DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COMPUTER SCİENCE

MSC

MODULE –

CME728_SEMANTİC WEB_1

Final Project

Faculty Department

Submitted to

Assist. Prof. Dr. Oğuzhan MENEMENCİOĞLU

MAIS ALHAMIDI	**2128150042**

SEM1, 2022/23

1. Find a domain that is proper for you.

The domain that I want to study is about my Faculty which is Computer Engineering and I want to make ontology about this domain, so I will try to make the relationship and the instance that I have in my domain that includes the subject and the professor and the course in this semester.

2. In your domain, find a dataset to transform.

I create datasets manually and give the information and the attributes and make that propriety by flowing explaining the text that I want to create the ontology.

3. Create a schema for your data.

By representing the class or subclass and others representing attributes, my data set has 19 columns.

Class (Faculty).

Courses : (the name of the Courses).

Department : (3defffrint department IT, CS, IS).

Professor: the name of the Professor includes 5 pressers.

Student (New_Student, Old_Student include 4 students).

Data Property : (Name, Code, Age, Course_Name, Semester, Student ID, Type).

Object Properties : (has_Boss , has_Professor , has_student , has_supervisor , Register , Register_By ,Teacher).

Individuals (5 professors,4 Students,5 courses,3 Departments).

I tried to convert my CSV using OpenRefine software to exper the schema or to transform to RDF and was to try creating in the wiki data about this data, so I made an account and already create one. Then I tried to find software where I can create my ontology.

Also, I will provide an XML file.

I) What to transform: The dataset and schema that I have identified and created.

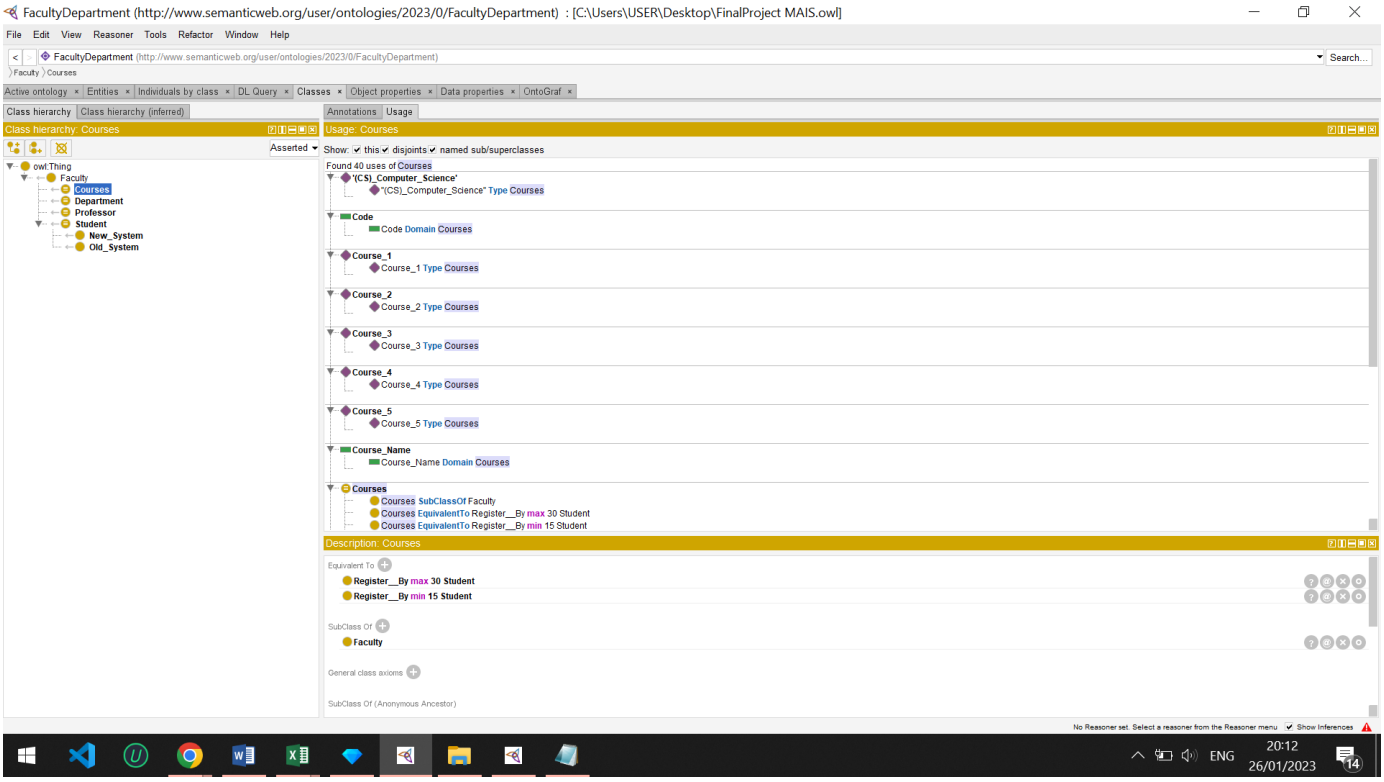
II) How to transform: The tool or library that I will use to convert my data into an ontology is Protégé.

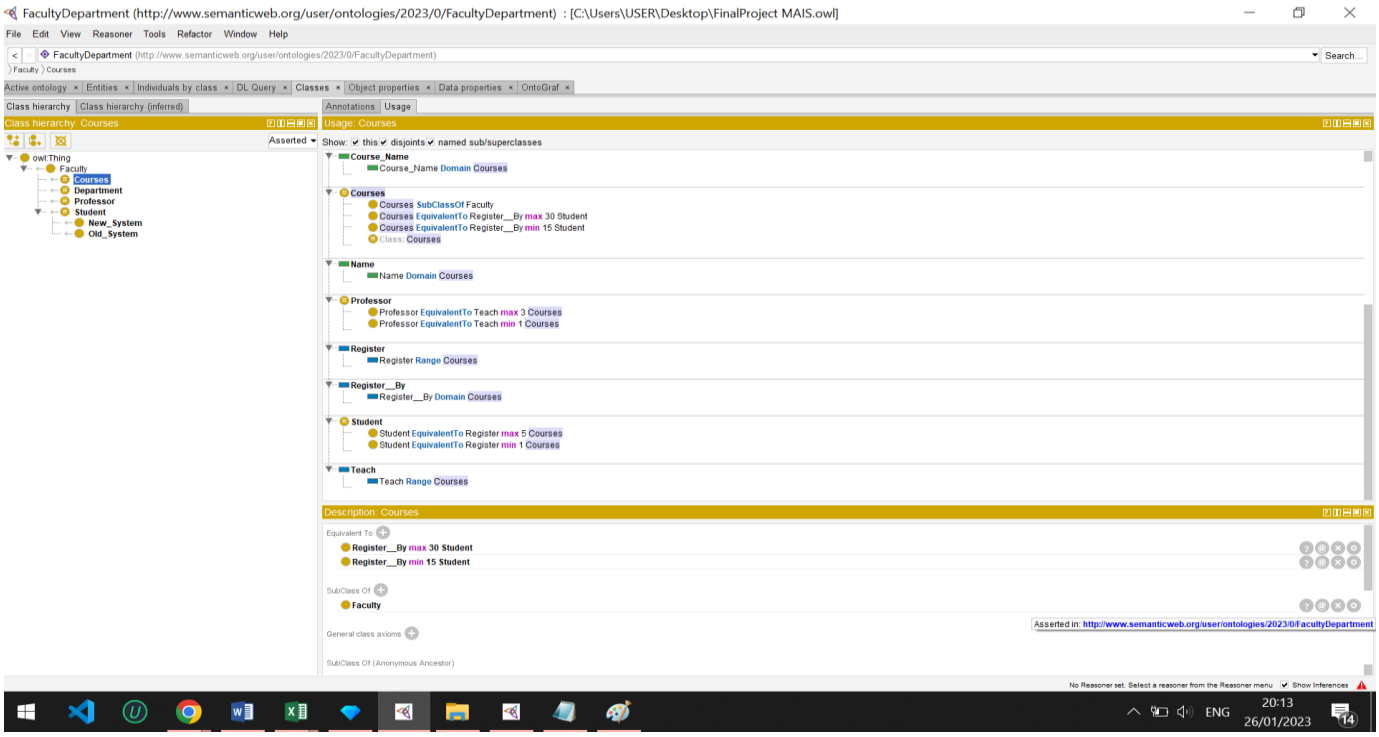
III) What was obtained from the transformation: The resulting ontology in RDF or OWL format. I provide a sample of my raw input file, the transformation processor used, and the RDF output file.

All Doucument will provide by googel Driv Link :

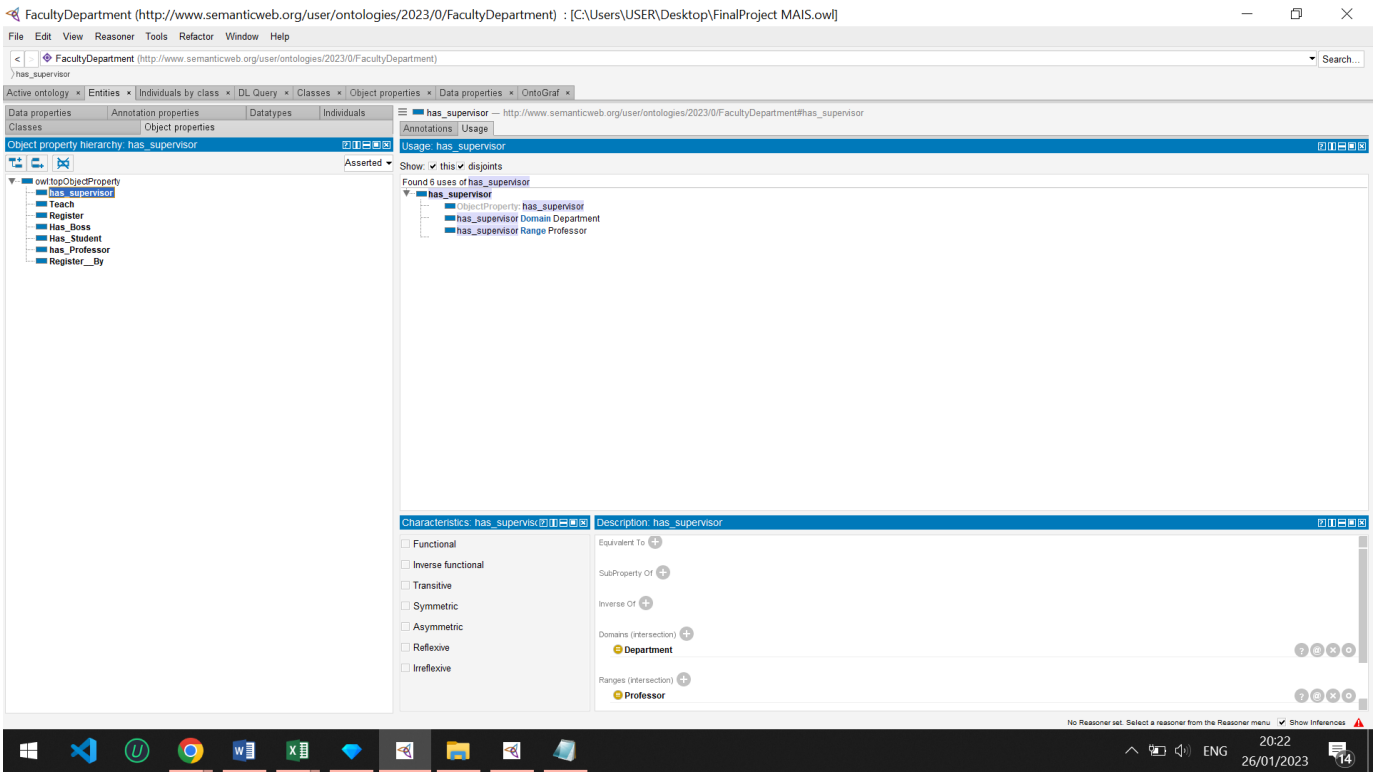
https://drive.google.com/drive/folders/1YPj8Do9TwRlVsfT9YhL7d7BSOb8PXCn2?usp=sharing

