

CS 681 Fall 2008

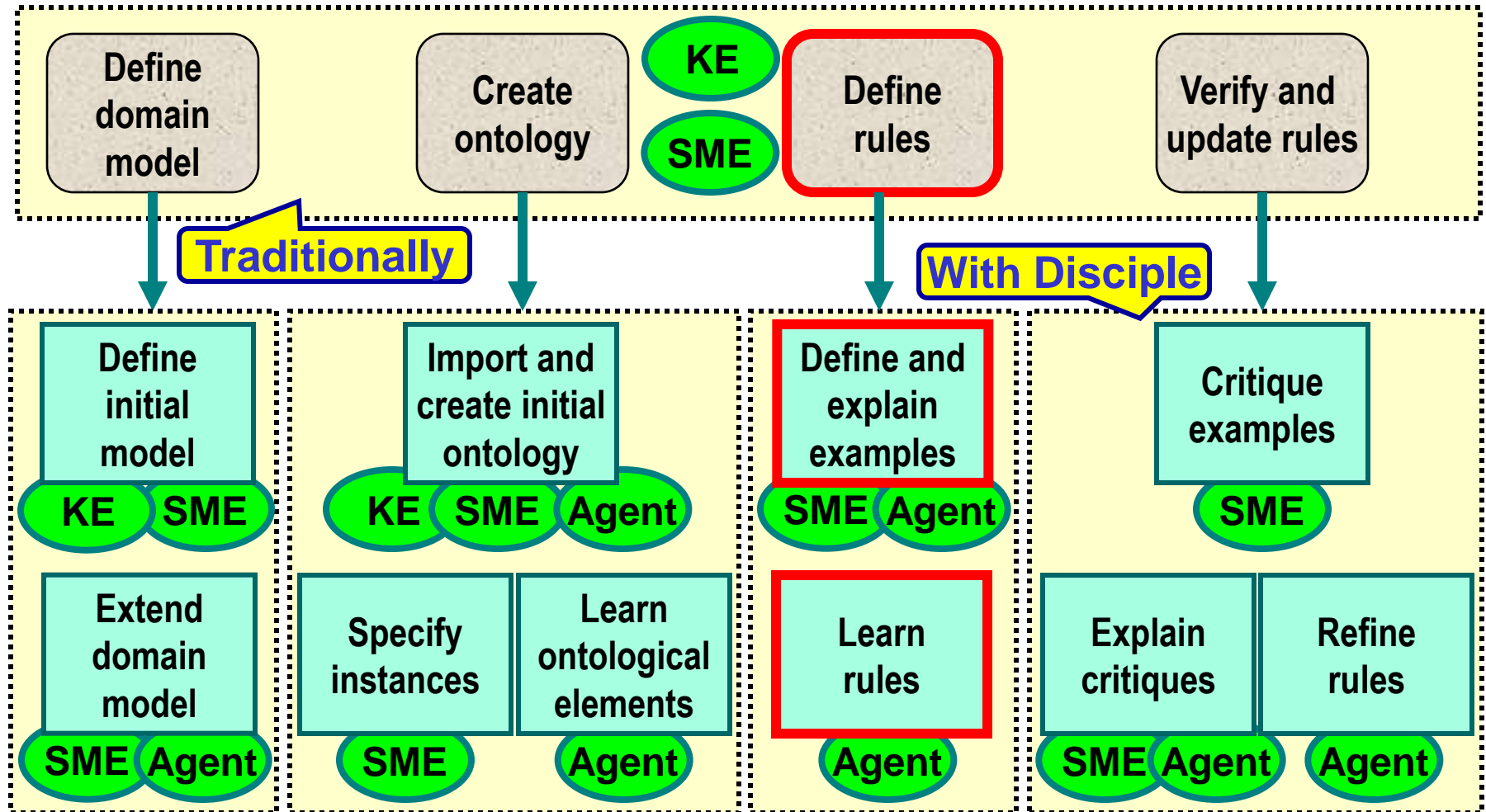
Designing Expert Systems

7. Multistrategy Rule Learning: Hands On

Gheorghe Tecuci
tecuci@gmu.edu
<http://lac.gmu.edu/>

**Learning Agents Center
and Computer Science Department
George Mason University**

Knowledge Base Development: Rules



Rules: Programming versus Learning

RULE

EXAMPLE



program

learn



Task
Assess whether John Doe is a potential PhD advisor for Bob Sharp.

Question
Is Bob Sharp interested in the area of expertise of John Doe?

Answer
Yes, because Bob Sharp is interested in Artificial Intelligence which is the area of expertise of John Doe.

Sub-task (1)
Assess whether John Doe is a potential PhD advisor for Bob Sharp in Artificial Intelligence.

