

from knowing nothing to
understanding **Nothing**
in 6 weeks

Haskell MOOC and Blended Course

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Course Catalogue

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Functional Programming (H) COMPSCI4021

- **Academic Session:** 2016-17
- **School:** School of Computing Science
- **Credits:** 10
- **Level:** Level 4 (SCQF level 10)
- **Typically Offered:** Semester 1
- **Available to Visiting Students:** Yes
- **Available to Erasmus Students:** Yes

ONLINE COURSE

Functional Programming in Haskell: Supercharge Your Coding

Get an introduction to Haskell, the increasingly popular functional programming language, with this University of Glasgow course.

[Register](#)



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What is Haskell?

- a functional programming language

```
rms xs =
```

```
    sqrt (foldr (\x a -> a+x*x) 0 xs /  
        fromIntegral (length xs))
```

- growing industry interest

Glasgow *was* the epicentre of Haskell development



Haskell at Glasgow



What we did

10 week, 10 credit Level 4 course



6 week MOOC

4 week f2f course

drop-in clinic

Course Design

Learning type: Acquisition

Learning through acquisition is what learners are doing when they are listening to a lecture or podcast, reading from books or websites, and watching demos or videos



Learning type: Collaboration

Learning through collaboration embraces mainly discussion, practice, and production. Building on investigations and acquisition it is about taking part in the process of knowledge building itself



Learning type: Discussion

Learning through discussion requires the learner to articulate their ideas and questions, and to challenge and respond to the ideas and questions from the teacher, and/or from their peers



Learning type: Investigation

Learning through investigation guides the learner to explore, compare and critique the texts, documents and resources that reflect the concepts and ideas being taught



Learning type: Practice

Learning through practice enables the learner to adapt their actions to the task goal, and use the feedback to improve their next action. Feedback may come from self-reflection, from peers, from the teacher, or from the activity itself, if it shows them how to improve the result of their action in relation to the goal



Learning type: Production

Learning through production is the way the teacher motivates the learner to consolidate what they have learned by articulating their current conceptual understanding and how they used it in practice



Our Unique Selling Points


1. interactive coding
2. rockstar interviews
3. social learning

1. interactive coding

Haskell Tutorials -- Interactive tutorials in your browser - Mozilla Firefox


Fedora Project - Start Pa... x Haskell Tutorials -- Inter... x +


localhost:4001/tutorial11/#step3 Search



University of Glasgow

Haskell Tutorials



Active users 

Type Haskell expressions in here.

```
λ 41
41
:: Num a => a
λ
```

[step 3/25]

OK, no surprises so far, you got back the number 41 as expected.

Now type a simple integer arithmetic operation, e.g. `6*7`, and observe that it evaluates to the expected result.







2. rockstar interviews





2. rockstar interviews

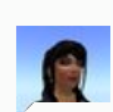
3. social learning


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  Zip remind

  [Follow](#) 25 SEP

With the lambda function introduction in the first week the function used in zipWith should have been defined as $(\lambda x y \rightarrow (x, y \rightarrow (x,y)))$.





 IMO this was the best teaching video in the course so far, by a large margin. At the risk of gushing, I thought it was very good in content and excellent in its form of presentation, even surviving the lack of HD because the fonts were all large and readable. If this is an indication of the direction in which the video content is evolving, we are in for a treat! :-)