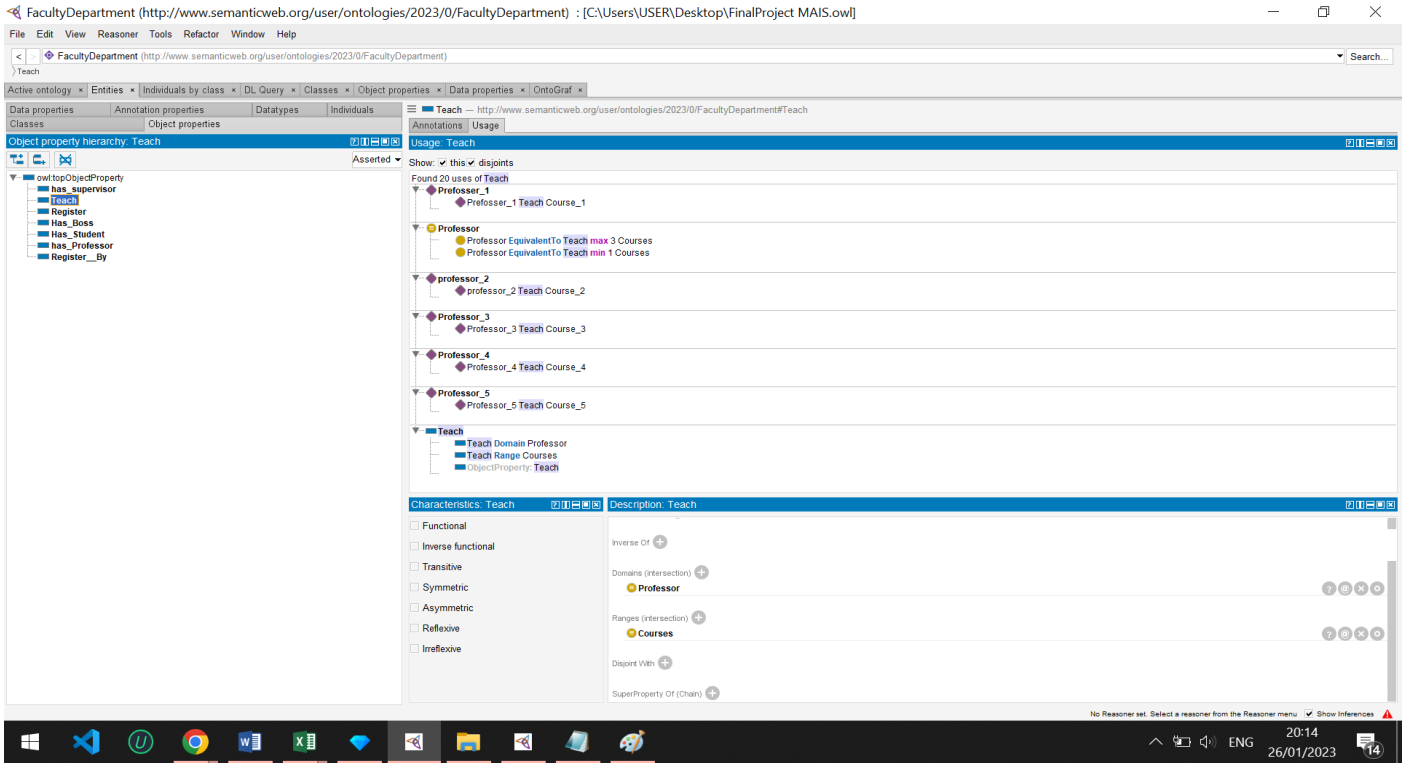
Classes

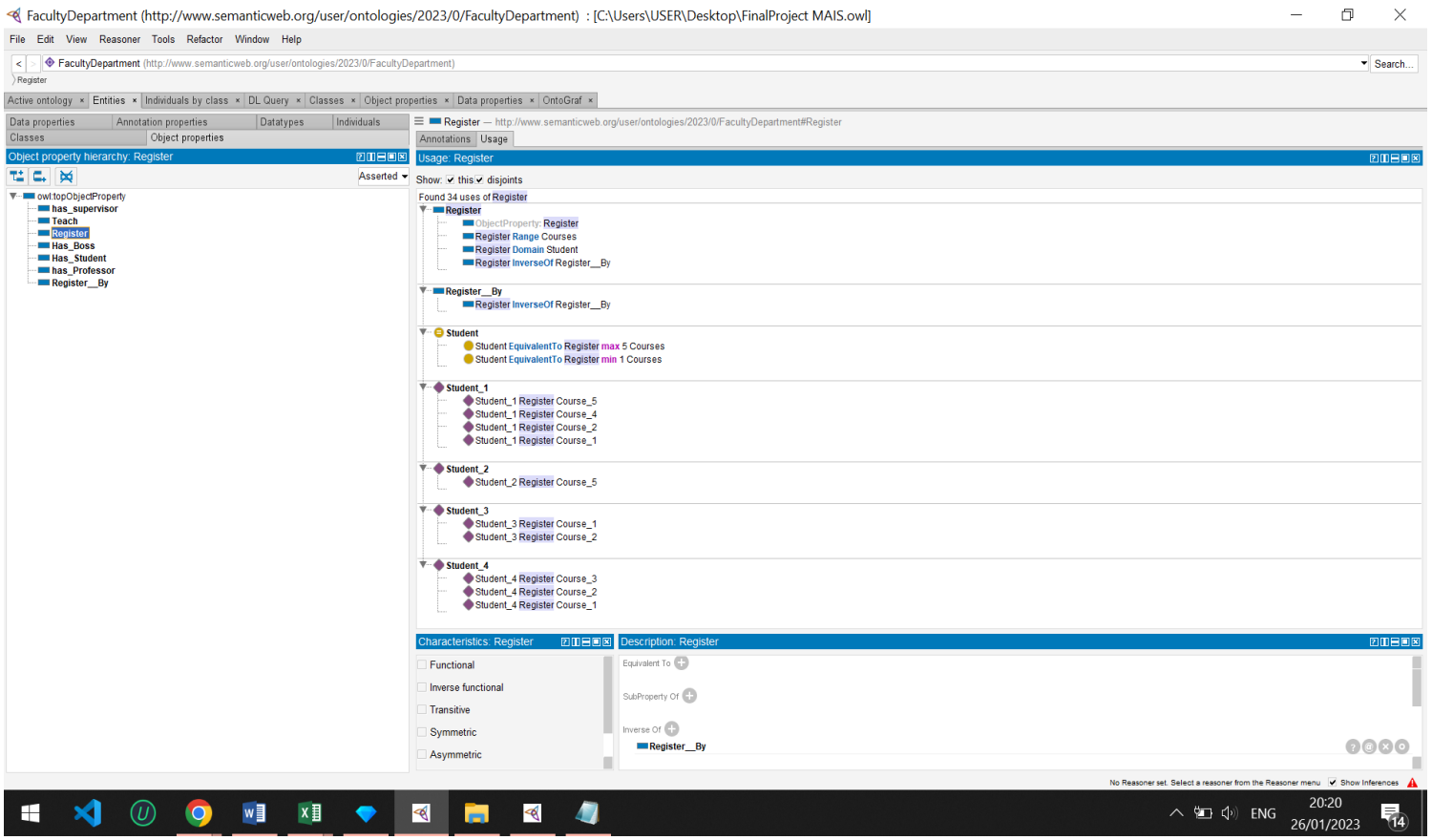

FacultyDepartment (http://www.semanticweb.org/user/ontologies/2023/0/FacultyDepartment) : [C:\Users\USER\Desktop\FinalProject MAIS.owl]
File Edit View Reasoner Tools Refactor Window Help
Class hierarchy: Courses
owl:Thing
Faculty
Courses
Department
Professor
Student
New_System
Old_System
Usage: Courses
Found 40 uses of Courses
'(CS)_Computer_Science'
"(CS)_Computer_Science" Type Courses
Code
Code Domain Courses
Course_1
Course_1 Type Courses
Course_2
Course_2 Type Courses
Course_3
Course_3 Type Courses
Course_4
Course_4 Type Courses
Course_5
Course_5 Type Courses
Course_Name
Course_Name Domain Courses
Courses
Courses SubClassOf Faculty
Courses EquivalentTo Register__By max 30 Student
Courses EquivalentTo Register__By min 15 Student
Description: Courses
Register__By max 30 Student
Register__By min 15 Student
Faculty
ENG
20:12
26/01/2023

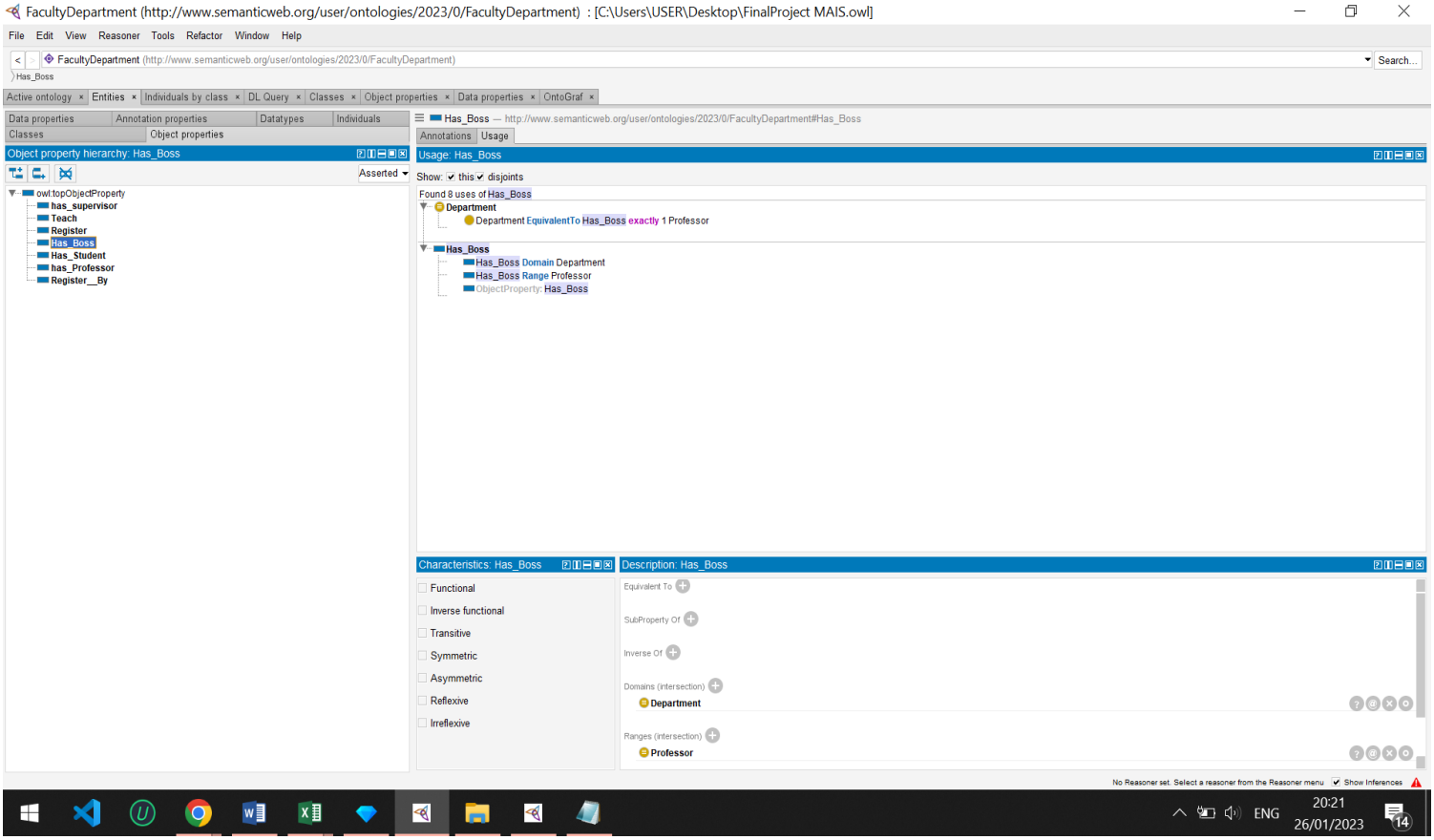

FacultyDepartment (http://www.semanticweb.org/user/ontologies/2023/0/FacultyDepartment) : [C:\Users\USER\Desktop\FinalProject MAIS.owl]
File Edit View Reasoner Tools Refactor Window Help
Class hierarchy: Courses
owl:Thing
Faculty
Courses
Department
Professor
Student
New_System
Old_System
Usage: Courses
Course_Name
Course_Name Domain Courses
Courses
Courses SubClassOf Faculty
Courses EquivalentTo Register__By max 30 Student
Courses EquivalentTo Register__By min 15 Student
Name
Name Domain Courses
Professor
Professor EquivalentTo Teach max 3 Courses
Professor EquivalentTo Teach min 1 Courses
Register
Register Range Courses
Register__By
Register__By Domain Courses
Student
Student EquivalentTo Register max 5 Courses
Student EquivalentTo Register min 1 Courses
Teach
Teach Range Courses
Description: Courses
Register__By max 30 Student
Register__By min 15 Student
Faculty
Asserted in: http://www.semanticweb.org/user/ontologies/2023/0/FacultyDepartment
ENG
20:13
26/01/2023

