endedAtTime xsd:dateTime "2023-01-22T18:05:07+00:00 2023-01-22T18:07:07+00:00"
13	Where can provenance on the issues be accessed?	<pre>SELECT ?report WHERE { ?assessment a mqio:MappingAssessment; mqio:hasValidationReport ?report . }</pre>	mqio:hasValidationReport mqio:MappingValidationReport t ex:validationReport-1
14	What quality metrics were associated with the detected quality issues?	<pre>SELECT ?metric WHERE { ?assessment a mqio:MappingValidationReport; mqio:hasViolation ?violation. ?violation mqio:isDescribedBy ?metric . }</pre>	mqio:isDescribedBy dqv:Metric ... mqio:Metric-D2 mqio:Metric-D3 ...
15	What quality dimensions represent the metrics?	<pre>SELECT ?dimension WHERE { ?assessment a mqio:MappingValidationReport; mqio:hasViolation ?violation. ?violation mqio:isDescribedBy ?metric . ?metric dqv:inDimension ?dimension. }</pre>	dqv:inDimension dqv:Dimension ... mqio:Metric-D2 mqio:Metric-D3 ...
16	What quality categories represent the dimensions?	<pre>SELECT ?category WHERE { ?assessment a mqio:MappingValidationReport; mqio:hasViolation ?violation. ?violation mqio:isDescribedBy ?metric . ?metric dqv:inDimension ?dimension. ?dimension dqv:inCategory ?category . }</pre>	dqv:inCategory dqv:Category ... mqio:Metric-D2 mqio:Metric-D3 ...
17	Who performed the quality refinement of the mapping?	<pre>SELECT ?agent WHERE { ?assessment a mqio:MappingRefinement; prov:wasAssociatedWith ?agent . }</pre>	prov:wasAssociatedWith prov:Agent ex:user-1
18	When was the refinement process completed?	<pre>SELECT ?time WHERE { ?assessment a mqio:MappingRefinement; prov:endedAtTime ?time . }</pre>	prov:endedAtTime xsd:dateTime "2023-01-22T18:05:07+00:00 2023-01-22T18:07:07+00:00"
19	What queries are associated with refinements?	<pre>SELECT ?query WHERE { ?refinement a mqio:MappingRefinement; mqio:usedQuery ?query . }</pre>	prov:usedQuery xsd:string "PREFIX rr: < "

20	What confidence score did these refinements have?	<pre> SELECT ?score WHERE { ?refinement a mqio:MappingRefinement; mqio:hasConfidence ?score . } </pre>	mqio:hasConfidence xsd:double "0.75"
21	What violations have been refined?	<pre> SELECT ?refinement WHERE { ?violation a mqio:MappingViolation; mqio:wasRefinedBy ?refinement . } </pre>	mqio:wasRefinedBy mqio:MappingRefinement ex:refinement-1
22	What quality requirements are associated with the mapping?	<pre> SELECT ?requirement WHERE { ?assessment a mqio:MappingAssessment; mqio:hasQualityRequirement ?requirement . } </pre>	mqio:hasQualityRequirement mqio:QualityRequirement ex:qualityRequirement-1
23	What quality measurements were associated with the requirements?	<pre> SELECT ?measurement WHERE { ?assessment a mqio:MappingAssessment; mqio:hasQualityRequirement ?requirement . ?requirement mqio:hasQualityMeasurement ?measurement . } </pre>	mqio:hasQualityMeasurement dqv:QualityMeasurement ex:qualityMeasurement-1
24	Are the requirements satisfied?	<pre> SELECT ?status WHERE { ?assessment a mqio:MappingAssessment; mqio:hasQualityRequirement ?requirement . ?requirement mqio:isSatisfied ?status . } </pre>	mqio:QualityRequirement dqv:value "true"^^xsd:boolean ;
25	What refinements are associated with the quality metrics?	<pre> SELECT ?refinement WHERE { ?assessment a mqio:MappingValidationReport; mqio:hasViolation ?violation. ?violation mqio:isDescribedBy ?metric . ?metric mqio:hasRefinement ?refinement. } </pre>	mqio:hasRefinement mqio:MappingRefinement ex:refinement-1