Université de M’sila
Département d’Informatique
Module : Logiques de Description et Ontologies (1ère Année Master IA)

Transformation à la logique de premier ordre

$$\Phi(\mathtt{A}, x) = \mathtt{A}(x)$$
$$\Phi(\top, x) = \top$$
$$\Phi(\bot, x) = \bot$$
$$\Phi(\neg \mathtt{C}, x) = \neg \Phi(\mathtt{C}, x)$$
$$\Phi(\mathtt{C} \sqcap \mathtt{D}, x) = \Phi(\mathtt{C}, x) \wedge \Phi(\mathtt{D}, x)$$
$$\Phi(\mathtt{C} \sqcup \mathtt{D}, x) = \Phi(\mathtt{C}, x) \vee \Phi(\mathtt{D}, x)$$
$$\Phi(\forall \mathtt{R}.\mathtt{C}, x) = \forall y\, (\mathtt{R}(x, y) \rightarrow \Phi(\mathtt{C}, y))$$

$$\Phi(\forall \mathtt{R}.\mathtt{C}, x) = \forall y\, (\mathtt{R}(x, y) \rightarrow \Phi(\mathtt{C}, y))$$
$$\Phi(\exists \mathtt{R}.\mathtt{C}, x) = \exists y\, (\mathtt{R}(x, y) \wedge \Phi(\mathtt{C}, y))$$
$$\Phi(\leq n\, \mathtt{R}, x) = \forall y_1 \ldots \forall y_{n+1} \left((\mathtt{R}(x, y_1) \wedge \ldots \wedge \mathtt{R}(x, y_{n+1})) \rightarrow \bigvee_{i<j\leq n+1} y_i = y_j \right)$$
$$\Phi(\geq n\, \mathtt{R}, x) = \exists y_1 \ldots \exists y_n \left(\mathtt{R}(x, y_1) \wedge \ldots \wedge \mathtt{R}(x, y_n) \wedge \bigwedge_{i<j\leq n} \neg y_i = y_j \right)$$