Open Source Logic System With Trees

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October 25, 2019

Purpose

The project has two primary goals:

- Create a free, open-source, web-based, interactive logic text.
- Create an online homework system that, ultimately, can be used in online/DE courses.

Background and Motivation

- PHIL 220 is the largest core course in the Department of Philosophy.
- Between 2014 and 2018, 2471 students enrolled in a section of the course.
- 1348 were enrolled in DE sections.
- Current DE textbook cost: $ 116 CAD ($\approx$ $156, 368$ CAD in total).
- Current use of TAs for in-person sections: marking midterms (*sometimes* homeworks).
- Common student feedback about the course: not enough interaction with TAs.

Resources and Existing Technology

This project will rely heavily on extent open education resources, supplementing each (and bringing them together).

- Prof. Jonathan Ichikawa's `forall`χ `(UBC edition)`
  - ▶ Based on a text by P.D. Magnus.
  - ▶ Offered under a Creative Commons License.

- *Carnap*: an open framework for in-browser formal reasoning exercises with automated marking support (Graham Leach-Krouse, Kansas State)

Why Trees?
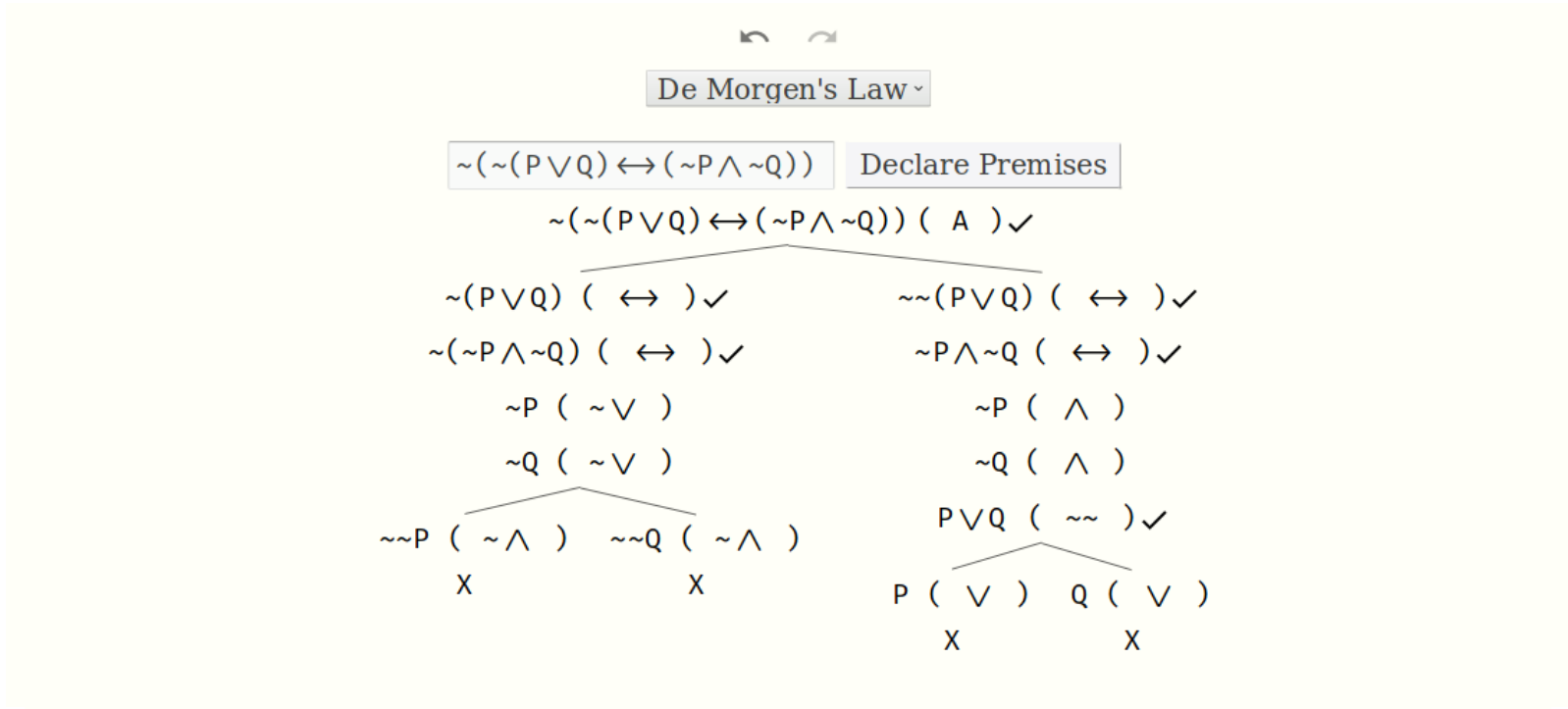
Users

- Any student enrolled in PHIL 220, in-person or online (but also 120, 320, 322, and 323). (*Online Text*)

- General Public. (*Online Text*)

- Other Universities. (*Text and Homework System*)

- UBC DE students. (*Text and Homework System*)

Timeline

- Building the tree widget: *Currently underway, nearing completion*
- Integrating our widget with *Carnap* for proof-checking: *Beginning now, through next summer*
- Creating the online text: *Summer 2020*
- Extensive user testing: *Academic year 2020-2021*

Modus Ponens ⌄

P→Q,P,~Q   Declare Premises

Continue Branch)

Split Branch)

Mark as Resolved)

Modus Ponens ⌄

P→Q,P,~Q   Declare Premises

P→Q   (A)

P   (A)

~Q   (A)

formula (rul)   formula (rul)

↺ ↻

~(~(P∨Q) ↔ (~P∧~Q)) | Declare Premises

~(~(P∨Q) ↔ (~P∧~Q)) (A)✓

~(P∨Q) (↔)✓   ~~(P∨Q) (↔)✓

~(~P∧~Q) (↔)✓   ~P∧~Q (↔)✓

~P (~∨)   ~P (∧)

~Q (~∨)   ~Q (∧)

~~P (~∧)   ~~Q (~∧)   P∨Q (~~)✓
   X   X
                                 P (∨)   Q (∨)
                                    X   X