[w](#) 26 SEP

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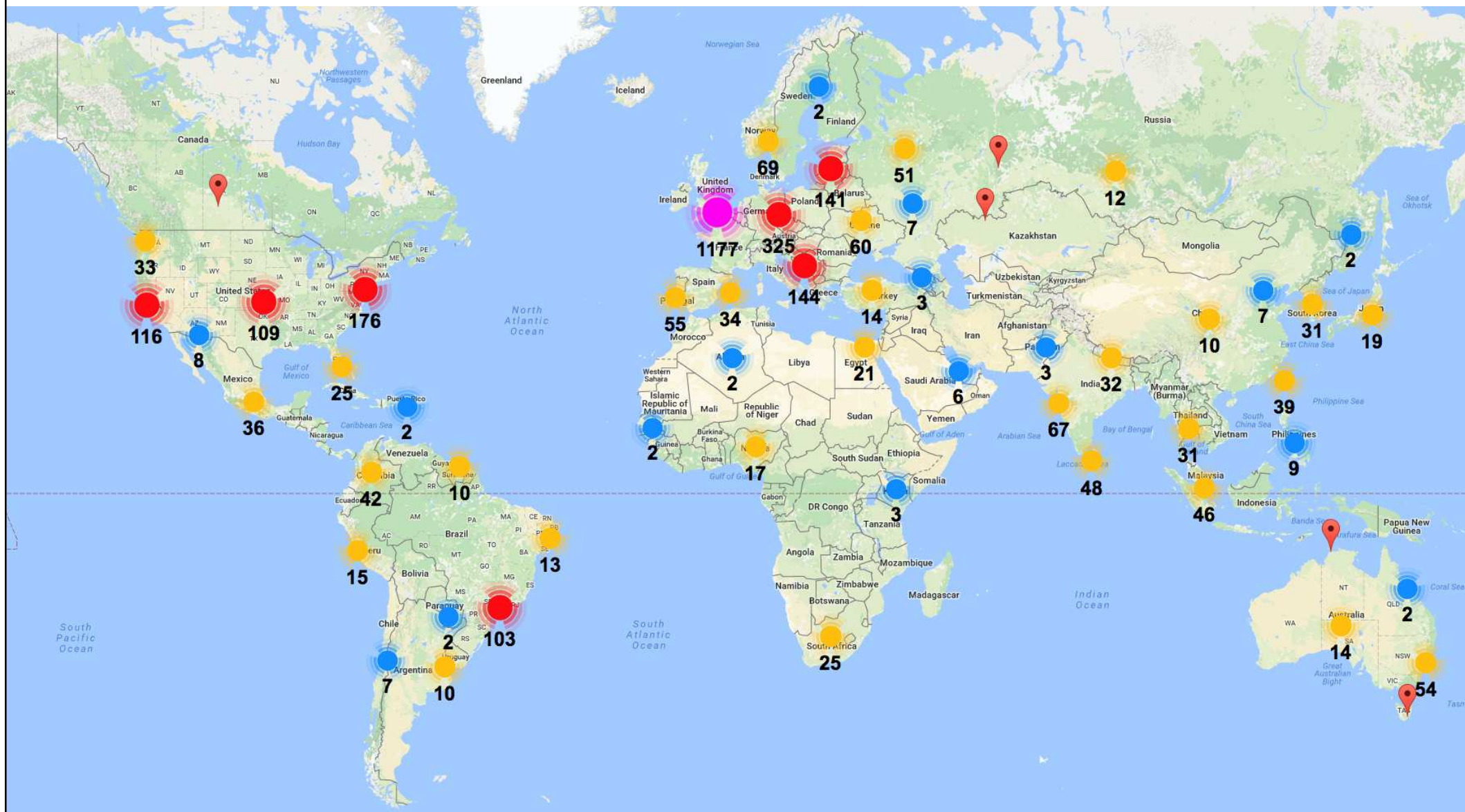
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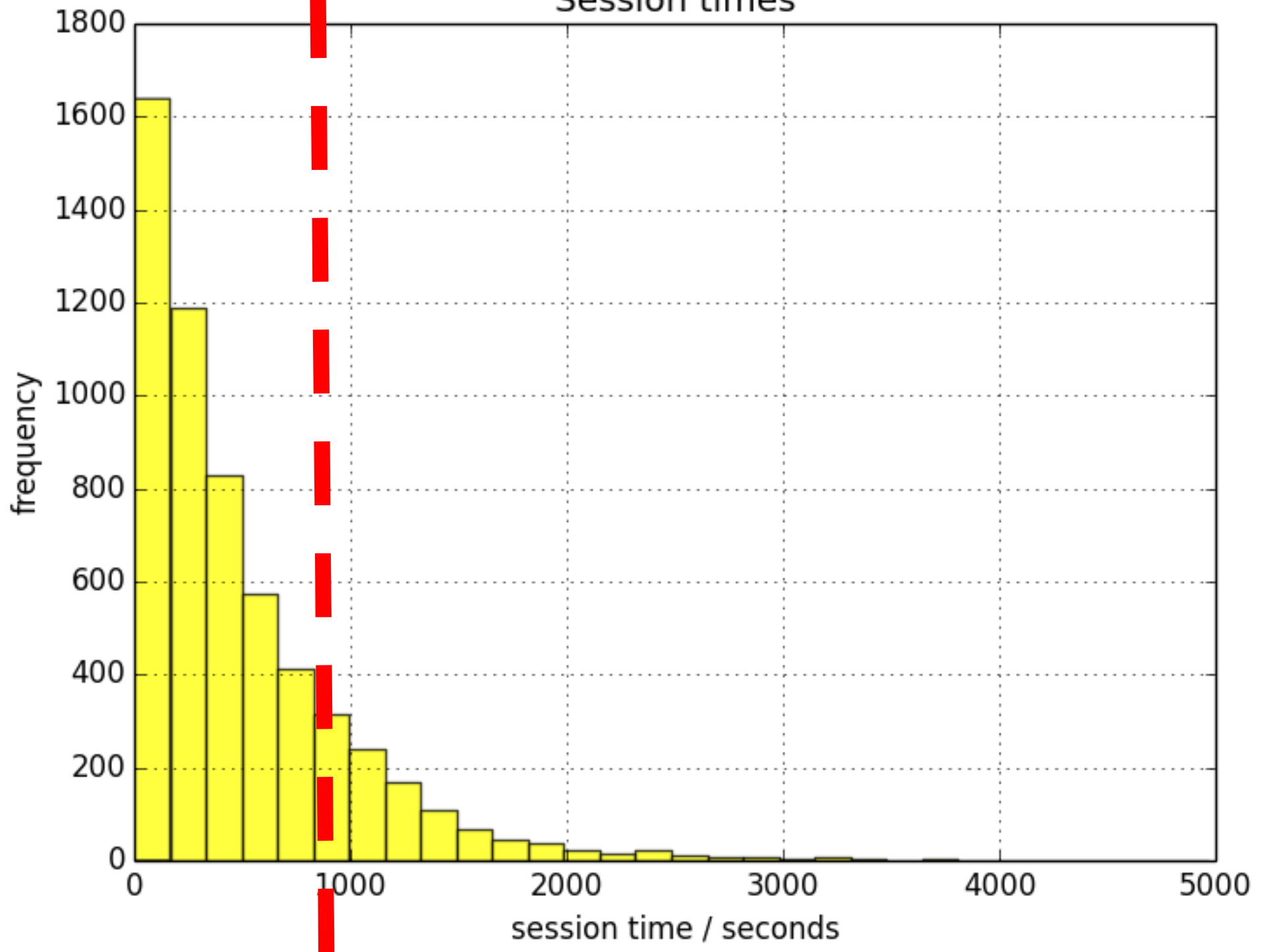
Agreed and presented at a very good pace: neither too

