

# **Functional Programming**

**(what it is, why do you care)**

# **Composition is KING**

**Functional programming means coding by composing functions. In other words, programs can be constructed through the definition and composition of functions**

# **Code is DATA**

**Functional programming means that functions are first-class citizens of the programming language, just like regular values.**

**I can build a list of functions, I can pass them as arguments to other functions, they can be the results returned by other functions**



# **Expression-Oriented Programming**

**Application code that is normally  
written as loops, if-statements and  
juggling-with-array-indexes becomes  
infinitely more readable / maintainable  
when it's rewritten in terms of  
MAP, REDUCE, FILTER, ZIP  
and ternary operators**

# **Equational Reasoning**

**Functional programming performs computations the way mathematicians solve equations - by avoiding global mutable state.**

**The equal sign does not represent assignment, it represents a binding between a certain identity and a certain value, or an equation**

# **Lazy Evaluation**

**Application logic that deals with infinite streams of data (like infinite scrolling in web applications) becomes more readable and will run in constant memory by leveraging lazy evaluation, a staple of functional programming**



A background image of a stone wall with light-colored rectangular stones in the center and darker, more irregular stones at the top and bottom.

**WHY?**

**Why Functional Programming?**

**Why Do You Care?**



**Managing state  
in a multi-core  
hardware environment  
is a nightmare**

**FP makes it easy**



The background of the slide is a close-up photograph of a stone wall. The stones are of various sizes and shapes, with colors ranging from light beige to dark brown. The texture is rough and uneven, with visible mortar joints.

**FP techniques are inherently  
parallelizable**

**FP is the lingua franca of  
Big Data**

**FP allows compilers to  
perform specific  
optimizations, like  
Tail Call Optimization  
and  
Stream Fusion**



**FP provides high-level  
abstractions,  
making the code  
more powerful**



A background image of a stone wall. The top portion of the wall is composed of light-colored, rectangular stones. The bottom portion features a mix of darker, more irregularly shaped stones in shades of brown and grey.

**FP enables programming by  
pattern matching**

**Pattern matching means  
treating the constituents  
of a data structure  
as constituents of a pattern.  
It makes manipulating  
complex data structures  
convenient and expressive**

A background image of a stone wall with light-colored, irregularly shaped stones in the center and darker, reddish-brown stones at the top and bottom.

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