>>> Functional Programming
>>> Using the example of Haskell

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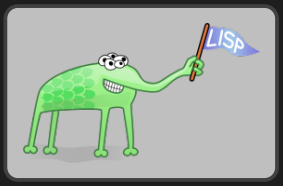
Date: 13. Januar 2020

>>> Overview

1. Introduction
2. Main differences to imperative programming
3. Examples
4. Fields of Application
5. Conclusion

>>> Languages

>>> Languages



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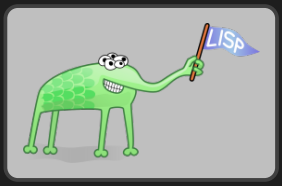

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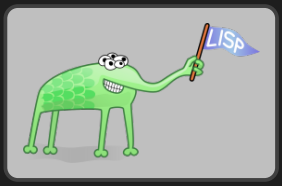

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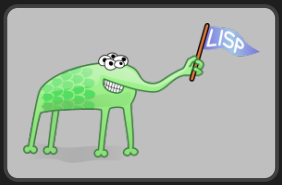
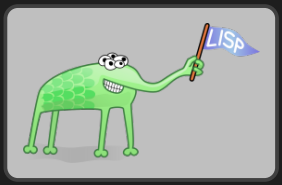


OCaml

elixir

>>> Languages



OCaml

elixir

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* Non-imperativeness

* First Class Citizenship

* Closures

* Lambdas

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  A function definition can take place without an explicit name in the position of a function symbol.

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>>> Examples

```haskell
sq :: (Floating a) => a -> a
sq x = x * x
```

```haskell
ringArea :: (Floating a) => a -> a -> a
ringArea r1 r2 = pi * (sq r1 - sq r2)
```

```haskell
fib :: Integer -> Integer
fib 0 = 0
fib 1 = 1
fib n = fib (n - 2) + fib (n - 1)
```

>>> Advanced Example

```haskell
gifts :: [String]
gifts =
  [ "And a partridge in a pear tree!", "Two turtle doves,", "Three french hens,"
  , "Four calling birds,", "Five golden rings,", "Six geese a-laying,"
  , "Seven swans a-swimming,", "Eight maids a-milking,", "Nine ladies dancing,"
  , "Ten lords a-leaping,", "Eleven pipers piping,", "Twelve drummers drumming,"
  ]

days :: [String]
days = [
  "first", "second", "third", "fourth", "fifth", "sixth", "seventh", "eighth",
  "ninth", "tenth", "eleventh", "twelfth" ]

verseOfTheDay :: Int -> String
verseOfTheDay day =
  "On the " ++ days !! day ++ " day of Christmas my true love gave to me... \n"
  ++ concat (map (++ "\n") [dayGift day d | d <- [day, day-1..0]]) ++ "\n"
  where
    dayGift 0 _ = "A partridge in a pear tree!"
    dayGift _ gift = gifts !! gift

main :: IO ()
main = putStrLn (concatMap verseOfTheDay [0..11])
```

>>> Fields of Application

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* Big Data

>>> Fields of Application

* Big Data
* Finance Sector

>>> Fields of Application

* Big Data
* Finance Sector
* Science

>>> Fields of Application

* Big Data
* Finance Sector
* Science
* Virtually everywhere

>>> Literature recommendations

* Learn you a Haskell for Great Good!
* Real World Haskell
* Parallel and Concurrent Programming in Haskell
* The Haskell School of Music

Thank you for your attention!

This presentation is available for download at:
https://github.com/nek0/presentation-fp-haskell