How to make Daemon thread

22.1 → daemon thread test

k2.setDaemon(True);

Advance Java

16:46

JDK

JRE → installed JRE.

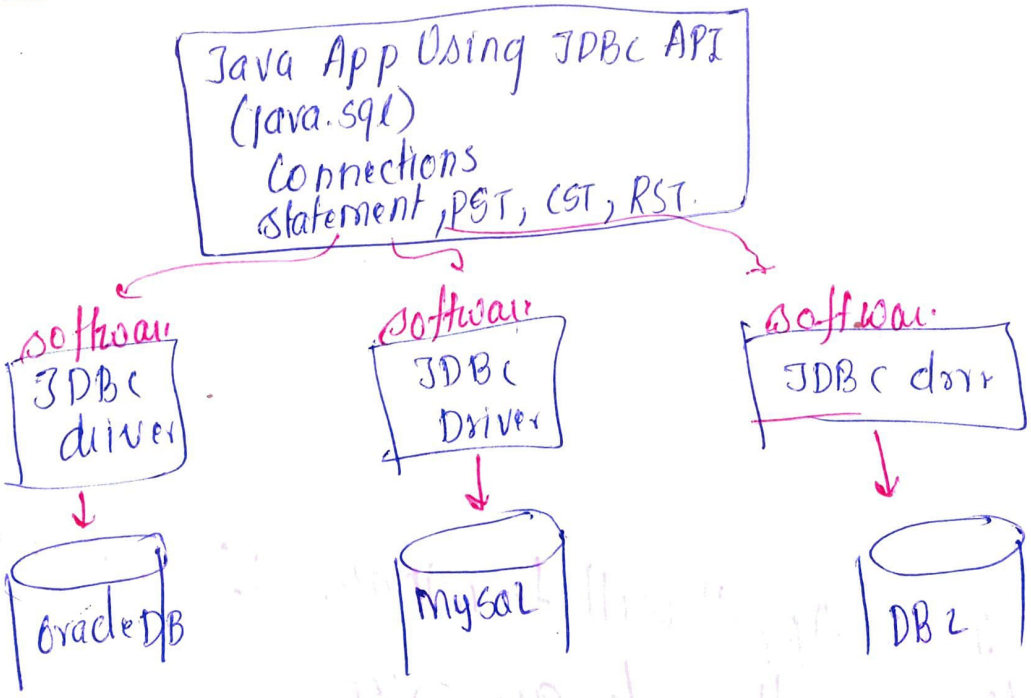
JDBC → Java database Connectivity.

What is it ? → API → Java.sql → to allow prog...
to connect to DB, CRUD, close connection.

Why JDBC?

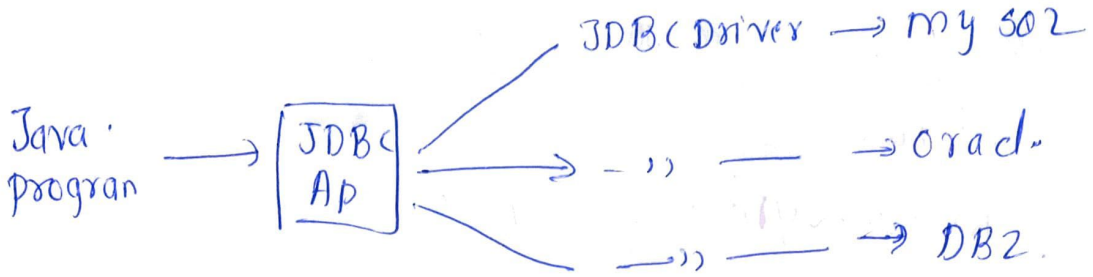
① platform independances → Java
→ allows platform independant apps (database) + DB vendor independant.
→ JDBC allows only Partial Independance
(*) → some part may vary from DBT to DBT.

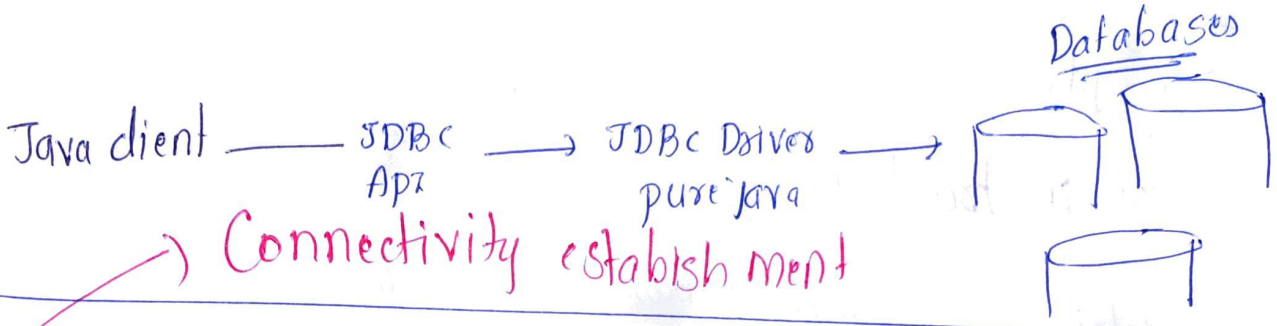
JDBC Driver → guarntees platform independance



How are JDBC are supplied?
in form of JARS.

JDBC driver → platform dependent
JDBC App → independent
When change Database → JDBC driver change.





Create java project → Next → libraries → classpath
→ add external jar 8.0.20 →

⊗ com.mysql.cj.jdbc → Driver.class

Load Type IV JDBC driver in JVM's methodarea Testing.

Api → java.lang.Class<T>
→ forName(FQCName) (Qualified)
Method.

SRC → tester → testconnection → load to MArea

```
main(){
//load JDBC driver in JVM memory (methodarea).
try {
Class.forName("com.mysql.cj.jdbc.Driver");
} catch ClassNotFoundExcepn.
```

optional in standalone but needed on Web server

22. Javadocs → class DriverManager

The basic service provi

→ getConnection (url, user, password);

To know user & password :- → syntax of JDBC URL

status

JDBC URL → Syntax → jdbc:subprotocol:subname

e.g jdbc:mysql://

17:37

DB related instruction

③ create database → create dabas sunbeam21;

use sunbeam21;

→

String Url → "jdbc.mysql://localhost:3306/sunbeam21?

→ use SSL=false&allowPublicKeyRetrieval=true";

main() {

string url =

establis

→ Connection establishment

getconnection (string

java.sql.

try (Connection Cn= DriverManager Connection interface

.getConnection( ); auto closable

{

syso ("connected to DB " +Cn);

}

ⓐ seperating Connections in JDBC utils

Day 1.1. → src → utils → DBUtils.java

```
public class DBUtils {
import java.sql.*  private static Connection cn;
```

(b/c we require only one connection)

```
//add static method to retur "SINGLETON"
   = single in entire java App) to call.

public static Connection fetchConnectn()
{
    if ( cn==null) {
        cn = DriverManager.getConnection (url, "root", "manag..
    {
    return cn;
}
```

Tester → testDButils →

```
main() {
try (Connection cn=fetchConnection()) {
    sysO("connected to dB"+cn);
```

ⓐ

My_emp → empid, name, addr, salary, deptid, join_date.

Query holder — java.sql.connection.

public Statement

Java docs → CreatStatement() throws SQL Exception

Returns → empty wrapper.

ⓐ Display on Java

222 Tester → testStatement

@ 1.1 main() {

try(Connection cn = fetchConnctn();) ⊗

Javadocs → interface Statement → AutoClosable

Statement

⊗ create empty statement → try

Statement st = cn.createStatement() { ⊗

Query Execution

executeQuery()
DQL(select)

executeUpda
DDL → create tab
DML → in/u/Del

execute
Stored
procedur

Javadoc → ExecuteQuery() →

ResultSet executeQuery(String sql)

↳ select x from emp;)

Collection of result

Interface ResultSet → AutoClosable →

→ table of data representing a database result set

Cursor of ExecuteQuery :-

cursor → positioned befor first row.

next → more cursor to next row

↳ can use while loop.

No Semicoln

⊗ add resultset autoclosable)

ResultSet rst = st.execatQuery("select * from myemp");

// rst is pointing to before first row
while(rst.next()){
//read & display;

Rows & colums are counted from 1

Result set processing

How to read Columns ?

public Type getType(int colPos), ,, → (String colName);

from Result set not DB

Generic SQL Type → independant of DB

Char/varchar/varchar → String
number → int/long.
number(m,n) → float/double
date → java.sql.Date
time → Time
timestamp → Timestamp.
clob → java.sql.clob → Character large ob.
blob → java.sql.Blob, Binary large Obj

Conversion syntax

while(empid ← rst.getInt(1)
Read name → rst.getString(2)
add → rst.getString(3)
deptid → rst.getString(4)
joindat → rst.getDate(5)

while(rst.next())
System.out.printf("Empid %d Name %s Address %s
%1.2f. Dept %s joined on %s (

224/ (, rst.getInt(1), rst.(getString(2), rst. . . . . —
(3), (4) (5) rst.getDate()).
}

- → tuesday → web server basic → (2)
What is http → (1)
Tcpip primer

15/11/2021 AS: 17 important

- interface remain same →
- specs remain same → } only implementation changes (oracle/mysql)

JDBC Driver Type 1

Disadvantage: platform independance

Different types of JDBC Driver → 15/11/2021 → 8:31

Object

1. display all emp emp details

sql = select * from my-emp

Steps: 0: add JDBC driver in run time class path (i.e add ext.jar)

1: DButil

1.1: load JDBC driver class in method area

class.forName ("com.mysql.cj.jdbc.Driver")

1.2: Get DB connect

Connection cn = DriverManager.getConnection ("jdbc:mysql://localhost:3306/sunbeam21?"useSSL . . .", name, pw)

if we call connection ten times it will create 10 connection

2. Create statement:

```
Statement st = cn.createStatement();
```

(3) Query : execution

```
select * from
ResultSet rst = st.executeQuery(sql);
```

4) RST => in memory view of selected rows and columns.

Cursor :—→ before first row

next() —→ return boolean —→ True → if next row available
—→ false → if not row available.

Row no start with "1"

(5) Read from cursor

```
while(rst.next()){
rst.getType ⟹ JDBC data type (generic SQL type):
DB independant.
```

(6) Autoclosable → rst —→ st —→ cn —→

Objective → Display details (id, name, salary, joindate) of all emps from a specific dept joined b/w start date & end date

sql = select empid, name, salary, join.date from my-emp where deptid =
and join.date b/w ( )

Javadocs → PreparedStatement

(X) It represents pre parsed or prepared

(X) cn.prepareStatement() —→ populated → holding Query.

(X) prepareStatement() —→ Support "IN" params

22L Image :-

Use Case → limitation of create statement

→ public statement createStatement()
used when we want parameterless Queries
→ non-repeatative
→ public PreparedStatement → Adv of prepared statement
used when we want parameterized Queries
→ prepared cnc → parsing & compilation → 1'
eg dynamic Queries
→ Repeative statemes used for

SQL Injection

(x) is a 10 Top 10 security attack
(x) statement → can be injected easily prone to attacks
(x) prepared → will not be prone to attacks

Prepared statement : compiled and stored → Counter of Rows

? → placeholder (In parameter counted from 1 onwards from left to right

→ I/p from user and access database.

→ Code 2.1 copy DB utils from 1.1 / Tester for Prepared Statement

```
main(){
    String sql = "select * param → Prepared statement
    try( Scanner ()
        Connection cn = fetchConnection();
        PreparedStatement pst = cn.preparedStatement(sql); → X
        // RST → executeQuery X
```

Befor executing query parameters post → in param → ? from left to right.

set in params.

public void setType(int paramPosition, Type val)

Type → JDBC

```
*
{
  syso("Enter dept_id, start date, end date")
  pst.setString(1, sc.next());
  pst.setDate(2, Date.valueOf(sc.next()));
  pst.setDate(2, Date.valueOf(sc.next()));
  pst.setDate(3, Date.valueOf(sc.next()));
```

set in parameters

setDate → Javadocs

String → java.sql Date

valueOf(String s)

yyyy-[m]m-[d]d

Query execution

execution method

Public ResultSet() → prepared statement

public ResultSet(String sql); → Statement

```
try(ResultSet rst = pst.executeQuery())
{ while(rst.next()){
    syso("Emp id %d Name %s salary %.", rst.getInt(1),
    rst.getString(2), rst.getDate(3), rst.getDouble());
```

(count column as per result set)

String sql = "select empid, name, sal,) Date (?) and join dat b/w (?) and (?)

