

Installation Notes for VWP: Verify with Weakest Preconditions

VWP requires:

1. SWI-Prolog
2. Alt-Ergo version 2.6.2
3. The VWP files can be downloaded from: cse.buffalo.edu/LRG/VWP/Examples

Two key files for the installation are `vwp.pl` and `index1.html`.

Read the section Windows Installation, MacOS installation or Linux installation, as applicable to your computer.

1. Windows Installation

1. Install SWI-Prolog

Download the 64-bit Windows installer from:

<https://www.swi-prolog.org/download/stable>

Run the installer and accept the standard options.

Open SWI-Prolog and enter (where `?-` is the Prolog prompt):

```
?- current_prolog_flag(version_data, Version).
```

SWI-Prolog should display its installed version.

2. Open PowerShell

Press Windows key + R, type

```
powershell
```

and press Enter.

PowerShell is Windows' command-line window. Enter each command below into that window.

3. Install OPAM

Run:

```
winget install Git.Git OCaml.opam
```

After installation finishes, close PowerShell and open a new PowerShell window.

If Windows reports that winget is unavailable, install or update Microsoft's **App Installer** from the Microsoft Store.

4. Initialize OPAM

Run:

```
opam init
```

Accept the recommended defaults, including OPAM's internally managed Cygwin environment.

This initial setup can take 15 minutes. On a slower computer, it may take longer.

If OPAM says that it cannot configure ordinary Windows PowerShell and asks whether to select a different shell, it is safe to answer **No**. VWP does not require permanent PowerShell configuration.

5. Install the tested Alt-Ergo version

Run:

```
opam update
```

```
opam install alt-ergo.2.6.2
```

This may take another 15-20 minutes (depending upon your computer) because some components are compiled during installation. Strongly recommend chai break 😊

6. Test Alt-Ergo

Run:

```
opam exec -- alt-ergo --version
```

The result should contain:

```
v2.6.2
```

To see where OPAM installed Alt-Ergo, run:

```
opam var bin
```

The directory will normally resemble:

```
C:\Users\YourName\AppData\Local\opam\default\bin
```

Do not run alt-ergo.exe directly from Windows Explorer. A direct launch may report missing libgmp-10.dll or zlib1.dll. The Windows version of VWP configures these required directories automatically.

7. Install and run VWP

Place vwp.pl and index1.html in the same directory, together with example test cases downloaded.

Start Prolog, and consult vwp.pl like this (?- is the Prolog prompt):

```
?- [vwp].
```

```
?- start_server.
```

VWP will locate the standard OPAM installation of Alt-Ergo automatically.

Next, bring up a browser and enter <http://localhost:8080>. VWP can be used from there.

2. MacOS Installation

1. Install Homebrew

If Homebrew is not already installed, follow the instructions at:

<https://brew.sh/>

Open the macOS **Terminal** application and verify the installation:

```
brew --version
```

2. Install SWI-Prolog and OPAM

In Terminal, run:

```
brew update
```

```
brew install swi-prolog opam
```

Verify SWI-Prolog:

```
swipl --version
```

3. Initialize OPAM

Run:

```
opam init
```

Accept the recommended defaults.

After initialization, update the current Terminal environment:

```
eval "$(opam env)"
```

4. Install the tested Alt-Ergo version

Run:

```
opam update
```

```
opam install alt-ergo.2.6.2
```

Verify the installation:

```
alt-ergo --version
```

The result should contain:

```
v2.6.2
```

You can find the executable with:

```
command -v alt-ergo
```

5. Start VWP

Whenever a new Terminal window is opened, first run:

```
eval "$(opam env)"
```

Then start VWP from that same Terminal window. This ensures that VWP can find Alt-Ergo.

6. Install and run VWP

Place vwp.pl and index1.html in the same directory, together with example test cases downloaded.

Start Prolog, and consult vwp.pl like this (?- is the Prolog prompt):

```
?- [vwp].
```

```
?- start_server.
```

VWP will locate the standard OPAM installation of Alt-Ergo automatically.

Next, bring up a browser and enter <http://localhost:8080>. VWP can be used from there.

3. Linux Installation

The following instructions are for Ubuntu and other Ubuntu-based Linux distributions.

1. Install SWI-Prolog and OPAM

Open a terminal and run:

```
sudo apt update
```

```
sudo apt install swi-prolog opam build-essential
```

Verify SWI-Prolog:

```
swipl --version
```

If only a command-line installation of SWI-Prolog is desired, swi-prolog-nox may be used instead:

```
sudo apt install swi-prolog-nox
```

2. Initialize OPAM

Run:

```
opam init
```

Accept the recommended defaults.

Update the current terminal environment:

```
eval "$(opam env)"
```

The initial setup may take several minutes because OPAM installs an OCaml compiler and supporting packages.

3. Install the tested Alt-Ergo version

Run:

```
opam update
```

```
opam install alt-ergo.2.6.2
```

If OPAM asks permission to install additional Ubuntu system packages, accept the request.

Verify the installation:

```
alt-ergo --version
```

The result should contain:

```
v2.6.2
```

Find the executable with:

```
command -v alt-ergo
```

The location will normally resemble:

```
/home/username/.opam/default/bin/alt-ergo
```

4. Start VWP

Whenever a new terminal is opened, first run:

```
eval "$(opam env)"
```

VWP normally finds Alt-Ergo through the system search path, so no installation-specific pathname should be required.

5. Install and run VWP

Place vwp.pl and index1.html in the same directory, together with example test cases downloaded.

Start Prolog, and consult vwp.pl like this (?- is the Prolog prompt):

```
?- [vwp].
```

```
?- start_server.
```

VWP will locate the standard OPAM installation of Alt-Ergo automatically.

Next, bring up a browser and enter <http://localhost:8080>. VWP can be used from there.

Troubleshooting

To verify the required programs on Windows:

```
opam exec -- alt-ergo --version
```

In SWI-Prolog, enter the goal (following the prompt ?-)

```
?- current_prolog_flag(version_data, Version).
```

To verify them on macOS:

```
swipl --version
```

```
eval "$(opam env)"
```

```
alt-ergo --version
```

If macOS reports that alt-ergo cannot be found, rerun:

```
eval "$(opam env)"
```

If VWP was already running when its source files were replaced or updated, close SWI-Prolog completely and restart VWP.

Linux troubleshooting

If alt-ergo reports “command not found,” run:

```
eval "$(opam env)"
```

```
alt-ergo --version
```

To test Alt-Ergo without changing the current terminal environment:

```
opam exec -- alt-ergo --version
```

Although some older Ubuntu releases provide an alt-ergo package through apt, the course uses OPAM so that every student receives the tested version 2.6.2.