

## Q&A Session for Programming Languages Lecture 19

Session Number: 1206813726

Date: 2020-11-13

Starting time: 14:27

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ANON - 14:35

Q: is haskell harder than scheme?

Priority: N/A

Steven Haussmann - 14:37

A: Haskell is significantly more elaborate, which does mean there's more to learn at first, but it also has a lot of conveniences that'll make it nicer to reason about what you're doing. So, it's mostly up to personal taste (:

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ANON - 14:37

Q: Which version should we download? 8.0.2?

Priority: N/A

Ana L. Milanova - 14:39

A: I suggest that you try to download and install the latest version. But if you have trouble, go back to an older version. On Catalina, I had to go back to 8.6.3.

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ANON - 14:37

Q: which download do we use? minimal installers stack or haskell platform?

Priority: N/A

Steven Haussmann - 14:42

A: The minimal installers should be just fine. It's a little obtusely written...the "Haskell Platform" option actually just has you use Chocolatey, a windows package manager, to install the tools

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ANON - 14:40

Q: I got 8.10.2, is that ok? i think it is the most latest one

Priority: N/A

Steven Haussmann - 14:42

A: Any reasonably recent version should be fine. We aren't going to be using any bleeding-edge functionality!

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ANON - 14:40

Q: do i just need the GHC?

Priority: N/A

Steven Haussmann - 14:46

A: I believe so. You'll be getting the compiler if you use one

of the installers from the Haskell website, or if you get it from your system's package manager

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ANON – 14:42

Q: Can we just install with brew like the other homework and type in  
Priority: N/A

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ANON – 14:43

Q: Can we just install with brew like the other homework and type in  
brew install ghc

Priority: N/A

Ana L. Milanova – 14:43

A: Yes, you can install with brew.

Ana L. Milanova – 14:49

A: But I had trouble on Catalina. Worked on older Mac OS. On Catalina, I had to go back and install an earlier version. If you run into problems on Mac, post on the forum and I'll go find the link that worked. Any reasonably recent version should work for us.

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ANON – 14:48

Q: So I am assuming you can have lists of lists, because they can be the same type. If that is true, do all the elements in each nested list need to be the same type? Can you have something like `[[1,2] [a,b]]`

Priority: N/A

Steven Haussmann – 14:51

A: By default, no, you can't mix the types. The type of `[[1,2], [3,4]]` is `Num a => [[a]]`, so it has a single type for its elements, which must be numbers. `[[1,2], ["a", "b"]]` fails to type-check; "a" isn't a number

Steven Haussmann – 14:52

A: You'd have to create a data type that could be either a number OR a string, and then handle both cases separately.

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ANON – 14:53

Q: In terms of creating a data type that can handle 2 types, is that out of scope for what we will be doing?

Priority: N/A

Steven Haussmann – 14:54

A: I don't believe it'll come up, no. However, we will be seeing similar ideas later in the lecture today (datatypes that could be one of several things)

Steven Haussmann – 14:58

A: just realized that I contradicted myself here (∴ I meant that we shouldn't have anything like lists full of completely unrelated types.

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ANON - 14:54

Q: why does foldr (-) 0 [1,2,3] return 2?

Priority: N/A

Ana L. Milanova - 14:55

A: It folds from right to left around 0:  $1 - (2 - (3 - 0))$

Steven Haussmann - 14:57

A: Contrast that with foldl, which performs  $((0 - 1) - 2) - 3$ , producing -6

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ANON - 14:58

Q: So if we have two parameters, we can write `\x\y` or `\xy`?

Priority: N/A

Steven Haussmann - 14:59

A: No, you must write it out explicitly.

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ANON - 14:58

Q: is `---` for comments

Priority: N/A

Ana L. Milanova - 14:59

A: Yes, that is for line comments.

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ANON - 14:58

Q: Good afternoon. The interactive shell is ghc-8.10.2 or ghc?

Priority: N/A

Steven Haussmann - 14:59

A: Those are probably just two names for the same thing: the compiler. The interactive shell/interpreter is called ghci

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ANON - 14:59

Q: But I believe on the previous slide, we had written `\xy`. So should this have been `\x\y`?

Priority: N/A

Steven Haussmann - 15:01

A: No, we just had `\x -> x*x` on slide 10.

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ANON - 15:01

Q: But Professor Milanova showed `fun = \xy x * y`

Priority: N/A

Ana L. Milanova - 15:02

A: `fun = (\x y -> x*y)`, yes, you can do that. (I will go back to see if I missed the arrow.)

Steven Haussmann - 15:03

A: Ah, I missed the drawn part! Yes, that's correct -- you can

concisely write a multi-argument function like that.

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ANON – 15:03

Q: Are head and tail built in functions?

Priority: N/A

Steven Haussmann – 15:03

A: Yes, they are.

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ANON – 15:03

Q: Oh alright sounds good. I just wanted to see if we could use the Short-Cut Lambda Notation for the Parameters. Thank you Professor

Priority: N/A

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ANON – 15:10

Q: But is apply\_n a Mutually Recursive Function or just a Recursive Function that calls itself?

Priority: N/A

Steven Haussmann – 15:11

A: Functions are mutually recursive if they call each other in sequence, generally going back and forth until they terminate.

Ana L. Milanova – 15:12

A: It is just a recursive function, yes. We can have the mutually recursive odd and even example we wrote in Scheme with letrec, just with let. Because in Haskell let is like letrec.

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ANON – 15:15

Q: So from Scheme, I'm aware that with let the bindings to the left and right cannot access the current binding. But this Example with apply\_n showed that even the current binding does not have access to the current binding as it is still being defined, correct

Priority: N/A

Ana L. Milanova – 15:17

A: Yes, that is correct. You cannot define recursive functions in Scheme.