UI and DBT are expected seperate

Layered architecture

228 Relath Database → Tables, rows, columns, primary key
No sql database

DESC my_emp → will be represented as class in java

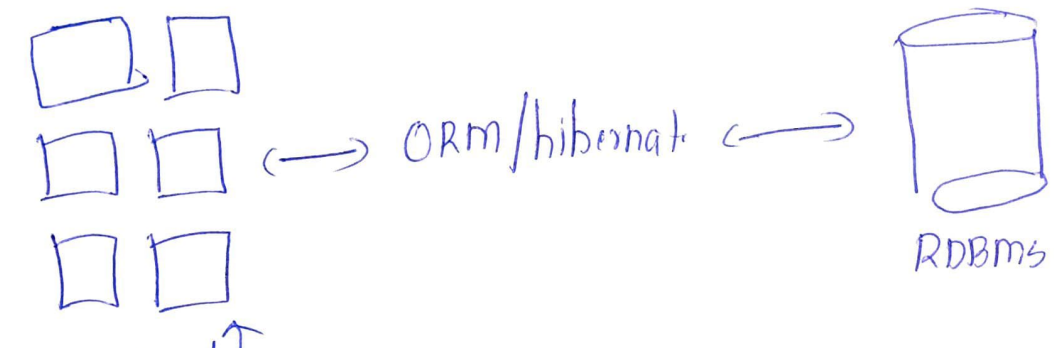
Table columns → non static / non-transient data members

Table Rows → emp class instance

Transform Table → Java

Object to relational Matching (ORM)

ORM overview



Object world	Relath DB
pojo classes	DB Tables
pojo properties	Table column
pojos	Table rows
unique id property	primary key

pojo → plane old java object
Vanila flavoured (no flavour)

⑧ Ordinary object (plane object)

⑧ no business logic; just plane.

Objective: Display (id, n, s, joindate) of all specific emps (above question)

Tester

DAO layer (data access object layer)
DAO i/f → to declare crud requirement
JDBC based class imp
① public Package class.
② state
③ constr

how DAO ret result to Tester?
ResultSet ✗
Collection of pojo

"POJO" → pojo/Entity/model/Domain classes → object view of data
pojo → DB table, Pojo property → Table Colo
Pojo row

DB Layer

DB/Tier/Layer (ERS layer)
Tables/rows/column

→ layered architecture

Code → copy utils → 2.0.2
SRC → pojos → Employee → Creating pojo

class employee {
// private int empId;
private String name;
private String address;
private Double salary;
private string deptId;
private Date joinDate;

Table ~~class~~ → class
Colum → attribute

public Employee(int empId name, salary join Date)
{

}

Getters & setters

}

230 Data access Layer

DAO layer

Naming IEmployeeDao

SRC → interface → DAO

{ add method declaration for getting selected employee.

① Layer → Database (my_emp)

② POJO → Employee

③ Heart of JDBC DAO →

3.1 → Interface

{

1) Getting selected method name.

for methods of DAO

** List<emp> getSelectedEmps(String dept, String strDate, String endDate) throws. {

DTO → data transfer object

Impl class → dao → employeeDaoImpl

class {

@ Override

getSelectedEmployee() {

State

private Connection cn;

private PreparedStatement pstl;

Add Constructor (one time implementation)

// Constructor() {

① get db connection

cn = fetchConnection();

sql = "select empid, name salary ....."

Prepared pst1 = cn.preparedstatm(sql)

Syso (DAO created)

{

(X) clean up method → closing all conection (Database

```
public void cleanupp(){
  if(pst1!=null)
     pst.close();
  if(cn!=null)
     cn.close();
  syso(employ dao clean up);
{
```

→ closing resources cleanup().

Boiler plate = repeatative cod

@ get selected em

① set placeholders → ?

```
pst1.setString(1,dept);
pst.setDate(2,Date.valueOf(strtDate));
pst.setDate(3,Date.valueOf(endDate));
```

→ parameter positio

1 2 3

? ? ?

Execute Query

Result set → method local variabl.

```
try(ResultSet rst=pst1.executeQuery()){
  while(rst.next()){
    Employee e1
    emps.add((new Emp(rst.getInt(1),rst.getString(2),
              rst.getDouble(3),rst.getDate(4)))
  {
  return emps;
}
```

adding to collection

Result Set View

Topmost layer Tester (User interface) TestLayeredApp

```
main(){
  try(scanner()){
  Create Dao instance
  EmployeeDaoImpl dao=new EmployeeDaoImpl();
```

232

Client request servicing phase

Syso(Enter dept start date, end date);

dao.getselectedEmploy(sc.next(), sc.next(), sc.next()).forEach(System.out::println);

Cleanup();

TestLayer AppCrud :→ copied earlier tester

{ boolean exit = false;

while(!exit){

Syso(1. ~~~ 2. ~~~ 3. ~~~ 4 ~~~);

try{

switch(sc.nextInt()){

case 1 :- Get selected emp;

Insertion emp in Database :

3 → no change in db table

3.2 → pojo → add required arg constructor (all args expt empid)

3.3 → DAO →

DTO → Data transfer object (pojo in tester) ← instance / object.

String addEmpDetails(Employee e) throws ;{

↖ add to interface.

Method implementation in DAO

⊗ private PreparedStatement pst1, pst2;

pst2 = Cn.

sql = "insert into my_emp values(default, ?, ? ? ? ?)" ← empid

Dao over

close pst2;

@ public String addEmpDetails(Employee newEmp) throws 233
SQLException {

pst2.setString(1, newEmp.getName());
.setString(2, .getAddress());
.setDouble(3, .getSalary());
(.getDeptId());
(.joinDate());

Query execution → executeUpdate();

DDL

int executeUpdate(String sql);

if no row update = 0 ← int executeUpdate();

if

if(updateCount == 1)
(return "Emp added");

Add case 2 :- Syso(Enter employee detail);
Syso(dao.addEmpDetails(new Employee(sc.next(), sc.next(), ...)));

Update empdetails

4.1) table → No chang
pojo → no chang → plane object of Employ

DAO if String → String updateEmpDetails(int empId, String newDept, Double salinc); throws SQLException.

→ Implemental method → private pst3;

pst3 = cn.prepareStatement("update my_emp set deptId=?
salary=salary+? where
empId=?");

close pst3

234 @Override

```
public EmployeeDaoImp
    pst3.setString(1, newdept);
    pst3.setDouble(2, salinc);
    pst3.setInt(3, empid);
```

Execute Update (DML)

```
if (updateCount == 1)
    return "Emp details updated";
return "failed to update";
```

Case 3 → to update

```
sysout(Enter emp_id, newdept, sal inc)
sysout(dao.updateEmpDetails(sc.nextInt(), sc.next(), ...));
```

---

⑤ Remove Employee

DAO Interface → string deleteEmp(Employee deleteEmp){

```
pst4 = cn.prepareStatement("delete from my_emp where
                            empid = ?");
```

@ → ? position

```
pst4.setInt(1, empid)
```

execute Update:

```
int updateCount = pst4.executeUpdate();
if (uc == 1)
    return "deleted";
return failed
```

---

case 4 → Delete added

Case study:

Transfer fund → stored procedure

```
Delimiter $$
create procedure transfer_funds (
    in sid int,
    in did int,
    in amt double,
    out sbal double,
    out dbal doubl
)
begin
```

Inpu

Stored procedure ↑ the speed of operation

Diff in proced & function

return valu

procedure vs function

- Stored procedure does not return anything

Callable Statement

Statement → pst → CST → CST hierarchy.

- used to execute procedure & function
- To pass in/out, inout params.

2.0.2 → pojos → Account

```
class Account{
    private int accNo;
    private String customerName;
    private String acType;
    private double balance;

    construct();
    toString();
}
```

Add new interface..

```
Dao → IAccountDao{
    String transferFunds(int sid, int destinId, double account)

Dao → Implementation class .. IAccountDao(
    private Connection cn;
    private CallableStatement cst1;
```

236 default constructor

```
Account ( ) {
    cn = fetchConnection ( );
```

Interface Connection
- cn.~~statement~~ createStatement
- cn.prepareStatement
- cn.prepareCall

→ creating statement methods of Statement

Callable → Statement → Returns o/p if fuction

"?" for procedure

{ ? = call <procedure-name>

call <procedure-name> → used for procedure

String ProcInvocation = "{ call <transfer_funds(?,?,?,?)}"

cst1 = cn.prepareCall(procInvoc);

Sysout(acct dao created);

? → Input, Result store

Assignment

solve → Tester ---> DAO (i/f, implclass) ---> DButils ---> POJO / Entity / Model / Controller / View

1. POJO : user, props, def constr
2. DButils
3. DAO i/f
   User AuthenticateUser (String email, String pwd)

DAO impl class

State Cn, pst1;

Constructor :- get the connection from DB utils,
pst1 = select 2 in params.

clean up :- close db resource

CRUD :→ set in params, pst1.executeQuery - - -→ RST.
If (rst.next()) - - -→ Valid login → return new user.
return null.

---

② Change password

I/p → email, password, new password
O/p A message string.

Topics page :-

③ Get All available topic names.
step1 :- Table
2. pojo : Topic
3 DAO (new) I/f, ITopicDao :-
List<String> / List<Topics> getAllTopics()
4) Impl → pst1 : select query

④ Get All tutorial titles under selected topic, ordered in desc manner
of Vlss
I/p → topic name.
e.g = Join query.
① DB Tables → tutorials
② POJO :- tutorial
③ properties : 6
④ DAO : I/f → List<String> getTutorialsByTopicName(String topicNa
⑤ Imp class → select on join on topics & tutorials

234

5 Get specific tutorial details :-

Content varchar[5000].

i/p tutorial id

~~Note: a~~

How to get Seives

show.

Rituals

Registering is Must of o/p

How to add Tomcat Server → Readme

16/11/2021 → Stored procedure Continuation

→ public void cleanUp(){

if (rst != Null)

rst.close();

if (cn != null)

cn.close();

check for out parameters → Register Out Parameter

public void registerOutParameter(int paramPos, int JDBCType);

Informing JVM about JDBC datatype of

DB —o/p param→ JDBC → Java(JVM)

Inform JVM of JDBC Type

Java docs → collableStatement

JDBC Types → java.sql.types.

Double → '8'

Registering param → 4 → (4, Types.Double);
(5, Types.Double);

register out param

cstl.registerOutParameter(4, Types.Double);
cstl.registerOutParameter(5, Types.Double);

IN — set value.
Out → Register its JDBC type with JVM.
} → IN/out/InOut parameters

IN/Out → Both

When to use IN/out/InOut:

IN → @CRUD methods (Service)

Execute Stored procedure.

cstl.execute();

Read Result from Out Params :-

⑥ Retrive the result stored in out param

API of CST →

public Type getType(int ...) throws SQLExecutn:
(Parameter Index)

return "updated src balance" + cstl.getDouble(4)
(Out parameter Pos)
+ "dest balance" + cstl.getDouble(5);

16/11/2021

Adj Java - D3

loading JDBC driver to method area → parsed, tokenised only once
optional in Standalone → mandatory in Web apps

① Create statement → prepared statement → Callable Statement

"empty statement holder"

they are interface

Query Parameters are first sanitised

④ Set IN Params → methods of PST

public void setType(int parampos, Type value);

? position

☆☆☆☆

Table → Pojo class

Column → Pojo attributes

Rows → Pojo object

? → IN/Out Parameter

Execution of stored Procedure

i) Stored Procedure :- step

① stored proc/function exist in DB

② create Callable statement from DB connection

③ API of Connection I/f

public CST prepareCall(String sql)

sql = "{ call procName(?, ? ...) }"

{ } → meant for JDBC Driv. To tranfer this to DB understandable for

Function syntax

Counting in function.

func: "{ (?) = call functionName ((?), (?), (?), (?) ...)}"
1. 2 3 ...

Day 2.1 SRC → Dao, pojo, utils,
→ Account.java

Advance Java

JDK → 11 version
↓
~~Apache~~ Jakarta EE 8 (maintained by eclipse foundath)

- Java EE perspective.

What is J2EE? → Run on any Webservice
It is specificath only (what part only)
Why seperatn?
Database independance.

- which specs? (Rules or Contract)?
specificath of primary services required for any enterprise foundatn.
- Whatis enterprise applicatn?
- it is industry grade platform which are build to operate in a corporate environment.

Vendor of J2EE specs?
— Oracle / sunmicro / Eclipse.

What Tomcat Server gives?

Servelet Apz, JSP APZ, security, Connection pooling, naming Servic.

What is Diff web / & app server?

→ web container + EJB (enterprise java bean) container
+ ALL J2EE services implementatn.

Other options

Apache → tomcat (web server) / Tomee

Oracle/sun – Glassfish

Red Hat → JBoss (wild fly)

Oracle/BEA → Weblogic

J2EE server independance ... Creat and deploy server side app

☆☆☆ layer involved in HTTP request-respona flow

Static Web ✗
✗ in html

Dynamic programming ✓
✗ J2EE, servelet

File Tab → dropdownlist → choose dynamic web projed →
projed → day3.2, Dynamic Web module Version → 3.1

SRc/main/java
build/class → Webcontext → root →
Typically same as folder
Content directory (src/man/webap
☑ Generate Web.xm deployment descriptn.

jar, war

jar
war → Web application archie.