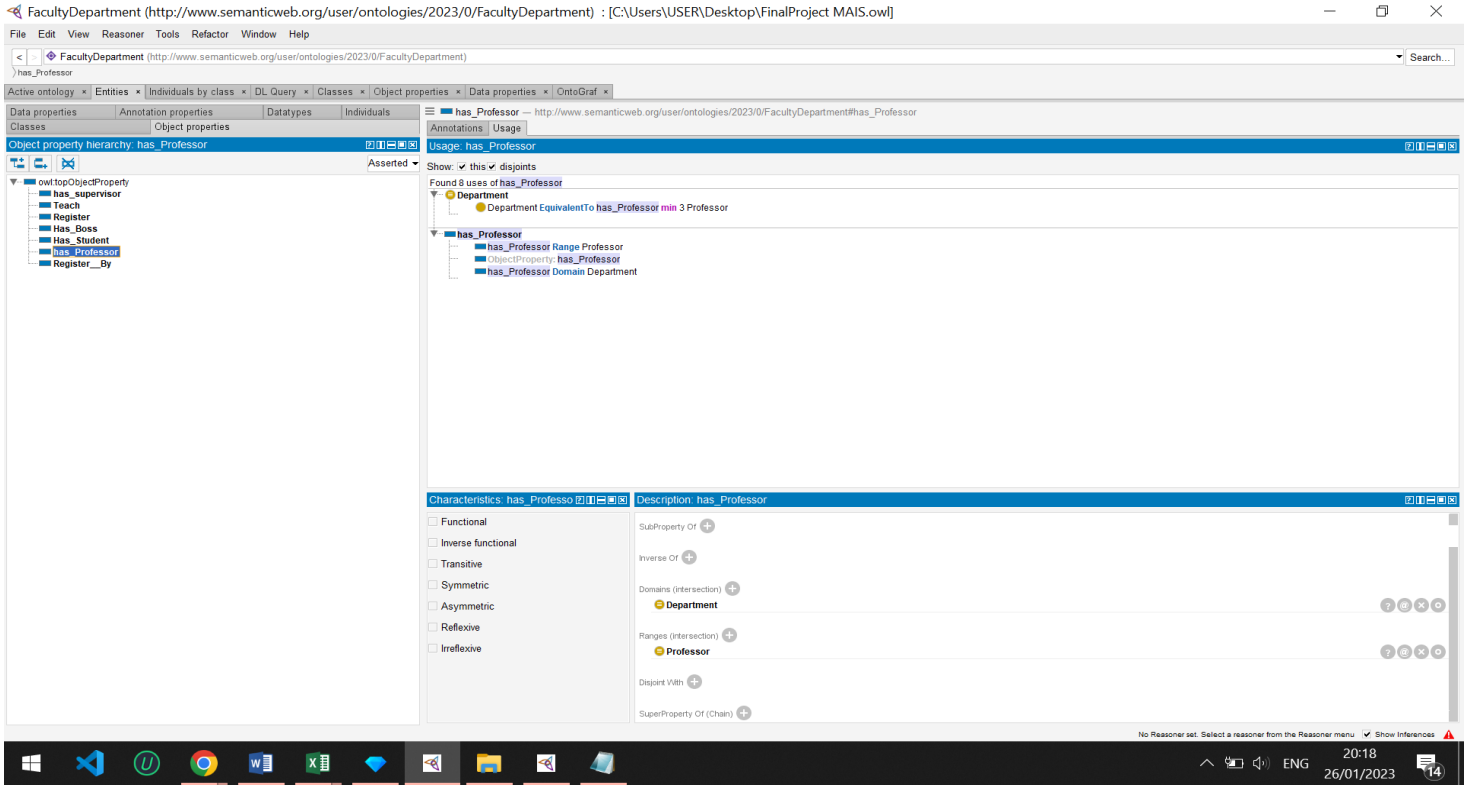
Objective Proprties






FacultyDepartment (http://www.semanticweb.org/user/ontologies/2023/0/FacultyDepartment) : [C:\Users\USER\Desktop\FinalProject MAIS.owl]
File Edit View Reasoner Tools Refactor Window Help
FacultyDepartment (http://www.semanticweb.org/user/ontologies/2023/0/FacultyDepartment)
Search...
Register
Active ontology × Entities × Individuals by class × DL Query × Classes × Object properties × Data properties × OntoGraf ×
Data properties Annotation properties Datatypes Individuals
Classes Object properties
Object property hierarchy: Register
Asserted
owl:topObjectProperty
has_supervisor
Teach
Register
Has_Boss
Has_Student
has_Professor
Register__By
Register — http://www.semanticweb.org/user/ontologies/2023/0/FacultyDepartment#Register
Annotations Usage
Usage: Register
Show: this disjoints
Found 34 uses of Register
Register
ObjectProperty: Register
Register Range Courses
Register Domain Student
Register InverseOf Register__By
Register__By
Register InverseOf Register__By
Student
Student EquivalentTo Register max 5 Courses
Student EquivalentTo Register min 1 Courses
Student_1
Student_1 Register Course_5
Student_1 Register Course_4
Student_1 Register Course_2
Student_1 Register Course_1
Student_2
Student_2 Register Course_5
Student_3
Student_3 Register Course_1
Student_3 Register Course_2
Student_4
Student_4 Register Course_3
Student_4 Register Course_2
Student_4 Register Course_1
Characteristics: Register
Functional
Inverse functional
Transitive
Symmetric
Asymmetric
Description: Register
Equivalent To
SubProperty Of
Inverse Of
Register__By
No Reasoner set. Select a reasoner from the Reasoner menu
Show Inferences
ENG
20:20
26/01/2023