IF: Assess whether ?O1 is a potential PhD advisor for ?O2.

Q: Is ?O2 interested in the area of expertise of ?O1?

A: Yes, because ?O2 is interested in ?O3 which is the area of expertise of ?O1.

MAIN CONDITION

Var	Lower Bound	Upper Bound
?O1	(PhD advisor, associate professor)	(person)
?O2	(PhD student)	(person)
?O3	(computer science)	(PhD research area)

Var	Relationship	Var
?O2	is interested in	?O3
?O1	is expert in	?O3

THEN: Assess whether ?O1 is a potential PhD advisor for ?O2 in ?O3.

IF: Assess whether ?O1 is a potential PhD advisor for ?O2.

Q: Is ?O2 interested in the area of expertise of ?O1?

A: Yes, because ?O2 is interested in ?O3 which is the area of expertise of ?O1.

MAIN CONDITION

Var	Lower Bound	Upper Bound
?O1	(PhD advisor, associate professor)	(person)
?O2	(PhD student)	(person)
?O3	(computer science)	(PhD research area)

Var	Relationship	Var
?O2	is interested in	?O3
?O1	is expert in	?O3

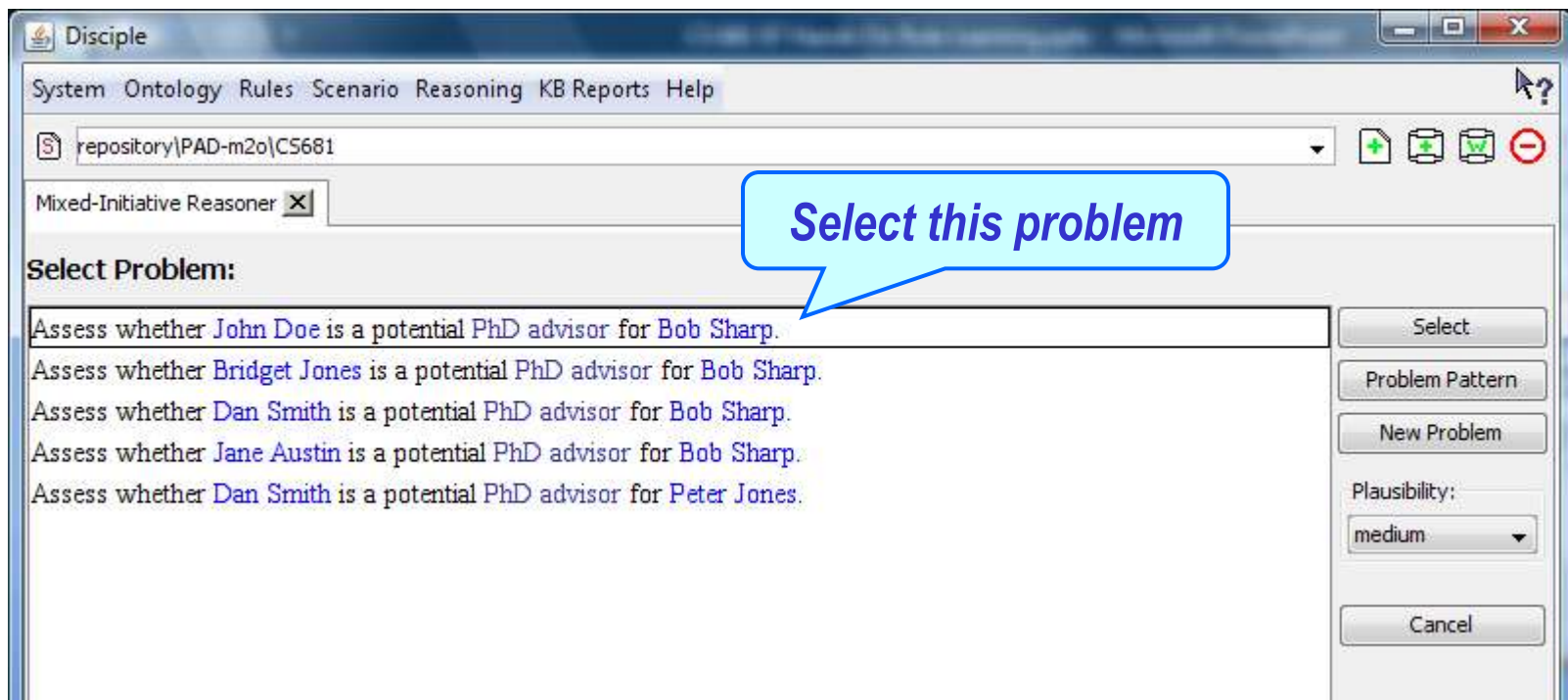
THEN: Assess whether ?O1 is a potential PhD advisor for ?O2 in ?O3.

