Phase 2

Day 1

14-05-2022

9 Days

JavaEE (JEE ) : Java Enterprise Edition

Servlet

JSP

JDBC

Hibernate

My SQL Database (self-learning).

Self learning (spring framework)

Phase 3 :

Spring framework and Spring boot

Phase 4 :

UI : HTML,CSS,JS (Self learning) Typescript and Angular framework

Phase 5 :

Testing

Docker

Jenkin

Kubernetes overview

AWS Overview

Java

J2SE J2EE J2ME

JavaSE JavaEE JavaME

JSE JEE JME

Java Standard edition Java Enterprise Edition Java Micro edition

Core Java It is use to create the

Standalone application web application.

Or

Desktop application

https://[www.google.com](http://www.google.com) --🡪 URL (Uniform resource locator)

http : hyper text transfer protocol secure (protocol)

www : world wide web

google 🡪 domain

com 🡪 commercial

http/https (req)-----🡪 server

Client Server

🡨----------http/https(res)

HTML/HTML5

CSS/CSS3

JS (JavaScript)

JEE

Spring and spring boot

Asp.net

Php

Python

Node JS

HTML 🡪 it is use to display the content on browser.

CSS 🡪 it is use to apply good look and feel of the contents.

JS🡪 Programming on web page or action on web page.

JEE : Java Enterprise Edition

JEE contains three modules ie Servlet, JSP (Java Server Pages ) and EJB (Enterprise Java Bean).

To run and deploy the server side technologies we required server.

Application point of view the server are divided into 2 types.

1. Web Server : Tomcat (Apache company), JEE Server
2. Application server or app server : Glashfish, web logic, jboss etc.

In Servlet, JSP and EJB no main method.

In server side technologies we compile the program and deploy this application on server.

Server contain container. Container is a part of server which is also known as engine or run time environment. Container is responsible to execute servlet, jsp and EJB program means load the class, create the object of that class, call the life cycle method and destroy the object.

If Server is type of web server which contains only one type of container ie web container. Web container is responsible to execute servlet and jsp program.

If server is type of application server which container different type of container like web container, ejb container, jms container etc. web container is responsible to execute servlet and jsp program and ejb container is responsible to execute ejb programs.

Application server provide extra features like connection pooling, thread management, resource management, security etc.

Development mode we use web server

Production mode we use application server.

Core java (AWT and swing).

Servlet : Servlet is a normal java program(but no main method) which help to create the dynamic web page on server side.

Servlet API : Application Programming interface.

import javax.servlet.\*; servlet is a package which contains set of classes and interfaces.

Import javax.servlet.Servlet; it is a interface which contains set of abstract method.

5 methods

init, service, destroy, getServletInfo, getServletConfig

among that init, service and destroy is known as life cycle method. life cycle methods means it will call automatically.

public class Demo implements Servlet {

we have to override all five methods mandatory.

}

GenericServlet : It is a type of abstract class which internally implements Servlet interface and provided the body for all method except service methods.

public class Demo extends GenericServlet {

so we have to override only one method ie service mandatory.

}

HttpServlet : it is a type of abstract class which internally extends GenericServlet. This class provided the body for service method as well as provided some extra method in the form of doXXX like doGet, doPost, doPut, doDelete etc.

doXXX is not a life cycle method. They wrap service method and provide some extra functionality.

public class Demo extends HttpServlet {

we have to override doGet, doPost, service(but not advisable). Don’t use service method use doGet or doPost.

}

GenericServlet use all type of protocol it http, ftp, smpt

HttpServlet : it is use only http protocol.

Web.xml is known as DD file (Deployment descriptor file).

Servlet and servlet-mapping tag is use to map the request.

<http://localhost:9393/SimpleServletApp/Hi>

<http://localhost:portnumber/ProjectName/UrlPattern>

through hyperlink or form (default) method consider as get. And it will call servlet doGet method.

if method is get the information send through url using url re-writing technique.

Syntax

URL?key=value&key=value&key=value

If method is post , then information send through body part. So post method is secure.

Day 2 : 15-05-2022

We can call doGet method through URL, Using hyperlink as well as form with method as get (by default method consider as get).