Folder structure

Servelet-api.jar

~~ADD~~ which is compulsory signature folder

Ans → WEB-INF

XML → case sensitive → keep lower

HTML index page

First index.html page →

Src → main → webapp → New → HTML

→ File Name : index → finish

Welcome Messag

```
<body>
    <h4> Welcome 2 web Applicatn </h4>
```

To run on server Lauch server

Right click on project → Run as → Run on server

→ tomcat → finish →

Run client & Server seperate

Chrome :- client side (only browser & Internet)

URL (uniform Resource locator)

http://localhost:8080/day3.2

Port no, URI

Reload → sending multiple request

IDE (server)

Lauch on External client (Redeploy → Run again)

Window → web browser → chrome →

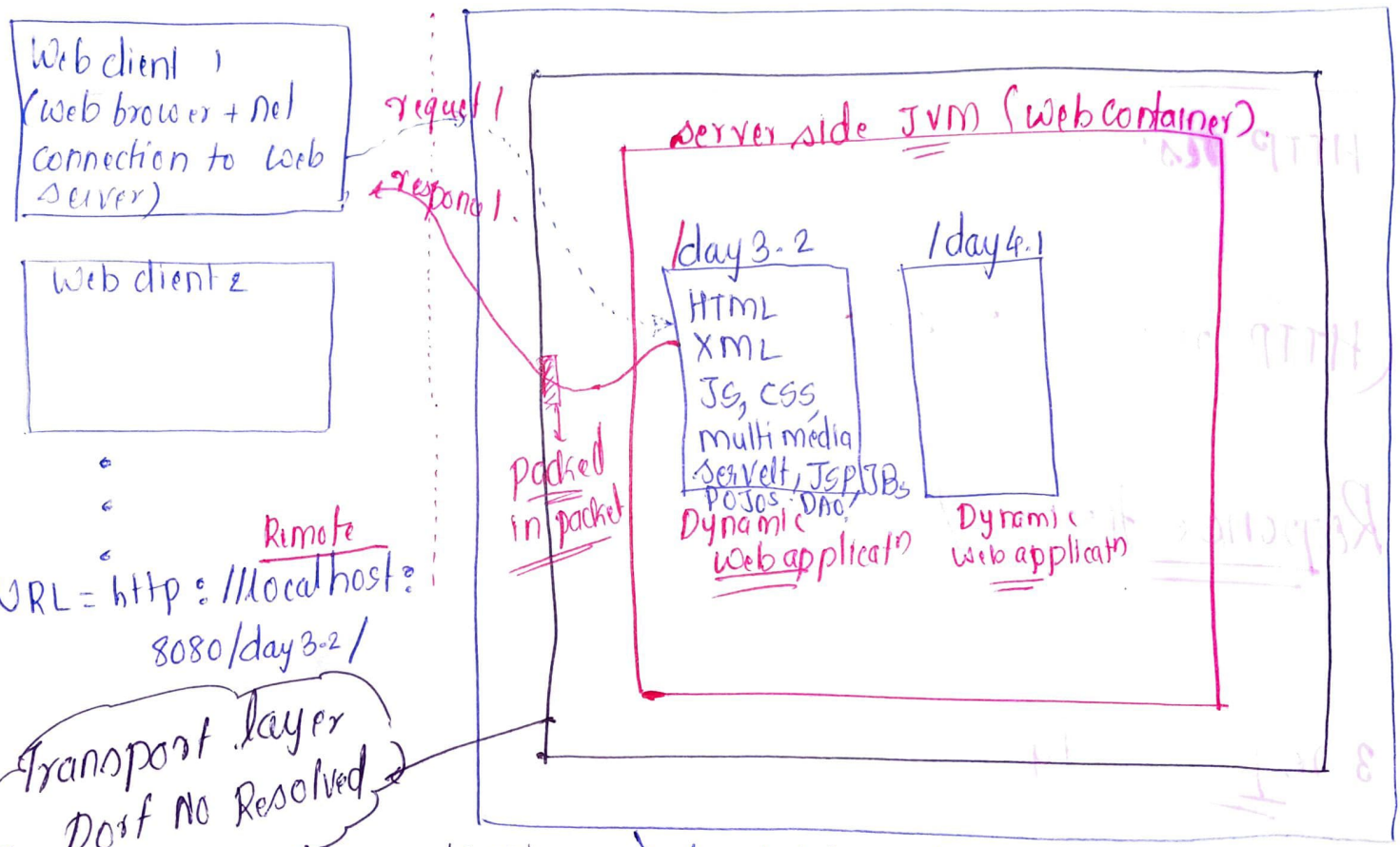
Redeploy

Stopping Servers

Vehicle bar → ■ → to stop

WC → Web Container

☆☆☆ HTTP Request Responce Flow



http → Applicatn layer uses TCP

Port on laptop

⊗ Different services run on different ports

6. **Web container** :- Serverside JVM ... ready made impln of services.

e.g Unit Servlet → **Servlet lifecycl**

e.g servlet life cycle, JSP, + creates req n resp obj.
+session tracking, Concurrency

8080 / Day8.2 / → given to Web container

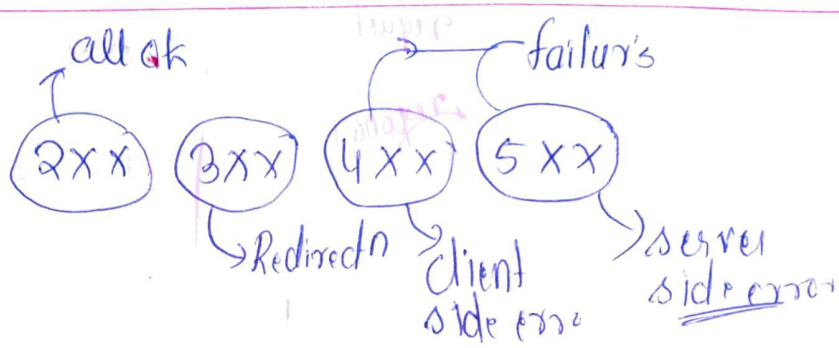
Uri → uniform resource

WC → WebINF → Web.xml

HTTP resp pkt

Resp status code = 1xx

HTTP response packet



Response Headers/

cookies, resp content-type → HTML2 (text/html), cont length,

3. **response body**

static or dynamic

HTTP → **Stateless** → don't remember client, client can send 100 request

** because Tcp connection is closed.

Web developer tool

inspect → Network → request → headers

Why Servelt ?

To add dynamic nature to the web applicatn whose life cycle is managed by wc (web container)

→ life cycle methods → init, service, destroy (wc)

init → called once (dao, instantion)

Service ~~Destroy~~ :- called multiple (ones per every request).

destroy → called once (called by wc)

Job list

① Request processing (programmer will)
② B.L (Business Logic)
③ Dynamic respons generatn
④ Data access (Dao --- class ... managing DAO layer)
⑤ page navigation.

Java docs → javax.servelet.

Interface servelet (

⊗ impl class → GenericServlet → HttpServlet →

Objective: Test basic servlet life cycle

① Step → Stop the server

⊗ src/main/java

↳ Right → new → class ⟹

package → pages

Nam = HelloServlet. No main

@WebServlet("/test");

Public class HelloServlet extends HttpServlet {

does not contain any abstr

@Override →

→ GenericServel → init(), distroy,

@Override
init() {

sop("in init" + thread.currentThread);

@overid
distroy() {

}

@Ova
doget( )
{ //set
resp.setContentType("Text/html");

print writer

char oriented

Method to Generate Response:-(doget( ));

try(PrintWriter pw = resp.getWriter())
{

pw.print("<h4> Hello from Servelt..!! </h4>");

"+LocalDateTime.now()+"</h4>");

How to educate WC (annotatn)

⊗ most important DStructure → Hashmap

Right-click → run as web

17/11/2021 Day 4 Advancejava

popular vendors and thier products

Apache → Tomcat/Tomee, Oracle-Glassfish, Ibom, Weblogi

request response flow ?

URL :- http://www.abc.com:8080/day4.1 → delegated to web container → Webserver Apache

How to change port no

Servers → web.xml → connector → port = "8080".

What is web container ?

- provider runtime environment for dynamic web component (servlet & jspfilter)

Jobs

1) Creating http request & http response object
2)

What is web.xml ?

Deployment discriptor one per webappln

- will be created by programmer
- will be read by web container
- only once at web app deployment time.
- It consist of deployment instruction,

8:38

J2EE Compliant folder structure of web dynamic appln

name of folder → context root

- <SRC>
- directory under root
  Web App
- WEB INF

8:52

---

9) why servlet ?

Ordinary Java class without main, represent dynamic web component

10 Servlet API implementation class in server 8:40 - 9:10

Service (servlet request req, servlet Responce resp)
↳ will be called only after init();

WC → servic → protected servic(http) → get post

doXXXX

doGet →
① step 1 : set responce contentType, (text/html) Sent to client.

client Browser will treate as html.

② step 2 :- To send responce from servlet:
printWriter → character oriented, buffered, o/p stream.
server to client

③ Send dynamic content :

Deployment of servlet :
(i) via annotation
@WebServlet (value = "/validate");

key of Hash map
value => full qualified Named of servlet class

/day4-1/validate → URI -> acts as key of Hashmap

Web containter : in lazy manner behaviour
ex: it will wait for first request

Client send :- http://host:port/day4.1/validate

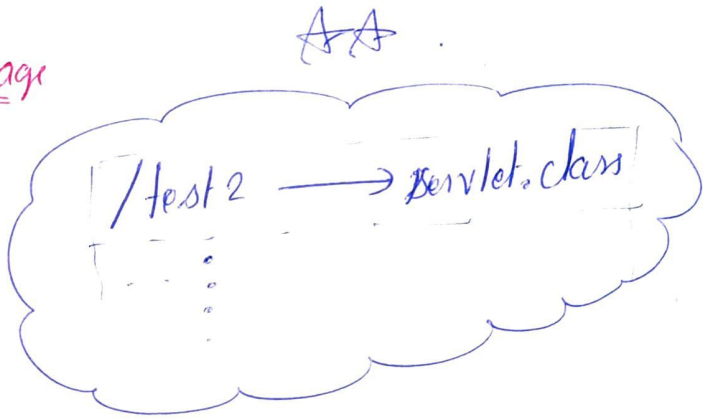
→ steps → in life cycle of servlet → loading of servlet & class object creation → init → service (Generic) → protected service (HttpServletRequest) → doGet(); doPost();

2nd / 3rd nth request :

→ no class loading
→ no init
→ public service → protected service → doPost();

Destroy()

Configuring Servlet using @ XML tags




```
<servlet>
    <servlet-name>abc</servlet-name>
    <class>
</servlet>

<servlet-mapping>
    <servlet-name>abc</servlet-name>
    <url-pattern>/test2</url-pattern>
</servlet-mapping>
```

What is default loading policy of WC for servlet?
lazy → WC will start servlet life cycle after client send first request

How to make WC Eager :- loadOnStartUp

because → getting connection from database is time consuming. hence connection should be started at deployment

time consuming initialisation → WC should be eager

→ javadoc → WebServlet → loadOnStartup

→ start life cycle at deployment phase only

@WebServlet(value = "/test", loadonstartup = 1) (positive.)

Or

XML tag:
<load-on-startup>1</...>

---

src → main → webapp → index.html:
web.xml → remove unwanted.

body
<h5>Lazy init of servlet
<h5>Eager init of servlet.

After click
URL → http://localhost:8080/Day4.1/test1
" " " /test2

IDE shortcut → Right click → servlet (creating Servlet)
package → pages
class name = servlet1 → edit URL mapping → /test1.

→ Add constructor

↳ add init() w/o argument
sysо("in init");

destroy()
sysо("in destroy.

↳ protected doGet( ) {
//set resp content type done for client browser
resp.setContentType("text/html");
Attach char oriented buffer
try(PrintWriter pw = resp.getWriter()) {
pw.println("<h4>Testing lazy init o/"+Locale

println in html
don't use \n in html
newline in html is different

SRC → main/java → new → Servlet → Servlet2

→ url mapping → /test2 → copy code of /test1

@WebServlet(value = "/test2", loadonstartup = 1)

↳ o/p → afterstartup → In init 123 → Eager loading

↳ life cycle of '2' started

How to get class name

servlet1 → sysO('in doget of :" + getclass());

Auto loading modified saved class

automatically class loading modification loaded after

Order of loading

copy servlet2 → servlet3

@WebServlet(value = "/test3", loadonstartup = 2)

o/p → Init 123
Init 1234 → Both will be loaded at init but

2 → 1 1 → 2.

Reading request from client :.

copy input.html → day3 help html → webapp

Default → GET

form tag < action = "test_input" >

URL = /day4.1/f1=madhura&browser=chrome

1st fill form

step1 → add link in Index.htm

< a href = "input.html" > Testing All z/p .

Step 1 :- write servlet

form action

testAU2nput —— URL pattern - /test_input

① set resp content type.

response.setContentType("text/html")

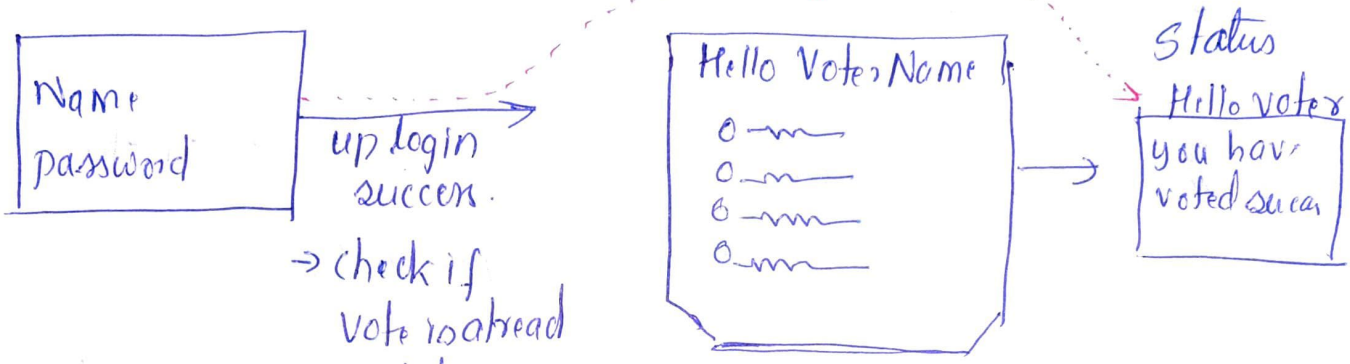
try (PrintWriter)

pw.print

? in url ⟶ start of Query string

Online Voting

:- upon casted voted



Objective :- login - logout flow in online voting app.

login.html ⟶ login servlet ⟶ successfull login -- redirect to candidate list page ⟶ display logged in voter.

