

L4F Workshop 3 (week 5)

Recap your previous L4F Knowledge

Let's first recap what you have done in/with/for L4F so far:

- LEARN (“the guide”), subsections “1. Welcome” and “2. Introduction” (in tutorial 1, week 3)
- LEARN (“the guide”), subsections “3. More Introduction”, “4. And More...”, and “5. And Yet More..” (i.e., completed section “First Things First”) (as homework after tutorial 1, still week 3)
- LEARN (“the guide”), complete section “Next Things Next” (as homework after tutorial 2, week 4)
- How to use L4F to find out whether a sequent is valid (in tutorial 2, week 4 – *hint*: re-visit it and think about its relationship to semantic tableau!)

You should thus already have a basic understanding of the three fields: *Sorts*, *Vocabulary*, and *Constraints*. Today we'll deepen that knowledge by, among others, going through the last subsection “11. Example of a theory” of the guide's section “Next Things Next”, which is on the puzzle *Mary had a little lamb*.

1 Puzzle: Mary had a little Lamb

For the first 20 to 25 minutes of this week's tutorial, the tutor will guide you through the puzzle *Mary had a little lamb* (subsection 11 in the “the guide” (LEARN)).

The goal is that you understand:

- What to define in the *Sorts* field (and what *enums* are)
- What to define in the *Vocabulary* field, particularly:
 - What are predicates? (Just like in the lecture!)
 - What are functions? (Will be formally covered in week 7)
- How to formalize using predicate logic!

Ask all your questions!

Puzzle: Logicians' Ball

Within the next approx. 15 minutes, try to complete the puzzle *Logicians' Ball* (first of *Advanced*).

Please note:

- A lot has already been specified, so you only need to translate the six sentences by exploiting the pre-defined function and predicate. You really just have to understand how to formalize *any* of the six sentences. Once you have one of them, the others can be added very quickly.
- The predicate took is written in an “infix” way, i.e., “x took y” in line 8. However, the *default* way is to write it in prefix “notation”, i.e., “took(x,y)”.
→ Use whatever you prefer!

Note to tutor: Try to keep at least 20 minutes available for the last puzzle so that students can still try (to start) solving it in groups!

Puzzle: Lost Property

For the last approx. 20 minutes, try to complete the puzzle *Lost Property* (second of *Intermediate*).

Try solving this puzzle in groups of three (or two if you like). This should be easy to realize with in-person tutorials. In online-tutorials, breakout rooms can be used.

20 minutes will likely not be enough to finish this puzzle. Just see how far you can come! It's advised to complete it at home during the week.

Homework for after the tutorial

There are two things you should consider doing:

- If you didn't complete the *Lost Property* puzzle (which is very likely!), try to solve it at home.
- You should read parts of the *Nuts and Bolts* section in “the guide” (link LEARN), which might show some useful information like the available settings, etc.