Advanced Java

1)What is JDBC?

ANS:

JDBC is a persistence technology which is used to develop peristence logic having the capability to perform persistence operations on persistence data of a perstence store.

2)Steps to develop JDBC application?

ANS:

There are six steps to develop JDBC application.

- ✓ **Register JDBC driver with DriverManager service.**
- ✓ **Establish the connection with database software.**
- ✓ **Create Statement object.**
- ✓ **Sends and Executes SQL query in database software.**
- ✓ **Gather the result from database software to process the result.**
- ✓ **Close all jdbc connection objects.**

3)Types of drivers in JDBC?

ANS:

Type 1 Driver :ODBC AND JDBC BRIDGE DRIVER
Type 2 Driver :NATIVE API
Type 3 Driver :NET PROTOCOL
Type 4 Driver :NATIVE PROTOCOL

4)Types of Connection objects?

ANS:

We have two types of JDBC Connection objects.

1) Direct JDBC Connection object

- ➢ **A JDBC Connection object which is created by the user is called direct JDBC Connectio object.**

ex:

```
Class.forName("oracle.jdbc.driver.OracleDriver");
```

Connection con=DriverManager.getConnection
("jdbc:oracle:thin:@localhost:1521:XE","system","admin");

2) Pooled JDBC Connection object

- A JDBC Connection object which is gathered from JDBC Connection pool is called
- pooled jdbc connection object.

5) Types of Statement objects?

ANS:

We have three Statement objects in JDBC.

1)Simple Statement object

It is an object of underlying supplied java class which implements java.sql.Statement interface.

2)PreparedStatement object

It is an object of underlying supplied java class which implements java.sql.PreparedStatement interface.

3)CallableStatement object

It is an object of underlying supplied java class which implements java.sql.CallableStatement interface.

6)Simple Statement vs PreparedStatement object?

ANS:

Simple Statement:

- It is not suitable to execute same query for multiple times with same values or different values.
- Framing query with variables is quite complex.
- We can't use string values directly to query without any conversion.
- It raises SQL injection problem.
- It does not allow us to insert date values in a database table column.
- It does not allow us to insert lob values in a database table column.

7. What is DatabaseMetaData?

ANS:

- **A DatabaseMetaData in an interface which is present in java.sql package.**
- **A DatabaseMataData provides metadata of a table.**
- **It gives information about database product name, database product version, driver name , driver versions, username and etc.**
- **We can create DatabaseMetaData object by using getMetaData() method of Connection object.**

ex

```
DatabaseMetaData dbmd=con.getMetaData();
```

8. What is ResultSetMetaData?

ANS:

- **A ResultSetMetaData is an interface which is present in java.sql package.**
- **A ResultSetMetaData provides metadata of a table.**
- **It gives information about number of columns, type of columns , datatype of a columns, size of a column and etc.**
- **We can create ResultSetMetaData object by using getMetaData() method of ResultSet obejct.**

ex:

```
ResultSetMetaData rsmd=rs.getMetaData();
```

9. Types of ResultSet object?

ANS:

We have two types of ResultSet objects.

1)Non-Scrollable ResultSet object

2)Scrollable ResultSet object

1)Non-Scrollable ResultSet object

- **A ResultSet object which allows us to read the records sequentially, unidirectionally is called non-scrollable ResultSet object.**
- **By default every ResultSet object is a non-scrollable ResultSet object.**

- If JDBC Statement object is created without type,mode value then ResultSet object is called non-scrollable ResultSet object.

ex:

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

ResultSet rs=st.executeQuery("select * from student");
```

2)Scrollable ResultSet object

- A ResultSet object which allows us to read the records non-sequentially, bi-directionally or randomly is called scrollable ResultSet object.
- If JDBC Statement object is created with type,mode value then ResultSet object is called scrollable ResultSet object.

ex:

```
Statement st=con.createStatement(type_value,mode_value);