Hands On: System Installation

Install the system from:

<http://129.174.113.212/wba/jdisciplesetup-v2008.11a-WBA.exe>

Load the “PAD-m2o\CS681” scenario KB.



Hands On: Modeling

Mixed-Initiative Reasoner [X]

Reasoning type: Reduction Reasoning mode: Modeling Plausibility: medium

Glossary TOC

Reasoning Hierarchy Graphical Viewer Report Reasoning Step

Assess whether John Doe is a potential PhD advisor for Bob Sharp

- professional reputation
- students learning experience
- responsiveness to students
- quality of student results
- advisor placement record**
- doctoral study duration
- publications with advisor
- student presentations
- personality and compatibility with student

Assess whether John Doe would be a good PhD advisor for Bob Sharp with respect to advisor placement record.

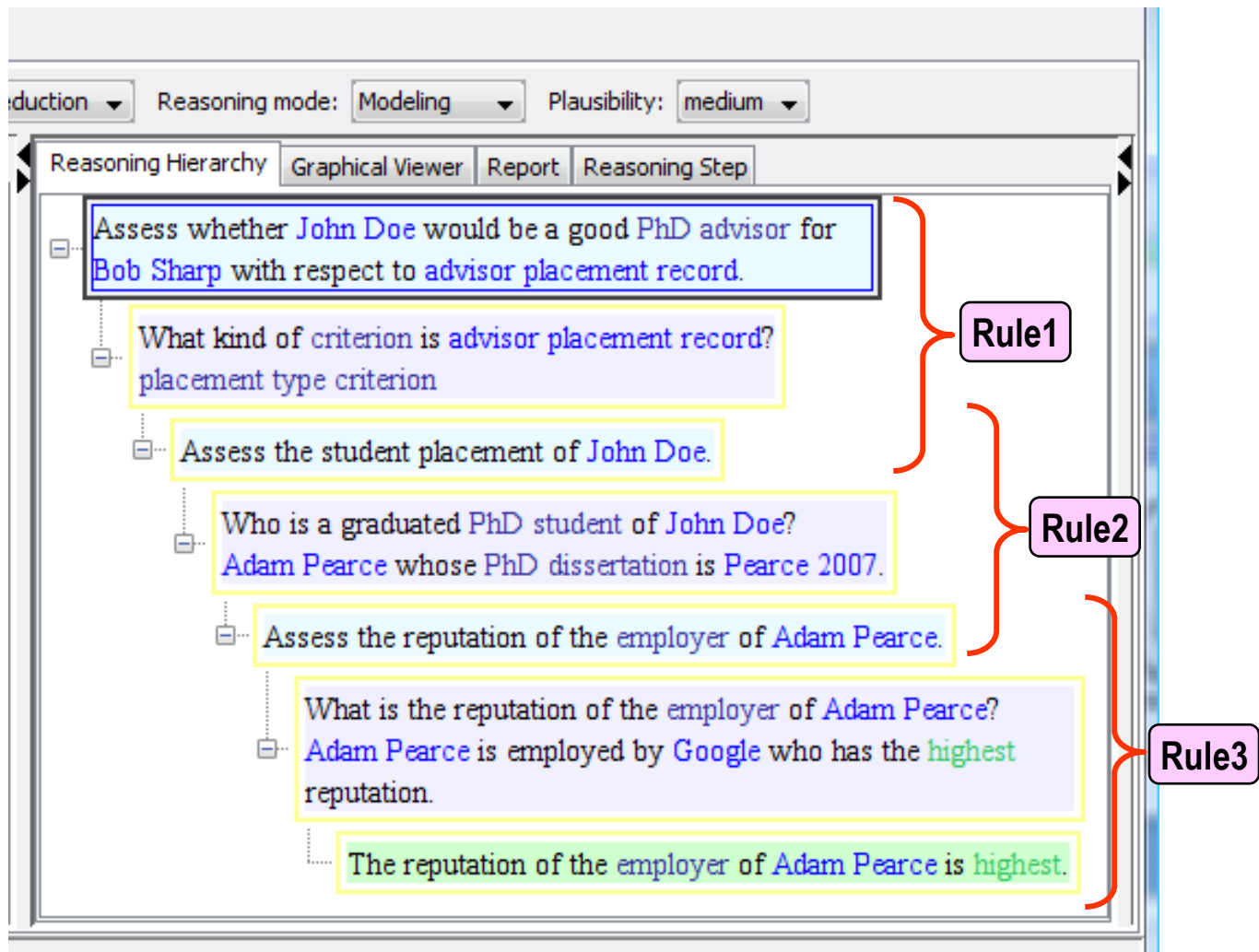
- What kind of criterion is advisor placement record?
placement type criterion
- Assess the student placement of John Doe.
- Who is a graduated PhD student of John Doe?
Adam Pearce whose PhD dissertation is Pearce 2007.
- Assess the reputation of the employer of Adam Pearce.
- What is the reputation of the employer of Adam Pearce?
Adam Pearce is employed by Google who has the highest reputation.
- The reputation of the employer of Adam Pearce is highest.

