

Module d'Ontologie

2020/2021

MASTER 2 IATI

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Cours 8 –

Création d'une Ontologie sur l'Editeur Protégé

Objectifs du cours 8

Apprendre à mettre une ontologie déjà conçue sur Protégé

Editer :

- 1. Les classes**
- 2. Les sous classes**
- 3. Les relations**
- 4. Les propriétés des classes et des relations**

Exemple de création d'ontologie (d)

1. Un **Animal** est une classe.
2. Une **Plante** est une classe, mais disjointe d'**Animal**.
3. Un **Arbre** est une sous-classe de **Plante**.
4. Une **Branche** est une *partie d'*un **Arbre**.
5. Une **Feuille** est une *partie d'*une **Branche**
6. Un **Herbivore** est un **Animal** qui ne *mange* qu'une **Plante** ou une partie d'une **Plante**.
7. Un **Carnivore** est un **Animal** qui *mange* aussi un **Animal**.
8. Une **Girafe** est un **Herbivore** qui ne *mange* que des **Feuilles**.
9. Un **Lion** est un **Carnivore** qui ne mange que des **Herbivores**.
10. Une **PlanteSavoureuse** est une **Plante** qui *est mangée par* un **Herbivore** et aussi par un **Carnivore**.

Exemple de création d'ontologie :

The screenshot displays the Protégé ontology editor interface for the 'AnimauxPlantes' ontology. The main window title is 'AnimauxPlantes (http://www.iro.umontreal.ca/lapalme/AnimauxPlantes.owl)'. The menu bar includes File, Edit, View, Reasoner, Tools, Refactor, Window, and Help. The toolbar shows navigation and search options. The main area is divided into several panes:

- Ontology header:** Shows the 'Ontology IRI' as `http://www.iro.umontreal.ca/lapalme/AnimauxPlantes.owl` and the 'Ontology Version IRI' as `e.g. http://www.iro.umontreal.ca/lapalme/AnimauxPlantes`.
- Ontology metrics:** A table showing various metrics for the ontology.
- Annotations:** A section for adding annotations, currently empty.
- Imported ontologies:** A section for listing imported ontologies, currently empty.

Metrics	
Axiom	0
Logical axiom count	0
Declaration axioms count	0
Class count	0
Object property count	0
Data property count	0
Individual count	0
DL expressivity	AL

Class axioms	
SubClassOf	0
EquivalentClasses	0
DisjointClasses	0

At the bottom of the interface, there is a status bar that reads: 'No Reasoner set. Select a reasoner from the Reasoner menu' and a checked checkbox for 'Show Inferences'.

- Installer Protégé, (sur l'image 5.2)
- Ouvrir Protégé
- Sauvegarder l'ontologie sous le format RDF/XML

définition des classes simples

The screenshot shows a web-based ontology editor interface. The main window displays the class hierarchy for the ontology 'AnimauxPlantes'. The hierarchy is as follows:

- owl:Thing
 - Feuille
 - Branche
 - Plante
 - Arbre
 - PlanteSavoureuse
 - Animal
 - Carnivore
 - Lion
 - Herbivore
 - Girafe

The 'Plante' class is selected, and its description is shown in the right-hand pane. Under the 'Disjoint With' section, the class 'Animal' is listed, indicating that 'Plante' and 'Animal' are disjoint classes.

At the bottom of the interface, there is a status bar that reads: "No Reasoner set. Select a reasoner from the Reasoner menu" and a checked checkbox for "Show Inferences".

Plante et Animal sont disjointes

définition des propriétés

The screenshot shows the Protege software interface for editing an ontology. The active ontology is 'AnimauxPlantes'. The 'Object property hierarchy' shows 'mange' as a sub-property of 'mangePar'. The 'Description' panel for 'mange' shows it is the inverse of 'mangePar' and has a domain of 'Animal'.

owl:topObjectProperty

- partieDe
- mangePar
- mange**

Annotations: mange

Annotations +

Characteristics:

- Functional
- Inverse functional
- Transitive
- Symmetric
- Asymmetric
- Reflexive
- Irreflexive