ResultSet rs=st.executeQuery("select * from student");
```

10. What is Batch Processing?

ANS:

- It is used to declare multiple queries in a batch and makes a single call to database.
- To add the queries in a batch we need to use addBatch() method of Statement object.
- To execute the batch we need to executeBatch() method of Statement object.

11. What is JDBC Connection pool?

ANS:

- It is a factory containing set of readily available JDBC Connection objects before actual being used.
- JDBC connection pool represent connectivity with same database software.

Advantages:

- It will give reusable JDBC Connection objects.
- With minimum number of jdbc Connection objects we can interact with multiple clients.

- A user is not resposible to create, manage or destroy jdbc Connection objects.
- A JDBC Connection pool is responsible to create, manage and destroy jdbc Connection objects.

Servlet

1)What is Servlet?

ANS:

Servlet is a server side web resource program which is used to enhance the funcationality of web server or application server.

or

Servlet is a java based dynamic web resource program which is used to generate dynamic web pages.

or

Servlet is a single instance multi-thread java based web resource program having the capability to develop web applications.

2) What is web application?

ANS:

Web Application is a collection of web resource programs having the capability to generate web pages.

We have two types of web pages.

1)Static web page / Passive web page

A web page which shows the same content for every request.

ex:

home page,services page,portfolio page,aboutus page,contactus page and etc.

2)Dynamic web page / Active web page

A web page which shows different content for every request.

ex:

gmail inbox page,stock market share value page,live cricket score page etc.

3)What is web resource program?

ANS:

A Web resource is any one of the resources that are created during the development of a Web application, for example, Web projects, HTML pages, JSP files, servlets, custom tag libraries, and archive files.

4) Types of url patterns?

ANS:

Every servlet will recognize with the help of url pattern.

Our container , server, client and other web resource programs will recognize each servlet by using url patterns.

URL pattern will hide technology name or class name from outsider for security reason.

We have three types of url patterns.

1) Exact match url pattern

2) Directory match url pattern

3) Extension match url pattern

Every web server is designed to support these url variables.

1) Exact match url pattern

It always starts with forward slash '/' and it will not ends with '*' symbol.

ex:

web.xml

```
<url-pattern>/test</url-pattern>
```

request url

http://localhost:2525/DateApp/test (valid)

http://localhost:2525/DateApp/best (invalid)

http://localhost:2525/DateApp/a/test(invalid)

2) Directory match url pattern

It always starts with forward slash '/' and ends with '*' symbol.

ex:

web.xml

<url-pattern>/x/y/*</url-pattern>

request url

http://localhost:2525/DateApp/x/y/z (valid)

http://localhost:2525/DateApp/x/y/z/test (valid)

http://localhost:2525/DateApp/y/x/z (invalid)

3) Extension match url pattern

It will start with '*' symbol having some extension.

ex:

web.xml

<url-pattern>*.do</url-pattern>

request url

http://localhost:2525/DateApp/x/y/z (invalid)

http://localhost:2525/DateApp/x/y/z.do (valid)

http://localhost:2525/DateApp/test.do (valid)

5. In how many formats we can display the data?

We can communicate to servlet program in three ways.

1) Browser to Servlet communication

2) HTML to Servlet communication

3) Servelt to Servlet communication

In browser to servlet communication we need to type our request url in browser address bar.

But typing request url in browser address is quit complex.

To overcome this limitation we need to use HTML to Servlet communication.

In html to servlet commucation we can give request to the servlet program by using html based hyperlinks or form pages.

The request which is generated by using hyperlink does not carry the data.

The request which is generated by using form page will carry the data.

In html based hyperlink to servlet communication we need to type our request url as href url.

ex:

```
<a href="http://localhost:2525/DateApp/test"> clickMe </a>
```

In html based form page to servlet communication we need to type our request url as

action url.

ex:

```
<form action="http://localhost:2525/DateApp/test">
    -
    -
</form>
```

6)What is web container?

ANS:

A web container is a software application or a program which is used to manage whole life cycle of web resource program i.e from birth to deadth.

Every server is designed to support web containers.

Servlet container manage whole life cycle of servlet program.

JSP container manage whole life cycle of jsp program.

Some part of industry considers servlet container and jsp container are web containers.

Tomcat is not a container , it contains servlet container and jsp container so we don't need to arrange seperately.

7) What is servlet Filter?

ANS:

Filter is an object which is executed at the time of preprocessing and

postprocessing of the request.

Diagram:

The main advantages of using filter is to perform filter task such as

1) Counting number of request

2) To perform validation

3) Encyrption and Decryption

and etc.

Like Servlet, Filter is having it's own Filter API.

The javax.servlet package contains thre interfaces of Filter API.

1)Filter

2)FilterChain

3)FilterConfig

1)Filter Interface

For creating any filter, we must and should implements the Filter interface.

Filter interface provides the following 3 life cycle methods for filter.

i)public void init(FilterConfig config)

IT is used to initialize the filter.

It invokes only once .

ii)public void doFilter(HttpServletRequest req,HttpServletResponse res,FilterChain chain)

This method is invoked every time when user request to any resources to which the filter is mappend.

IT is used to perform filtering task.

iii)public void destroy()

This method is invoked only once when filter is taken out of the service.

2)FilterChain

It is responsible to invoke the next filter or resource in the chain.

FilterChain contains only one method.

i)public void doFilter(HttpServletRequest req,HttpServletResponse res)

It passes the control to the next filter or resource.

3)FilterConfig

For every filter our servlet container creates FilterConfig object.

It is one per filter.

8)Explain servlet life cycle methods?

There are three life cycle methods in servlets.

1) public void init(ServletConfig config)throws ServletException

It is used for instantiation event.

This method will execute just before servlet object creation.

2) public void service(ServletRequest req,ServletResponse res)throws ServletException,IOException

It is used for request arrival event.

This method will execute when request goes to servlet program.

3) public void destroy()

It is used for destruction event.

This method will execute just before servlet object destruction.

9)What is ServletConfig object?

ANS:

A ServletConfig is an interface which is present in javax.servlet package.

ServletConfig object will be created by the web container for every servlet.

ServletConfig interface is used to read configuration information from web.xml file.

We can create ServletConfig object as follow.

ex:

```
ServletConfig config=getServletConfig();
```

10. What is ServletContext object?

ServletContext is an interface which is present in javax.servlet package.

ServletContext object is created by the web container for every web application i.e it is one per web application.

ServletContext object is used to read configuration information from web.xml file and it is for all servlets.

We can create ServletContext object by using getServletContext() method.

ex:

```
ServletContext context=getServletContext()

or

ServletConfig config=getServletConfig();

ServletContext context=config.getServletContext();
```

11) What is RequestDispatcher object?

ANS:

In including the response, output of source servlet program and output of destination servlet program goes to browser window as response.

In source servlet program output will be added but not code.

To perform including the response we need to use RequestDispatcher object.

We can create RequestDispatcher object as follow.

ex:

```
RequestDispatcher rd=req.getRequestDispatcher(url-pattern);