FacultyDepartment (http://www.semanticweb.org/user/ontologies/2023/0/FacultyDepartment) : [C:\Users\USER\Desktop\FinalProject MAIS.owl]
File Edit View Reasoner Tools Refactor Window Help
FacultyDepartment (http://www.semanticweb.org/user/ontologies/2023/0/FacultyDepartment)
Search...
Has_Boss
Active ontology × Entities × Individuals by class × DL Query × Classes × Object properties × Data properties × OntoGraf ×
Data properties Annotation properties Datatypes Individuals
Classes Object properties
Object property hierarchy: Has_Boss
Asserted
owl:topObjectProperty
has_supervisor
Teach
Register
Has_Boss
Has_Student
has_Professor
Register__By
Has_Boss — http://www.semanticweb.org/user/ontologies/2023/0/FacultyDepartment#Has_Boss
Annotations Usage
Usage: Has_Boss
Show: this disjoints
Found 8 uses of Has_Boss
Department
Department EquivalentTo Has_Boss exactly 1 Professor
Has_Boss
Has_Boss Domain Department
Has_Boss Range Professor
ObjectProperty: Has_Boss
Characteristics: Has_Boss
Functional
Inverse functional
Transitive
Symmetric
Asymmetric
Reflexive
Irreflexive
Description: Has_Boss
Equivalent To
SubProperty Of
Inverse Of
Domains (intersection)
Department
Ranges (intersection)
Professor
No Reasoner set. Select a reasoner from the Reasoner menu
Show Inferences
ENG
20:21
26/01/2023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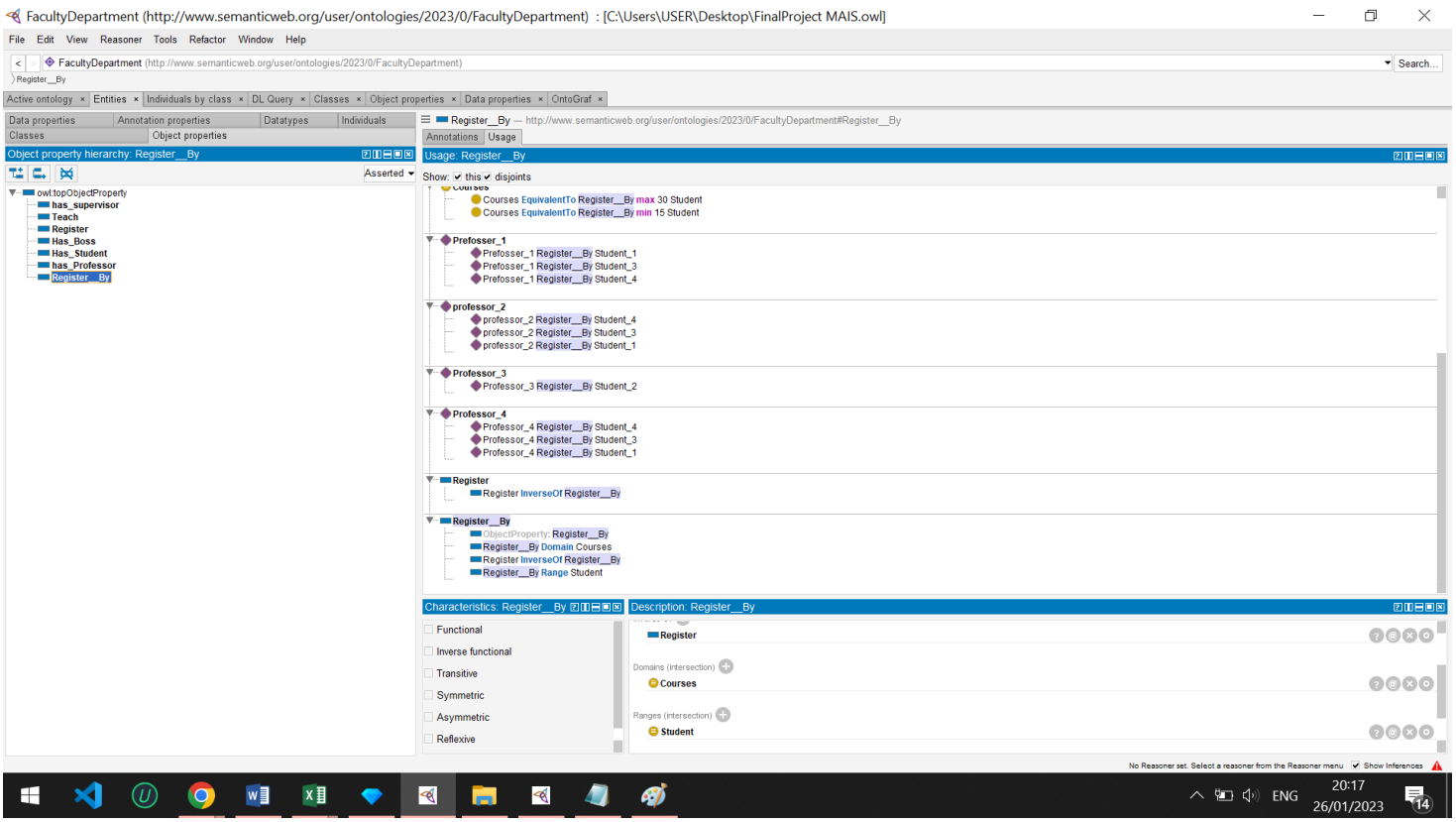
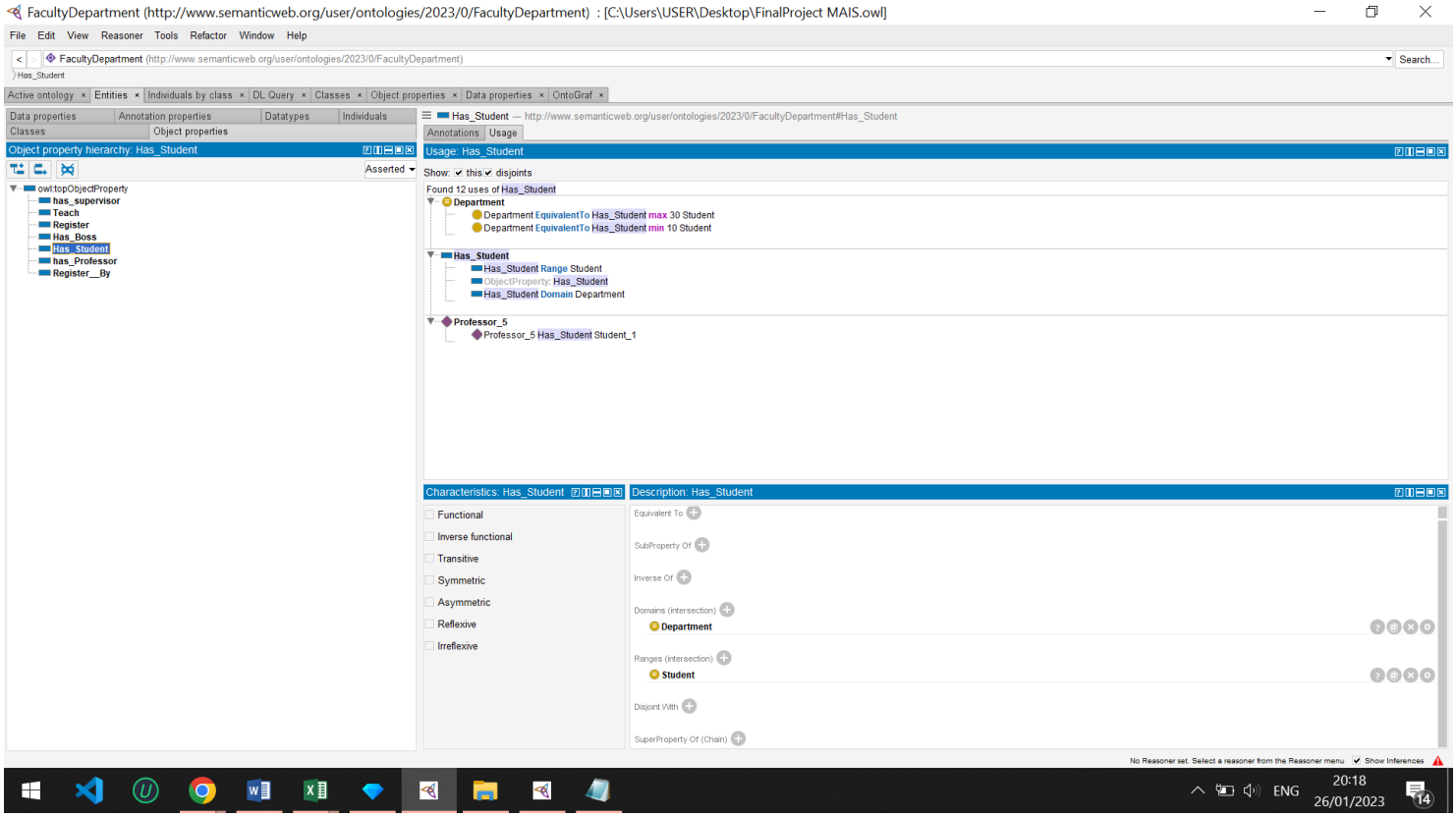
File Edit View Reasoner Tools Refactor Window Help
FacultyDepartment (http://www.semanticweb.org/user/ontologies/2023/0/FacultyDepartment)
Search...
has_Professor
Active ontology Entities Individuals by class DL Query Classes Object properties Data properties OntoGraf
Data properties Annotation properties Datatypes Individuals
Classes Object properties
Object property hierarchy: has_Professor
Asserted
owl:topObjectProperty
has_supervisor
Teach
Register
Has_Boss
Has_Student
has_Professor
Register__By
has_Professor — http://www.semanticweb.org/user/ontologies/2023/0/FacultyDepartment#has_Professor
Annotations Usage
Usage: has_Professor
Show: this disjoints
Found 8 uses of has_Professor
Department
Department EquivalentTo has_Professor min 3 Professor
has_Professor
has_Professor Range Professor
ObjectProperty: has_Professor
has_Professor Domain Department
Characteristics: has_Professo
Functional
Inverse functional
Transitive
Symmetric
Asymmetric
Reflexive
Irreflexive
Description: has_Professor
SubProperty Of
Inverse Of
Domains (intersection)
Department
Ranges (intersection)
Professor
Disjoint With
SuperProperty Of (Chain)
No Reasoner set. Select a reasoner from the Reasoner menu
Show Inferences
ENG
20:18
26/01/2023