Description: mange

Equivalent to +

SubProperty Of +

Inverse Of +

mangePar

Domains (intersection) +

Animal

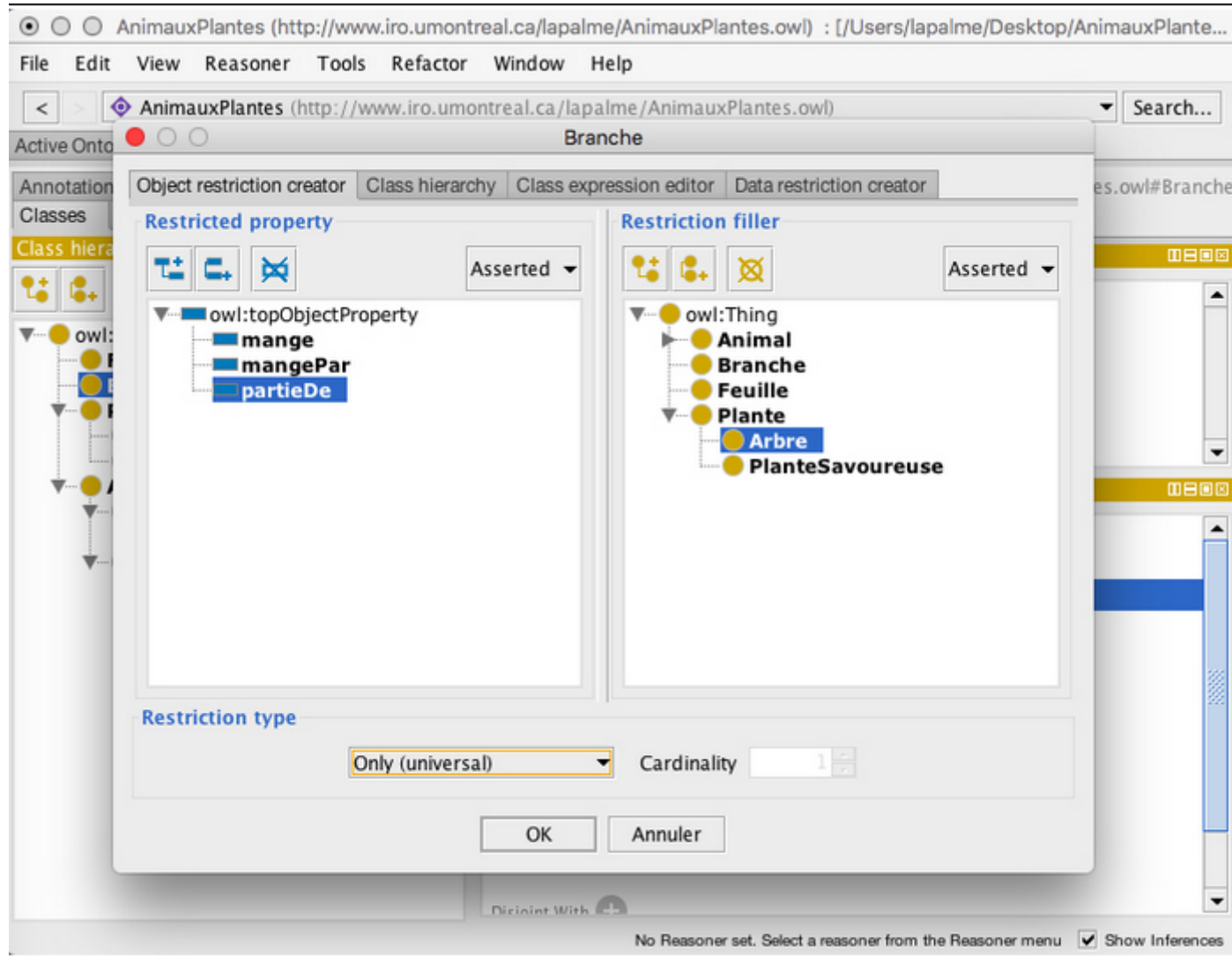
Ranges (intersection) +

Disjoint With +

No Reasoner set. Select a reasoner from the Reasoner menu Show Inferences

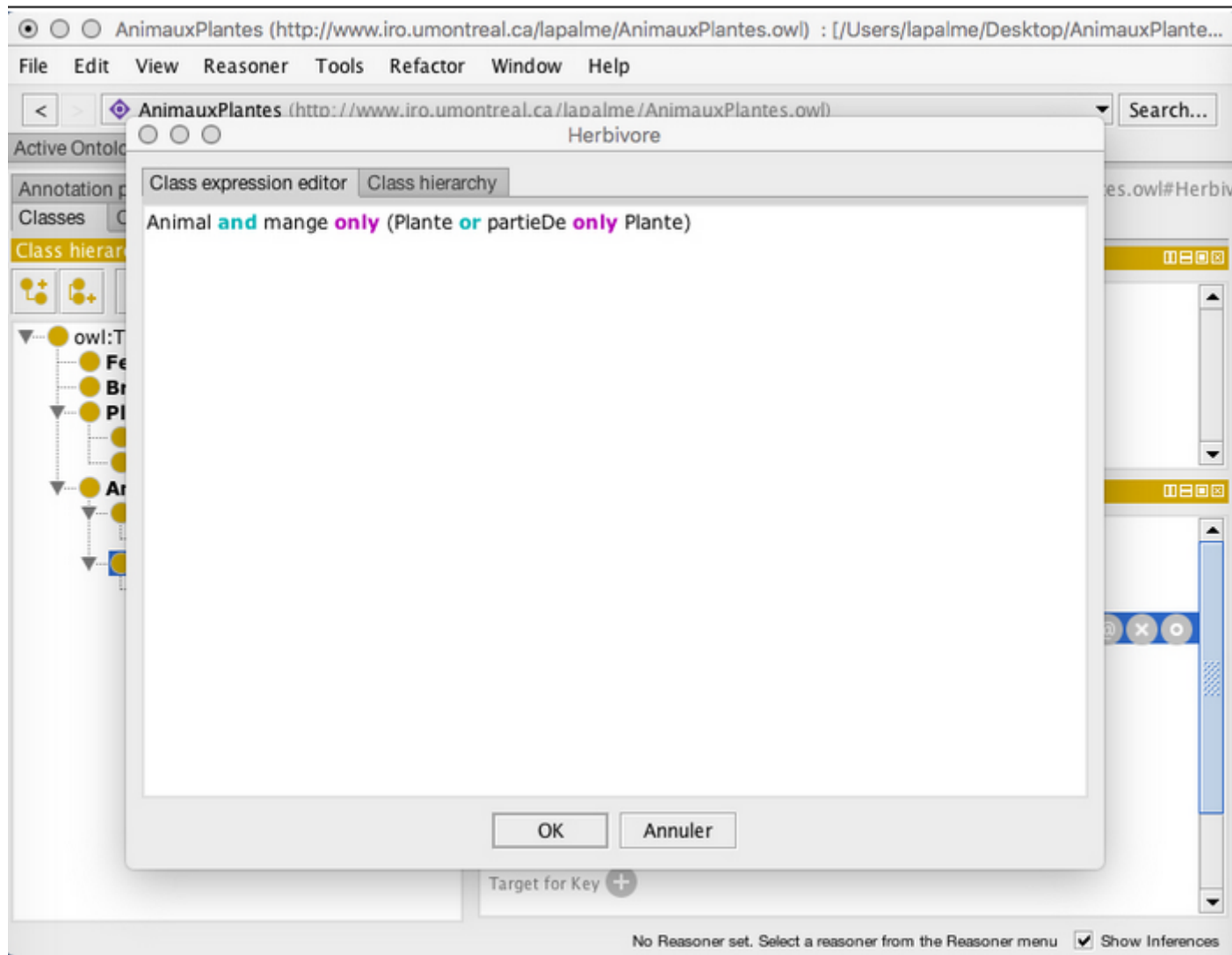
mange est inverse of **mangePar**

définition des classes complexes



Une **Branche** est une partie d'un **Arbre**

définition des classes complexes suite



Un **Herbivore** est un **Animal** qui ne *mange* qu'une **Plante** ou une *partie d'*une **Plante**

définition des classes complexes suite

The screenshot shows the Protege software interface. On the left, a class hierarchy tree is visible, with 'Carnivore' selected under the 'Animal' class. The main area displays the 'Description: Carnivore' panel, which shows the class is a subclass of 'Animal and mange some Animal'. The 'mange' property is highlighted in purple in the original image. The interface also shows various tabs like 'Class Annotations' and 'Class Usage', and a search bar at the top.

