**[Tutorial 2](https://www.myefrei.fr/moodle/mod/resource/view.php?id=38589)**

**NI HE**

**BI2**

**Artificial Intelligence for Knowledge Discovery**

rules.append("[rule1: (?x mcf:PartOf ?y), (?y mcf:PartOf ?z) -> (?x mcf:PartOf ?z)] ");

rules.append("[rule2: (?x rdfs:subClassOf ?y), (?y rdfs:subClassOf ?z) -> (?x rdfs:subClassOf ?z)] ");

rules.append("[rule3: (?a, rdfs:subClassOf, ?c), (?c, mcf:InsertOn, ?b) -> (?a, mcf:InsertOn, ?b)]");

rules.append("[rule4: (?a, mcf:IsInvolvedIn, ?c), (?c, rdfs:subClassOf, ?b) -> (?a, mcf:IsInvolvedIn, ?b)]");

rules.append("[rule5: (?a, mcf:LeftSubClassOf, ?b) -> (?a, rdfs:subClassOf, ?b)]");

rules.append("[rule6: (?a, mcf:RightSubClassOf, ?b) -> (?a, rdfs:subClassOf, ?b)]");

rules.append("[rule7: (?a, mcf:HasFunction, ?b) -> (?a, mcf:ContributesTo, ?b)]");

rules.append("[rule8: (?a, mcf:ContributesTo, ?c), (?c, mcf:IsInvolvedIn, ?b) -> (?a, mcf:ContributesTo, ?b)]");

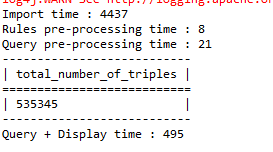
rules.append("[rule9: (?a, mcf:ContributesTo, ?c), (?c, rdfs:subClassOf, ?b) -> (?a, mcf:ContributesTo, ?b)]");

rules.append("[rule10: (?a, mcf:InsertOn, ?c), (?c, mcf:PartOf, ?b) -> (?a, mcf:InsertOn, ?b)]");

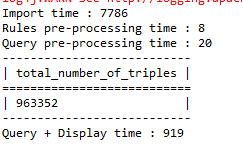
rules.append("[rule11: (?a, mcf:IsInvolvedIn, ?c), (?c, mcf:IsInvolvedIn, ?b) -> (?a, mcf:IsInvolvedIn, ?b)]");

rules.append("[rule12: (?a, mcf:ContributesTo, ?b), (?b, mcf:Flexion\_of\_knee\_joint, ?c) -> (?a, ContributesTo, ?c)]");

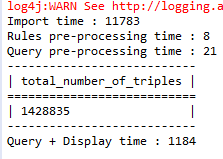
1. What is the size (number of triplets) of each knowledge base before and after saturation?



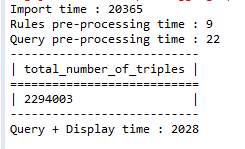
MyCF2



MyCF2Sat



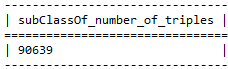
go



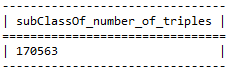
go-plus

1. Consider rdfs: subClassOf, part of and 3 other properties specific to each ontology of your choice. For each property, how many triplets are there before and after saturation?

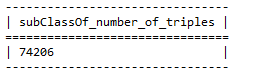
-------------------------------- ---subClassOf----------------------------------



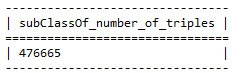
Go



Go-plus

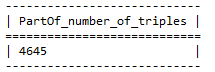


MyCF2

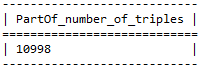


MyCF2Sat

------------------------------------Part Of-------------------------------------

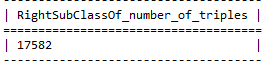


MyCF2

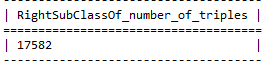


MyCF2Sat

--------------------------------Right Sub Class Of-------------------------------

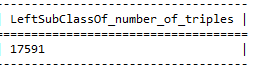


MyCF2

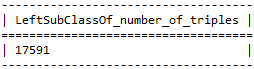


MyCF2Sat

---------------------------------Left Sub Class Of-------------------------------



MyCF2

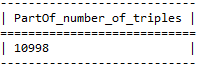
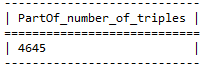


MyCF2Sat

1. Choose three rules for each ontology. How many triplets are inferred for each rule?

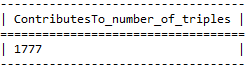
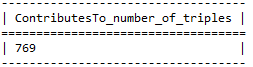
I don’t get the rules of Go, so I don’t know how to figure out this .