If method is get it will send the data through URL in the form of key-value pairs like

URL?key=value&key=value&key=value

Through get method we can send maximum 255 character data.

Get method is not secure.

We can call doPost method with form method as post we can’t call doPost method through URL as well as hyperlink. If method is post it will send the data through request body part. Post method is secure. But performance wise it is slower than get method.

RequestDispatcher : It is a interface which provided set of methods which help to navigate from one page to another page base upon the conditions.

Syntax

RequestDispatcher rd1 = request.getReqeustDispatcher(“path”);

If target page is servlet page then we have to write the URL pattern as path.

If target page is html page then we have to write the pageName.html

rd1.forward(request,response); : we can get the output of only target page.

rd1.include(request,response); : we can get the output of source + target page.

Session Tracking :

Http protocol is known as state less protocol. If any client send the request to server base upon the request it will give the response back to client. Next time if client send once again same request it consider as new client

Session : it is a collection of http request and response within a particular period of a time.

To track the session is known as session tracking.

1st request -----------🡪

2nd request + cookies file (session id)-🡪

Client Server

🡨-------1st response + cookies (with session id)

Using some technique and API we can track the session.

1. Cookies : Cookies is a small text file created by server when client send first request to server. Cookies files contains lot of information with session id and this file stored in client machine.

Limitation of cookies : Client can make disable cookies option in browser.

Cookies not a secure. Any one can hack the cookies files.

1. URL re-writing technique : this is technique we were use if cookies option is disable in client machine we were adding session through URL.

?sessionId=asfsaf&AS^^ASFafsafs666as6fsaf

This technique is good if cookies is disable in client machine.

But it work only with get method not with post method.

1. HttpSession : HttpSession is a interface which provide set of method which help to track the session.
2. SSL : secure socket layer : using application server or with certification we can make https call to do secure session.

JWT (Json Web Token)

JSP (Java Server Pages)

Limitation of Servlet

1. Servlet is normal Java program if we do any changes in servlet program we have to re-compile and re-deploy the application on server once again.
2. In Servlet if we want to write any html code or (presentation logic). It must be written in pw.println(“<b>Welcome to Servlet</b>”); inside pw.prinltn everything string consider. So IDE doesn’t provide any help to write html code.
3. Servlet is complex. If we want to display any simple message through servlet we have to make normal java class that class must be extends or implements type of servlet. Then we have to override life cycle method, then we have to create the PrintWriter class object and we have to provide the servlet class details in web.xml file or using annotation.

JSP : Java Server Pages .JSP is tag based scripting language which help to create dynamic web page on server side.

JSP Tags

1. Scripting tag
   1. scriptlet

<%

Java code (The code which we write inside doGet or doPost)

%>

* 1. declarative tag

<%!

Variable declaration

%>

* 1. expression tag :

<%=

Expression or varaibleName

%>

* 1. <%-- JSP Comments -- %>

1. Implicit object
   1. out : out is equal to PrintWriter class object.
   2. request : it is equal to HttpServletRequest interface reference.
   3. response : it is equal to HttpServletResponse interface reference.
2. Action tags
   1. Jsp include
   2. Jsp forward
3. JSTL Tags

Day 3

21-05-2022

Limitation of JSP

1. JSP is not a secure. If we write business logic or database logic everyone can see the code.
2. JSP is a type of servlet. Mean when we run the jsp program internally It will convert to servlet. Ie phase is known as page translation phase. So performance wise jsp is slower than servlet.
3. In JSP we can’t use set of line code again and again like method. We can include whole jsp jsp or forward jsp page. But can’t include set of line of code.

Can we write the business logic or database logic in servlet inside doGet or doPost method?

Yes we can write, But if we write simple or complex business logic or database logic inside doGet or doPost method that logic become local to that servlet. We are not calling doGet or doPost method it will call by container. So same logic we can’t use once again.

So we have to write the business logic in separate normal java classes and those classes is known as service class. Service class which contains pure business logic. Inside doGet or doPost method we have to create the object of service class and call the business method.

According to standard if html or jsp page contains forms tag with property that form must be map to Java bean class.