New project day4-2 → add web.xml → Finish

3-1

→ copy login form → Webapp.

How To tell which is Welcome page

Web.xml welcome file < login.html <>

✱ Table requirement → Voter details
→ Candidate details → POST

Make "POST"
< action = "authentic" method = "post" > Ritual

Login Servlet

SRC/M/Java → servlet → pages → Login Servlet
URL mapping → /authenticate
→ init(), doPost()
destroy()

```
@Override
doPost( ) {
```

✱
```
@Override
init( ) {
@overrid
doPost ( ){
    response.setcontentType("text/html");
    try{ PW pw = getwriter( )){
}
```

Setting DB Voters

✱ Voter pojo → src/main/java → new class → pojos
→ Voter

```
Voter {
    private int id;
    private String name;
    private " email;
    private " password.
    private boolean status;
    private " Role;
```

Constructor, to string, getter setter.

16

DAO / DButils

Adding JAR files to webapp

→ copy DButil from earlier project
→ SRC/main/java → DButils.
→ ad

Adding JDBC driver to webapp.

① JDBC Jar
→ <WEB-INF>/lib → all jar copied here.
↗ Or
<tomcat>/lib
↘ We need to call every new appl

PUDT ~~TUPI~~ DUPT

DAO → interface → dao
→ IVoterDao.

{
method declaratn for user Authentical
Voter authenticateUser(String name, String pwd) throwSQLEx;
}

Dao → class Impl :

{
private Connection cn;
private PrepareStatement pst1;
Constructor {
cn = fetchConnection();
pst1 = cn.prepareStatement("Select * from voter
where nam=? & password=?");
Sysо(VoterDao created)

DaO - clean up

```
} if(PST1 != null)
    pst1.close()
  if(cn != null)
    cn.close()
}
```

Add Constructor as per requirement

@override authenticate user.

```
{
  pst1.setString(1, name);
  pst1.setString(2, pwd);
```

because we will have only '1' entry

```
try(ResultSet rst = pst.executeQuery()){
  if(rst.next())
    return new Voter(rst.getInt(1), name, pwd, rst.getString(3)
                     pwd, rst.boolean(5), rst.getString(6));
                     ↑ID                  ↑email
                                          ↑status
    return null;
}
```

Servell- will manage all above

init() → instation
do post → authenticate
destroy → clean

→ Eager Start

```
init( //all slow task
@WebServlet(value="/authenticate", loadonStat=1);
init(){ Private VoterDaoImpl dao; → instanh.
surround by ← dao = new VoterDaoImp();
try-catch.  }
```

To Send exception to WC.

Centralised error handling in WebApp

18 ⊛ try() {

Rethrow to WC

Centralised error handling in Webapp

} catch (Except e) {
rethrow it by wrapping it int
Servlet exception
}.
|| ServletException(String msg, Throwab rootcause)
throw e; // error
throw new ServletException("initialisation failed,"+getclass()
e);
}

Destroy() → {

Wrap in RuntimeExceptn

do{ postdao.cleanup()
wrap in try catch

Rethrow not required

try(){
} catch(SQLE e){
throw new RuntimeExcept("err in
destroy(" "+getclass(), e)

Service → protected Service → doPost()

Rethrow used wrapping to WC

try(Pw){
String nm = req.GetParameter("name");
String pwd = —— (" pass");
Servlet has to call Dao
Voter user = dao.authenticate(nm, pwd); —— ⊛

for any server side exception Use :
ServletException()
Generate retry link

⊗ // In case of success print → Success + Voter details)
// otherwise retry link.

```
If (user != null)
    pw.print("<h5>Login Successfull & your details" + user);
else
    pw.print("<h5>Invalid login please + "</h5>");
    pw.print("<h5><a href='login.html'>Retry</a></h5>");
```

Redirect / Navigate automatic (page Navigation) :

P Navigatn

client pull
(after new request Navig

Server pull
" Navigate in same request

Browser Generates

S_1, S_2 (two servlets) → client pull → $S_1 \longrightarrow S_2$
Server pull → $S_1 \longrightarrow S_2$

① clint pull :
⊗ action from client required
⊗ Button, Link click (client + Browser Involved)

⊗ client has not to click any link
auto Redirect

API of HttpServletResponse
void sendRedirect(String)

sendredirect()

13:07

Javadocs → HttpServlet → sendredirect

$S_1 \longrightarrow S_2$

```
response.redirect("S2");
```

Login Servlet :-> if Condition (

if (user != null){
// redirect client to (client pull 2) to list page
// in next request comming from dn.
pw.print("<h5> from login page <5>");
response.SendRedirect("candidate_list");

Automatic Response Generated to Browser

Candidate_list Servlet

Src/main/java -> pages new servlet -> CandidateListPage.

@ WebServe("/candidate_list") URL mapping "/candidate_list"

-> Doget( ) ;

{ // set content type get pw print msg : "from candidate list page" };

response.setcontentype("text/html");

try(PW pw = response.Writer()){

pw.print("<Hu> from candidate list page </h4>");

3. display voter details.

pw.print(<h5> Validate Voter Details" + User + "</h5>);

Name

+request.getParameter("nam

+ "</h5>)

302 -> Browser understands redirect and sends new automatic request -> Location

Default "GET"

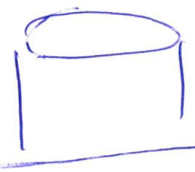
Every request is new Request

flush() :——→ @ before redirect not allowed.

→ 17

16:06 Repeate

user ——→



18/11/2021 Folder structure

WebINF (mandatory)

web.xml (deployment desc of webapp)
Who: we
When: only one @ dep time.
Content: welcome file, servel dep

classes - pojo, dao, ...

<lib> additional jar (e.g JDBC JAR, spring, hibernate

Servlet API → specificatn = Jakarta
implementn = Tomcate.

Servlet-API → <tomcat-install>/lib
Specs → servlet-api.jar ——→ remain same for all servers
Implementatn → Catalina.jar.

↓

Servlet I/f → javax.servlet.Servlet
→ 5 method, 3 life cycle methods

22

Implement by GenericServlet
abstract class
init & destroy - concrete
service → abstract

regarding http servlet Read me

If we direct implement then we cannot extend it & many functionalities

javax.servlet.http.HttpServlet
abstract
No abstract method

this should be overridden

public void init(){
→ to configure
→ dao

popular

b/c we cannot make object of this class

Public service( )

protected service(HttpServletRequest ,)

get post put delete

If we sub class and don't override
→ error 405

so we are to override required only

8:33

Page navigation

Redirect scenario →

CP (client is involved)

SP (

download registerable form

navigation completed in '2' requests

formaction = Urlpattern

Internal working of redirect 2 map

query string

Array String → moderate Hackerrank
Geeks for geek (40 50

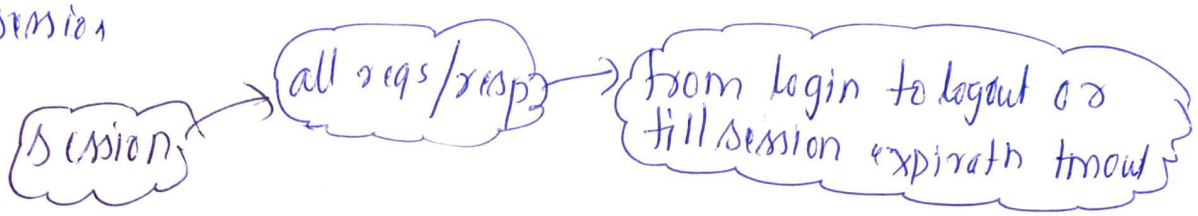
How to remember client

Session tracking

⊗ Conversational b/w client & server (may contain multiple request)
⊗ Since it is stateless hence unable to

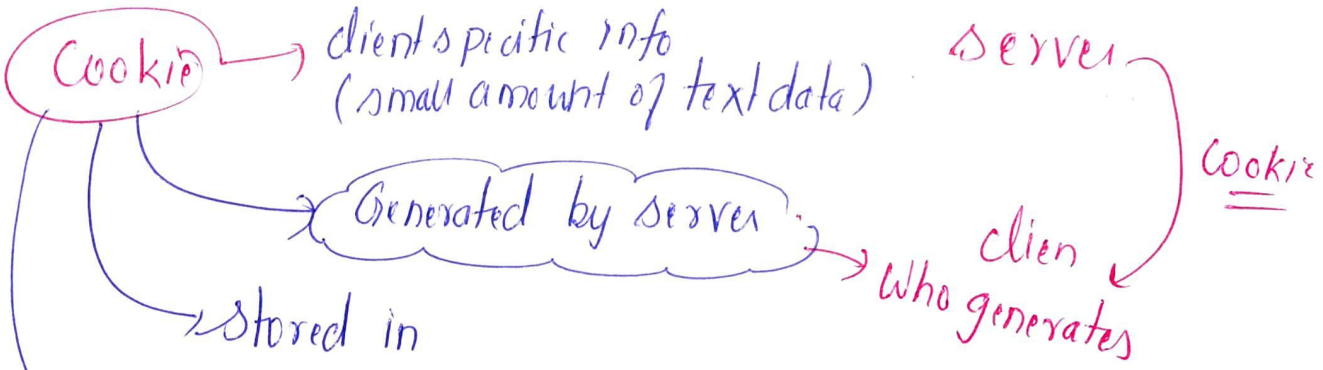
Need of session tracking

① To identify the cln among multiple cln.
② To remember the conversional state of the clnt (e.g: list of purchased books/ shopping cart/ bank account detail/ stocks) through out session



Technique to implement ⟶ Cookie

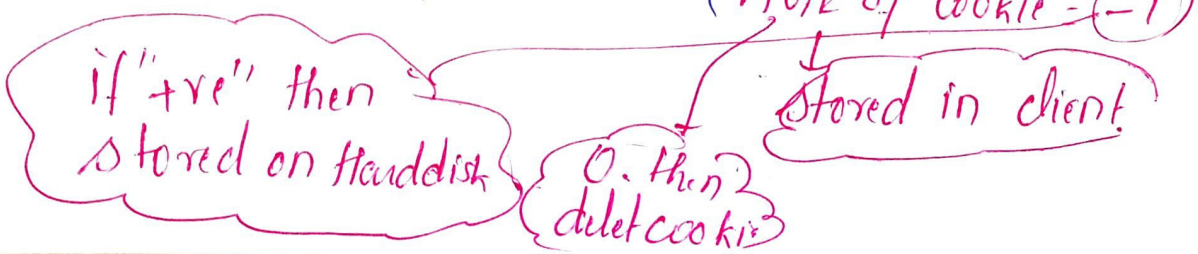
① plain cookie based Approch.



Exchange in headers

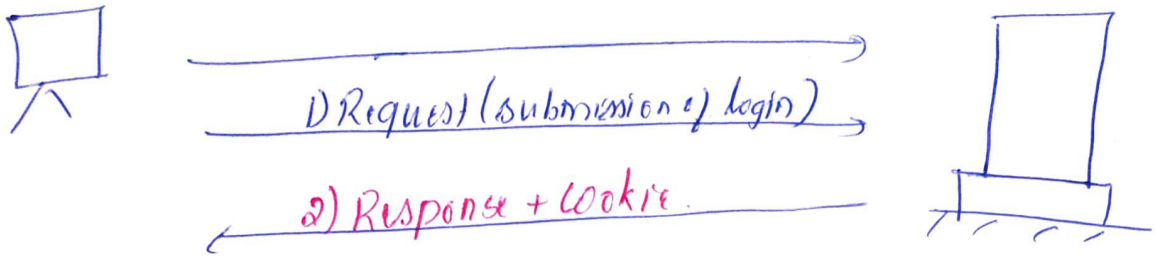
privacy setting : client checks for security check

→ We accept cookies (AGE of cookie -1)



24

client ——————→ same website
(request + cookie) ——————→ retrieve cookie



① Create a cookie

Cookie class

Javax.... cookie (string name, string val) ; ← class

Disadvantage

Only text is allowed
objects ✗
image ✗

Add cookies to resp header

API HttpServletResponse.
addCookie ( ):

Client side:

Cookie enabled → ✓
Cookie disabled → fails miserably.

Stored in browser cache (till age expires)

How to read Cookies

getCookies( ) ——→ return Cookie[ ]

If null → cookies not available

Copy day 4.2 → 5.1 WARNING while copying.

RC → properties → Web project setting → context root [day 5.1]

→ Welcome page → login.html

After submit

/authenticate → server check if there is mapping.