Un **Carnivore** est un **Animal** qui *mange* aussi un **Animal**.

définition des classes complexes suite

The screenshot displays the Protégé interface for the 'AnimauxPlantes' ontology. The 'Class hierarchy' panel on the left shows a tree structure where 'Girafe' is a subclass of 'Herbivore', which is a subclass of 'Animal'. The 'Description: Girafe' panel on the right shows the class definition: 'Girafe' is a subclass of 'Herbivore' and 'Animal and mange only (Plante or partieDe only Plante)'. The 'mange' property is highlighted in purple, and 'partieDe' is highlighted in blue.

Une **Girafe** est un **Animal** qui ne *mange* qu'une **Plante** ou une *partie de* **Plante**

définition des classes complexes suite

The screenshot shows a web-based ontology editor interface. The main window displays the class hierarchy for 'Lion'. The hierarchy is as follows:

- owl:Thing
 - Feuille
 - Branche
 - Plante
 - Arbre
 - PlanteSavoureuse
 - Animal
 - Carnivore
 - Lion**
 - Herbivore
 - Girafe

The 'Lion' class is highlighted in blue. The right-hand pane shows the 'Description: Lion' section, which includes the following information:

- Equivalent To: +
- SubClass Of: +
 - Carnivore
 - mange only Herbivore**
- General class axioms: +
- SubClass Of (Anonymous Ancestor):
 - Animal and mange some Animal**
- Instances: +

At the bottom of the interface, there is a status bar that reads: "No Reasoner set. Select a reasoner from the Reasoner menu" and a checked checkbox for "Show Inferences".

