سرفصل آموزشی

پک پایه تا پیشرفته متخصص برنامه نویسی جاوا

فهرست سرفصل‌های دوره‌های آموزشی

Java SE 2

Jakarta EE 11

سرفصل‌های دوره آموزشی

Java SE

Java Platform Overview (JCP, JSR, RI, TCK, JEP)

- JVM, JIT, Byte Code, Security Manager, Optimizer
- Java editions (ME,SE,EE), Containers and Components
- JDK, JRE, CLASSPATH, JAR and Configurations

Java Code Conventions and Documenting / Clean Code

- Java Keywords, Operators, Control flow
- Data Types, Wrapper Classes and Enumerated Types
- Java Memory Model and GC
- Method Chaining / Cascading & Builder Pattern
- Strings, Arrays, Numbers and Parameter Passing

Data Types, Variables and Arrays

- The Primitive Types
- Reference Types
- Local variable type inference
- Declaring Multiple Variables
- Identifiers
- Local Variables
- Instance and Class Variables

- Understanding Variable Scope
- Literals
- Declaring a Variable
- Dynamic Initialization
- The Scope and Lifetime of Variables
- Type Conversion and Casting
- Arrays
- One-Dimensional Arrays
- Alternative Array Declaration Syntax
- Arrays-Sorting
- Arrays-Searching

Operators

- Arithmetic Operators
- Assignment Operators
- Relational Operators
- Logical Operators
- Short-Circuit Logical Operators
- The ? Operator
- Operator Precedence

Control Statement

- If
- if-else-if
- switch
- while
- do-while
- for
- For-Each

- Enhanced for
- Using break
- Using continue
- Return

Overview of Object Oriented Analysis and Design (UML)

- Abstraction, Encapsulation and Class Design
- JavaBean Conventions, Immutable Objects
- Packaging and Java Standard Packages, Façade pattern
- Static Modifier and Early Binding
- Singletons and Overview of OO Design Patterns
- Polymorphism (Ad-Hoc, Subtyping, Parametric) and Inheritance

Template Method, Strategy, Factory Method, Abstract Factory

- Java Root class and Type Casting (Narrowing and Widening)
- Object Copy (Shallow vs. Deep)

Prototype Pattern

- Generics and Type Erasure
- Interfaces and Design by Contract

Interfaces

- Defining an Interface
- Implementing Interfaces
- Accessing Implementations Through Interface References
- Partial Implementations
- Nested Interfaces
- Applying Interfaces
- Variables in Interfaces
- Interfaces Can Be Extended
- Default Interface Methods
- Static Interface Methods
- Private Interface Methods
- Private static Interface Methods
- Multiple Inheritance Issues
- Use static Methods in an Interface
- Final Thoughts on Packages and Interfaces

Multiple Inheritances in java

Proxy Pattern

Nested, Inner, Local and Anonymous Classes

Functional programming, Lambda Expressions, Method Reference and Stream

- Using Variables in Lambdas
- Working with Built-In Functional Interfaces
- Implementing Supplier
- Implementing Consumer and BiConsumer

- Implementing Predicate and BiPredicate
- Implementing Function and BiFunction
- Implementing UnaryOperator and BinaryOperator
- Checking Functional Interfaces
- Returning an Optional
- Using Streams
- Creating Stream Sources
- Using Common Terminal Operations
- Using Common Intermediate
- Putting Together the Pipeline
- Lambda Expression Fundamentals
- Functional Interfaces
- Some Lambda Expression Examples
- Block Lambda Expressions
- Generic Functional Interfaces
- Passing Lambda Expressions as Arguments
- Lambda Expressions and Variable Capture
- Method References
- Method References to static Methods
- Method References to Instance Method
- Method References with Generics
- Constructor References
- Predefined Functional Interfaces

Collections Framework, Iterator

- Collection
- List
- Set
- Queue
- ArrayList
- LinkedList

- ArrayDequeue
- PriorityQueue
- .HashSet
- .Map
- .HashMap
- Iterator

Object Pool and Pooling

Exception, Error, Cause

- Exception-Handling Fundamentals
- Exception Types
- Uncaught Exceptions
- Using try and catch
- Multiple catch Clauses
- Nested try Statements
- Throw
- Throws
- Finally
- Java’s Built-in Exceptions
- Creating Your Own Exception Subclasses
- Chained Exceptions

Creating and Using Annotations

- Annotations (Metadata)
- Annotation Basics
- Specifying a Retention Policy
- Obtaining Annotations at Run Time by Use of Reflection
- Obtaining All Annotations

- The AnnotatedElement Interface
- Using Default Values in annotation
- Marker Annotations
- Single-Member Annotations
- The Built-In Annotations
- Introspection and Java Reflection API

