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Java EE Introduction

- Java EE Overview
- Java EE Technologies
- Java EE Architecture
- MVC
- Servlets and JSP with the JSP Standard Tag Library (JSTL)
- Web Application Basics □ How the Web works, Thin Clients, TCP/IP
- HTTP overview, Brief HTML review
- Overview of Java EE, servlets & Web applications.
- Servlet Basics
- Servlet API
- HTML Forms
- HTTP: Request-response, headers, GET, POST
- Overview: How Servlets Work
- Servlet Lifecycle: init(), service(), destroy()
- Requests and responses
- Core Servlet API: GenericServlet, ServletRequest, and ServletResponse





- HTTP Servlets: HttpServletRequest, HttpServletResponse and HttpServlet
- Accessing Parameters
- Additional Servlet Capabilities
- HTTP headers and MIME types
- RequestDispatcher: Including and forwarding
- Sharing data with the request object attributes
- Sharing data with ServletContext attributes
- Error Handling
- JavaServer Pages
- Basics and Overview
- JSP architecture
- JSP tags and JSP expressions
- Fixed Template Data
- Lifecycle of a JSP
- Model View Controller (MVC)
- Model 1/Model 2 Architecture
- Data Sharing among servlets & JSP
- Object scopes or “buckets”
- Request, application, session and page scope
- Predefined JSP implicit objects (request, session, application,





- `<jsp:useBean>`
- `<jsp:getProperty>`, `<jsp:setProperty>`
- `<jsp:include>`, `<jsp:forward>`
- Using Custom Tags
- Custom tags overview
- Reducing JSP complexity
- Tag Libraries
- Tag Library Descriptor (TLD)
- Loading a tag library in a web app
- The JSTL
- JSP Expression Language (EL)
- Using custom tags
- The `c:url`, `c:param`, `c:forEach`, `c:out` tags
- More JSP Capabilities and Session Management
- HTTP as a stateless protocol
- Hidden form fields
- Cookies: Overview, API, Using cookies
- Session overview: Cookies and session tracking
- HttpSession
- Putting data into a session object
- Retrieving data from a session object
- Using session data in servlets and JSPs





- Additional JSP Capabilities
- Exception handling and error pages
- Directives (page, include, others)
- Import declarations
- Multithreading considerations and data safety
- SingleThreadModel interface
- Additional JSP Capabilities
- JSP Directives
- JSP Error Pages
- JSP and Java
- Declarations, Scriptlet overview, Scriptlet syntax
- More JSTL
- Overview of JSTL libraries
- The JSTL Expression Language
- Expressions, Type Coercion, Operators, String concatenation, Implicit Objects
- The Core JSTL Library
- General Purpose: c:out, c:set, c:catch
- Conditional: c:if, c:choose,
- Overview of other capabilities
- Additional Topics





Servlet Filter overview

- Filtering examples, lifecycle, & filter chains
- Filter API, Modifying a request, Modifying a response
- JDBC
- Introduction Relational Database and JDBC Overview
- Overview, Table Relationships, Web Based Data Access, JDBC Characteristics
- JDBC Architecture, JDBC API Overview
- DriverManager, JDBC Drivers
- Naming databases with JDBC URLs
- Connecting to a database
- Connection interface, Establishing a connection
- DataBaseMetaData
- Handling Database Exceptions
- Data Access
- DAO – Data Access Objects, O-R Mapping, Value Objects
- Processing Database Data
- Executing statements, precompiled statements and stored procedures Processing ResultSets,
- Dealing with Null data
- Updating, inserting, retrieving data





- Controlling Transactions
- JDBC Driver Types
- DataSource
- Java EE and DataSource, Using JNDI
- Connection Pooling
- Overview, Usage, Advantages





Overview of Spring Technology

- Shortcomings of Java EE, Spring Architecture

Spring Introduction

- Managing Beans, The Spring Container, IoC, DI
- Configuration Metadata – XML, @Component, Auto-Detecting Beans

Dependencies and Dependency Injection (DI)

- Dependency Inversion, Dependency Injection (DI) in Spring, DI Configuration – XML, @Resource

Working with Bean Properties

- Configuring Value Properties, Property Conversions, Setter / Constructor Injection

Spring Expression Language for Configuration

- Configuring and using lists, sets, etc.

Additional Capabilities

- Factory Methods, Bean Aliases, Definition Inheritance (Parent Beans)

The Spring Container and API

- ApplicationContext
- ClassPathXmlApplicationContext, FileSystemXmlApplicationContext, Constructors, Usage





- Resource Access – Overview, Resource Implementations
- Validation
- Overview, JSR-303
- Declarative Validation, @NotNull, @Size, @Min, etc
Configuration, Injection
- Bean Scope and Lifecycle
- Bean Scope Defined, Configuring, Inner Beans, Bean Creation
Lifecycle, Lifecycle Callbacks

BeanPostProcessor, Event Handling

- MessageSources
- Defining and Using Resource Bundles, Localization/I18N

Annotation Driven Configuration

Stereotypes: @Component, @Service, @Controller, @Repository

Java EE 5 Annotation Support

Defining Custom Annotations

Autowiring

Java Based Bean Metadata (JavaConfig)

