Industry versus academia?
Learning and teaching programming

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Teaching in the Industry in the 90s....
Functional programming in SML ... on a mainframe.

A type theory course that became my first book.
Is Erlang any good for ASCII art?
In Universities,

students are there
to learn how to learn!
In Universities, students are there to learn how to learn!

In Industry, students are there to learn how to do stuff!
\( \lambda \) vs ERLANG

 logos of different software tools
Follow through

Programming Language Technology.

Projects, reading, extending, embedding.

Confer like it’s 1999 ...
Top Down Vs Bottom Up
Erlang or Haskell or ... 

Unexpected ";" on line 4 

Real or “teaching” language? 

Oh for subsets!
Erlang Programming

A Concurrent Approach to Software Development

Francesco Cesarini & Simon Thompson

O'REILLY®
Knowledge Transfer Partnership

Erlang Solutions, University of Kent, 2011.
“Beacon Project”

University of Kent’s fiftieth anniversary 2015.
Functional and Concurrent Programming in Erlang

Learn the theory and practice of functional programming in Erlang, through practical exercises and suggested projects.

Go to course

8,500 enrolled on this course

Duration
4 weeks

Weekly study
5 hours
<table>
<thead>
<tr>
<th>Week</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section</td>
<td>2.1</td>
</tr>
<tr>
<td>Component</td>
<td>2.1.5</td>
</tr>
<tr>
<td>LOs</td>
<td>To deploy the recursion template of the previous section to make recursive definitions.</td>
</tr>
<tr>
<td></td>
<td>To modify the template in appropriate ways to define particular functions.</td>
</tr>
<tr>
<td>Type</td>
<td>homework</td>
</tr>
<tr>
<td>Time</td>
<td>20 minutes</td>
</tr>
<tr>
<td>Content</td>
<td>Exercises to reinforce …</td>
</tr>
<tr>
<td></td>
<td>● product of a list of numbers</td>
</tr>
<tr>
<td></td>
<td>● maximum of a list … start at ([X]); remember can use (\text{max}) as well as computing the maximum of two values “by hand”.</td>
</tr>
<tr>
<td></td>
<td>Exercises to stretch …</td>
</tr>
<tr>
<td></td>
<td>● defining the list (\text{span}/2) giving ([M, M+1, \ldots, N]).</td>
</tr>
<tr>
<td></td>
<td>● picking out the even numbers in a list</td>
</tr>
<tr>
<td>Additional material</td>
<td>Could have an optional exercise sheet and video about list comprehensions … not essential but a nice piece of notation which is useful in some examples like quicksort. Hmm …</td>
</tr>
<tr>
<td>Notes</td>
<td></td>
</tr>
<tr>
<td>Transition</td>
<td>Let’s see how the solutions to this work out.</td>
</tr>
</tbody>
</table>
Media tech

“Good enough” is good enough.

Lights!

Microphone?
Social learning
FL approach.
Huge potential beyond programming 101
Let’s not re-invent the wheel!

- Compiler
- Dialyzer
- Wrangler
- EUnit
- QuickCheck / PropEr
- Tracer
Behind the Scenes

Interaction tech

Multiple modalities

```
$ft = new Feedbacktool();
$job = new FTJob();
[...]
$job_id = $ft->compute($job);
```

```
compute(Job) ->
[...]
JobId.
```
Things fail...
... so do automatic tools

- Manually monitor selection of solutions
  - Identify common error patterns
  - Incrementally improve automatic feedback
- “Ask the teacher” button
- Traditional forums
The Teacher’s Perspective

- Invent an exercise (or use an existing one)
- Write a solution for it
- Write tests for your solution
- Plug it into the Feedback Tool
- Configure
Motivation
If MOOCs cost so much more than a normal course, why do it?

- Economic benefits
- Branding benefits
- An approach to getting faculty truly interested in improving their teaching and trying new technologies and methods in a “controlled” environment with measurable outcomes
- Do you trust others to tell you how, what, why?
Fun!
Just did the first online live session for Psychology of Programming and you know what? It was actually kind of fun and nice! Discussed homework and used breakout rooms for deeper conversations in smaller groups. Not the same as a real lecture, of course, but not bad!

9:20am · 8 Feb 2021 · Twitter Web App

Not sure if I am getting better at moderating or students are getting more excited about participating online?
Day 1 or remote training. Why Erlang? Current view. Chuffed to have the one and only @samaaron on the course!
Top Down vs Bottom Up
Interactive tech vs sociability
Synchronous vs asynchronous
Pure online vs blended
Shared resources vs “not invented here”
Textbooks as a community resource?
Industry versus academia?
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