Un **Lion** est un **Animal** qui *mange* aussi un **Animal**

définition des classes complexes suite

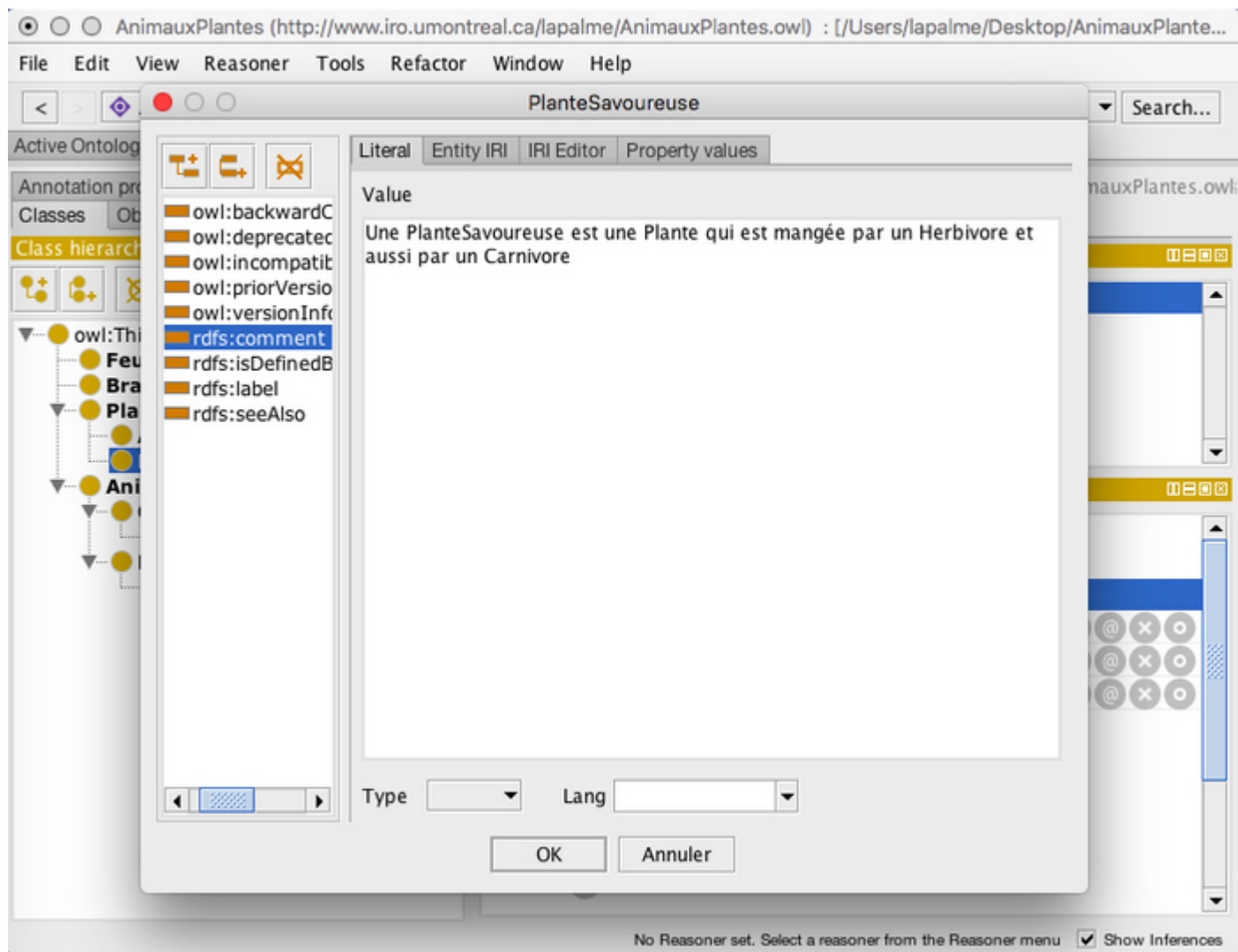
The screenshot shows a web browser window displaying an OWL editor interface. The browser address bar shows the URL: `http://www.iro.umontreal.ca/lapalme/AnimauxPlantes.owl`. The interface includes a menu bar (File, Edit, View, Reasoner, Tools, Refactor, Window, Help) and a search bar. The main content area is divided into several panels:

- Class hierarchy:** A tree view showing the hierarchy of classes. The root is `owl:Thing`, which includes `Feuille`, `Branche`, `Plante`, `Arbre`, `Animal`, `Carnivore`, `Lion`, `Herbivore`, and `Girafe`. The class `PlanteSavoureuse` is highlighted in blue, indicating it is the selected class.
- Annotations:** A panel for adding annotations to the selected class.
- Description:** A panel showing the class description. It includes a "SubClass Of" section with the following entries:
 - `mangePar some Carnivore`
 - `mangePar some Herbivore`
 - `Plante`
- Instances:** A panel for adding instances of the class.

At the bottom of the interface, there is a status bar that reads: "No Reasoner set. Select a reasoner from the Reasoner menu" and a checkbox labeled "Show Inferences" which is checked.

Une **PlanteSavoureuse** est une **Plante** qui *est mangée par* un **Herbivore** et aussi par un **Carnivore**

définition des classes complexes suite



définition des classes complexes suite

The screenshot displays a web-based ontology editor interface. The browser address bar shows the URL: `http://www.iro.umontreal.ca/lapalme/AnimauxPlantes.owl`. The interface includes a menu bar (File, Edit, View, Reasoner, Tools, Refactor, Window, Help) and a search bar. The main content area is divided into several panels:

- Class hierarchy: Lion**: A tree view showing the ontology structure. The hierarchy is: `owl:Thing` (parent) → `Feuille`, `Branche`, `Plante` (children) → `Arbre`, `PlanteSavoureuse` (children of `Plante`) → `Animal` (child of `owl:Thing`) → `Carnivore`, `Lion`, `Herbivore` (children of `Animal`) → `Girafe` (child of `Herbivore`). The `Lion` class is highlighted in blue.
- Instances: Léo**: A panel showing the instance `Léo` under the class `Lion`.
- Annotations: Léo**: A panel showing no annotations for the instance `Léo`.
- Description: Léo**: A panel showing the class `Lion` as a type for the instance.
- Property assertions: Léo**: A panel showing no property assertions for the instance `Léo`.

