Introduction to F# 3.0

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FP emphasizes application of functions
Functions as in math!
• Avoid State and Mutation
• Call the function twice and get the same answer
• First class in FP
• Imperative, changes in state
• Foundations on lambda calculus
• (Alonzo Church in the 1930s’)
  • Function definition
  • Function application
  • Recursion
Fortran 1957, John Backus

Lisp 1958, John McCarthy
Some history

- (1970) ML by Robin Milner, University of Edinburgh
  - Hindley–Milner type inference algorithm
  - Simply typed polymorphic lambda calculus
- ML → StandardML → Caml → OCaml unifying functional, OOP and imperative
- (2005) F# by Don Syme, Microsoft Research
  - F# is essentially a .NET adaptation of OCaml bringing the power of FP to .NET
Lambdas in curly brace languages:
{
  "JavaScript": 1995,
  "C#": 2007,
  "PHP": 2009,
  "C++": 2011,
  "Java": 2014
}
There's no escaping them now
...and why it matters

F# is...

... a programming language.
F# is...

...a **functional** programming language
F# is...

... a functional programming language for .NET.
F# is...

...a functional and object oriented programming language for .NET
F# is...

...a functional, object oriented and imperative programming language for .NET
F# is...

...a functional, object oriented, imperative and explorative programming language for .NET
F# is...

...a multi-paradigm programming language for .NET
An open source compiler
Development Environments

Microsoft Visual F#

MonoDevelop 3.0
Getting F#

- F# on Mac
- F# on Linux
- F# on Windows
- F# on Android
- F# on iOS
- F# on GPU
- F# on FreeBSD
Books

- About F#
  - Real-World Functional Programming
  - Beginning F#
  - Programming F#
  - F# For Scientists
  - Visual F# 2010 for Technical Computing
  - Professional F# 2.0
  - Expert F# 3.0

- And more general about programming languages through F#
  - Programming Language Concepts
Links

- On the Web
  - http://fsharp.org/
  - http://fsharp.github.com/
  - http://fsharp.net/ (Visual Studio edition)
  - http://research.microsoft.com/fsharp
  - http://www.tryfsharp.org/
  - Don Syme - http://blogs.msdn.com/dsyme
  - http://code.msdn.microsoft.com/fsharpsamples
Links

- Community
  - F# open source list
  - News from F# blogs
  - GitHub and CodePlex projects
  - F# code snippets
  - Ask on StackOverflow
  - Join Twitter conversations (#fsharp)
  - F# on IRC
  - Athens F# User Group
The language designer to thank for F#

- Don Syme
- Academic info
F# interactive action, driven by Expert F# 2.0;;

Just show me the gist*

* [https://gist.github.com/biboudis/9653956](https://gist.github.com/biboudis/9653956)
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