@WebServlet( );

Log: LoginServlet → Add cookie

if (user != null)

before → Redirect →

Step1:- create cookie. //

Cookie c1 = new Cookie (~~nm, pwd~~)

"clnt_info", user.toString());

response.addCookie(c1);

Additional header =

Enable cookies

privacy and other site data → no sites added

(*) How to retrieve validated user from Cookie

Cookie [ ] cookies = request.getCookies();

if (Cookie != null)

{

pw.print("<h4> Validated voters " + request.getparameter("name"))

Retrive get cookie

```
for(Cookie : cookies)
    if(c.getname().equals("clnt_info"){
        pw.print("<h5> Validated Voters detail" + c.getValue()
    }
```

Where to see cookie

Inspect → more → application

Blocking Cookies

add site. localhost:8080/days.1/

---

localhost:8080/days.1/

Disadvantages of cookie

- ⊗ Web developer has to slog more to manage cookies
- ⊗ Cookies can handle only text, storing obj & images is difficult
- ⊗ As cookies "↑" it will result into increased traffic
- ⊗ entire state of the clnt. is saved on the clnt side, if the clnt browser rejects the cookies.
  client

Session tracking based on HttpSession API

Entire state is saved on server side, (HttpSession object)
But the key to this httpsession is still sent to client in form of a cookie (cookie management done by WC)

Only one cookie is main — One cookie

Storage → on Session object → Session Object
observer.

10 client 5 request each → no of session object 10 → Related to client

session object key is sent to "client"

Copy → 5.1 → 5.2 → http session based

Rc → properties → web project setting → context root → S2

Login Servlet :-

```
if (user != null)
```

⊗ cookie based approch

Steps :- HttpSession → get http session();
→ 2/5.

① Get Http SessionObject.
Api of HttpServletRequest
HttSession getSsion

Meaning:- Servlet request wc to i.e created n return a new httpsession object (for new client) or ret existing one from wc's

Step! :-// get httpSession from wc.
// Api of HttpServlet Request
/* getsession()

HttpSession session = request.getSession();

To check new or existing

Session.isNew()

24

How to find out session Id:-

```
Syso("sessionID" + session.getID());
```

predefined name of cookie → Name & Value

JSESSIONID, Val = faq...

How to save data in Httpsession:- Scope (entire scope);

public setAttribute(); → String name, Object attval);

→ Accepts → Objects

server side object

Getting Values from Httpsession

```
hs.getAttribute("clnt_info");
Customer cust=(Customer)hs.
```

---

loginservlet Saving validated email

5.2

```
session.setAttribute("clnt_details", user);
```

Session.GetAttribute( )

Getting user details:-

Get HTTPSession → request.GetSession();

```
HttpSession hs=request.getSession();
syso("New session " + hs.IsNew)
("sessionID " hs.getID)
```

```
Voter client = hs.get("clnt_details")
if(client != null){   → Type cast
syso("validated voter"+client);
syso(
}else
    syso(no cookies session failed);
```

How to remove attribute from session

removeAttribute(String attsName); → removeAttribute

How to Invalidate session

Candidate list page:

add link for logout

Servelt required for log out

```
pw.print(<a href='logout'>Log me out</a>);
```

Logout servlet

@WebServlet("/logout");

```
doGet(){
setContentType("text/html");
    try(PrintWriter pw= response.getWriter(){
        //confirm if client i remembers
          i.get session
        HttpSession session = request.getSession();
        syso("session new = ");
        syso("session ID"+session.getId());
        Get user details
        Voter user = (voter)session.getAttribute("clnt_details");
          if(user != null)
                pw.print(User details from logout page: "+user)
```

```
else {
    pw.print(no cookies);
    //invalidate httpSession
    session.invalidate();
    //
        Visit again →
    //send "visit again" in case admin logged in
}
```

Conditional Rendering

check the role

```
If (user.getRole().equals("admin");
    pw.print("<h5> <a ref='login.html'>Visitagain>
```

(X) checking voter & admin, voted or not voted

loginServlet

before redirectoring

```
If (user.getrole().equals(("admin")) {
    response.sendRedired("admin_page")
} else if (user.isfatus())
        respond.sendRedired("logout");
else
    response.sendRedired("candidate list");
```

Admin Page ⇒ copy logout

```
doGet( )
try(pw){
    HttpSession hs = request.session();
    pw.print("<h4> Welcome Admin, Hello
    Voter admin = (Voter) hs.getAttribute(Cnt_data))
    if(admin != null)
else
    pw.print(session failed);
```

Add → Candidate pojo :-

```
Public class candidate {
        private int candidateId;
        private String name;
        private int votes;
Constructor, Getters, Setters.
```

Dao interface for Candidate

* Method to display all candidate

```
List < Candidate > getAllCandidate(){
```

Impl class ICandidateDao.

```
State cn → psl
psl
Constructor : {
        cn = fetchConnection();
        pst1 = cn.prepareStatement(" select * from Candidate ");
        Syso("dao created);
```

Connection closing only once (Multiple Dao)

add static method in DBUtils :-

```
{ if(cn != null)
        cn.close()
}
```

```
→ public List < Candidate > getAllCandidates(){
        List < Candidat > list new Arraylist < >();
        try( ResultSet rst = cn.pst.executeQ() ){
            { while( rst.next() ) {
                list.add( new Candidate( ... , ... , ... , ... );
            }
        return list;
```

How share resources - all over app.

→ login servlet.

DBUtils.Connection.

We can add Dao/class in http Sessions

add to Sessions ☆☆☆.

Session.setAttribute("Voter_dao", VoterDao);

("Candidat_dao", CandidateDao);

Candidate Servlet :- if(client = null)

pw.print ~~~ ~~~.

Candidate

CandidateDaoImp CDao = (Candi·). hs.getAttribute( )

//Invoke Candid dao methods List of Candi·

List<Candidate> = CDao.getAllCandidates();

Dynamic Form Generatn

pw.print("<Form Action="logout">

for(Candidate c: candidates)

pw.print("<input type="radio" name="candidate_id value=" + c.getcandateId() + ">" + c.getName() + "
");

Lab

How mark session object for GC

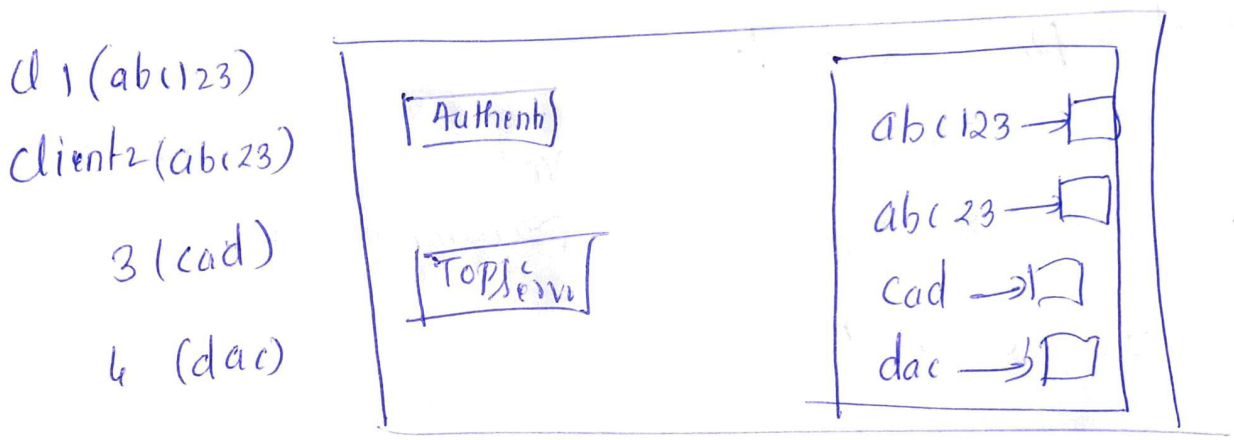
session.invalidate();

response.sendRedirect("candidate_list");

sends empty response
code → 302
header →
location = candidate_list
cookie = JSESSIONID = ...

Browser sends back
http://localhost:8080/day5.2/candidate_lis
+ cookie if enabled

Dynamic Web app



Form → "action" ☆☆⊖

logout page

To check if user has reached logout how? direct or after voting

// Get user details from session.
get user from session.
if (user.isStatus())
else. you have already voted.

else { read from request

Int candidateId = Integer.parseInt(request.getParameter("candidate_id"));

Increament Vote Count :-

Increase candidate → ↑

change status of voter → True.

// get daos from session scope.

CandidDaoImpl candidateDao = ( )session.getAttribute(candidate_dao)

VoterDaoImpl voterDao = ( ) " ("voter_Dao");

Candidate Dao Interface

→ add a method to incr votes for specific candidate

String incrementCandidateVotes() → int candidate id.

Candidate dao Class impl.

pst2 = ("update Candidates set votes = votes+1 where id = ?");

Crease pst2()

pst2.setInt(1, candateId);

int updateCount = pst2.executeUpdate();

if ( ) == 1)

return(success)

return "Votes updath failed";

Voter Dao Interface :- String updateVotingStatus(int voterId)

Voter impl class

```
@override
pst2 = cn.prepareStat("update voters set status = true
int updateCount = pst2.executeUpdate(); where id = ?);
if (updateCount == 1)
    return "voted successfully";
```

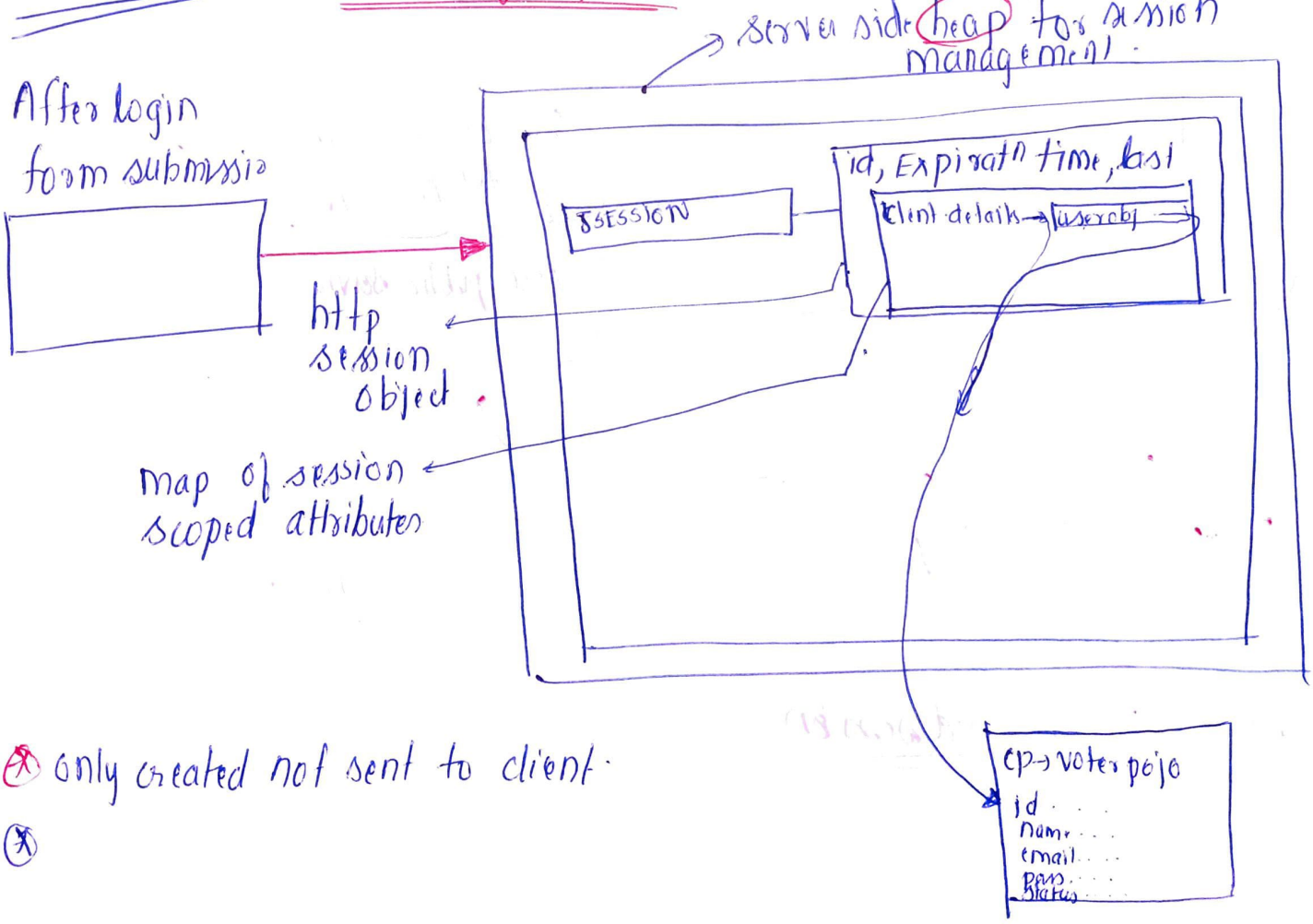
logout page :- Transaction Case : Use case

```
Candate do. incrementCandideVotes(candidateId);
pw.print(voterDao.upadeVotingStatus(candiadeId));
```

visits | top name author content Date.

