PLC: Workout 8 [80 points]

Due date: Monday, April 18th, by midnight

About This Homework

This assignment is about theorem proving in Agda using lemmas already proved in the IAL, and writing your own inductive proofs.

How to Turn In Your Solution

Follow this link to create your repo on Github Classrooms:

`https://classroom.github.com/a/Hr58adzL`

If you work with a partner, please add to your repo a file called `partners.txt`, and list your name and your partner's name there. Both of you should submit your solution: each partner pushes it to their github repo.

How To Get Help

You can post questions in the Discussions section of ICON.

You are also welcome to come to our office hours. See the course's Google Calendar, linked from the github page for the class, for times and Zoom links for office hours. You can also find these on the "Zoom links, office hours" page under "Pages" on ICON:

`https://uiowa.instructure.com/courses/179776/pages/office-hours`

1 Reading

Read Chapter 4 of Verified Functional Programming in Agda, available for free (on campus or VPN) here:

`https://dl-acm-org.proxy.lib.uiowa.edu/doi/book/10.1145/2841316`

2 Proving theorems using the IAL [30 points]

In files named like `uselib1.agda`, you will find theorems to prove. You should not prove these by induction (there is no penalty if you do, but it will likely be very difficult). Instead, you should just apply theorems from the IAL, in particular from nat-thms.agda. [10 points each]

3 Inductive theorems [50 points]

In files named like `ind1.agda` you will find theorems to prove, where you will need to use induction, as well as possibly lemmas from the IAL. [10 points each]