Phase 3 :

8 classes

Day 1 : 25-06-2022

Spring framework and Spring boot

Creating Rest Full Web Service using Spring framework as well as Spring boot.

Junit testing using 5.x

MVC :

View -🡪 JSP or HTML

Controller 🡪 Servlet

Model 🡪 Java Bean link with table

Service class pure business logic

Dao class : using jdbc or hibernate.

Resource class : database connectivity

JSP is a type of servlet when we run jsp program internally it will convert to servlet.

JSP and Servlet object creation taken care by web container. It is a part of server ie tomcat server.

Issue with Model

EJB : Enterprise Java Bean

View -🡪 html or jsp

Controller -🡪 servlet

Model -🡪 EJB

JEE : Servlet, JSP and EJB

To run EJB program we require EJB container. Which is part of Application server. Jboss, Web Logic, Glashfish server.

Application server is heavy.

EJB is very complex to the develop the application.

Spring framework is replacement of EJB Application.

Spring Framework Vs EJB

Java technologies

.net framework

Framework : framework contains lot of pre-defined classes and interfaces which internally connected to each other to perform specific task. Framework internally follow standard. Framework also known as implementation of design pattern. Design pattern means best practice or solution of repeating problem.

Framework is not a final product it is a protocol or template. So if we develop any application using framework 70 to 80% task done by framework. We have to write 20 to 30% code to make final product.

Collection framework is like a data structure.

Html template

Struts : Struts is type of open source framework provided by apache (tomcat) which is also known as web framework . which internally follow MVC architecture. Provided lot of API for view layer, model layer and controller layer.

Struts is known as Controller centric framework.

JSF : Java Server Faces. JSF is a open source framework provided oracle. Which internally follow MVC architecture. JSF is replacement of JSP.

JSF is known as View centric framework.

Hibernate : Hibernate framework is use to improve DAO layer. Hibernate is a replacement of JDBC.

Spring Framework: spring framework is open source light weighted framework which is also known as layer architecture framework or onion architecture framework. Which help to improve all layer in the application.

Spring provide lot of pre-defined module which help to improve layer like

1. Spring core
2. Spring context
3. Spring MVC : spring MVC is known as Model Centric framework.
4. Spring DAO : Data Access object
5. Spring ORM
6. Spring REST
7. Spring AOP
8. Spring boot
9. Spring security
10. Spring cloud
11. Spring micro service
12. Spring integration

Etc

Spring core and Spring context

IOC : Inversion of control : IOC is a concept. It is also known as programming design pattern. In place of creating or maintaining any resource like object explicitly allow to create and maintain by container. Pull from container whenever require and use it and leave it.

Web Container will create the object of those classes if the class is type of servlet or jsp it will not create the object for normal classes like java bean, server or dao.

EJB container. It will create the object of classes only if those class are type ejb.

Spring framework is light weighted framework not a part of any server and it will create the object normal class that class is known as in spring framework as POJO (plain old java object).

DI : Dependency Injection : DI is a implementation of IOC.

We can do totally 3 types of DI

1. Constructor Base DI
2. Setter Base DI
3. Interface DI

Spring framework support 2 types of DI ie constructor base and setter base DI.

We can do DI in spring framework using two ways

1. Using XML file configuration
2. Using Annotation

DI using XML file configuration

Day 2: 26-06-2022

Autowired

Autowired is a features of Spring framework which enables us to inject the object or complex object dependency injection implicitly rather than explicitly.

Autowired byType means it must be provided only one bean tag details for that class. Not more than one.

If you want more than one bean class then we can use byName. In byName id name and reference of that class must be match.

DI using Annotation

If we want to do DI for normal POJO class we have to use @Component annotation. This annotation is known as generic annotation.

@Component // <bean class="com.Employee" ></bean>

If we want to pull the object in main class by default id consider as class name according to camel naming rules. If class name contains one word the id name must be in lower case like for Employee class id name is employee. If class name contains more than one word then id name must be like EmployeeDetails then id name is employeeDetails. By default id follow camel naming rules.

By default @Component annotation is not enable we have to enable this annotation using xml file or using configuration class with few more annotation.

@Component

@Autowired

@Value

@Scope

Day 3 : 07-07-2022

DataSource : providing the source of the data. DataSouce is use to provide the Database connection in proper manner with the help Application Server.

Using JNDI (Java Naming Directive Interface) lookup we will search resources in application server.