FacultyDepartment (http://www.semanticweb.org/user/ontologies/2023/0/FacultyDepartment) : [C:\Users\USER\Desktop\FinalProject MAIS.owl]
File Edit View Reasoner Tools Refactor Window Help
FacultyDepartment (http://www.semanticweb.org/user/ontologies/2023/0/FacultyDepartment)
Search...
Register__By
Active ontology Entities Individuals by class DL Query Classes Object properties Data properties OntoGraf
Data properties Annotation properties Datatypes Individuals
Classes Object properties
Object property hierarchy: Register__By
Asserted
owl:topObjectProperty
has_supervisor
Teach
Register
Has_Boss
Has_Student
has_Professor
Register__By
Register__By — http://www.semanticweb.org/user/ontologies/2023/0/FacultyDepartment#Register__By
Annotations Usage
Usage: Register__By
Show: this disjoints
Courses EquivalentTo Register__By max 30 Student
Courses EquivalentTo Register__By min 15 Student
Prefosser_1
Prefosser_1 Register__By Student_1
Prefosser_1 Register__By Student_3
Prefosser_1 Register__By Student_4
professor_2
professor_2 Register__By Student_4
professor_2 Register__By Student_3
professor_2 Register__By Student_1
Professor_3
Professor_3 Register__By Student_2
Professor_4
Professor_4 Register__By Student_4
Professor_4 Register__By Student_3
Professor_4 Register__By Student_1
Register
Register InverseOf Register__By
Register__By
ObjectProperty: Register__By
Register__By Domain Courses
Register InverseOf Register__By
Register__By Range Student
Characteristics: Register__By
Functional
Inverse functional
Transitive
Symmetric
Asymmetric
Reflexive
Description: Register__By
Register
Domains (intersection)
Courses
Ranges (intersection)
Student
No Reasoner set. Select a reasoner from the Reasoner menu
Show Inferences
ENG
20:17
26/01/2023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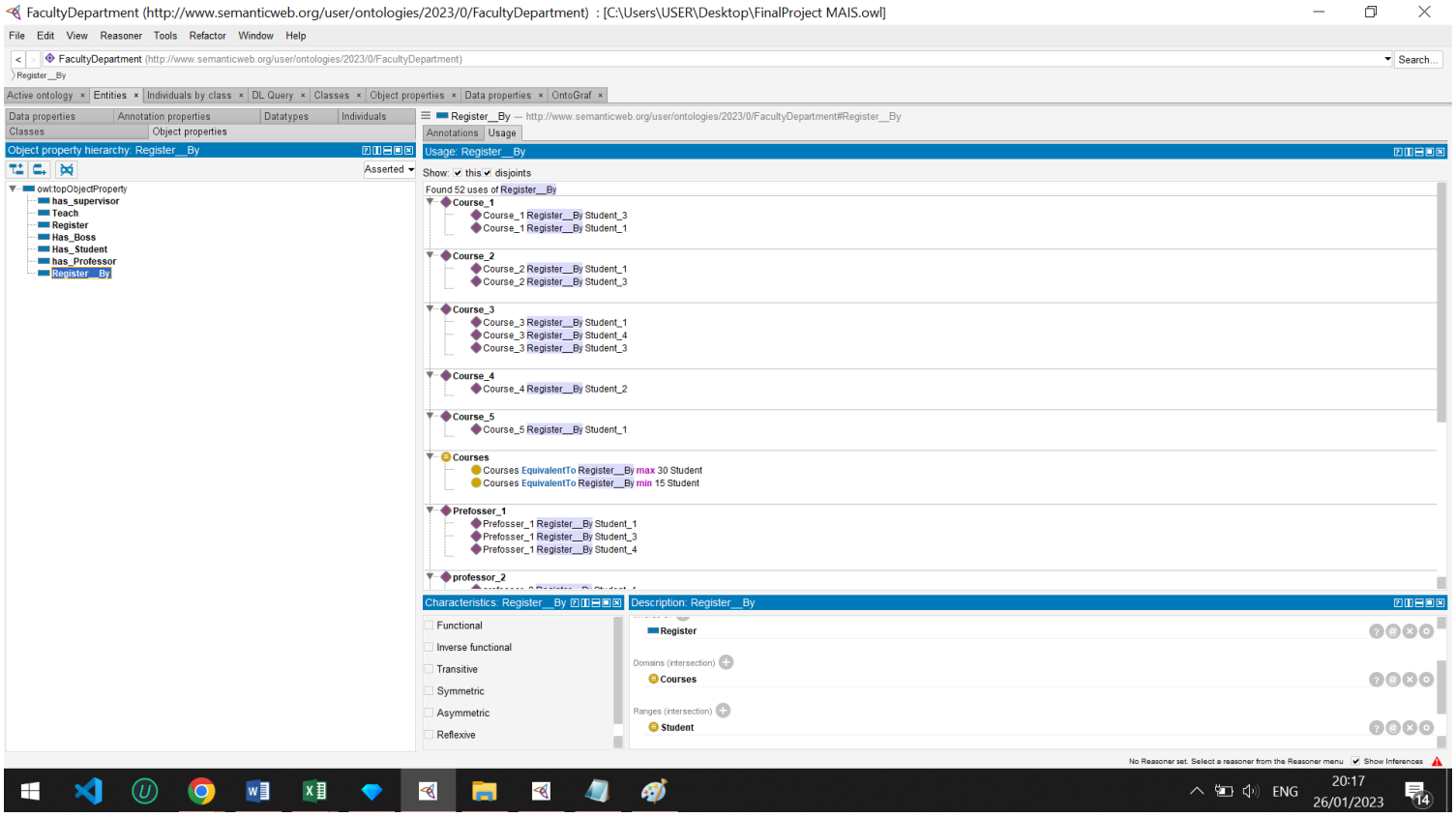
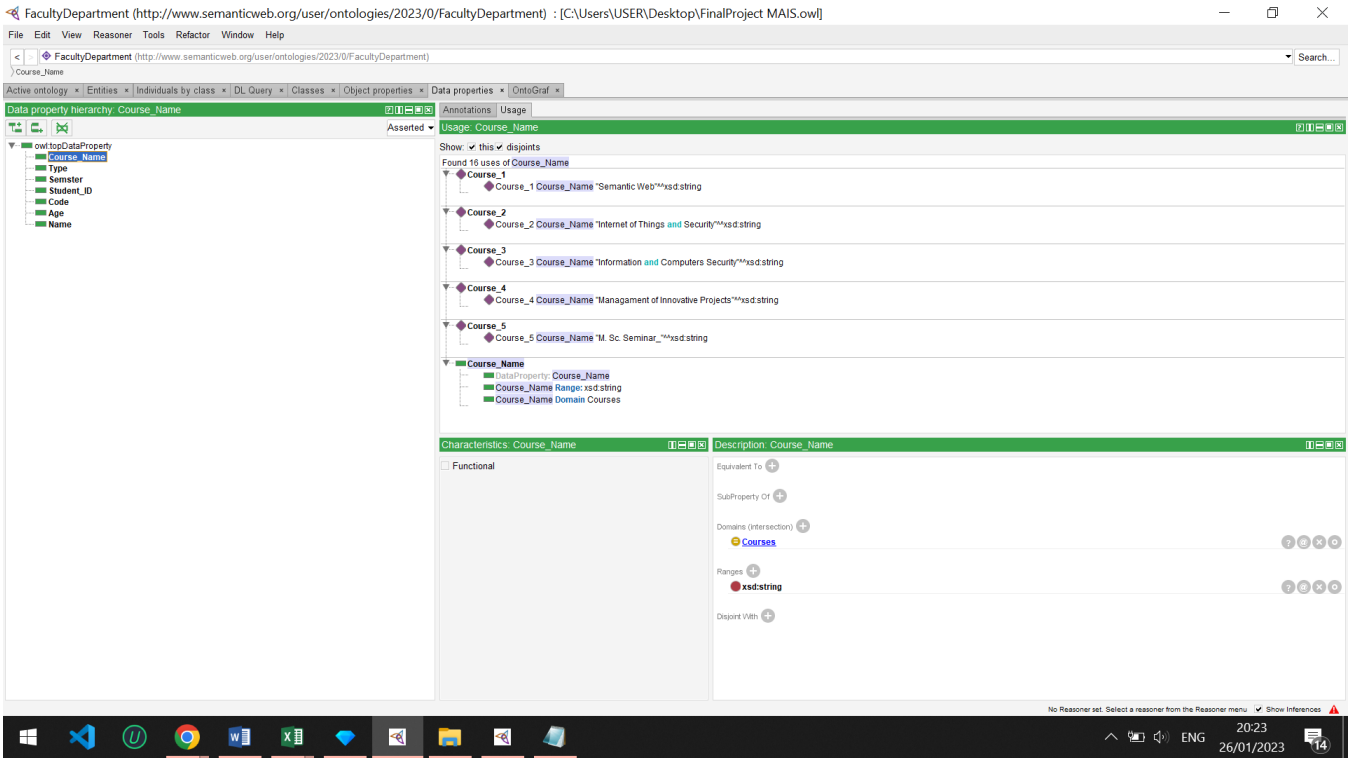
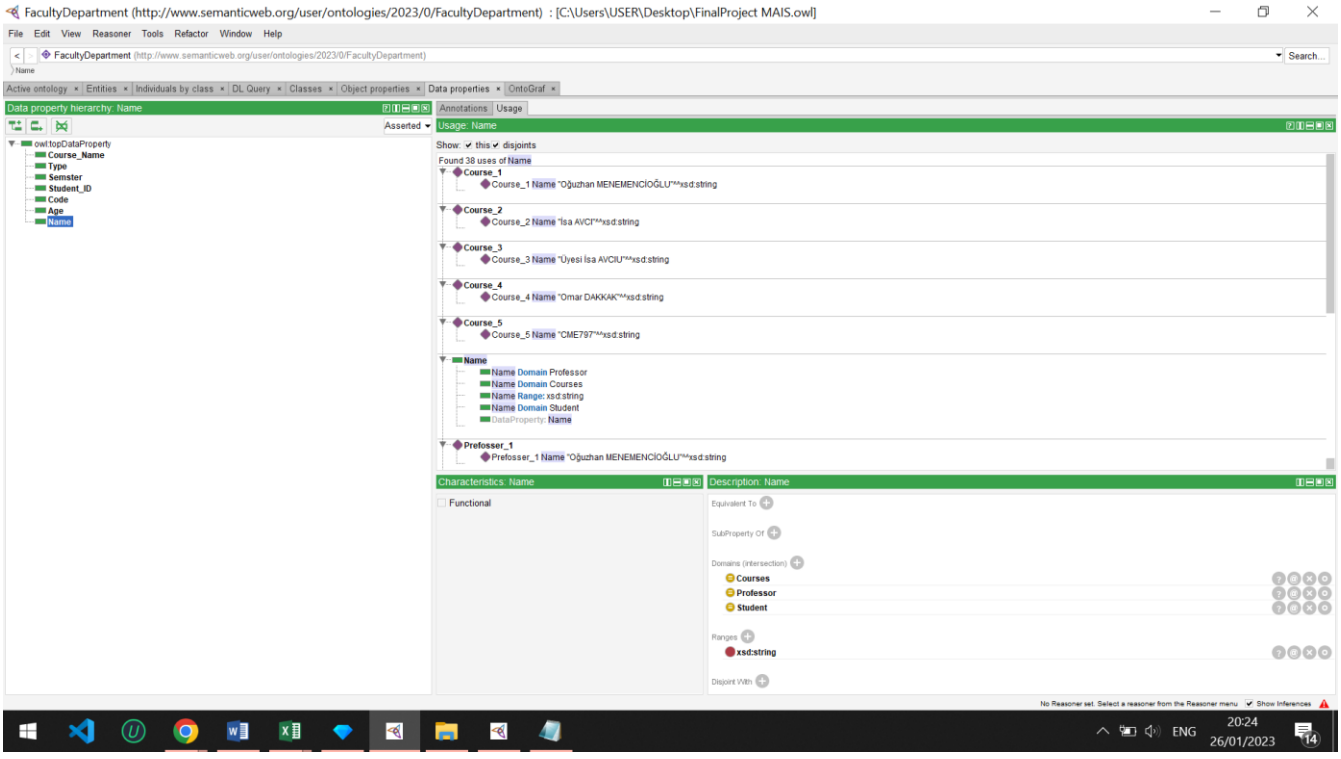
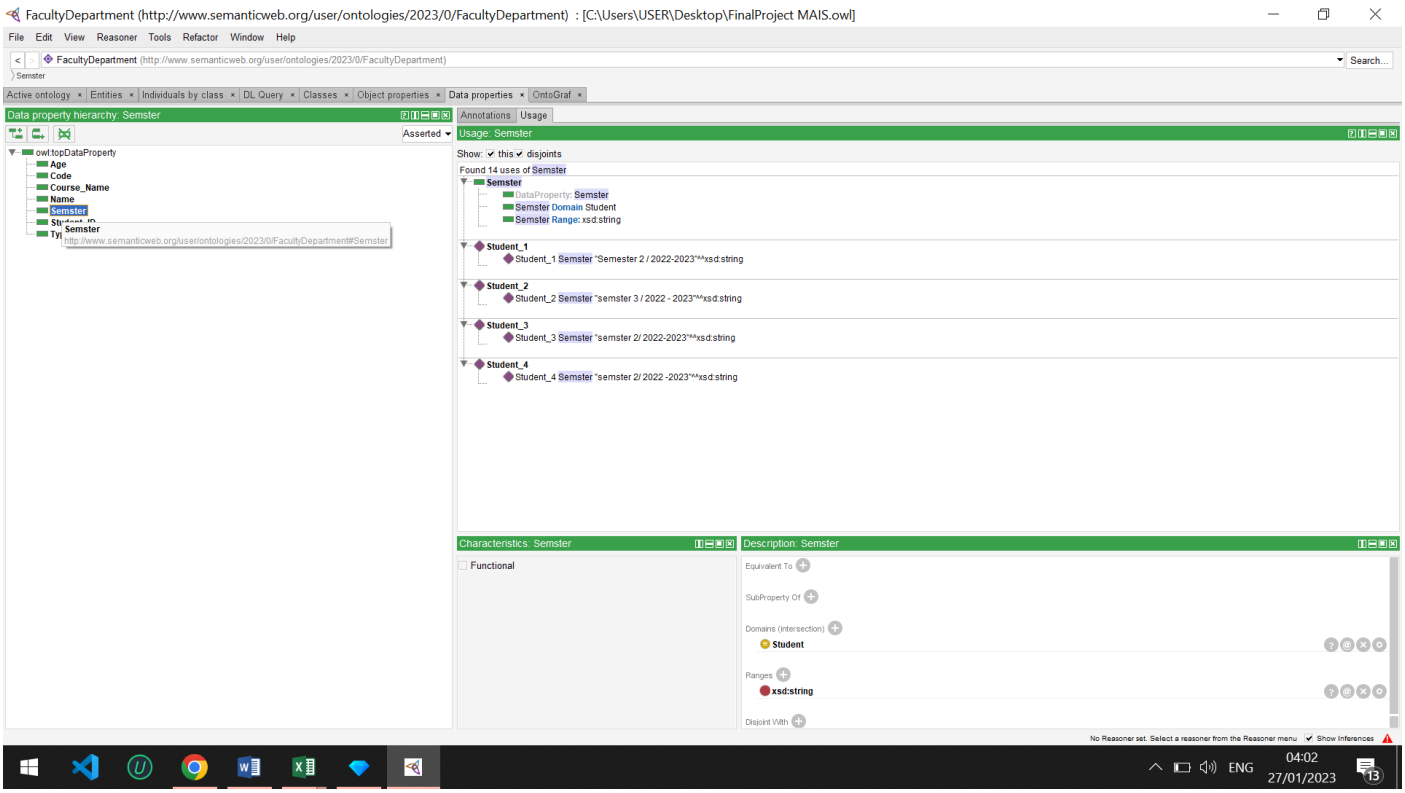
File Edit View Reasoner Tools Refactor Window Help
Object property hierarchy: Has_Student
owl:topObjectProperty
has_supervisor
Teach
Register
Has_Boss
Has_Student
has_Professor
Register__By
Has_Student — http://www.semanticweb.org/user/ontologies/2023/0/FacultyDepartment#Has_Student
Usage: Has_Student
Found 12 uses of Has_Student
Department
Department EquivalentTo Has_Student max 30 Student
Department EquivalentTo Has_Student min 10 Student
Has_Student
Has_Student Range Student
ObjectProperty: Has_Student
Has_Student Domain Department
Professor_5
Professor_5 Has_Student Student_1
Characteristics: Has_Student
Functional
Inverse functional
Transitive
Symmetric
Asymmetric
Reflexive
Irreflexive
Description: Has_Student
Equivalent To
SubProperty Of
Inverse Of
Domains (intersection)
Department
Ranges (intersection)
Student
Disjoint With
SuperProperty Of (Chain)
ENG
20:18
26/01/2023


FacultyDepartment (http://www.semanticweb.org/user/ontologies/2023/0/FacultyDepartment) : [C:\Users\USER\Desktop\FinalProject MAIS.owl]
File Edit View Reasoner Tools Refactor Window Help
Object property hierarchy: Register__By
owl:topObjectProperty
has_supervisor
Teach
Register
Has_Boss
Has_Student
has_Professor
Register__By
Register__By — http://www.semanticweb.org/user/ontologies/2023/0/FacultyDepartment#Register__By
Usage: Register__By
Found 52 uses of Register__By
Course_1
Course_1 Register__By Student_3
Course_1 Register__By Student_1
Course_2
Course_2 Register__By Student_1
Course_2 Register__By Student_3
Course_3
Course_3 Register__By Student_1
Course_3 Register__By Student_4
Course_3 Register__By Student_3
Course_4
Course_4 Register__By Student_2
Course_5
Course_5 Register__By Student_1
Courses
Courses EquivalentTo Register__By max 30 Student
Courses EquivalentTo Register__By min 15 Student
Prefosser_1
Prefosser_1 Register__By Student_1
Prefosser_1 Register__By Student_3
Prefosser_1 Register__By Student_4
professor_2
Characteristics: Register__By
Functional
Inverse functional
Transitive
Symmetric
Asymmetric
Reflexive
Description: Register__By
Register
Domains (intersection)
Courses
Ranges (intersection)
Student
ENG
20:17
26/01/2023

