

Lab 8

EECS4312

Objectives

To Do

Submit

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November 22, 2015

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Learning Outcomes

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Specifying Requirements for Business Systems

- Develop the abstract state of a Banking System using records.
- Use IDs to reference bank accounts so that accounts can be added, removed, as well as supporting deposit, withdraw, transfer etc.
- Records can describe dependent types, e.g. where the the set of account IDs change (if an account is added or removed) and thus the functions mapping account IDs to customer names, balances etc. change.
- Validation of such business systems.

This lab depends on the lectures given in class.

Learning Outcomes

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Big Bank System

- BigBank1 has accounts referenced by IDs and the ability to also transfer money between accounts referenced via their IDs. Prove all the conjectures in the theory excluding invariant2_preservation which is a challenge question for your enjoyment (but not needed for your grade)
- BigBank2 has records with dependent types for modifying functions so that accounts can be added and removed via their ID references. Add “withdraw” command to fix the type correctness problem. Then prove all the conjectures. Some hints are given as proveit strategies.

This lab depends on the lectures given in class.

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

```
% Exercises for Lab8  
% % proveit --importchain --clean top.pvs
```

```
top : THEORY  
BEGIN  
    IMPORTING Time  
    IMPORTING BigBank1  
    IMPORTING BigBank2  
END top
```

Run proveit on top.pvs

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- The `4312-lab8` directory also has the `Time.pvs` theories (for T-ASAMs)

Submit your work 1

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- Remove all files from your `4312-lab8` directory other than `*.pvs` and `*.prf` files.
- Run the following command in the directory:
- `proveit --importchain --clean top.pvs`
- All theorems must be proven, unless stated otherwise.

Submit your work 2

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- Now submit your 4312-lab8 directory:

```
> submit 4312 lab8 4312-lab8
```
- 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.