Spring framework with DataSource features. (we are going the improve model layer) with the help of JDBC

*DriverManagerDataSource*

*It is pre-defined class provided by spring framework which help to achieve datasource using spring framework without depending upon any server. Datasource help to us to provide the database connection.*

Phase 4

CSS it is like a spring framework

Bootstrap it is like spring boot

@Component : POjo or JavaBean generic annotation

@Service : Service layer annotation

@Repository : Dao layer annotation using jdbc or hibernate.

Spring DAO or JDBC : Spring framework provided pre-defined class JdbcTemplate which wrap the JDBC code.

JDBC provided only few api is Statement, PreparedStatement and CallableStatemnet.

Spring MVC : Model View Controller :

Spring MVC is a type of spring module which help to improve the controller and model layer as well as we can improve view layer using Spring form tags.

Spring MVC internally follow MVC architecture. It provided FrontController design pattern. Spring MVC provided pre-defined class is DispatcherServlet as a FrontController. It is type of controller which control all sub controller. In Spring MVC we have to configure this controller in web.xml file or may be java class.



@RequestMapping : This annotation is use to map the url pattern. This annotation we can write on class level as well as method level. This annotation is use to map our request.

@Controller it is like a Servlet. It provide more features than servlet.

class MyController {

@RequestMapping(value=”hello”,method=RequestedMethod.GET)

public ModelAndView sayHello(HttpSession hs,HttpServletReqeust req) { // DI for HttpSession

//coding…… or call model layer

ModelAndView mav = new ModelAndView();

mav.setViewName(“display.jsp”);

return mav;

}

}

We have to configure DispatcherServlet front controller in web.xml file

<servlet>

<servlet-name>dispatcher</servlet-name>

<servlet-class>org.springframework.web.servlet.DispatcherServlet</servlet-class>

</servlet>

<servlet-mapping>

<servlet-name>dispatcher</servlet-name>

<url-pattern>/</url-pattern>

</servlet-mapping>

DispatcherServlet once receive request from view technologies. It will search spring configuration file start with pre-fix servletname-servlet.xml file.

Day 4

In DAO layer want do want

core jdbc

jdbcTemplate

Hibernate

Spring ORM : Object Relation Mapping : Spring doesn’t provide any orm tool. It provide use some dependencies which help to integrate with existing orm tool like hibernate or jpa.

**Dependencies**

Spring MVC

Mysql connector

Spring jdbc

Spring orm

Hibernate

Spring ORM module provided pre-defined class ie *org.springframework.orm.hibernate5.LocalSessionFactoryBean*

*Which help to integrate spring framework with hibernate.*

In DAO layer if we want

1. Core jdbc then we have to do the DI for DriverManagerDataSource.

*org.springframework.jdbc.datasource.DriverManagerDataSource*

1. If we want to do JDBC template then we have to do the DI for JdbcTemplate.

*org.springframework.jdbc.core.JdbcTemplate*

1. If we want to Hibernate we have to DI for LocalSessionFactoryBean

*org.springframework.orm.hibernate5.LocalSessionFactoryBean*

Day 5

09-07-2022

Spring boot: Spring boot is a spring module. But this module not help to do any specific task. Spring boot module is use to do bootstrap for all spring modules.

Spring boot provide RAD features(Rapid Application Development).

Spring boot is a basically in which bootstrap or quickly start up a simple or complex spring application with configuration.

Spring boot = all spring modules – XML file + few annotation + embedded web server.

Spring boot itself is a standalone application (which contains main method). Which help to develop any type of application mainly web application.

Spring boot component

1. Spring boot starter
2. Spring boot auto configurator
3. Spring boot CLI (Command Line Interface)

Spring boot starter : The main responsibility of Spring boot starter is use to combine a group of common or related dependencies into a single dependencies depending upon the type of application you are developing.

Spring boot web starter

Spring boot testing starter

Spring boot jpa starter

Spring boot security starter

Spring boot aop starter

Spring boot auto configurator To develop spring based application it required lot of configuration using xml file or annotation.

The main responsibility of Spring boot auto configurator is to reduce the spring configuration using xml or annotation. In Spring boot doesn’t contains xml file but adding few annotation it provide configuration details.

Spring boot auto configuration is responsible to provide all auto configurator details.

@SpringBootApplication = @Configuration + @ComponentScan + @EnableAutoConfiguration

Spring boot with

1. Maven : maven providing configuration file ie pom.xml.

Xml base

1. Gradle : no xml file not a part of spring framework or gradle tool.

Xml less

Spring boot cli : it provide features to run the Spring boot application through command prompt.

