

# Types and Semantics for Programming Languages

## Instructions

1. The exam lasts two hours.
2. Place your student identity card face-up on the desk in front of you. The invigilator may come to check your identity, and in this case you may be asked to allow the invigilator to briefly use your computer. The exam time has been calculated to allow time for such interruptions.
3. You may log into your computer as soon as you are ready to do so.
4. To download the exam paper, open a terminal window and type:

`getpapers`

This will create a subdirectory `tspl-pe` in your home directory, containing the following files.

<code>tspl-pe/papers/exam.pdf</code>	the exam
<code>tspl-pe/papers/instructions.pdf</code>	these instructions
<code>tspl-pe/templates/Exam.lagda</code>	exam template to edit
<code>tspl-pe/original_templates/Exam.lagda</code>	backup of exam template

The directories `tspl-pe/papers` and `tspl-pe/original_templates` are read only, but you may read and write `tspl-pe/templates`.

5. To setup the Agda environment, open a second terminal window and type:

`tspl-setup`

This will open a browser, with three tabs which contain the textbook *Programming Language Foundations in Agda*, the documentation for the Agda standard library, and the documentation for Agda. (The browser may also attempt to link to the internet, which brings up a tab labeled “Problem loading page”; this is expected and not a problem.)

*(Note that internet access has been disabled.)*

**Do nothing further until the start of the exam is announced!**

*Please Turn Over*

6. When the start of the exam is announced, open the exam paper

```
tspl-pe/papers/exam.pdf
```

with the standard PDF viewer.

7. Change to the template directory

```
cd tspl-pe/templates
```

and edit the file

```
Exam.lagda
```

to include your answers, using Emacs or anything else suitable. You are recommended to save your work on a regular basis.

8. Before submitting, make sure your file is processed by Agda correctly. Code which prevents the file from compiling should be made into comments. If you fail to solve part of a problem, you may get more credit if you indicate clearly which part you have not solved.
9. *Please ensure before submission that the file `Exam.lagda` contains your solutions to the exam.* Submit your file using the command:

```
examsubmit Exam.lagda
```

If you get an error, please check carefully that your file is called `Exam.lagda` and that you are in the same directory as this file. If you continue to have problems, please contact one of the invigilators.

Repeated submit commands are allowed, and will overwrite previous submissions. The last file submitted will be the one marked.

10. When the invigilators announce the end of the exam, you must submit and log out immediately.