JavaBean : it is a type of normal class but we have to follow some rules

1. Class must be public
2. All instance variable part of Java bean class must be private .
3. For each variable we have to write two method ie setter and getter.
4. Setter method is use to set the value and getter method is use to get the value.

Login.jsp (View )------------------🡪LoginController (Servlet )------🡪 (in controller receive the value from form, then create the JavaBean class object, set the value . Then create service class object class service method and pass the JavaBean class object --------------🡪LoginService (check the username and password) if correct it return success or failure.

In Servlet base upon the result it will re-direct to success or failure page.

Scope object : In Web Application ie Servlet and JSP we are not creating the object of class. Object creation taken care by Web container.

class A {

int a=10;

}

class B extends A{

A obj = new A();

}

If Servlet or JSP contains in type of variable and if we want to access those variable in another page ie servlet or jsp.

In Web Application we can share the data between servlet or jsp to another servlet or jsp using scope object concept.

1. Page scope or servlet scope
2. Request scope
3. Session scope
4. Application or ServletContext scope

Page scope or servlet scope : Instance variable in servlet is known servlet scope variable or object.

In JSP if we declare the variable in declarative tag that is known as JSP scope variable or object.

So if you want to access the variable from servlet to jsp or vice-versa we have to set the value in scope object.

Request scope

request.setAttribute(“key”,value); in servlet or jsp set it.

request.getAttribute(“key”); in another servlet or jsp get it.

In Servlet we can move from one page to another page using

1. RequesttDispatcher method : this method is belong to request object.

Which provide two method include and forward. Includes means source + target as a one page. Forward means we will get only target page.

1. sendRedirect method : this method is belong to response object. response.sendRedirect(“pageName/urlpattern”). If we use sendRedirect method we can see the output of only target page. Like forward belong RequestDispatcher.

But RequestDispatcher forward method doesn’t destroy request it maintain old request. sendRedirect method destroy old request it will generate new request.

If we set any value in request scope and if we use RequestDispacher forward method still we can get value from request scope. But in response.sendRedirect we can’t get the value because it will generate new request.

Session scope : session scope hold the value if request also get destroy.

Same method we can use in session scope also.

If we want session object in Servlet we have to create with help of request object.

HttpSession hs = request.getSession();

In JSP web container provided session object ie implicit object.

If session get destroy then you can set the value in ServletContext in servlet or application implicit object in jsp.

To get the ServletContext object we have to take the help of init method. init method contains ServletConfig reference as parameter.

Day 4

Program

Input

Process

Output

Limitation of file system

1. data redundancy (storing same record again and again or duplicate record).
2. Data consistency (format of the file).

Info.txt

Id/name/age

1/ravi/21

22-05-2022

Data : raw fact

Information : processed data or meaningful data.

Database : we are storing the data in table format.

Dbms : Database Management System : it is a software which help to store the data in table format.

Excel sheet : DBMS

In excel sheet we can store the data in table format.

Employee Detail

Employee

Id Name Age

100 Ravi 21

101 Ramesh 22

TrainerStudentDetails

TId TName Tech SId SName Age

1 Raj Java 100 Seeta 21

1 Raj Java 101 Reeta 22

1 Raj Java 102 Meeta 23

2 Ajay Python 103 Keeta 24

RDBMS : Relational Database Management System

Trainer

PK(primary key)

TId TName Tech

1 Raj Java

2 Ajay Python

Student

PK(Primary key) FK(Foreign key)

SId SName Age TSID

100 Seeta 21 1

101 Meeta 22 1

102 Keeta 23 2

103 Teeta 24 null

PK : if column is primary key it doesn’t allow duplicate. It doesn’t’ allow null value. in single table we can make only one column as primary key.

FK : Foreign key is use to refer the primary key. If column is FK it will allow only those values which present in primary key column it can allow duplicate. It can allow null value.

These all are RDBMS database.

MySQL, Oracle, Db2, SQL Server 2022, postgres SQL etc

My SQL is type of open source RDBMS database.