some stats

- MOOC signups: 6.3K
- active learners: 3.1K
- completions: 900
- Glasgow students: 120



Session times



Research Opportunity

Functional Baby Talk: Analysis of Code Fragments from Novice Haskell Programmers

Jeremy Singer and Blair Archibald

School of Computing Science
University of Glasgow
UK

`jeremy.singer@glasgow.ac.uk` `b.archibald.1@research.gla.ac.uk`

What kinds of mistakes are made by novice Haskell programmers, as they learn about functional programming? Is it possible to analyse these errors in order to improve the pedagogy of Haskell? In 2016, we delivered a massive open online course which had an interactive code evaluation environment. We captured and analysed over 160K interactions from learners. We report typical novice developer behaviour; for instance, the mean time spent on an interactive tutorial is around eight minutes. Although our environment was restricted, we gain some understanding of novice learner errors. Parenthesis mismatches, lexical scoping errors and do block misunderstandings are common. Finally, we make recommendations about how such beginner code evaluation environments might be enhanced.

1 Introduction

The Haskell programming language [11] has acquired a reputation for being difficult to learn. In his presentation on the origins of Haskell [17] Peyton Jones notes that, according to various programming

Advantages for Glasgow students

1) larger and more diverse learner community

2) flexible learning - where/when you like

3) backup face-to-face clinics if required

4) fresh, interactive learning materials

Feedback from Glasgow students

Beginning of the course was online

with activities to help with learning.

Particularly enjoyed the online platform and community

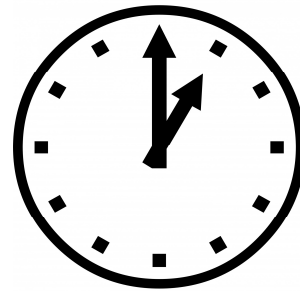
Video lectures were great and gave students a chance to learn at own pace.

Suggested improvements from Glasgow students

- more practical lab sessions
- course became exponentially harder with the last couple of topics [...] shift it so that these come earlier
- Probably fix some bugs with the online interpreter

Conclusion

- Investment



- Outcomes