* rules.append("[rule1: (?x mcf:PartOf ?y), (?y mcf:PartOf ?z) -> (?x mcf:PartOf ?z)] ");



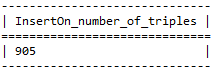
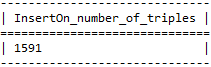
MyCF2

* rules.append("[rule8: (?a, mcf:ContributesTo, ?c), (?c, mcf:IsInvolvedIn, ?b) -> (?a, mcf:ContributesTo, ?b)]");



MyCF2

* rules.append("[rule10: (?a, mcf:InsertOn, ?c), (?c, mcf:PartOf, ?b) -> (?a, mcf:InsertOn, ?b)]");

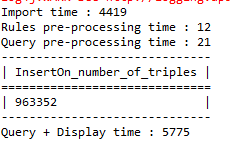
 

MyCF2

1. What is the inference time of the set of rules for each knowledge base? P.S. You should measure the execution time for the same machine.

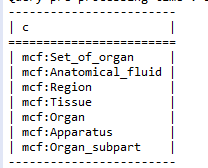
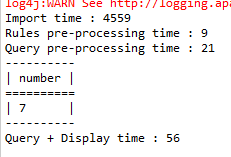
Same problem with question 3,can’t get GO rules

MyCF2 execution time is 12

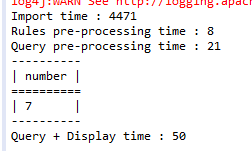
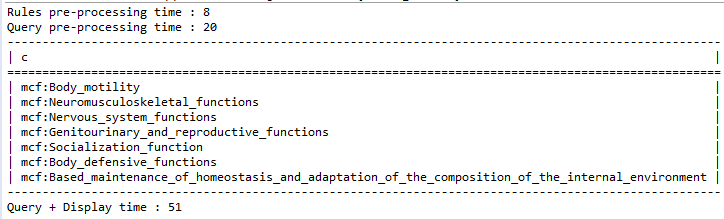


1. Choose two classes of MyCF, one of which is subclass of mcf: Anatomical\_entity and the other is subclass of mcf: Functional\_entity, and calculate the number of respective subclasses. Measure time response to the query, using the three different reasoning engines (Hybrid, Forward, and Backward) implemented by Jena.

The number of Anatomical\_entity: 7

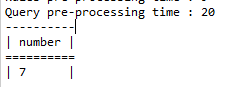
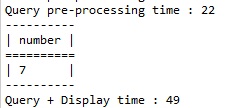
 

The number of Functional\_entity: 7

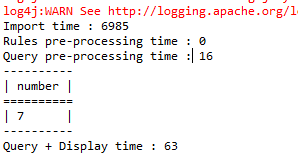
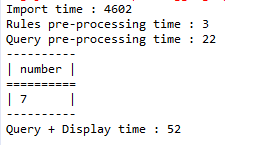
Hybrid for Anatomical\_entity : 22

Hybrid for Functional\_entity : 20

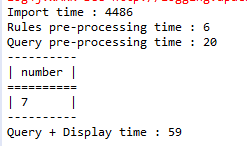
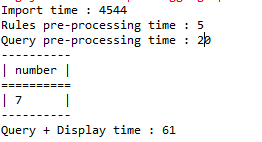
forward for Anatomical\_entity : 22

forward for Functional\_entity:16



backward for Anatomical\_entity : 20

backward for Functional\_entity : 20



Qustion6: The question want me to choose two GO classes,

I try to find the classes of go, but I don’t find it.