Select

Modeling

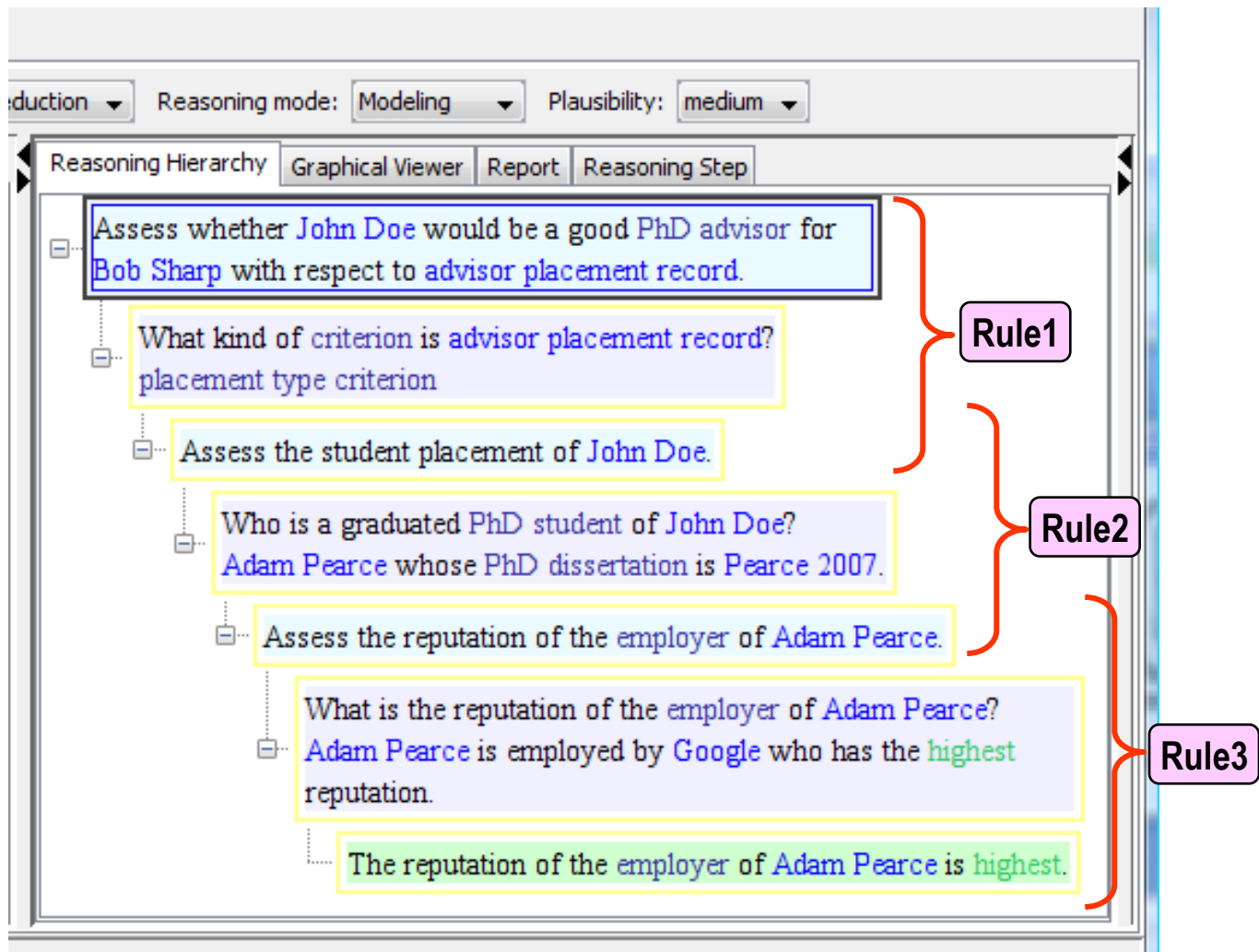
Hands On: Manual Definition of Rules

Study the ontology and manually define the three reduction rules suggested by the modeling:



Hands On: Learning of Rules

Use the rule learning module of Disciple to learn three reduction rules from the following modeling:



Discussion

Compare the processes and the results.