

Lab 5

EECS4312

Objectives

To Do

Submit

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October 11, 2015

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# Learning Outcomes

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- In this Lab, you learn to specify systems by declaring new datatypes. In PVS, one has basic types such as nat, int, real, bool etc and uninterpreted types. But there are also ways to define new types:
  - Predicate subtyping (treated in previous labs)
  - Product Types: via tuples and records
  - Sum types: via the DATATYPE declaration including enumerations, and recursive types such as stacks, lists and trees.
- You also practice the T-ASM (Timed Abstract State Machine) method for specifying mission critical systems via function tables. The Lab involves the small bank example of slides07.pdf treated in class.

You must specify and prove four theories as shown in the `top.pvs` file below:

```
% Exercises for Lab5
% proveit --importchain --clean top.pvs
top : THEORY
BEGIN
    IMPORTING datatype0    %% simple DATATYPE
    IMPORTING stack_soln  %% recursive DATATYPE
    IMPORTING SmallBank   %% bank example slides07
    IMPORTING SmallBank2  %% bank example RECORD
END top
```

## Preparation

Review slides07.pdf. In SmallBank2 we use the RECORD type to encode the state

# Result of running proveit on top.pvs

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- See `top.summary.txt` in the `4312-lab5` directory supplied with Lab5.
- The `4312-lab5` directory also has the `Time.pvs` theories (for T-ASAMs)

# Submit your work 1

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- Remove all files from your `4312-lab5` directory other than **\*.pvs** and **\*.prf** files.
- Run the following command in the directory:
- `proveit --importchain --clean top.pvs`  
(see previous slide for summary file)
- All theorems must be proven.

# Submit your work 2

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- Now submit your 4312-lab5 directory:  

```
> submit 4312 lab5 4312-lab5
```
- You will get confirmation of your submission.
- Ensure that you follow the instructions (and naming conventions) carefully and precisely to ensure that your submission can be checked.
- To obtain a grade on your quiz, you must complete and submit this Lab according to the instructions.