Data Proprites



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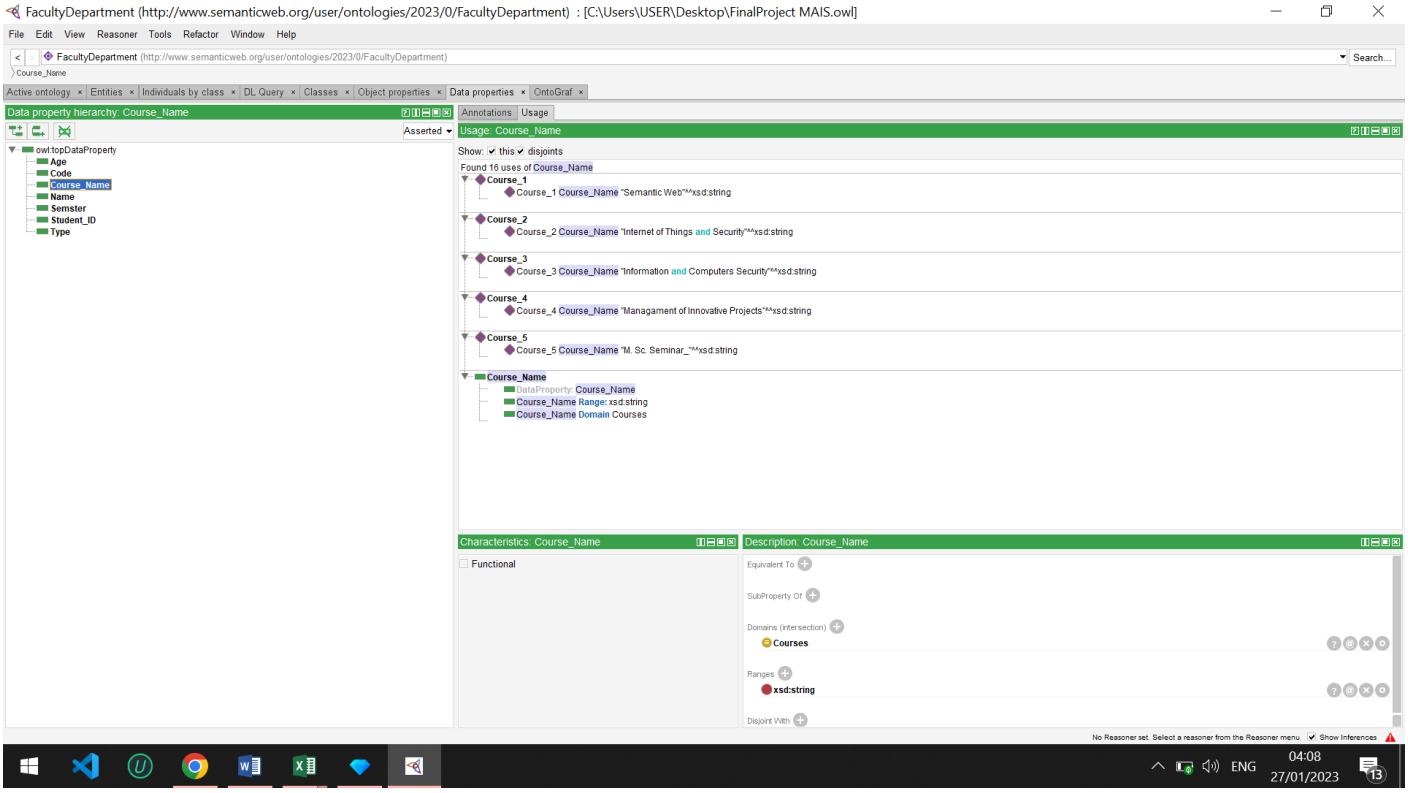
File Edit View Reasoner Tools Refactor Window Help
Active ontology Entities Individuals by class DL Query Classes Object properties Data properties OntoGraf
Data property hierarchy: Semster
owl:topDataProperty
Age
Code
Course_Name
Name
Semster
Usage: Semster
Found 14 uses of Semster
Semster
Student_1
Student_2
Student_3
Student_4
Characteristics: Semster
Functional
Description: Semster
Equivalent To
SubProperty Of
Domains (intersection)
Student
Ranges
xsd:string
Disjoint With
No Reasoner set. Select a reasoner from the Reasoner menu
Show Inferences
ENG
04:02
27/01/2023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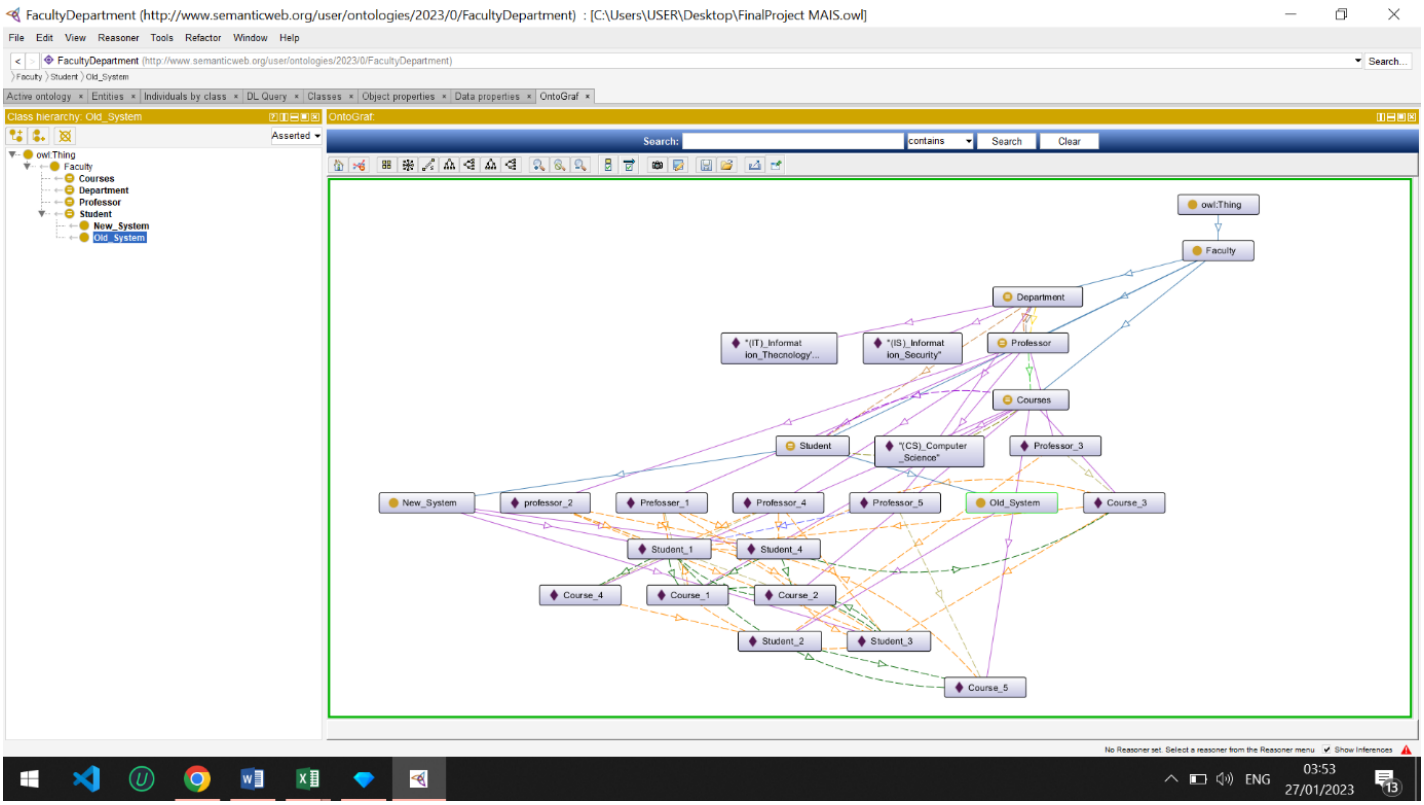
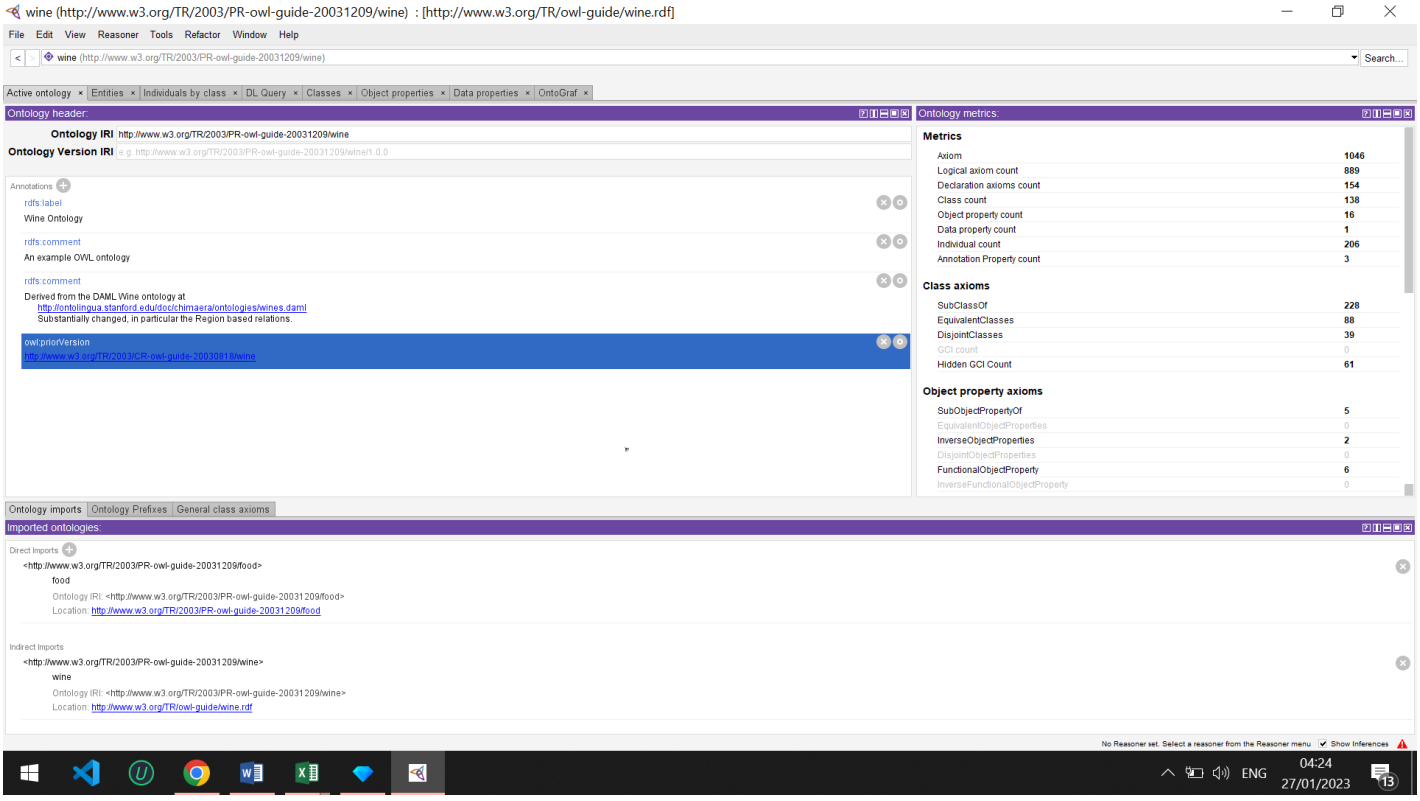
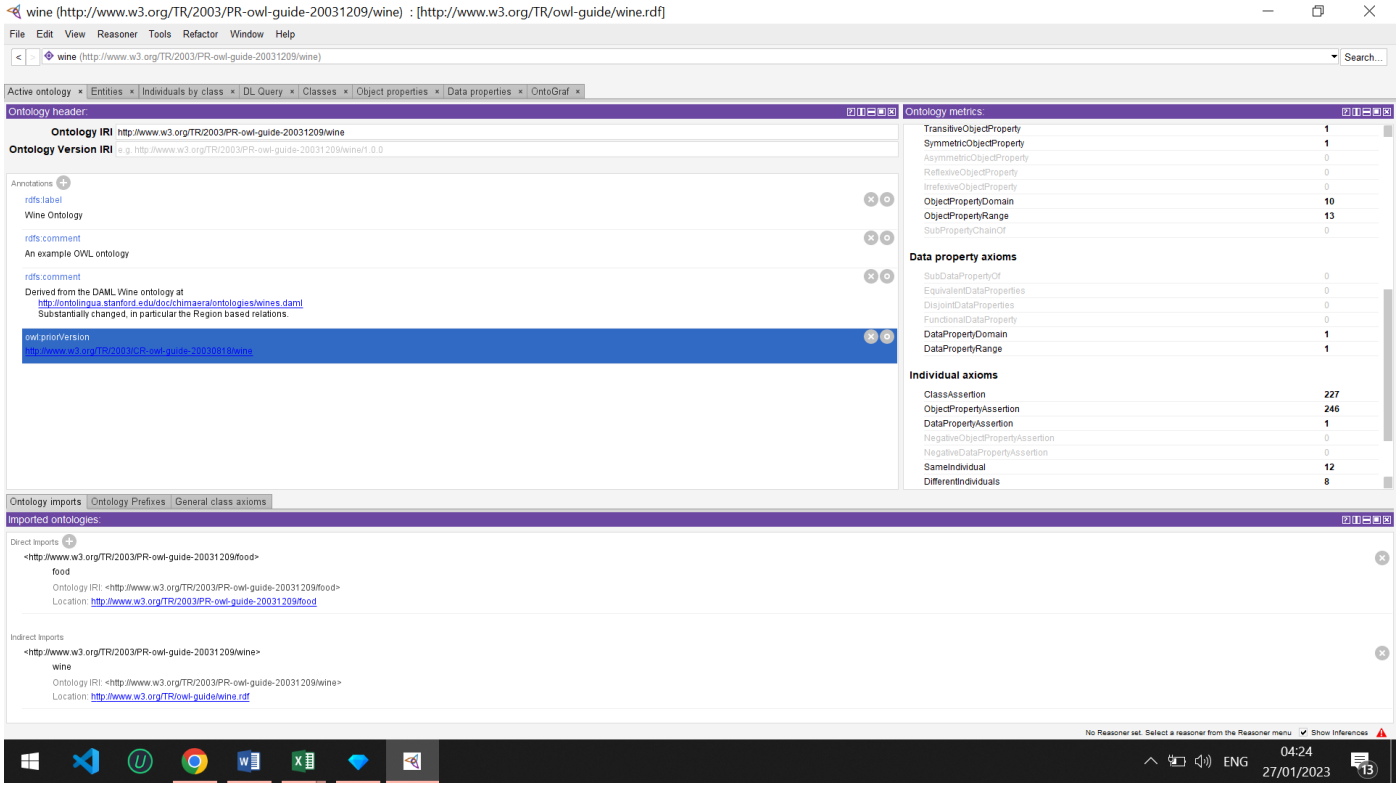
File Edit View Reasoner Tools Refactor Window Help
Active ontology Entities Individuals by class DL Query Classes Object properties Data properties OntoGraf
Data property hierarchy: Course_Name
owl:topDataProperty
Age
Code
Course_Name
Name
Semster
Student_ID
Type
Usage: Course_Name
Found 16 uses of Course_Name
Course_1
Course_2
Course_3
Course_4
Course_5
Course_Name
Characteristics: Course_Name
Functional
Description: Course_Name
Equivalent To
SubProperty Of
Domains (intersection)
Courses
Ranges
xsd:string
Disjoint With
No Reasoner set. Select a reasoner from the Reasoner menu
Show Inferences
ENG
04:08
27/01/2023