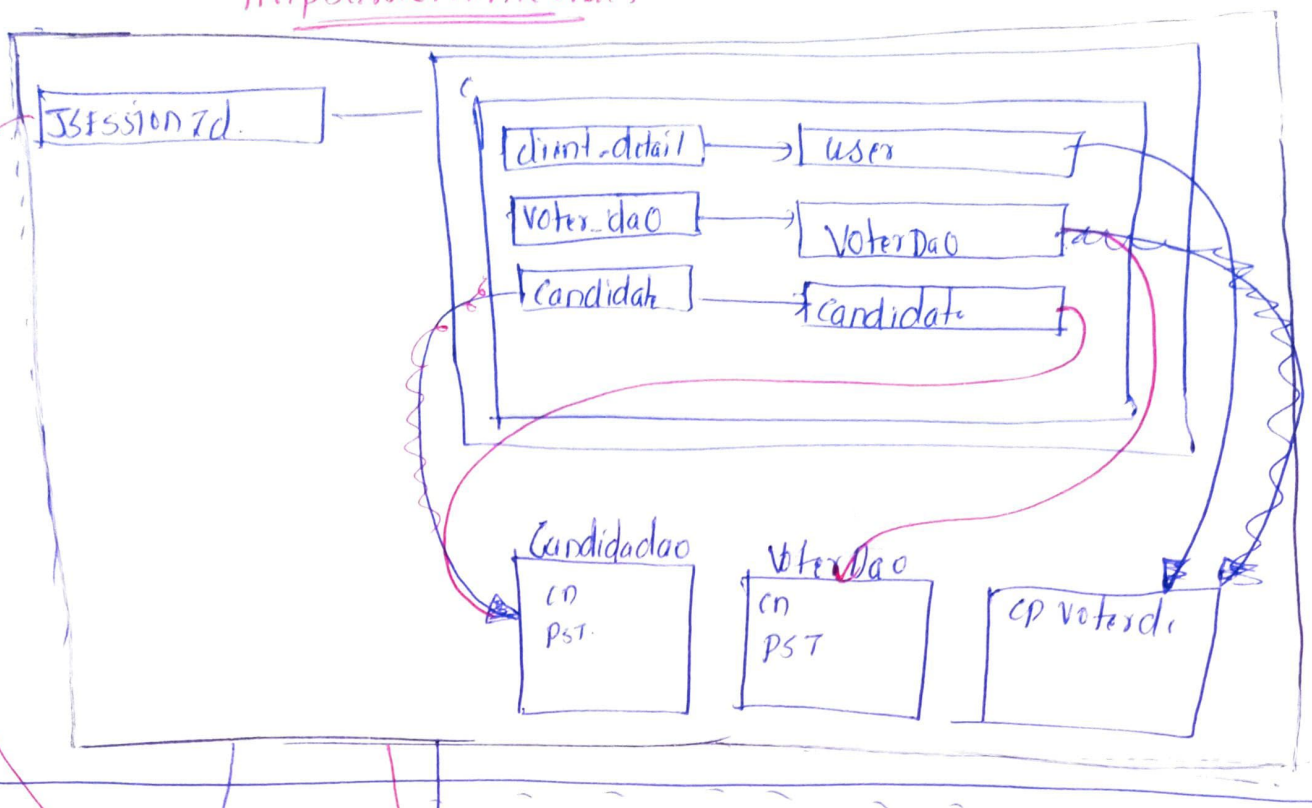
Id | name | author | data | visitis | conte | topic Id.
1 2 3 4 5 6 7

19/11/2021 :- Internals of HttpSession



- only created not sent to client.
-

HttpSession Internals



req 2
http://host:port
/day1/candidate list
method: ~~post~~
cookie: JSESSIONID

Req 1

Cookie response sent to client
Res
SC: 302 | Location: candidatelist
Set Cookie: JSESSIONID abc1234

dnl 1
rama, ramA123
cookie - JSESSIONID
abc123USER

We check if there is servlet matching it
↳ call public service

HttpSession hs = request.getSession( )

Executed on outer map:

VoteDao ← hs.getAttribute ( ) ← inner map

---

new client started session

client 2 → req 21 → JSESSIONID XY21234

id, expiretime, last

client_detail | User2

Outer Map

* holder of session object

Outer < String (value of JSESSIONID), HttpSession >

Inner map

<String (attr name), object>

Servlet Life Cycle (managed by WC)

55: @web application deployment time, WC prepares a map either using servlet tag from web.xml or @annotation (for faster look up.

key = URL pattern (e.g. /authentic)

Value = Fully Qualified servlet class name.

Web container checks load on start up @deploymn)

- specified
- not specified.

specified

* WC starts the init sequence (A)
* WC locates servlet class (from WEB-INF/classes) load to MA (Class.forName()) instantiates it (using default const)
* Create ServletConfig object & populates it with init parameters if any → 2/f.

WC invoke method, public void init() on servlet instance, by passing ServletConfig object to it. Init sequence over, Invoked exactly once in life of servlet.

3rd Servlet Config object → Init() → populated
- ⊗ → null object created
- → i.e empty

for supply initial parameter what is prefered method?
xml → to keep changes external

```
<init-param>
    <param-name>
```

Initialisation of parameter via xml

Day 6.1 project: login servlet
→ comment annotation
→ open web.xml.

```
<!-- login servlet deployment tags -->
<servlet>
  <servlet-name> login </>
</servlet> pages.LoginServlet </> <load-on-startup> 1 </>
<servlet-mapping>
    <servlet-name> login
    <ur-pattern> /authenticate
```

private to servlet


```
<init-param>
    <param-name> dB_url
    <param-value> jdbc:mysql://localhost:3306/
</>

<init param>
    <param name> user name
    <param value> root
</>

<init param>
    <param name> pwd </>
    <  value > root </>
```

Getting init parameters

→ all changes b/c to make database independant

login-servlet:

```
default Constructor() {
    syso("in def ctor of " + getclass + " Config " + getServletConfig;

parameterised constructor(){
    syso("in parameterized ctor");

init(){
    ServletConfig econfig = getServletConfig();
    syso("conf in init " + config);
```

How to Access servlet Specific init param

```
// API of servletConfig : public String getInitParameter(String name);
String url = config.getInitParameter("dB_url");
String username = config.getInitParameter("user_name");
                  ,,                      ("pwd");
```

6.1 DButils — Add to DButils

```
static public void openConnection(String url, String UsesName, String Pass
{   if(cn==null)
    cn = DriverManager.getConnection(url, username, pass);
```

Login servlet : init

```
try openConnection(url, username, password);
```

⊗ parameterized is not called never

"Thread is per request"

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Concurrency in Wc

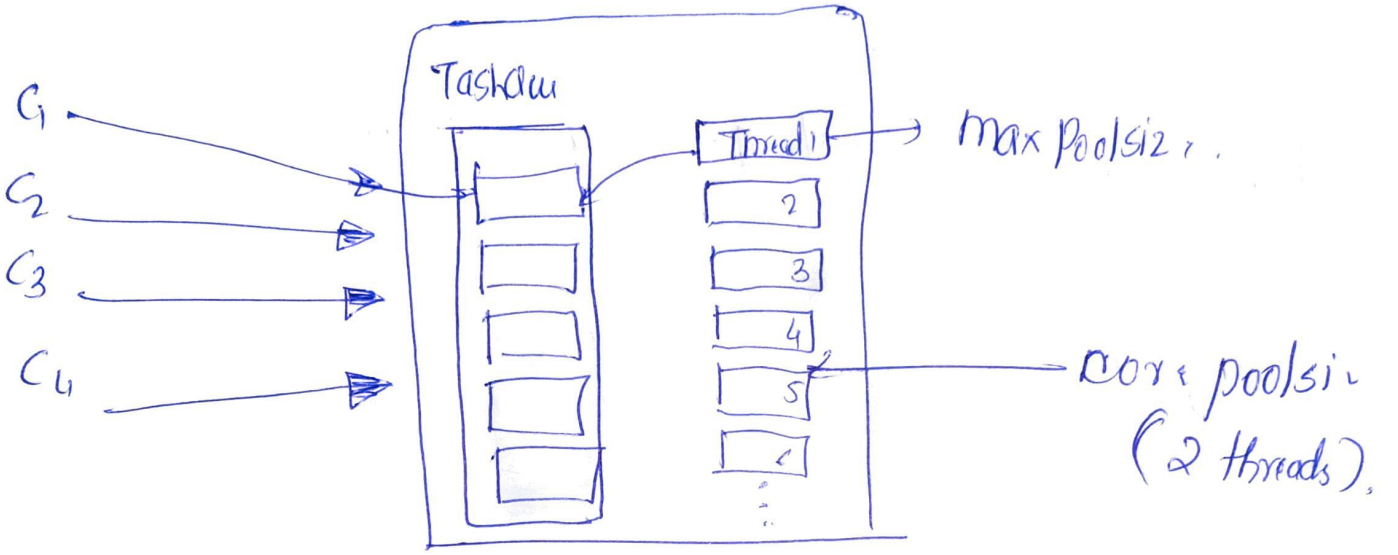
Executer Framework (thread pool executer)

⊗ part of standard Edition :-

Why executer framework?

Thousands of thread creation per request overheads Wc

⊗ everything managed by Web container.



Thread pool is created at "startup" :-

Servlet based and GG2

11:48 → Revise

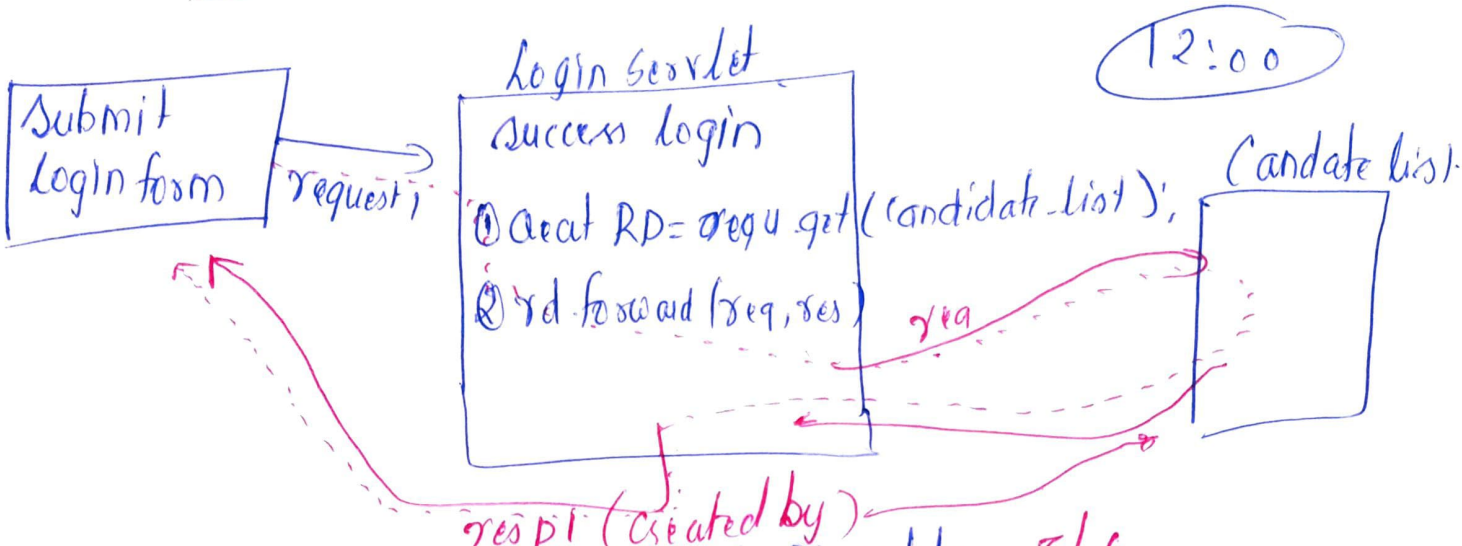
Server pull :-

talking the client to next page in same request

⊗ client sends to req to serv.

Steps for server pull

Request Dispatching / resource chaining



Servlet request :- getRequestDispatcher. I/f

object that request from client and dispach

servlet object → servlet
→ html.

RequestDispatcher Object

Day 6.2 → Day 6.2 line-81 →

// Server pull : Requestio dispatching tech. (forward scenario)

Step1:- Create RequestDispatcher object.

getRequestDispatcher(String path);

rd.forward

RequestDispatcher rd = request.getRequestDispatch("candidate list");

Url pattern of next Servlet.

---

forward(rqust, Resp);

forwards a request from a servlet to another resource (servlet, jsp file)

⊗ forward the clnt request to next page. In same request.

rd.forward(request, response);

42

rd.forward(req, res);

① wc suspends current execution page, do

② clear pw Buffer

③ wc calls → candidatelist(servlet) → get methods
do post methods

6.2 candidate list page → change to dopost

Same thread → executes rd.forward

⊗ Control comes back to caller

Session →

⊗ narrower scope will do.

⊗ In order to share u

Scopes in Web applicatn

core java → default default
private default protected public

page → request → session → applicatn

client pull

client → server (.)