Spring boot with DI

Spring boot with Web Application (Web Starter) : web starter internally provided in build web server ie tomcat. Spring boot no need to add web.xml file as well as spring configuration file. No need to add Front controller ie DispatcherServlet.

If we want to add any database configuration details or any other details spring boot provided properties file or yml file.

application.properites

Or

application.yml

In this file we have to configure all spring boot configuration details.

Spring boot with 1.56

80% to 85% auto configuration default classes loaded.

Spring boot with Web application ie web starter

Spring boot with View as JSP with Login Page Example

Spring boot with MVC (model view controller ) Dao layer using JPA.

Hibernate is a Framework

JPA (Java Persistence API) is a technologies. JPA is a type of EJB.(Enterprise Java Bean).

JPA is a specification and Hibernate is implementation base upon the JPA.

Starter :

Web starter

Jpa starter

Mysql connector dependencies.

Jasper for JSP as a view

index.jsp

<a href=”storeEmployee”>Store Employee</a>

EmployeeController

@RequestMapping(value=”storeEmployee”,method=RequestedMethod.GET)

public String storeEmployee() {

return “storeEmployee”;

}

storeEmployee.jsp

form with id,name,salary with submit and reset button.

16-07-2022

Web Service :

Giving the service for web application when two application running using different technologies or language.

Amazon or online shopping --------------------🡪

Java or Asp.net or php or python Credit card asp.net

Debit card php

Net banking python

Phone pay node js

Google pay java

Paytm etc

Etc

Java Req -🡪

Amazon XML/JSON Google pay

Java 🡨Asp.net res Asp.net

XML : eXtensible Markup language

JSON JavaScript Object Notation

2 types of web service

1. SOAP base web service : Simple Object Access Protocol. SOAP is base upon SOA (Service Oriented Architecture).

Using SOAP Web service we can share the data between two technologies only in the form of XML.

XML

DTD

XSD

Xpath

XSTL

XSL

XQuery

JAX\_B

1. RESTfull web service : Representational State Transfer. According to REST full web service we can consume and produce the data in any format base upon application or client requirement. Like XML, JSON, plain text, html etc.

Restfull web service doesn’t allow any standard. It is like style to expose our resource servlet, jsp or spring boot as web service.

Employee emp = new Employee();

emp.setId(100);

emp.setName(“Ravi”);

emp.setSalary(12000);

XML

<Employee>

<Id>100</Id>

<Name>Ravi</Name>

<Salary>12000</Salarty>

</Employee>

JSON

{“id”:100,”name”:”Ravi”,”salary”:12000}

MVC :

Model Layer : JavaBean /Entity, Service class, Dao class and Resource class.

Controller :

@controller annotation then view must be jsp or html.

@RestController : if controller is restfull web service then view can be any other technologies. Like asp.net, php, python, plain js, angular or react js.

Controller and Model no view

REST API

Class Supervisor {

private Employee emp;

private int supervisoId;

}

Get method

1. Return string message
2. Return string message in plain text format
3. Return string message in htm format
4. Return string message in xml format
5. Return user-defined object in json format
6. Return collection of user defined object in json format.

We can pass the value for rest api get methods using two ways

1. Query param

URL?key1=value :single value

url?key1=value&key2=value : multi value

by default html form with get method internally use query param concept.

1. Path param

URL/value1 :single value

URL/value1/value2 : multi value

Get method is use to get the resources.

If method is get we can all through URL or using hyperlink.

Select query

Post : This method is use to store the resources like employee, customer, order, account etc.

Post method we can’t call through URL or hyperlink. We can call post method with form with method as post.

To verify post, put and delete method we have to use browser rest client plugin like Arc or post man etc.

Insert query

Put : This method is use to update the resource.

Update the query

Delete

17-07-2022

Spring boot with Rest full web service with DB (Spring data)