OntoGraf


FacultyDepartment (http://www.semanticweb.org/user/ontologies/2023/0/FacultyDepartment) : [C:\Users\USER\Desktop\FinalProject MAIS.owl]
File Edit View Reasoner Tools Refactor Window Help
Active ontology Entities Individuals by class DL Query Classes Object properties Data properties OntoGraf
Class hierarchy: Old_System
owl:Thing
Faculty
Courses
Department
Professor
Student
New_System
Old_System
OntoGraf:
Search: contains Search Clear
owl:Thing
Faculty
Department
"(IT)_Informat ion_Theonology"...
"(IS)_Informat ion_Security"
Professor
Courses
Student
"(CS)_Computer _Science"
Professor_3
New_System
professor_2
Professor_1
Professor_4
Professor_5
Old_System
Course_3
Student_1
Student_4
Course_4
Course_1
Course_2
Student_2
Student_3
Course_5
No Reasoner set. Select a reasoner from the Reasoner menu
Show Inferences
ENG
03:53
27/01/2023


wine (http://www.w3.org/TR/2003/PR-owl-guide-20031209/wine) : [http://www.w3.org/TR/owl-guide/wine.rdf]
File Edit View Reasoner Tools Refactor Window Help
wine (http://www.w3.org/TR/2003/PR-owl-guide-20031209/wine)
Search...
Active ontology Entities Individuals by class DL Query Classes Object properties Data properties OntoGraf
Ontology header:
Ontology IRI http://www.w3.org/TR/2003/PR-owl-guide-20031209/wine
Ontology Version IRI e.g. http://www.w3.org/TR/2003/PR-owl-guide-20031209/wine/1.0.0
Annotations
rdfs:label
Wine Ontology
rdfs:comment
An example OWL ontology
rdfs:comment
Derived from the DAML Wine ontology at
http://ontolingua.stanford.edu/doc/chimaera/ontologies/wines.daml
Substantially changed, in particular the Region based relations.
owl:priorVersion
http://www.w3.org/TR/2003/CR-owl-guide-20030818/wine
Ontology metrics:
Metrics
Axiom 1046
Logical axiom count 889
Declaration axioms count 154
Class count 138
Object property count 16
Data property count 1
Individual count 206
Annotation Property count 3
Class axioms
SubClassOf 228
EquivalentClasses 88
DisjointClasses 39
GCI count 0
Hidden GCI Count 61
Object property axioms
SubObjectPropertyOf 5
EquivalentObjectProperties 0
InverseObjectProperties 2
DisjointObjectProperties 0
FunctionalObjectProperty 6
InverseFunctionalObjectProperty 0
Ontology imports Ontology Prefixes General class axioms
Imported ontologies:
Direct Imports
<http://www.w3.org/TR/2003/PR-owl-guide-20031209/food>
food
Ontology IRI: <http://www.w3.org/TR/2003/PR-owl-guide-20031209/food>
Location: http://www.w3.org/TR/2003/PR-owl-guide-20031209/food
Indirect Imports
<http://www.w3.org/TR/2003/PR-owl-guide-20031209/wine>
wine
Ontology IRI: <http://www.w3.org/TR/2003/PR-owl-guide-20031209/wine>
Location: http://www.w3.org/TR/owl-guide/wine.rdf
No Reasoner set. Select a reasoner from the Reasoner menu
Show Inferences
ENG
04:24
27/01/2023


wine (http://www.w3.org/TR/2003/PR-owl-guide-20031209/wine) : [http://www.w3.org/TR/owl-guide/wine.rdf]
File Edit View Reasoner Tools Refactor Window Help
Active ontology | Entities | Individuals by class | DL Query | Classes | Object properties | Data properties | OntoGraf
Ontology header:
Ontology IRI http://www.w3.org/TR/2003/PR-owl-guide-20031209/wine
Ontology Version IRI
Annotations
rdfs:label
Wine Ontology
rdfs:comment
An example OWL ontology
rdfs:comment
Derived from the DAML Wine ontology at
http://ontolingua.stanford.edu/doc/chimaera/ontologies/wines.daml
Substantially changed, in particular the Region based relations.
owl:priorVersion
http://www.w3.org/TR/2003/CR-owl-guide-20030818/wine
Ontology metrics:
TransitiveObjectProperty 1
SymmetricObjectProperty 1
ObjectPropertyDomain 10
ObjectPropertyRange 13
Data property axioms
DataPropertyDomain 1
DataPropertyRange 1
Individual axioms
ClassAssertion 227
ObjectPropertyAssertion 246
DataPropertyAssertion 1
SameIndividual 12
DifferentIndividuals 8
Ontology imports | Ontology Prefixes | General class axioms
Imported ontologies:
Direct Imports
<http://www.w3.org/TR/2003/PR-owl-guide-20031209/food>
food
Ontology IRI: <http://www.w3.org/TR/2003/PR-owl-guide-20031209/food>
Location: http://www.w3.org/TR/2003/PR-owl-guide-20031209/food
Indirect Imports
<http://www.w3.org/TR/2003/PR-owl-guide-20031209/wine>
wine
Ontology IRI: <http://www.w3.org/TR/2003/PR-owl-guide-20031209/wine>
Location: http://www.w3.org/TR/owl-guide/wine.rdf
No Reasoner set. Select a reasoner from the Reasoner menu
Show Inferences
ENG
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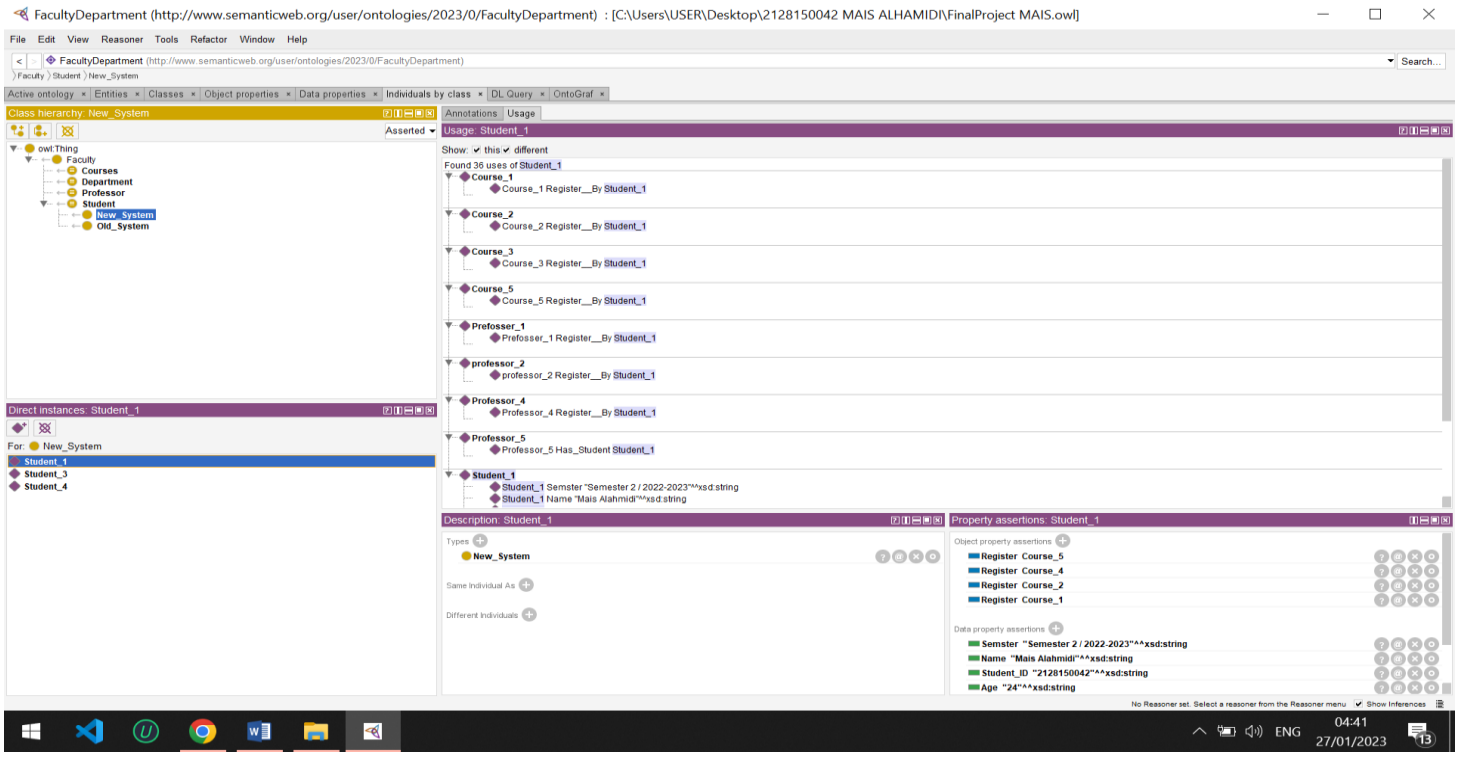
Individual


