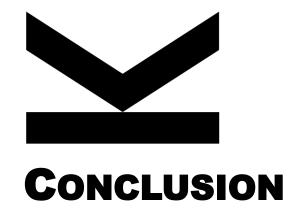
FUNCTIONAL PROGRAMMING



FUNCTIONAL PROGRAMMING PRINCIPLES

Pure functions which are referential transparent no external side effects parameters and return values only expressions (function applications) returning values Generics generic data types abstract from concrete element types generic functions abstract from concrete parameter types ■ Function parameters for parametrizing functions with functions higher-order functions Working with functional data structures immutable value semantics higher-order functions Functional exception handling exceptional values as returns



FUNCTIONAL PROGRAMMING PRINCIPLES

- Function composition□ composition operators creating complex functions from simpler functions
 - ☐ general scheme of computation
 - □ based on Monoids
 - □ parallel reduction
- Monads

Reduction

- ☐ generic way of building chains of computations
- □ Monad type determines how computations are composed
- Lazy evaluation
 - □ by-name parameter passing or function objects
 - □ Java Streams as lazy sequences of elements
 - allowing computation chains
 - powerful collect operation with mutable containers
 - sequential and parallel processing