Creating project using spring initializer

<https://start.spring.io/>

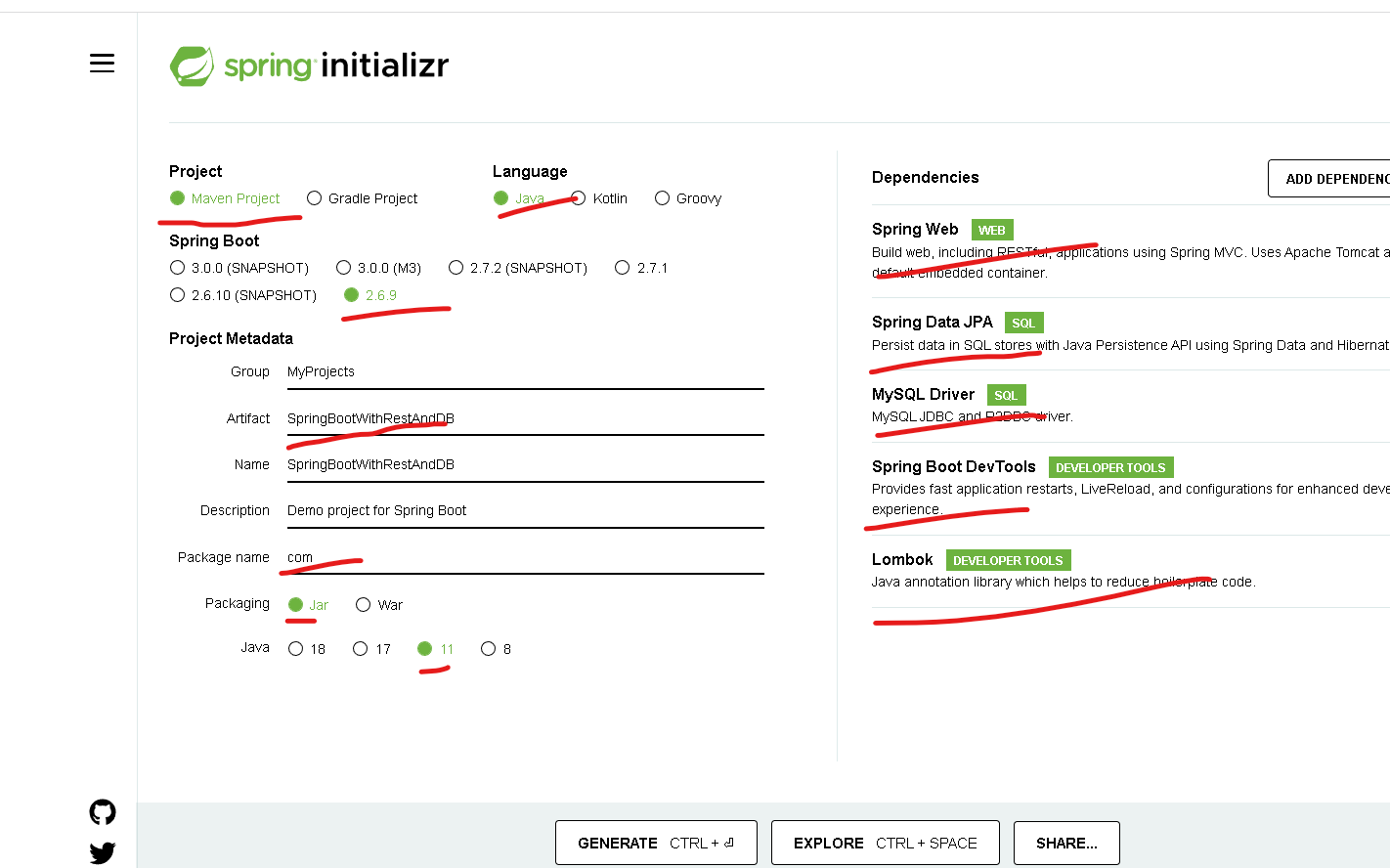
**Spring web : it is use to create the web application or rest full web service**

**Jpa : to connect database using jpa or spring data.**

**Mysql : it provide mysql connector to connect mysql database**

**Dev tool : it will automatically refresh the application if we do any changes.**

**Lombok : it provide getter and setter and constructor for java bean class without writing explicitly.**



Testing : Testing is use to find the defect or error or bugs in the application.

Read a, b

Compute sum = a+b

Write b

We are going to check the function functionality without main method working or not.

public int add(int a, int b) {

int sum = a+b;

return sum;

}

Public String checkUser(String name, String pass) {

Logic

return success

Or

return failure;

}

Testing mainly divided into two types

1. Black box testing

Input Process output

1. White box testing

Input process output

Unit testing is a type of white box testing. Where individual component or code of software are tested. Generally we write the code in function or method or classes or modules or procedure.

Junit : jUnit is a open source framework provided set of API which help to do the unit testing.

Junit testing with 3.x version

Junit testing with 4.x version

Junit testing with 5.x version

Junit test suite : it is use to combine more than one test case.

Junit test case : it is a type of class which contains more than one function or methods which help to test function functionality.

TestNG