Overview – code-centric Configuration

@Configuration, @Bean, and @Value

Importing and @Import





- Autowiring in Configuration Classes
- Mixing XML Configuration and @Configuration
- XML vs Annotation Based Configuration
- Other Capabilities
- SpEL – Spring Expression Language
- Validation

Database Access with Spring

- Issues with JDBC / Typical JDBC Flow
- Introduction to Spring DAO Support
- Spring Database API, (Simple)JdbcTemplate, (Simple)JdbcDaoSupport, DataSources,
- Working With and Configuring, <list>, <set>, With Bean Refs, <map>, <props>
- Queries and Inserts
- RowMapper, ParameterizedRowMapper, Passing Arguments, queryForObject, query, update
- Additional API Capabilities
- Additional query methods, Passing Type Arguments, queryForList, FetchSize, MaxRows
- Using Spring with Hibernate





- Overview of Template Approach, SessionFactory configuration
- Using Contextual Sessions
- Using Spring with JPA
- LocalEntityManagerFactoryBean,
LocalContainerEntityManagerFactoryBean,
JNDI,PersistenceUnitManager
- DAO Support – @PersistenceUnit, @PersistenceContext

Aspect Oriented Programming (AOP)

- Overview of AOP
- AOP Basics, Aspect, Joinpoint, Advice, Pointcut
- Introduction to Spring AOP
- Capabilities, Configuration (Annotation Based and XML),
Weaving, Joinpoints
- Using Aspects
- Defining Advice, Configuring Pointcuts, Targets and Proxies
- XML Configuration with <aop:>

AspectJ Pointcuts, Autoproxies

- Using @AspectJ Annotations





Spring Transaction (TX) Management

- Intro to Spring Transaction Management
- Overview, Component TX Model, TX Propagation, Declarative Transactions, TransactionManagers
- Using Spring Transactions
- Annotation Configured Transactions
- @Transactional and its settings
- XML Configured Transactions
- new <tx:*> elements, Configuring tx:advice, and tx:attributes
- Defining the TX advisor

Introduction to Spring Web Integration and Spring MVC

- Integrating Spring with Java EE Web Apps, ContextLoaderListener, WebApplicationContext
- Spring Web MVC Overview, Capabilities, Architecture
- Spring MVC Basics
- DispatcherServlet, Configuration, mvc Namespace
- Controllers, @Controller, Handler Methods
- @RequestParam and Parameter Binding
- View Resolvers
- Writing Controllers, @Controller, @RequestMapping, @RequestParam, @PathVariable
- Forms and Binding, Spring Form Tags, @ModelAttribute





Overview of Spring Security

- Overview – Capabilities, Architecture
- Introduction to Spring Security
- HTTP Security
- Method Security
- Annotation-Based Security
- Expression-Based Access Control
- Authentication Providers





Hibernate Course Syllabus -Introduction to Hibernate

- Issues with Persistence layers and Object-Relational Mapping (ORM)
- Hibernate Overview and Benefits
- Hibernate architecture overview
- POJO (Plain Old Java Object) Based Mapping
- Getting started with Hibernate quickly
- Overview of the Hibernate distribution
- Configuring Hibernate
- hibernate.cfg.xml file
- SessionFactory configuration
- Connection properties, Database dialect
- Configuration class, Session Interface
- "Hello World" Program for Hibernate
- Mapping a Class
- Persistent Entity Class, Hibernate Mapping
- File, Mapping the Entity Class
- Primary keys: Id property, Generated Id
- Hibernate Type System
- Working with sessions and Persistent Objects
- Logging – log4j Overview and configuration for Hibernate





Optimistic Locking / Versioning

- Detached Objects and Optimistic Locking
- Versioning overview and Using Versioning
- Locking Objects

Relationships

- Object Relationship Overview
- Mapping Collections of Value Objects
- Entity Relationships: 1-N, N-1, N-N, 1-1
- Mapping Entity Relationships
- Uni and Bi-directional Relationships
- The Relationship "inverse"
- Cascading Over Relationships
- Queries Across Relationships (Lazy and Eager)

Inheritance Mapping

- Entity Inheritance with Hibernate
- Table-per-class mapping
- Table per Subclass mapping
- Table per Concrete Class mapping





Additional Querying Capabilities

- Projection Queries, Aggregate queries
- Bulk updates and deletes
- Native SQL Queries
- Query Filters

The Criteria API

- Overview of the Criteria API
- Working Querying with the Criteria API
- Query by Example

Hibernate and Java Persistence / EJB 3

Overview of Java Persistence / EJB 3

- Relationship between Java Persistence and Hibernate
- Overview of Annotations
- Mapping Entities with Hibernate Annotations
- The EntityManager, Persistence Context and Persistence Unit
- Working with Transactions – EntityTransaction, Managed, and Unmanaged Environments
- Inserts and Updates
- JPQL – Java Persistence Query Language
- Versioning
- Relationships





Advanced Topics

- Components and Multi-Table Mapping
- equals() and hashCode()
- Caching and Efficiency
- Design Considerations

*** Syllabus can be modified based on your requirement**

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