Introduction to Formal Semantics

Tutorial Lecture 3: Predication

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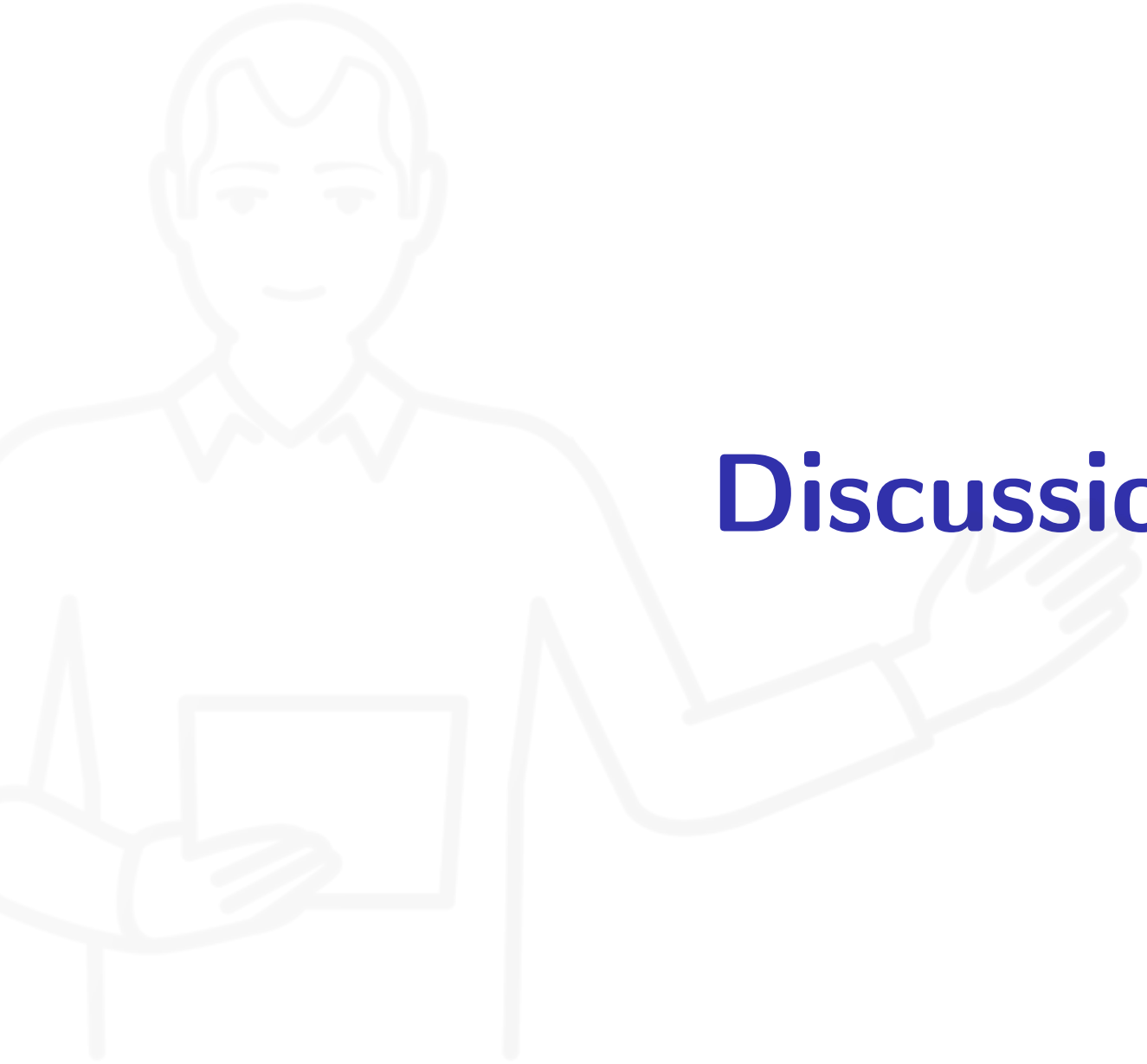
Tutorial Overview

- **FOL-Translations**
  Exercise 2
- **Semantic interpretation and function assignments**
  Exercises 3

Reading:

- Coppock, E., and Champollion, L. (2021). Invitation to formal semantics. Manuscript, Boston University and New York University (Ch.4)



Discussion

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- Did you have any difficulties understanding **the main concepts**?
- Were the **exercises** difficult?
- Is there something you would like to review from **tutorial 2**?

