

Edux, Your Elixir Education Sandbox

Viktor Gergely

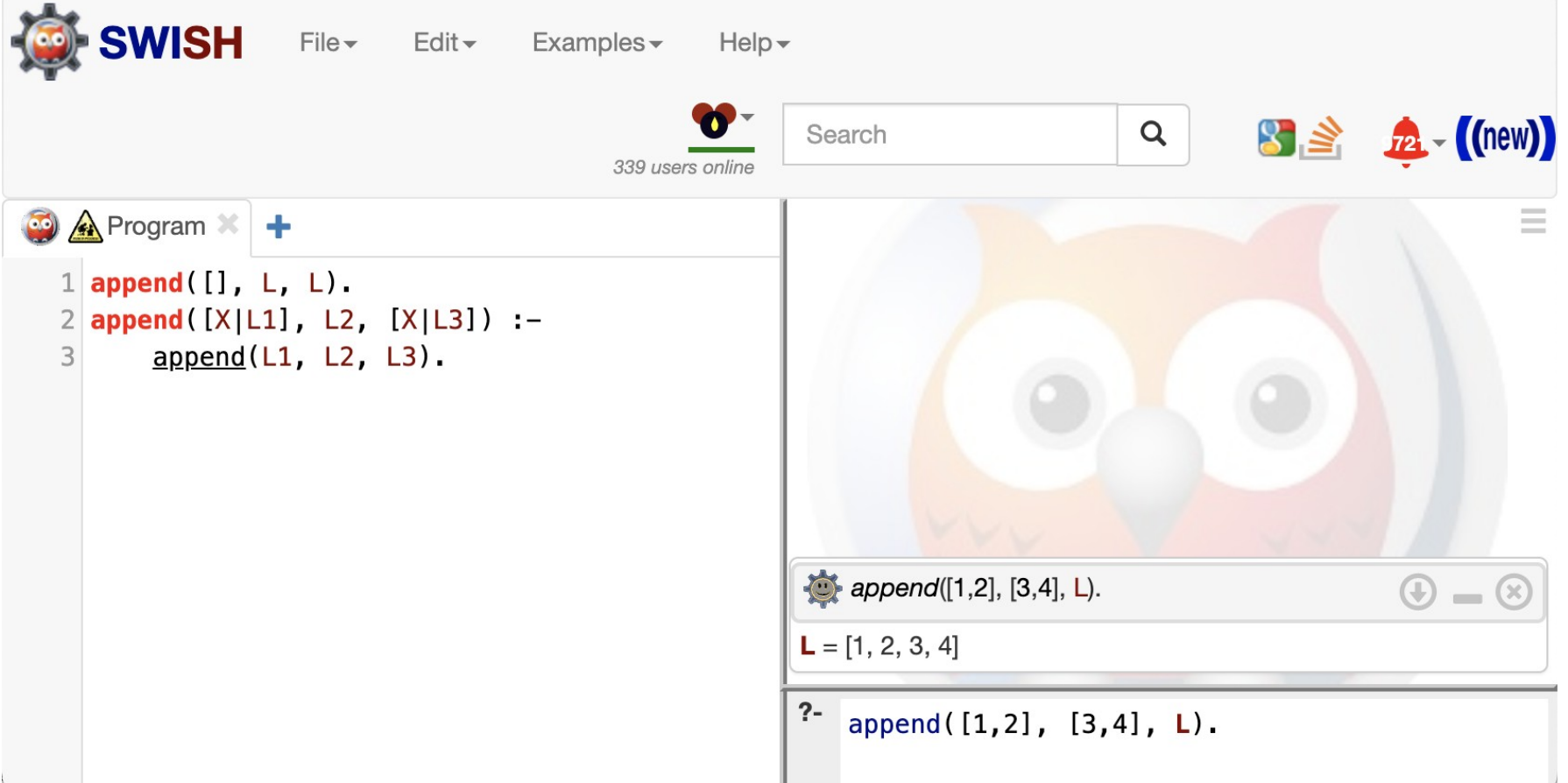
Budapest University of Technology and Economics, Hungary
viktor.gergely@erlang-solutions.com



History and demand

- Declarative Programming: Prolog for a long time, Elixir since 2021
- Well-known and bullet-proof sandboxes for Prolog (SWI, Tau)
 - Try out your code on a website
 - Compile it and use the interactive shell to test your code
 - Web shell without need to install anything on your laptop
 - Suitable for experimentation, small programs
- Students: do you have this for Elixir, too? Hm...
- Livebook – good, but still needs local installation
- Let's create one! Done during the summer of 2023

The Prolog roots



The image shows the SWISH Prolog IDE interface. At the top, there is a header with the SWISH logo, a gear icon, and menu items: File, Edit, Examples, and Help. Below the header, there is a search bar and a notification icon with the text "(new)". The main area is divided into two panes. The left pane shows a Prolog program with three lines of code: `1 append([], L, L).`, `2 append([X|L1], L2, [X|L3]) :-`, and `3 append(L1, L2, L3).`. The right pane shows a large owl illustration and a console window. The console window displays the query `append([1,2], [3,4], L).` and the result `L = [1, 2, 3, 4]`. Below the console window, there is a prompt `?- append([1,2], [3,4], L).`

The Elixir result

Edux - an Elixir shell for education

Compile

```
defmodule Demo do
  def hello do
    :world
  end
end
```

Demo.hello

Run

```
Interactive Elixir (1.14.4) - press Ctrl+C to exit
(type h() ENTER for help)
iex(1)> c("<module>.ex")
[Demo]
iex(2)> Demo.hello
:world
iex(3)>
```

[Github project page](#)



What you need

- A simple HTTP server
- Ability to run an Elixir shell (iex OS command) from your application
- Websocket support for interactivity
- Concurrency for serving multiple users on a website



How to make it?

- Let's create an Elixir application to run Elixir shells :)
- A simple HTTP server – **Plug**
- Ability to run an Elixir shell (iex OS command) from your application – **calling `os:cmd` from Erlang (stdio communication)**
- Websocket support for interactivity – **cowboy Erlang library**
- Concurrency for serving multiple users on a website – **built-in concurrency on the BEAM**



Features

- Simple and easy-to-use web interface for starters
- No need to install anything locally
- Elixir, HTML, CSS, JavaScript
- Separate sessions for each user, code memory by cookies



Open-source concepts

- Public, open-source code, free to read and contribute
- Elixir philosophy
 - Open-source tools and libraries
 - Active community of developers
 - Modern approach in environment to fit developer needs
- For students
 - Elixir in Elixir
 - What Elixir can do beyond the mandatory studies
 - Go open-source!



Thank you!

- References:

- Swish Prolog shell: <https://swish.swi-prolog.org/>
- Tau Prolog shell: <http://tau-prolog.org/sandbox/>
- TryErlang: <https://www.tryerlang.org/>
- Edux github repo: <https://github.com/vikger/edux>
- Running Edux at BME: <http://dps.iit.bme.hu/>
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