Dynamic Proxy and AOP

Multithreaded Programming

- The Main Thread
- Creating a Thread
- Implementing Runnable
- Extending Thread
- Java Thread Model
- Understanding Thread Concurrency
- Synchronization and Locking
- Thread Cache and volatile
- Executor Service, Future and Thread Pools
- Introducing the Single-Thread Executor
- Shutting Down a Thread Executor
- Submitting Tasks
- Waiting for Results
- Using isAlive( ) and join( )
- Thread Priorities
- Synchronization
- Using Synchronized Methods
- Timer, Scheduling and Re-Try
- Shutdown Hooks and JVM Shutdown Sequence

I/O BASIC, Channels and related classes

- File
- Temporary File
- I/O Basics
- Streams
- InputStream
- FileInputStream
- FileOutputStream
- BufferedInputStream
- BufferedOutputStream
- Byte Streams and Character Streams
- The Predefined Streams
- Reading Console Input
- Reading Characters
- Reading Strings
- Writing Console Output
- The PrintWriter Class
- File Handling and Performance Issues
- Regular Expressions
- Writing Software Agents
- Object Serialization and Versioning
- XML Processing
- XML Bindings and Marshaling using JAXB
- JSON Processing Libs
- Properties class and JVM Properties
- Logging and Log Levels

JAVA NETWORKING

- Networking Concepts
- Socket Programming
- URL class

- URLConnection class
- HttpURLConnection
- HttpClient class
- Non-Blocking I/O using Channel and Selector

Java Database Connectivity (JDBC)

- What is the JDBC API?
- JDBC Drivers
- Making a Connection
- Creating and Executing a Statement
- Retrieving Values from a ResultSet
- SQL and Java Datatypes
- SQL NULL Versus Java null
- Creating and Updating Tables
- Handling SQL Exceptions and Proper Cleanup
- Handling SQLWarning
- Dynamic vs. Static SQL, SQL Injection and Security Issues
- Transaction Management and Isolation Levels
- ACID Properties of a Transaction
- Cached RowSet

ORM and Overview of Hibernate

Overview of Java Persistence API (JPA)

سرفصل‌های دوره آموزشی

Jakarta EE

Overview of Client / Server Computing (2, 3, n-tier, Web…)

- Overview of Internet Protocols, Browser and Web Server Interactions, HTTP Protocol, HTML and JavaScript
- Web Application Technologies Review
- Java EE Application Server and Containers
- Java EE Build Process and Maven (overview, modeling …)
- Using Apache Tomcat (install- config)
- Building and Deploying Web Modules

Servlet

- Servlet model
- Servlet structure and deployment
- Servlet API Hierarchy
- Servlet Interface (ServletConfig, ServletContext, ServletRequest, ServletResponse, RequestDispatcher)
- The servlet container model
- Filter
- Listeners
- Async Servlet
- Request redirect, Request dispatch
- Java EE patterns
- XHR, AJAX
- Server Sent Events (SSE) and Long Polling
- Scalability with Asynchronous Request Processing

Web Sockets

- Session Tracking (Cookies & HTTP Sessions)
- Container Managed Security and SSL (HTTPS)
- Java Server Pages (JSP) and Standard Actions
- Expression Language (EL) & Functions
- Creating and Using TAGLIBs
- Internationalization (i18N) and Localization
- JNDI and Resources
- Lookup vs. Injection, Using Java EE Container Injection
- Data Source & Connection Pooling
- Migrating from Tomcat to Glassfish Application Server
- JTA Transactions vs. Local Transactions
- Web Application Architecture Models

Overview of Core J2EE Patterns and Architectural Tiering

- Implementing Front Controller & Action Mapping
- Developing Sample Web MVC Framework
- Compare Architectures: JSF vs. Struts2 vs. Spring Web MVC
- Java Server Faces (JSF)
- JSF/JSP vs. JSF/Facelet vs. JSF/CDI
- Facelet, Managed Bean and Faces Controller
- Navigation Rules
- JSF Resource Bundles
- JSF Template

Overview of spring

- The Spring Container
- Web Applications
- Persistence Support
- Aspect-Oriented Programming
- The Java EE Modules
- The Factory Pattern
- Inversion of Control XML View: Declaring Beans
- Java View: Using Beans
- Singletons and Prototypes

Hibernate

- Hibernate Architecture
- Hibernate Mapping XML Configuration
- Hibernate Configuration Files
- Hibernate Session Factory

Jpa

- Jpa Architecture
- ORM Components
- Entity structures
- xml configuration
- Transaction types
- Database connection properties
- JPQL
- SQL Native Commands
- JPA Annotations
- Rollback Exception Handling

- Auto increment Strategies
- EntityManager و EntityManagerFactory و EntityTransaction
- JPA Relations
- Secondary Tables
- Hibernate And JPA Integration

Web services

- SOAP Web Service
- JAX-WS / WSDL
- RESTful Web Services
- JAX-RS / WADL

SOA Concepts

- Distributed Systems
- Overview of Message Oriented Middleware (MOM)
- Overview of Java Messaging Services (JMS)
- Overview of Enterprise Application Integration (EAI)
- Overview of Service Composition
- Overview of Enterprise Service Bus (ESB) & JBI
- Overview of BPEL (Business Process Execution Language)