Lab 0
EECS4312
Logic
PVS
Preparation
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After the Lab

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EECS4312

September 5, 2016

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Logic 1

- Mathematical logic has become a *lingua franca* for describing computational thinking.
- It is used for specifying digital software and hardware systems, annotating programs with assertions, defining the semantics of programming languages, and predicting system behaviour by proving or refuting claims about software or hardware systems.
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PVS

- PVS (Prototype Verification System) is a specification language and theorem prover for validating specifications.
- It helps specifiers and modellers to design coherent specifications, implement functions meeting those specifications, and provides interactive assistance to prove theorems that validate the specifications or mathematical models.
- PVS can then be used to validate the specifications. For example, if you have specified what it is to reverse a list, then you should be able to prove that if you reverse the list again you get the original list.
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Preparation

- Watch PVS in a hurry Video: `https://youtu.be/He0RTaPkVt4`
- Read the slides *PVS-Intro-Slides.pdf* in this Lab0 directory. In particular start reading at slide 19 for instructions on how to use the proof rules `flatten` and `split`.

(*PVS-Quick-Reference.pdf* is a summary of basic PVS commands in emacs).

What you must do

- Prove the theorems in *pvs_hurry.pvs*, using PVS.
  - From the command line in Prism, or using the SEL-VM: *pvs*
  - This brings up a window in the emacs editor (you need to learn how to use it)
  - Follow the instructions and prove all the theorems
- Next, follow the instructions in *PVS-Lab0-Ex.1.pdf*
- Next, attempt to prove the conjectures in *propositional_logic.pvs*, using the proof rules `flatten` and `split`.

Lab0

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Logic

PVS

Preparation

To Do

After the Lab

- This Lab is not graded.
- There is no Quiz this week.
- There will be a Quiz next week on the material you did in class and this Lab.
- See next slide for work you should do this week outside of the Lab.

Additional work to be done this week on your own

The site `http://seldoc.eecs.yorku.ca/` has PVS help (e.g. see *Getting started with PVS*).

Review the following this week (logon with EECS account):

- Logic and Set Theory `http://bit.ly/2cnawwN`
- Do the PVS WIFT tutorial, especially the telephone book example. `http://bit.ly/2cnfSIg`.