

INFOSOFT IT SOLUTIONS

Training | Projects | Placements

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FUNCTIONAL PROGRAMMING

Introduction to Functional Programming

- Overview of Functional Programming Concepts
- Comparison with Imperative and Object-Oriented Paradigms
- Benefits and Principles of Functional Programming

Functional Programming Fundamentals

- Functions as First-Class Citizens
- Immutability and Pure Functions
- Higher-Order Functions and Function Composition
- Recursion and Tail Call Optimization

Functional Data Structures

- Lists, Tuples, and Maps
- Sets and Option Types
- Persistent Data Structures
- Handling State and Mutability

Declarative Programming

- Declarative vs. Imperative Styles
- Understanding Declarative Constructs
- Expressions and Lazy Evaluation

Functional Programming in Practice

- Language Examples: (e.g., Haskell, Scala, Clojure, or others)
- Pattern Matching and Algebraic Data Types
- Error Handling and Monads
- Parallel and Concurrent Functional Programming

Functional Design Patterns

- Functional Design Patterns Overview
- Combinators and Functors
- Monoids and Monads
- Applicative and Foldable Structures

Functional Programming Techniques

- Currying and Partial Application
- Memoization and Lazy Evaluation
- Generative and Recursive Programming

Functional Programming for Real-World Applications

- GUI and Web Development with Functional Programming
- Functional Reactive Programming (FRP)
- Testing and Debugging Functional Code
- Performance and Optimization Techniques

Advanced Topics in Functional Programming

- Category Theory Basics
- Type Systems and Type Inference
- Domain-Specific Languages (DSLs) in Functional Style
- Future Trends and Developments in Functional Programming