All these databases use SQL (Structured Query language) which help to interact to with database

In Virtual lab open the terminal

mysql –u root –p

Password : Simplilearn

show databases : this command is use to check the databases available in your login .

syntax to create the own database

create database databasename;

Example

Create database university\_batch

use databaseName This command is use to switch to existing or created database.

Example

Use university\_batch

show tables : this command is use to check number of tables present in database.

Syntax to create the table

Employee

Pk

Id Name Salary

Number type string type float type

create table employee(id int primary key,name varchar(10), salary float);

if you want to check the structure of the table we can write the command as

desc employee; This command is use to verify the table structure.

To insert the record in table

Insert into employee values(1,’Raj’,12000);

To view the records from database we have use to command as

select \* from employee

to retrieve the records with conditions.

select \* from employee where id=1;

select \* from employee where name ='Ajay';

select \* from employee where salary > 15000;

delete the record with condition

delete from employee where id=5;

update query

update employee set salary = 35000 where id=1;

using any database we store the record but we can’t create the application.

Using programming language we can create the application but we can’t store the data permanently.

JDBC : Java database connectivity : JDBC is a API (Application Programming interface) which provided set of classes and interfaces which help to connect the any database through Java technologies to insert, delete, update and retrieve the records using Java.

Connecting database through Core Java program (main class)

JDBC always throw checked exception. So whenever you are writing the JDBC code you have to write try catch and throws mandatory.

We have to load the driver. Driver is a pre-defined class provided by vendor whose database we are going to connect.

Java provided pre-defined class ie Class (name of the class itself is a class which contains forName() static method).

Class.forName(“driverName”);

There are totally 4 types of driver

Type 1 : from java8 onward type 1 driver removed.

Jdbc odbc bride driver

Type 2

Jdbc native api driver

To use this driver we have to downloads native api base upon the database.

Type 3   
 jdbc net protocol driver

To use type 3 driver we require application server like webpshere, weblogic

Type 4

Thin driver or pure driver.

If we want to use type 4 driver all vendor provide their class in the form jar file which help to connect their database.

We are going to use type4 driver for mysql database.

5.x version

8.x version

We have to establish the connection.

JDBC provided pre-defined class ie DriverManager which container getConnection is a static method which takes 3 parameter url, username, password. This method return type is Connection interface reference.

JDBC provided pre-defined interface

Ie Statement and PreparedStatement

Both are interface which provide set of method which help to do the operation on table.

Now we have to create the reference of statement interface.

With help of Statement reference you have to call executeUpdate() method. this method is to do DML operation. If operation done successfully it return > 0 else generate exception or zero depends upon the query.

If you want to retrieve the record we have to use the

stmt.executeQuery(“select query”); This method return type is ResultSet interface reference. It is like a iterator which help to retrieve the record one by one.

PreparedStatement is a type of interface which help to do dynamic query with parameterized query concept.

Performs wise PreparedStatement is faster than Statement because in Statement each time query get compile in java side and execute in database side. But in PreparedStatemant query compiled only once and execute n number of times.

28-05-2022

MVC : Model View Controller

View --🡪 Presentation Logic -🡪 HTML or JSP

Controller --🡪 Servlet (type of servlet )

Model ----🡪 Normal Java classes

JavaBean class ---🡪

Service class ---🡪 This class is use to write any simple or complex

Business logic.

Dao class (Data Access Object )---------🡪 This class contains pure database logic

Ie using JDBC or hibernate.

Resource class --------🡪

JSP provide three types of directive tags

1. page
2. include : it is use to include static or dynamic jsp or html page to current page.

<%@ include file=”pagename.jsp” %>

1. taglib

29-05-2022

Student Table

Sid Sname age Class

1 A 10 5

Teacher Table

TId TName Age

1 Ab 35

Subject

Sid Subject

1. Phy
2. Che

Classes

Cid Class

100 1st

101 2nd

102 3rd

1st hyperlink add student

2nd hyperlink add teacher

3rd hyperlink add classes

4th hyperlink add subject

5 th hyperlink to make the relationship

Teacher Id

Subject Id

Rid or ClassId

6th to display all details.