Exercises

Exercise 2

(1) Rick bought a bottle of gin **while** Morty dated Jessica.

a. [Bought(rick',bottleOf(gin'))] $\wedge$ [Dated(morty',Jessica')]

b. $\varphi \wedge \psi$

(2) **If** all girls wanna have fun **and** Cindy Lauper is a girl, **then** she wants to have fun.

a. $[\forall x[\text{Girl}(x) \rightarrow \text{HaveFun}(x)] \wedge \text{Girl}(\text{cindy\_lauper'})] \rightarrow \text{HaveFun}(\text{cindy\_lauper'})]$

b. $(\varphi \wedge \psi) \rightarrow \sigma$

(3) Han is **either** Keylo's father **or** Rey's.

a. [fatherOf(han',kylo')] $\vee$ [fatherOf(han',rey')]

b. $(\varphi \vee \psi)$

Exercise 2

(4) **Only** two stars exist.

a. $[\exists x \exists y[\text{Star}(x) \wedge \text{Star}(y) \wedge x \neq y \wedge \forall z(\text{Star}(z) \rightarrow x = z \vee y = z\ )]]$

b. φ

(5) A software company **that** develops games **not** far from Osaka.

a. $[\exists x[\text{SoftwareCompany}(x) \wedge \text{Develops}(x, \text{games}') \wedge$
$\text{CloseTo}(\text{Location of}(x) \wedge \text{Location of}(\text{osaka}')]]$

b. φ / $?/\varphi \wedge \neg\psi/$ $\varphi \wedge \psi \wedge \sigma$

(6) A friend of Harry Potter **is** unemployed.

a. $[\exists x[\text{friendOf}(x,\text{harry\_potter}') \wedge \text{Unemployed}(x)]]$

b. φ

- A software company develops games and it is not far from Oaska

Exercise 3

(1) Ally loves Jack.

(2) John rent Susan the flat.

(3) Phoebe is Prue's and Piper's sister.

Exercise 3

(1) Ally loves Jack.

$[\![\text{Loves(ally', jack')}]\!]^M =$

1 if $\langle [\![\text{ally'}]\!]^M, [\![\text{jack'}]\!]^M \rangle \in [\![\text{Loves}]\!]^M$

(2) John rent Susan the flat.

(3) Phoebe is Prue's and Piper's sister.

Exercise 3

(1) Ally loves Jack.

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(2) John rent Susan the flat.

$[\![\text{Rents(john', susan', flat')}]\!]^M =$

1 if $\langle [\![\text{john'}]\!]^M, [\![\text{susan'}]\!]^M, [\![\text{flat'}]\!]^M \rangle \in [\![\text{Rents}]\!]^M$

(3) Phoebe is Prue's and Piper's sister.

Exercise 3

(1) Ally loves Jack.

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(3) Phoebe is Prue's and Piper's sister.

$[\![\text{sisterOf(phoebie', prue')} \wedge \text{sisterOf(phoebie', piper')}]\!]^M =$

1 if $\{\langle [\![\text{phobie'}]\!]^M, [\![\text{prue'}]\!]^M \rangle, \langle [\![\text{phobie'}]\!]^M, [\![\text{piper'}]\!]^M \rangle\} \in [\![\text{sisterOf}]\!]^M$

Exercise 3

(4) Robert Pattinson is Batman

$[\![\text{robert\_ pattinson'} = \text{batman'}]\!]^{M} =$

1 if $[\![\text{robert'}]\!]^{M} = [\![\text{batman'}]\!]^{M}$

(5) Somebody is lazy.

$[\![\exists x.\text{Lazy}(x)]\!]^{M,g1} =$

1 iff there is an $e \in D$ s.t.: $[\![\text{Lazy}(x)]\!]^{M,g1[x/e]} = 1$

$g_1[x \longmapsto e]$ e.g. $g_1(x) =$ Miley

(6) Everyone is unique

$[\![\forall x.\text{Unique}(x')]\!]^{M,g2} =$

1 iff for all $d \in D$: $[\![\text{Unique}(x')]\!]^{M,g2[x/d]} = 1$

$g_2[x \longmapsto d]$ e.g. $g_2(x) =$ Celena

Conclusion

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If you need further help or have additional questions, please contact us.