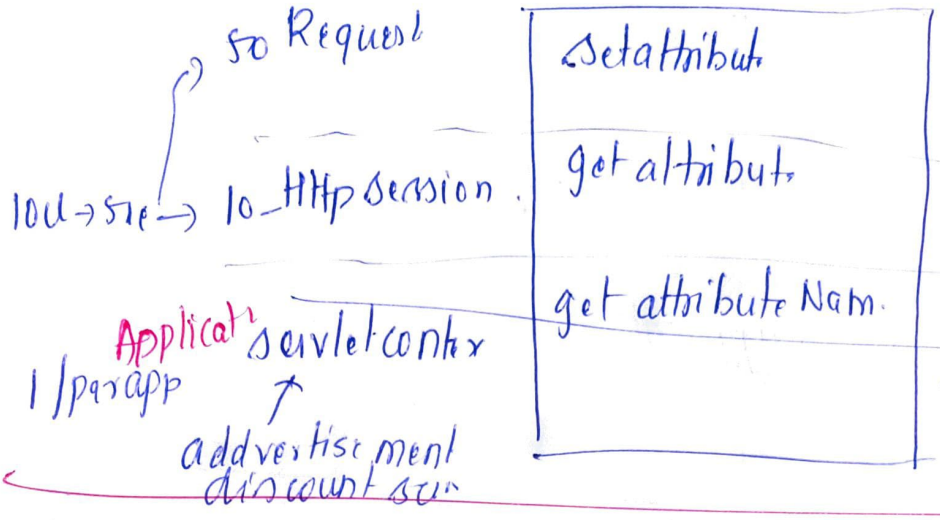
RDdispacher → request → client pull scope?

server pull scop?

How to keep data in required scope

→ session → setAttribute ( )

only & invoker object changes



Significan

scope:- current request only
Gasba called after current resp committed

scope = current session shared across all web pages from same web app same clien

scope = entire web shared across all web pages from same web applicatn for any client.

Login servlet → Decrease scope of

request.setAttribute("user_detal", user);

HttpSession for → client pull

We cannot empty Buffer befor dispatch give Exception

& last page is suppose to generate response

getParameter Vs getAttribut

→ limited to string

→ limited to object

---

page → page → server

page → app → client pull

③ Include Scenario (include page)

- we can send details of resource also but it is not allowed to status code

6.3 → forward → include.

→ does not discard PW Buffer

Can do post & do get call each other yes

Stop the server remove → applicatn →

- we can call override get & post

Assignment Discussion

DButils

All URLs :-

After selecting topic

T

min scope required in client pull is session

Tutorial Dao psti = select name from tutorials where topic_id = ? ordered by visit desc;

Authenticate page :- add tutorial dao; entire web app only once instantiated.
add clean up ();

Tutorials page :- add servlet

HttpSession session = request.getSession

Tutorial dao = (TutorialDao) session.getAttribute("tut_dao")

// Invoke tutorial dao to get name

for (String s: Names)

pw.print("<h5>   </h5>");

adding Query string :

 "
+ s+ " </h5>)

/Tutorial detail doGet( ):

Con. try{ PW = respons. getwritter());
{
HttpSession session = request.session();
TutorialDao = ( ) session.getAttribute("tut_dao")
String Topicname = respo req.getParameter("tut_name")

TutoriaDaoImpl.java

public String updateVisits(int tutorialId) throws
pstm.setInt(1, tutorialId);

Log out link <h5> Logout </h5>");

Servlet (/logout) → do get

HttpSession = request.getSession();
User user = (user) session.getAttribute("user-detail");
pw.print("<h5> Hello.

Back link → Dynamic link Back link

NumberFormatException.

<h5><a href = /tutorials ? topic_id = "+ tutorialDetails.
getTopicId()

JSP (Java Server pages)

20/11/2021

Dynamic web page (having

Why JSP ?

- JSP allow seperath presentath (html) logic from business (servlet) logic.
- Typically JSP cointain → presentation logic
- Java beans or custom tags

Ease of development : JSP pages are autogenerate translated by w.c into servlet & compiled, & deployed.

Servlet → Compiled → deployed

Day7.1 → only JSP content :-

web.xml → index.jsp → welcome page

Create JSP page in Web-app →

Web INF → privat

Webapp → JSP new → JSP → index

Configuring JSP templat

JSP Files → Encoding → utf-8

@Server TimeStamp

→ Body section <h3> Welcome 2 JSP <\h3>.

@Server TimeStamp :-

<%= LocalDateTime.now() %> <\h3>

JSP API

→ go to tomcat home folder → lib → jsp-api → Specifica

Implementath → JASPER

Servlet → HttpServlet

→ Interface Servlet

↓

Interface JspPage

jspDestroy();

jspInit();

↓

HttpJspPage

↓

_jspService(HttpS req, response) {

we should not override service → translation is done by WC

(X) programer should not touch

Jsp life cycl

client request!

test.jsp (web app)

Translation phase ---- o/p will translate servlet page perporfed by WC called one per Jsp life cycl

↓

o/p -- cointainer specific name (Tomcat test_jsp.java, its stored under work.)

↓

Compilatn phase ---- o/p - page translate class

↓

locate.class from server specific folder, loaded using class.forName()

↓

public void jspInit

We pools out a thread... run()

public void _jspService(HttpServletRequest rq, rs) throw SE, IO,

(X) We ~~cannot~~ should not override → called per request

↓

Jspdestroy()

---

index.jsp → index_jsp.jav

Javax.servlet
Javax.~~http~~servlet.http
Javax.servlet.jsp.x

Three are important and compulsory added files imports

Translath → Complitation → Runtime

Jsp comments :- syntax <%--comment text--%>

clay fol
index.jsp

<hs>Test Comments

<!-- client side --> → client ignores

Implicit objects :

Out → it is jsp specific (writer ≈ printWriter)

Javadocs → JspWriter.

(X) out → jspwriter (datatype)

(X) request → HttpServletRequest

(X) respons → Http servlet Respons

session → HttpSession → datatype.
Config →

Create object req.getSession();
JSPs implicitly participate in session tracking.

Implicit session tracking

Config → ServletConfig (→ servlet-specific)

10 JSP → 10 config object
1 config/JSP.

Applicatn → servletContext() →

2 webapps →

Exception → is not accessible to all JSPs

Page → current translated page class

X PageContext ** ☆☆☆☆☆☆

∴ represent current page environment.

12 JSP's → 12 page context

Javadocs → PageContext → abstract class →

Page Scope

Apz used in page context

pageContext.SetAttribute( );

Scripting Elements

Scriptlets :- Can be used to add java code directly. Avoid scriptlets.

Syntax :- <% java code ... %> → within body.

location inside the translated page : within → _jspService

Usage →

day7.1 → index.jsp → <a href = "~~test1.jsp~~
"login_form"> Test scriplet.

Copy the form tag

day7.1 → login.jsp → Body paste.

action = display.jsp

---

day7.1 → display.jsp → Body Embed java code in Html

Scriplet.

<% out.print("<H5> Hello, "+request.getParameter("name")
"Password" +request.getParameter("pass")
%> no deploy no refresh

---

why no to scriplets → mixture

In case of post also we get o/p

~~JSP~~ Ex: JSP Expression :

Syntax :- <%= expr to evaluate %>

Evaluates an Express ⟶ convert to string

⟶ send it to clnt Browser.

e.g <%= new Date() %>

Expression to evaluate :- java method, invocation which ret val

or const expr or attribute, or variable, (Instance var

→ stored in translated page : within _jspService.

e.g <%= new Date() %>

<%= session.getAttribute("user_dtls") %>

<% session.setAttribute("nm", 1234) %>

error
o/p → blo
→ Ref is null

align = "center" style = "color : red"> session id : <lh5>

<% = session.getId() %>

Implicitly session is added.

<h3> Request Parameter via JSP Expression <>

<h5> Hello, <% = request.parameter("name"); %>

We can use directly

Expression Language Syntax :-

Implicit object → can be assesed only to scriplets n expressions.

E Implict object → accessible to EL syntax ${...})

syntax: (Expression La

${ expr to evaluate } . to be added in Body

translate to string. send it to clnt Browser.

EL implicit objects → can be assesible only via EL syntax

param → name of map cointaining request param.

only read Param

they are thread safe

day 7 o/1

display.jsp

Param map

only Parameter.

<hr>

<h4> useing EL syntax </h4> → map =

<h5> param: ${ param } → o/p key value

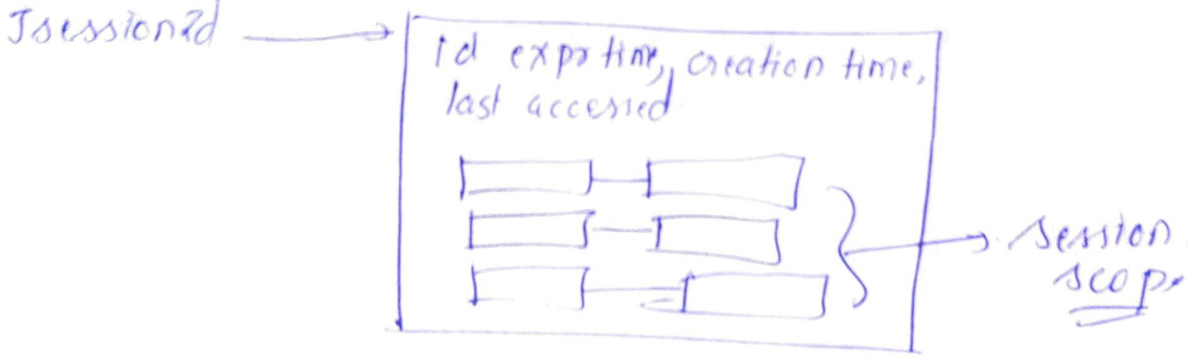
Params Vs Attributes

- Params
  1. Read only
  2. thread safe (Immutability)
- Attributes
  1. String object
  2. thread unsafe
  3. Readable / writable

Different map for EL Syntax

1. pageScope → name of map containing page scoped attribute
2. requestScope ——— " ——— request ———
3. SessionScope ——— " ———
4. applicationScope ——— " ———
5. pageContext ——— " ———

1. → one per page
2. " " request
3. " " session
4. " " applicatn



day 7.1 → index page → Testing SOP

day 7.1 → Webapp → Scopes.jsp

PDPP

EL syntax is for getting values

hence use Scriptlet :

PDP2
PRSA

<% // add a attribute under varying page requ sess A

pageContext.setAttribute("nm1", 1234); → private within page
request. ——— ,, ——— (nm2)
session. ——— ,, ——— (nm3)
application. ——— ,, ——— (nm4)

%> → server side Comment

<% -- use client pull : lin -- %>

<hs>

 next

---

day 7 to 1 → use A → next.jsp.

<%-- Display attribute --%>

<hs> Page scoped attribut : ${pageScope.nm1}

Inbuilt getter
access to getter

null → Blank

<hs) ——— ,, — : ${requestScope:nm2}.

——— ,, ——— ${sessionScope.nm3}
——— ,, ——— ${applicationScope.nm4
——— , ———

Scopes → 10 → from first page.
next → from file pag

Redirect in JSP

Scopes →

<% response.sendRedirect("next.jsp"); %>

Request Dispatcher Server pull

<% requestDispatcher rd = request.getRequestDispatcher("next.jsp");
rd.forward(req, res);

// URL seen is of first page only.

inspect → shows Request

clarity in scope

Include scenario

① add → out.flush(); → After committing not allow

② rd.include(request, resp); → Passing directly

---

next → ${nm4} → will be treated as attribute

nm4 → Checks in all the maps

nm4 → will be blank.

Lower performance

---

writing java code → Scriplle
to get parame → EL syntax

JSP Declaration:-

Syntax:- Represents privats members of the translated servlet class

Syntax = <%! %> → Out side body

Head Body.

⑤ will be added - jspService

Default scope = private

② used for override (jspInit, jspDestroy);

→ index → fol → testing JSP.

fol → test.jsp → <Head> < >

```
<%!
    String mesg = "Some message!!!";
    //can override life cycle and ordinary methods.
    public void jspInit(){ sysout( ) }
%>
```

⊗ assignment → ~~page~~ ? help.

22/11/2021 D-8

Q) How to get a cookie value with name JSESSIONID?

JSP expression

<%= session.getId() %>

Or

Via cookie. EL syntax.

${session.id}. X

${pageContext.session.id} ---> pageContext.getSession().getId()...sent to client

Or

${Cookie.JSESSIONID.Value} cookie.get("JSESSIONID").getValue() -> sent to clnt.

What will be the o/p for.

http://host:port/day8/one.jsp → Context path

How to get the value of session time out?

${pageContext.session.maxInactiveInterval} (EL Syntax)

≈ pageContext.getSession().getMaxInactiveInterval()

~~JSP~~ How to set session scoped attribute?

<%

session.setAttribute(nm);

%>

JSP expression.

session => HttpSession (Hint: jsp expression)

<%= session.getAttribute("nm") %>.

EL syntax

${sessionScope.nm} or ${nm}

URL Rewritting

If in client pull if Cookies are disabled

Day 8 webapp → Index → <hs> Testing URL Rewriting

Copy login.jsp from previous

Index.jsp ⟹ hs → sessionID: ${pageContext.session.id}

test1.jsp

<%

Create session scoped attribute to store user detail:

session.setAttribute("user_dtls", request.getParameter("name")
+ ":" request.getParamet("pass"));

send Redirect("test2");

<%

Test2.jsp

hs → User Details : ${sessionScope.user_dtls}

hs → Log me Out </> → Will show error

test3.jsp

<hs> from test3 : sessionID = ${pageContext.session.id}

<hs> user Detail from log out page :

${pageContext.session.invalidate()}

// pageContext.getsession().invalidate()

if don't want error → write in script let.