04-06-2022

Limitation of JDBC

1. Using JDBC we can’t store java object directly in database as well as we can’t retrieve Java object from database. We have to write code or logic in DAO layer to convert Java Object into query format and vice-versa.
2. JDBC use sql language. SQL is database dependent language.
3. JDBC throw checked exception and exception hierarchy is database dependent.
4. JDBC doesn’t support relationship. Is a relationship (inheritance ) and has a relationship.

class Employee {

}

class Manager extends Employee { Manager is a Employee

Address add = new Address();

}

class Address {

}

ORM : Object Relation mapping ORM is a concept. According to ORM

Object Relation

On Programming side On Database side

class Employee { Employee

id,name,salary variable ID,Name,Salary 🡪 column

}

Mapping

Employee (class name)---- Employee (Table)

Id -🡪ID data types PK

Name 🡪 NAME data types

Salary🡪SALARY data types

Mapping -🡪

Using XML

Using Annotation

The implementation of ORM is Hibernate and JPA (Java Persistence API (Application Programming interface))

Hibernate

Hibernate is a open source framework provided by jboss which provide ORM features.

Hibernate is third party vendor tool. To do programming using Hibernate we require set of jar files.

Maven or Gradle

Both are build tool which help to build the application. Build tool is responsible to compile the program, run the program, creating jar or war files, help to download the dependencies ie jar file.

Maven is xml base tool which use pom.xml file

Gradle is xml less tool.

POM.xml Project Object Model : This file hold the complex configuration details about the maven project.

Now we have to provide the Database Details or database configuration details.

1. ways
2. using xml file (alone hibernate xml file is good)
3. using properties file (with spring framework xml or properties file is good)
4. using java classes

Transaction

Through JDBC by default all DML Operation ie insert, delete and update are auto commit.

Through Hibernate by default not auto commit so we have to do DML operation under transaction.

SQL 🡪 structured query language

Select \* from employee (here employee is table name generally sql is not a case sensitive)

Retrieve all column from a table.

HQL 🡪 hibernate query language (HQL is database independent)

select emp from Employee emp (Employee is a JavaBean class name and emp is a object name) we are retrieve all objects from Employee class.

06-05-2022

HQL : Hibernate Query Language

Select emp from Employee emp : retrieve all object

HQL with conditions

Select emp from Employee emp where emp.salary > 3000

Query qry = session.createQuery("select emp from Employee emp where emp.salary > :salary");

qry.setParameter("salary", salary);

Query qry = session.createQuery("select emp from Employee emp where emp.salary > ?1");

qry.setParameter(1, salary);

retrieve partial object

only one property

select e.name from Employee emp retrieve only name

select e.salary from Employee emp retrieve only salary

select e.id from Employee emp retrieve only id

select e.salary from Employee emp where e.salary > 34000

retrieve more than one property

select e.name,e.salary from Employee emp retrieve name and salary

select e.id,e.name from Employee emp retrieve id and name

Hibernate Support is a and has a relationship

Has a relationship

Divided into three types

1. collection mapping or array mapping
2. association mapping
3. component mapping

Collection Mapping

Student is a class

Sid

SName

Marks[]

Sid SName Marks

Student

PK

Sid SName

1 Ramesh

Marks

CPK

Sid abc marks

1 0 80

1 1 86

1 2 56

1 3 90

1 4 76

Association mapping :

Inside one class we are creating the object of another class it may be one objet or multiple objects.

Four types

One to one person passport

One to many Trainer Students

Many to one Employee Department

Many to many Students SkillSet

Trainer

PK

TId TName Tech

1 Raj Java

Students

PK FK

Sid SName Age TsId

100 Seeta 21 1

101 Meeta 22 1

Many to Many relationship

Employees

empId EmpName

1. Raj
2. Ravi

Technologies

TId Tech

100 Java

101 Python

Employees\_Technologies

EmpId TId

1. 100
2. 101
3. 100

11-05-2022

Creating Servlet, JSP and Hibernate using MVC style maven project

Trainer --🡪 Student

One To Many

Employee -- > Insurance

JSTL : JSP Standard Tag Libraries

Using JSTL we can do core(basic java programming), xml, sql functionality using pure tag base.