Lazy evaluation in Haskell

exploring some mental models and implementations

Takenobu T.

Contents

- Expression
- Evaluation

- References

- Evaluation on Haskell (GHC)
- How to control the evaluation

Expression

What is an expression?

An expression denotes a value

An expression evaluates to a value

What are expressions on Haskell

Expressions examples



What is a value?

Evaluation strategy

When? What extent?

WHNF

Thunk

Strictness, Bottom

Evaluation on Haskell (GHC)

Evaluation in Haskell (GHC)

How to control the evaluation

References

References

- [1] Haskell 2010 Language Report https://www.haskell.org/definition/haskell2010.pdf
- [2] Thinking Functionally with Haskell http://www.cs.ox.ac.uk/publications/books/functional/
- [3] Types and Programming Languages https://mitpress.mit.edu/books/types-and-programming-languages
- [4] Lazy evaluation https://wiki.haskell.org/Lazy_evaluation
- [5] Haskell/Lazy evaluation https://wiki.haskell.org/Haskell/Lazy_evaluation
- [6] Lazy vs. non-strict https://wiki.haskell.org/Lazy_vs._non-strict
- [7] Parallel and Concurrent Programming in Haskell http://chimera.labs.oreilly.com/books/123000000929
- [8] Implementing lazy functional languages on stock hardware: the Spineless Tagless G-machine Version 2.5 http://research.microsoft.com/en-us/um/people/simonpj/Papers/spineless-tagless-gmachine.ps.gz
- [9] Making a Fast Curry Push/Enter vs Eval/Apply for Higher-order Languages http://research.microsoft.com/en-us/um/people/simonpj/papers/eval-apply/

References

- [10] Being Lazy with Class http://www.seas.upenn.edu/~cis194/lectures/06-laziness.html
- [11] The Incomplete Guide to Lazy Evaluation (in Haskell) https://hackhands.com/guide-lazy-evaluation-haskell/
- [12] Laziness http://dev.stephendiehl.com/hask/#laziness
- [13] Evaluation on the Haskell Heap http://blog.ezyang.com/2011/04/evaluation-on-the-haskell-heap/
- [14] How to force a list https://ro-che.info/articles/2015-05-28-force-list
- [15] GHC illustrated http://takenobu-hs.github.io/downloads/haskell_ghc_illustrated.pdf