Disabled Cookiee → Every time new sessionId is created and no client is remembered

⊗ Session Tracking Technique (Develop Cookie Independant App)

⊗ We require SessionID *(which is not send)

Embed SESSIONID in URL

⊗ Encoding the URL to cointain the JSESSIONID info.

We ⟶ checks JSESSIONID in cookie ⟶ if not found checks in URL

How To :- EncodeURL(String origURL); → client pull (1)

Rets => orig URL, JSESSIONID = 12345.

for client pull 2

encodeRedirectURL(String redirectURL)

redirect URL, JSESSIONID = 1234

Test1.jsp (client needs to remember here after)

=> // method of HttpServletResponse: public void encodeRed

Don't use deprecated response.sendRedirect(resp.encodeRedirectURL("test2.jsp"));

Test2.jsp <a href = <%= respons.encodeURL("test3.jsp"); >.

<%

String url = response.encodeURL("test3.jsp");

<a href = <%= url %> > Log Me Out .

End to End Encryption (Https)

① Cookie are checked ⟶ encode URL

Page directive

* commands/messages for JSP Engine (= JSP container = WC)
  @ Translation time

syntax:- <%@ %>

① Page directive // command applicable to page only.

- import → comma seperated list
- session --- boolean attribute default = true.

To disable session tracking, specify session = "false";

Error Page :- "URL of err handling")

tells WC to forward user to err handler page

---

index.jsp:- <a href testu.jspa>

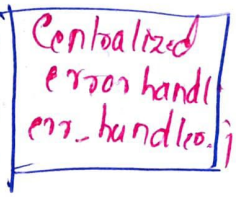
test4 → <%
int result = 100/10; //method local variable _jspService
%>
hs → Result : <%= result %>

---

isErrorPage: error handling

<%@ page errorPage = "err_handler.jsp" %>

one.jsp ——→ <%@ page isErrorPage = "True" %>



%@ page errorPage = "err_handler.jsp" %>
two.jsp. ——→

Ten.jsp ——→

→ test4.jsp

```
<%@ page
    errorPage = "my_err_handler.jsp" %>
```

webapp → newjsp → my_err_handler.jsp.

error handling.

```
<%@ page isErrorPage = "True" %>
<h5 style = "color: red;"> Error Message <%= exception.getMessage() %> </h5>
```

Error msg Via EL syntax

```
${exception}  ${pageContext.exception.message}
```

Javadocs get URI

/days/one.jsp → URI

get is not write.

my-err_handler.jsp

```
${pageContext.errorData.requestURI}
```

To get status code

```
${pageContext.errorData.statusCode}
```

How to tell WC To forward all error to Handler.

⊗ write in web.xml : → (Whenever change Web.xml Reload Server)

```
<!-- error page related tag -->
<error-page>
    <exception-type> java.lang.Exception </exception-type>
    <location> /my_err_handler.jsp </location>
</error-page>
```

Session expiration time out :

```
${pageContext.session.maxInactiveInterval}
```

4. HttpSession :- setMaxInactiveInterval(int interval);

writing in Web.xml (changing timeout time)

```
<session-config>
    <session-timout>1</session-timout>
</session-config>
```

after one minute session will be expired

---

5. isThr ISThreadSafe = "true | false"; default (True) → Recommended

true ⇒ informing WC → Jsp is already written in thread-safe manner

--- Don't apply thread safety

---

false ⇒ informing WC ... Apply thread safety

- WC will mark entire servlet as synchronised hence killing Concurrency, all other client will have to wait

---

Context Scoped attribute → are inherently thread-unsafe so access them always from within synched block ☆☆☆

e.g <% POJO→ LoanScheme : interestRate : 10% : 1 copy.

100% Synch on APPA

<% application.setAttribute("scheme", new LoanScheme()); //10%

%>

Now due to market Condition : u want to modify intres rate = 12%

All Costomer needs to blocked till changes are done.

```
<% synchronized(Applicatn){
    application.getAttribut("schem");
LoanSchem Loan =
    loan.setInterestRate(12);}
%>
```

Setting global Attribute

Equivalent step in Servlet :-

Servlet class can implement (Tag I/f → deprecated.) → singleThreadModel( )

Include Directive :-

<%@ include (file) = "URI of the page to be included" %>

Index → test5.jsp

test5 →

```
<head>
<%!
    int data = 1230 // → Instance Variable
%>
</head>
<body>
<% String mesg = "hello";
   pageContext.setAttribute("nm1", 3456);
%>
<%@ include file = "test6.jsp" %>
```

test6.jsp :-

```
<H5> From Include page </>
<H5> Instance Var :
<H5> local var :
<H5> Page scoped Attribute : ${pageScope.nm1}
```

AAA at compilation time compiler copy paste.
all data memembers test6 copied in test5

(*) Indicates page Scope → pages are merged at compile time.

JSP Actions

① Standard Actions :- use Bean, set Property, get Property, forward include, param, plug in

✗ Commands/msgs meant for WC to be interpreted @ translation time & applied @ req. processing time (run time)

✗ Syntax :- impl class = jsp-api.jar (specs)

<jsp: actionName attribute list >

→ Body of tag/Action

</ : >

✗ JSP std actions related to request Dispatcher

RD's forward scenario

<jsp: forward page = "dispatcher URL" />

e.g. In one.jsp

<jsp: forward page = "two.jsp" />

WC invoke → rd = rd.forward.

Index :- Testing forward action

Test7.jsp :- href = {"test7.jsp?pid=101&name=mango&price=50"}

test7.jsp hs → "in first page"

<%
//create product pojo n add it in a suitab scope →

src/main/java → pojos → product {
private int productId;
private String name;
" double price;
Constructor, getters, setters.
}

Test 7. Product product1 = new Product(Integer.parseInt(request.getParameter(
, ——"——("name"), Double.——"——(request.Param("id")
request.setAttribute("Product_dtls", product1);
<jsp:forward page = "Test8.jsp" />

Test 8.jsp = <Body>
product Details : ${product_dtls}
or
{requestScope.product_dtls}

<hs> Param: ${param} → map of request parameters

Include Scenario

<jsp:include page "test8.jsp" />

64

Admin use case of Voter:

UseBean:- (jsp:useBean)

Reame jsp ⇒

Why Java beans

① to allow programmer to sep B.Logic in Java Beans (Req processing logic, page navigation & resp generatn will still part of jsp

② JBs can store conversational state of clnt (JB's properties will reflect clnt state) +

One JB per client

What is JB

① pkged public java class

JB Naming Convection → Strict → Camel casing

public void setRegAmount(doubl. val);

set → capital.

---

⑤ Business logic → methods
public methods →

Day 8.2 → copy 5.2

SR/main/java packag beans.

class ~~Voter~~ UserBean. {

//properties non static, non transient data members.

private string name;

private string password;

// Referenu Voter dao
private VoterDaoImpl voterDao; } client specific info
// To hold validated user details } client conversational
private bVoter userDetails;

Default constructor → invoked by WC
{
// creat Dao instance.
VoterDAO = new VoterDaoImpl();
sysout("user bean created");
Getters & setters

// Add Business Logic for user Authenticatn, to return dynamic navigational outcome
public
public string ~~Authenticate~~ ValidateUser() { → zero Args → b/o
// invoke Dao's method for login
bean
userDetails = VoterDao.AuthenticateUser(name, password);
If (userDetails == null) → Invalid
return "login";
return → check the role
If (userDetal.getRole().equals("admin")) {
return admin;
If (userDetails.isStatus())
return "logout";
return "candidate_list";

< jsp: useBean id = "bean id" class = "fully qualified bean class name" scope = "page, request | session | application" />.
default scope = page ← Web container created
To remember from login to logout ⇒ session.
e.g

66 <Jsp:useBean id="voter" class "beans.VoterBean" scope="session">

↓

We checks if this bean (= attribute) exist already in given scope

session.getAttributed("voter");

null
bean doesn't exist
session.setAttribute("voter", new VoterBean())

not
already exist

<Jsp:usebean> tag sets.

8.2 → webapp → copy login

head → <jsp:useBean id="user" class="beans.UserBean"
Body scope="session" />

→ 1 per client

<jsp:setProperty name="voter" property="email" value
="abc@gmail" />.

<jsp:setProperty name="user" property="*" />

→ All matching setters

Validate.jsp :- <head>
<jsp:Bean id="user"
<Jsp:setProperty property="*" name="user" />

form = name
pass → We don't have "pass" we have "password"

Henu password will be null
pass X

Form parameter must match to javabean setters

Change to password

Validate.jsp <Body> ⊗ JspBean → entry in inner Map

How to invoke JavaBean's BOL using EL Synta

${sessionScope.user.ValidateUser()}.
≈ session.getAttribute("user").validateUser()}.

Debug → check page before, Cache page

Validate.jsp → <jsp:forward page = "${sessionScope.user.ValidateUser}" />

JSP forward → ".jsp" ⚠ → add externally.

---

webapp → new jsp → candidate_list.jsp.

<h5> in candidate_list userDetail : ${sessionScope.userBean.getUserDetails()}

Bean name.

Bean is kept in

— Details {

equivalent code

session.getAttribute("user").getUserDetails() : to string and sent to client.

user —

Admin.jsp

<h3> in admin page Hello ...

<h3> you are currently in as

${ sessionScope.user.UserDetails.~~status~~ Role }

${ sessionScope.user.userDetails.name }

EL to get name for an Voter

Logout.jsp

<h3> ${ sessionScope.user.UserDetail.name };

${ pageContext.session.invalidate() }

Invalidating Session

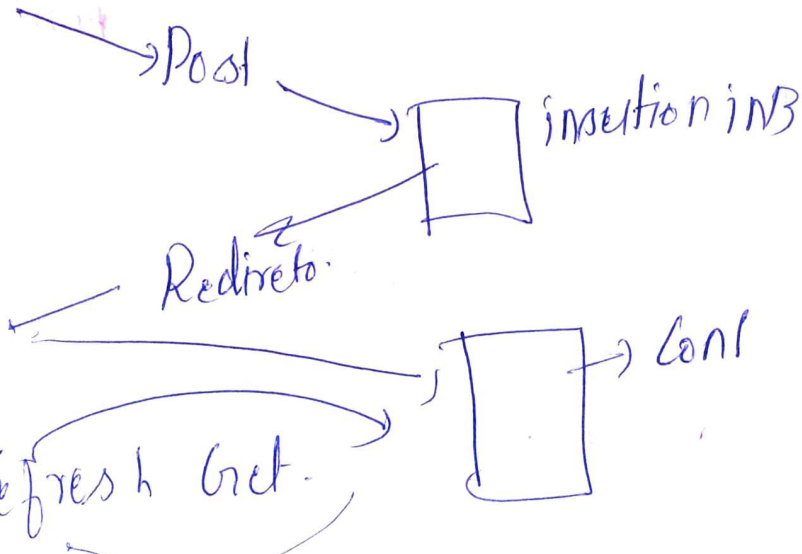
How to avoid multiple firing on DB if page refreshed

Double submission problem

* Cause = Server pull.

Soln = server pull by PRG pattern

P → Redirect → Get pattern



Validate.jsp :- <jsp:fo

JSTL (jsp standard tag library)

Readme.jsp →

Why? →

⊗ When jsp standard action are insufficient to solve requirement.

Using JSTL

② use taglib directive to import JSTL tag library

Syntax: <%@ taglib uri="URI of JSTL tag lib" prefix="tag pref %>.

Tag prefix ⟹ "c"

<c:redirect url="${sessionScope.my_bank.closeAccount()}" />.

↳ send redirect
+
include redirect (embd in url JSESSION)

Validate.jsp = <%@ page . . . . . >.

<%@ taglib uri="/core" prefix="c" %>

Ctrl+space

prifix.

<c:redirect ~~page~~ url="${sessionScope.user.validateUser()}" ".jsp" />

8.2 Logout How to navigate after some delay → Use.

<%

respons.setheader("refresh", "5"; url="+request.getContextpal

refresh

Core Java Topic

Emp e_1 = new emp();

Emp $e_2 = e_1$;

$e_3 = e_1$.clone();

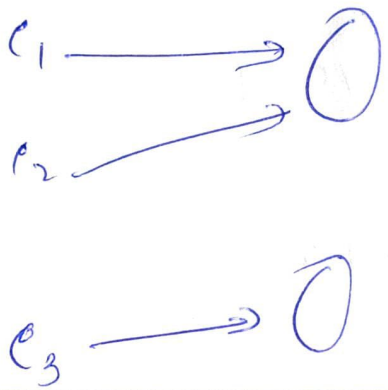
Java docs → clone() → protected → overriden.

- creates and return a copy of this object having same stat
- it is shallow copy (bit by bit).

throws → cloneNotSupportException.

Returns → Object → if not implement Cloneable Interface

- cloneable → marker Interface



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8 day Covariance & Cloning

```
@Override
Public Student clone() throws cloneNotSupportedException
{
    return (student)
}
```