Ana L. Milanova – 15:19

A: I meant, you cannot define recursive functions in Scheme using "let". You can with "letrec".

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ANON – 15:16

Q: Which version did you install for Mac OS Catalina?

Priority: N/A

Ana L. Milanova – 15:18

A: 8.6.3. I will go back and find the link that worked, and will post on the forum.

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ANON - 15:16

Q: I just downloaded the compiler and extracted the files. The .exe file to run the interactive shell are located in bin

Priority: N/A

Steven Haussmann - 15:17

A: If you downloaded it directly, instead of using an installer, you'll want to add that bin folder to your \$PATH -- that way, you can just type ghci/etc. in the terminal and run it, without having to be in that folder

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ANON - 15:24

Q: 'quot' is integer division?

Priority: N/A

Steven Haussmann - 15:24

A: Yes; it's short for "quotient"

Ana L. Milanova - 15:24

A: Yes, that is correct. Returns the quotient in integer division.

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ANON - 15:30

Q: Im trying to install Haskell on Windows. Im not sure what to do with the .tar.xz file I downloaded

Priority: N/A

Steven Haussmann - 15:35

A: You can open that up with 7zip. It's just an alternative compression format, much like .gz

Steven Haussmann - 15:35

A: You can also just grab the Stack installer, which is an executable, and should do everything for you.

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ANON - 15:30

Q: Does this lecture cover enough material on Haskell to start and complete the next Homework?

Priority: N/A

Ana L. Milanova - 15:35

A: It covers essentially all you need to start and complete the homework. There are some parts of Haskell, Lazy evaluation, that we'll use, but it will be easy to figure out for the purpose of the homework, from the homework description.

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ANON - 15:37

Q: Ive extracted the Haskell file, what should I be looking for to run the compiler now? (e.g. a specific

Priority: N/A

Steven Haussmann - 15:41

A: If you're doing it manually, then the executables are in the bin folder. For example, ghc-8.10.2\\bin\\ghci.exe is the interpreter

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ANON - 15:43

Q: After the in for the let (let .. in ..) statement is where we can continue the body for a function?

Priority: N/A

Steven Haussmann - 15:43

A: That ends the bindings and begins the let body, yes.

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ANON - 15:44

Q: And anything in the body can access those variables we made?

Priority: N/A

Steven Haussmann - 15:44

A: Correct. The bindings will be available in the let body.

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ANON - 15:46

Q: Where should I place files for the Haskell interpreter?

Priority: N/A

Steven Haussmann - 15:47

A: Check the discussion forum in a bit -- we'll put some more information there

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ANON - 15:50

Q: Can you casts Strings to Integers?

Priority: N/A

Steven Haussmann - 15:53

A: You can use read to do so: for example, let x = read "123" in x + 3 Note that this will cause the program to panic if the string isn't a valid integer.

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ANON - 16:02

Q: So : is just cons?

Priority: N/A

Steven Haussmann - 16:08

A: Correct.

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ANON - 16:03

Q: saw that cons is also the : symbol

Priority: N/A

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ANON - 16:04

Q: can we see what the editor looks like?

Priority: N/A

Ana L. Milanova – 16:08

A: What editor are you referring to? You can write your code in any editor then load the code into the interactive haskell (ghci) then run functions.

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ANON – 16:05

Q: what's the difference between type and data?

Priority: N/A

Steven Haussmann – 16:07

A: The "data" keyword defines an algebraic datatype -- a type that's made up of one or more data constructors. "type" is for declaring a plain type; for example, "type IntList = [Int]"

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ANON – 16:05

Q: I noticed today from my Submitty submission for exam 2 that I got this warning: "Note: The version you have selected to be graded is not the version graded by the instructor/TAs." Is this a Submitty bug?

Priority: N/A

Konstantin Kuzmin – 16:07

A: It sure looks like Submitty just misinforming you. We are grading your version #9, and I don't see any issues with your submission.

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ANON – 16:09

Q: with regards to the exam, I had to submit an earlier version of my exam since I wasn't able to revise one of my problems in time. However, I cannot check to see my submitted answers since it seems to use my most recent submission when I look at it. is there a way to look at my submission properly?

Priority: N/A

Konstantin Kuzmin – 16:19

A: We are grading your version #3 that you selected as the version to grade. If it is not what you wanted to do or if you are unsure about the answers that comprise this version #3, please send us an email to the ProgLang mailing list.

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ANON – 16:09

Q: could we see what your GHCI looks like?

Priority: N/A

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ANON – 16:10

Q: sorry I meant what does the ghci look like? Does it look just like a command prompt in windows?

Priority: N/A

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ANON - 16:15

Q: how do you load a file into the terminal to run it like submittty would?

Priority: N/A

Ana L. Milanova - 16:18

A: :l Interpreter.hs

Ana L. Milanova - 16:19

A: :r

Ana L. Milanova - 16:24

A: :r will reload after you have made changes.

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ANON - 16:16

Q: also for the future, i think there's a co-host feature for webex so both professors can be the host :)

Priority: N/A

Konstantin Kuzmin - 16:21

A: I'm not sure if this feature is available for Events... I was only able to find the "alternate host" feature which we are using already but it's different from co-host. If you have any experience with this, please share it with us.

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ANON - 16:19

Q: So I reinstalled using chocolately. How do I launch the interpreter?

Priority: N/A

Ana L. Milanova - 16:20

A: ghci should work? You might have to set the path and create a link to the .exe though.

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ANON - 16:26

Q: In GHCi, can you get the head and tail of a Nil List?

Priority: N/A

Ana L. Milanova - 16:28

A: head (1:[]) should get the head 1. But head [] should throw an Exception.