At the bottom of the interface, a status bar indicates: "No Reasoner set. Select a reasoner from the Reasoner menu" and a checked checkbox for "Show Inferences".

Ajout des individus

The screenshot displays the Protégé OWL editor interface. The main window title is "AnimauxPlantes (http://www.iro.umontreal.ca/lapalme/AnimauxPlantes.owl)". The menu bar includes "File", "Edit", "View", "Reasoner", "Tools", "Refactor", "Window", and "Help". The address bar shows the URL "http://www.iro.umontreal.ca/lapalme/AnimauxPlantes.owl". The active ontology is "AnimauxPlantes". The interface is divided into several panes:

- Class hierarchy: Lion**: A tree view showing the hierarchy of classes. The classes are: owl:Thing, Feuille, Branche, Plante, Arbre, PlanteSavoureuse, Animal, Carnivore, Lion (selected), Herbivore, and Girafe.
- Annotations: Léo**: A pane showing annotations for the individual "Léo". It contains a single annotation: "Figure 11".
- Description: Léo**: A pane showing the description of the individual "Léo". It lists the types: "Lion".
- Property assertions: Léo**: A pane showing property assertions for the individual "Léo". It lists: "Object property assertions", "Data property assertions", "Negative object property assertions", and "Negative data property assertions".
- Instances: Léo**: A pane showing instances of the class "Lion". It lists: "Léo".

At the bottom of the interface, there is a status bar that reads: "No Reasoner set. Select a reasoner from the Reasoner menu" and a checkbox for "Show Inferences" which is checked.

Léo le Lion; Sophie la Girafe ; Olivier l'Arbre ; Rose-Marie la PlanteSavoureuse
Batavia la Feuille ; LaPalme la Branche.

Vérification de la cohérence de l'ontologie

The screenshot shows the Protege software interface for an ontology named "AnimauxPlantes". The main window displays a class hierarchy on the left and a detailed view of the "AnimalPlante" class on the right.

Class Hierarchy:

- owl:Thing
 - Feuille
 - Branche
 - Plante
 - AnimalPlante**
 - Arbre
 - PlanteSavoureuse
 - Animal
 - AnimalPlante
 - Carnivore
 - Lion
 - Herbivore
 - Girafe

Class Annotations:

- Annotations: AnimalPlante

Description: AnimalPlante

- Equivalent To: +
- SubClass Of: +
 - Animal and Plante**
- General class axioms: +
- SubClass Of (Anonymous Ancestor)
- Instances: +
- Target for Key: +

At the bottom of the window, it states: "No Reasoner set. Select a reasoner from the Reasoner menu" and "Show Inferences" is checked.

Vérification de la cohérence de l'ontologie

The screenshot displays a web-based ontology editor interface. The browser address bar shows the URL: `http://www.iro.umontreal.ca/lapalme/AnimauxPlantes.owl`. The interface includes a menu bar (File, Edit, View, Reasoner, Tools, Refactor, Window, Help) and a search bar. The main content area is divided into several panels:

- Class hierarchy: AnimalPlante**: A tree view showing the hierarchy of classes. The root is `owl:Thing`, which has children `owl:Nothing` and `AnimalPlante`. `AnimalPlante` is further divided into `Animal`, `Branche`, `Feuille`, and `Plante`.
- Annotations: AnimalPlante**: A panel for viewing and editing annotations for the selected class.
- Description: AnimalPlante**: A panel showing the logical description of the class. It includes:
 - Equivalent To**: `owl:Nothing`
 - SubClass Of**: `Animal and Plante`
 - General class axioms**: A section for defining general axioms.
 - SubClass Of (Anonymous Ancestor)**: A section for defining anonymous ancestors.
 - Instances**: A section for listing instances of the class.

At the bottom right, there are checkboxes for `Reasoner active` and `Show Inferences`.

Références du cours 8

<https://perso.limsi.fr/hamon/Teaching/P13/MRC-2018-2019/TP/TP5.pdf>