FacultyDepartment (http://www.semanticweb.org/user/ontologies/2023/0/FacultyDepartment) : [C:\Users\USER\Desktop\2128150042 MAIS ALHAMIDI\FinalProject MAIS.owl]
File Edit View Reasoner Tools Refactor Window Help
Active ontology | Entities | Classes | Object properties | Data properties | Individuals by class | DL Query | OntoGraf
Class hierarchy: New_System
owl:Thing
Faculty
Courses
Department
Professor
Student
New_System
Old_System
Direct instances: Student_1
For: New_System
Student_1
Student_3
Student_4
Annotations | Usage
Usage: Student_1
Found 36 uses of Student_1
Course_1
Course_1 Register__By Student_1
Course_2
Course_2 Register__By Student_1
Course_3
Course_3 Register__By Student_1
Course_5
Course_5 Register__By Student_1
Prefosser_1
Prefosser_1 Register__By Student_1
professor_2
professor_2 Register__By Student_1
Professor_4
Professor_4 Register__By Student_1
Professor_5
Professor_5 Has_Student Student_1
Student_1
Student_1 Semster "Semester 2 / 2022-2023"^^xsd:string
Student_1 Name "Mais Alahmidi"^^xsd:string
Description: Student_1
Types
New_System
Same Individual As
Different Individuals
Property assertions: Student_1
Object property assertions
Register Course_5
Register Course_4
Register Course_2
Register Course_1
Data property assertions
Semster "Semester 2 / 2022-2023"^^xsd:string
Name "Mais Alahmidi"^^xsd:string
Student_ID "2128150042"^^xsd:string
Age "24"^^xsd:string
No Reasoner set. Select a reasoner from the Reasoner menu
Show Inferences
ENG
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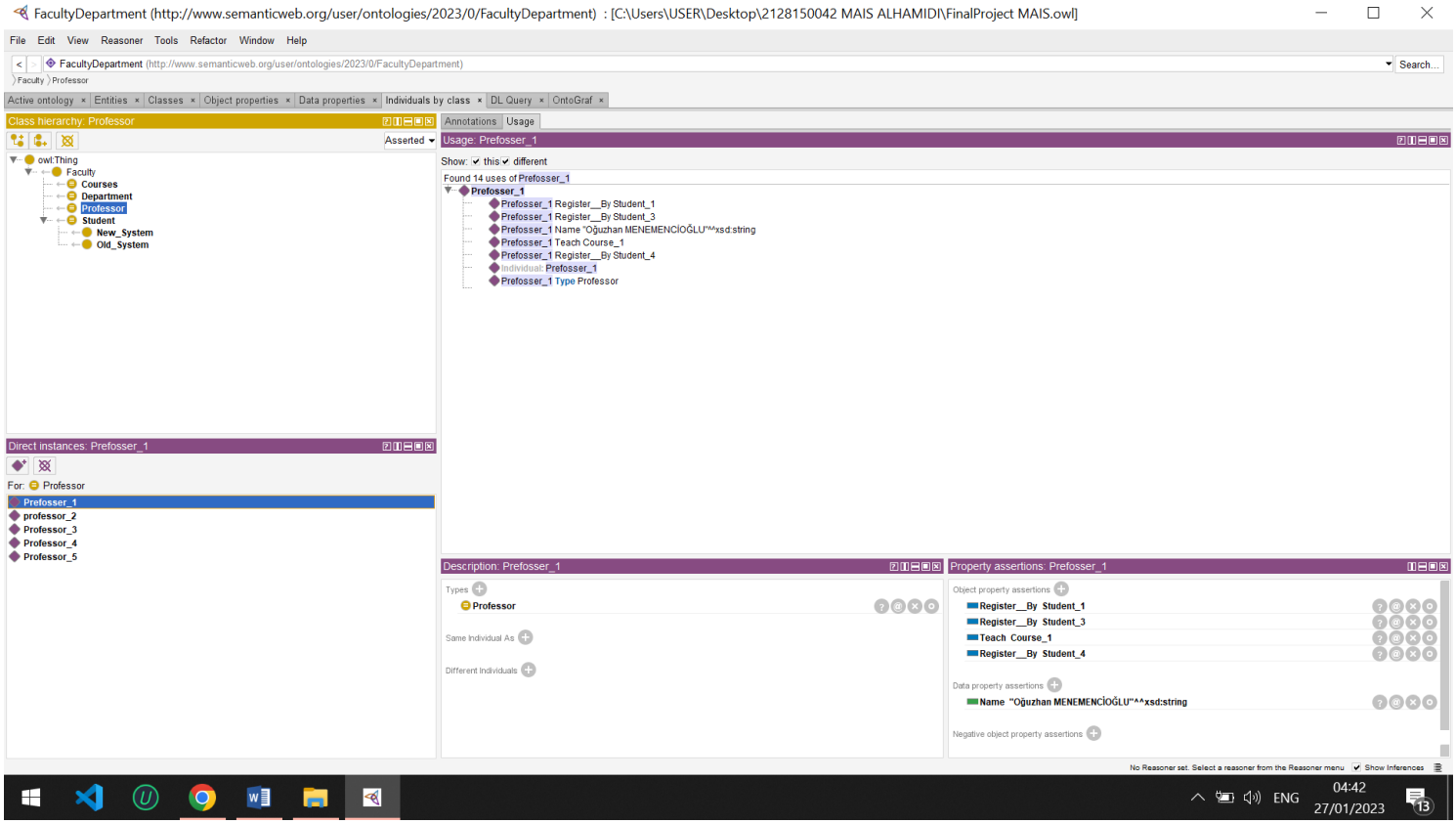
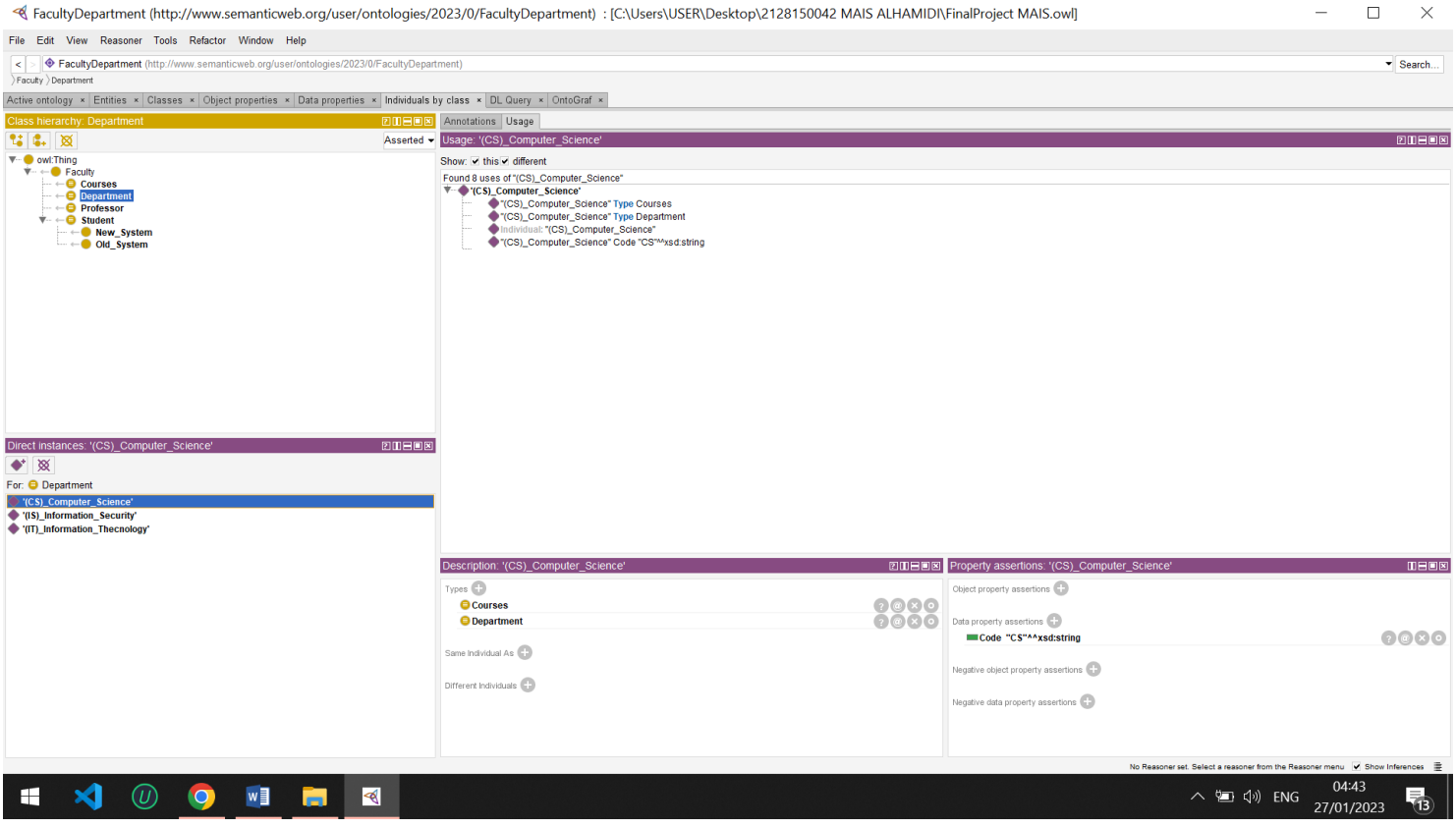

FacultyDepartment (http://www.semanticweb.org/user/ontologies/2023/0/FacultyDepartment) : [C:\Users\USER\Desktop\2128150042 MAIS ALHAMIDI\FinalProject MAIS.owl]
File Edit View Reasoner Tools Refactor Window Help
Active ontology Entities Classes Object properties Data properties Individuals by class DL Query OntoGraf
Class hierarchy: Professor
owl:Thing
Faculty
Courses
Department
Professor
Student
New_System
Old_System
Usage: Prefosser_1
Found 14 uses of Prefosser_1
Prefosser_1
Prefosser_1 Register__By Student_1
Prefosser_1 Register__By Student_3
Prefosser_1 Name "Oğuzhan MENEMENCİOĞLU"^^xsd:string
Prefosser_1 Teach Course_1
Prefosser_1 Register__By Student_4
Individual: Prefosser_1
Prefosser_1 Type Professor
Direct instances: Prefosser_1
For: Professor
Prefosser_1
professor_2
Professor_3
Professor_4
Professor_5
Description: Prefosser_1
Property assertions: Prefosser_1
Register__By Student_1
Register__By Student_3
Teach Course_1
Register__By Student_4
Name "Oğuzhan MENEMENCİOĞLU"^^xsd:string
ENG 04:42 27/01/2023


FacultyDepartment (http://www.semanticweb.org/user/ontologies/2023/0/FacultyDepartment) : [C:\Users\USER\Desktop\2128150042 MAIS ALHAMIDI\FinalProject MAIS.owl]
File Edit View Reasoner Tools Refactor Window Help
Active ontology Entities Classes Object properties Data properties Individuals by class DL Query OntoGraf
Class hierarchy: Department
owl:Thing
Faculty
Courses
Department
Professor
Student
New_System
Old_System
Usage: '(CS)_Computer_Science'
Found 8 uses of "(CS)_Computer_Science"
'(CS)_Computer_Science'
"(CS)_Computer_Science" Type Courses
"(CS)_Computer_Science" Type Department
Individual: "(CS)_Computer_Science"
"(CS)_Computer_Science" Code "CS"^^xsd:string
Direct instances: '(CS)_Computer_Science'
For: Department
'(CS)_Computer_Science'
'(IS)_Information_Security'
'(IT)_Information_Thecnology'
Description: '(CS)_Computer_Science'
Property assertions: '(CS)_Computer_Science'
Courses
Department
Code "CS"^^xsd:string
ENG 04:43 27/01/2023