Philosophy 453 S. M. Cohen
Philosophy of Language

Translation

FOE ("First-order English") is an artificial language whose syntactic and semantical rules are based on those of the uninterpreted first-order language FOL ("First-order Logic"), as described in a separate handout. The difference between FOL and FOE is that the non-logical vocabulary of FOE — its names and predicates — are interpreted, rather than uninterpreted, symbols. FOE is thus a **first-order interpreted language**. What follows is a guide to translating between English and FOE. We will list the vocabulary of a fragment of FOE and then indicate its English interpretation. Finally, we will write some sentences in FOE, along with their translations into colloquial English.

Syntax

Names

elly, gary, heidi, herschel, orfy, willy, 2:00, 2:01, 2:02 ….

Predicates

Person(x), Pet(x), Dog(x), Cat(x), Chases(x, y), LargerThan(x, y), Loves(x, y), Fed(x, y, z), x < y.

Semantics

FOE	English
heidi	*Heidi*
orfy	*Orfy*
herschel	*Herschel*
willy	*Willy*
gary	*Gary*
elly	*Elly*
2:00	*2 pm, January 1, 2008*
2:01	*2:01 pm, January 1, 2008*
…	…
Person(x)	*x is a person*
Pet(x)	*x is a pet*
Dog(x)	*x is a dog*
Cat(x)	*x is a cat*
Chases(x, y)	*x chases y*
Larger(x, y)	*x is larger than y*
Loves(x, y)	*x loves y*
Fed(x, y, z)	*x fed y at (time) z*
x < y	*x is earlier than y*

Some Easy Translations

FOE	English
Cat(herschel) ∧ Cat(orfy)	*Herschel is a cat and Orfy is a cat.*
Dog(heidi) ∧ Dog(willy)	*Heidi and Willy are dogs.*
Loves(heidi, gary)	*Heidi loves Gary.*
Fed(gary, heidi, 2:00)	*Gary fed Heidi at 2 pm.*
¬(Dog(orfy) ∧ Dog(willy))	*Not both Orfy and Willy are dogs.*
¬(Cat(willy) ∨ Cat(heidi))	*Neither Willy nor Heidi is a cat.*
Dog(willy) → ¬Person(willy)	*If Willy is a dog, then he isn't a person.*
∃x (Pet(x) ∧ Dog(x))	*Some pets are dogs.*
∃x (Pet(x) ∧ Cat(x))	*Some cats are pets.*
∀x (Pet(x) → (Dog(x) ∨ Cat(x)))	*Every pet is either a dog or a cat.*
∀x (Dog(x) → ¬Cat(x))	*No dog is a cat.*
¬∃x (Dog(x) ∧ Cat(x))	*No dog is a cat.*
∀x (Cat(x) → Larger(willy, x))	*Willy is larger than every cat.*
¬∃x Fed(elly, willy, x)	*Elly has never fed Willy.*

Some Harder Translations

∃x (Person(x) ∧ ∃y (Fed(x, orfy, y) ∧ y < 2:30))
Someone fed Orfy before 2:30.

∃x ∃y (Fed(gary, heidi, x) ∧ Fed(elly, herschel, y) ∧ x < y)
Gary fed Heidi before Elly fed Herschel.

∃x ∃y (Fed(elly, orfy, x) ∧ Fed(elly, herschel, y) ∧ x < y)
Elly fed Orfy before (she fed) Herschel.

∀x (Dog(x) → ∃y (Cat(y) ∧ Chases(x, y)))
Every dog chases some cat (or other).

∃y (Cat(y) ∧ ∀x (Dog(x) → Chases(x, y)))
There is a (particular) cat that every dog chases.

∃x (Dog(x) ∧∀y (Cat(y) → Larger(x, y)))
Some dog is larger than every cat.

∀x ((Dog(x) ∧ ∀y (Cat(y) → Larger(x, y))) → Loves(gary, x))
Gary loves any dog who is larger than every cat.

∃x ∃y (Cat(x) ∧ Cat(y) ∧ ¬(x=y))
There are at least two cats.

∀x∀y((Dog(x) ∧ Larger(x, heidi) ∧ Dog(y) ∧ Larger(y, heidi)) → x=y)
There is at most one dog larger than Heidi.

Dog(willy) ∧ ∀y ((Dog(y) ∧ ¬(y=willy)) → Larger(willy, y))
Willy is the largest dog.