rd.include(req,res);
```

12) Scopes of Servlets?

ANS:

We have three types of scopes in servlet.

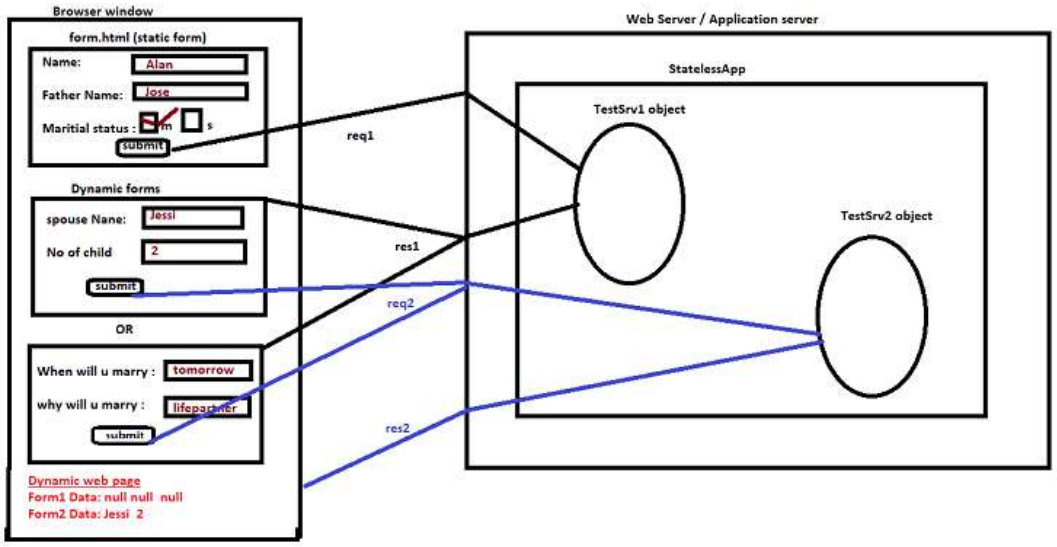
1) Request scope

2) Session scope

3) Application scope

13) What is stateless web application?

ANS:



Above diagram demostrate stateless behaviour of web application.

By default every web application is a stateless web appplication.

In stateless behaviour of web application , no web resource programs can access previous request data while processing the current request.

To overcome this limitation we need to use Session Tracking.

14)What is state full web application?

ANS:

In statefull web application , all web resource programs can access previous request data while processing the current request during a session.

15)What is session tracking and its techniques?

ANS:

Session tracking is used to make our web application as statefull web application even though our HTTP protocol is stateless.

In stateless web application , no web resource programs can access previous request data while processing the current request during a session.

In statefull web application , all web resource programs can access previous request data while processing the current request during a session.

There are four technique to perform session tracking or session management.

1) Using hidden box fields

2) HttpCookies

3) HttpSession with Cookies

4) URL Rewriting

<u>3) HttpSession with Cookies</u>

In HttpSession with cookies, for every request it will create a unique session id.

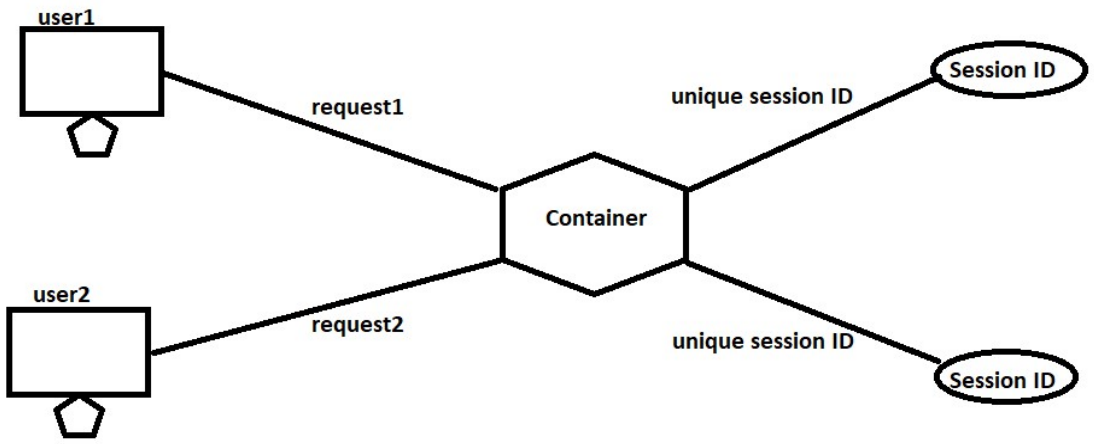
Our web container uses that session id to identify a user is a new user or existing user.

HttpSession object we can use to perform following task.

Bind the objects

To manipuate the data in HttpSession object.

Diagram:servlet7.2



methodology.

We have seven doXxx(-,-) methods.

1) doGet(-,-),2) doPost(-,-),3) doPut(-,-),4) doDelete(-,-),5) doHead(-,-),6) doOption(-,-),7) doTrace(-,-)

Q)What is the difference between GET and POST methodology?

GET	POST
It is a default methodology.	It is not a default methodology.
It will carry limited amount of data.	It will carry unlimited amount of data.
It sends the request fastly.	It sends the request bit slow.
It not suitable for secure data.	It is suitable for secure data.
It shows the query string.	It does not show the query string.
It is not suitable to perform file uploading or encryption.	It is suitable to perform file uploading or encryption.
To process get methodology we will use doGet(-,-) method.	To process post methodology we will use doPost(-,-) method.

JSP

1)What is JSP?

ANS:

JSP stands for Java Server Pages.

It is a dynamic web resource program which is used to created web applications.

2) Servlet vs JSP?

ANS:

Limitations with Servlets

To work with servlet strong java knowledge is required.

It is not suitable for non-java programmers.

It does not give any implicit object.

(Object which can be used directly without any configuration)

Configuration of each servlet program in web.xml file is mandatory.

Handling exceptions are mandatory.

We can't maintain HTML code and Java code seperately.

Advantages of JSP

To work with jsp strong java knowlege is not required.

It is suitable for java and non-java programmers.

It supports tag based language.

It allows us to work with custom tags and third party supplied tags.

It gives 9 implicit objects.

Configuration of each jsp program in web.xml file is optional.

Handling exceptions are optional.

We can maintain HTML code and java code sperately.

It gives all the features of servlet.

3)JES class?

ANS:

4)Types of tags in JSP?

ANS:

JSP Tags/Elements

JSP contains following tags.

1) Scriting Tags

i) scriptlet tag

ex:

<% code here %>

ii) expression tag

ex:

<%= code here %>

iii) declaration tag

ex:

<%! code here %>

2) Directive Tags

i) page directive

ex:

<%@page attribute=value %>

ii)include directive

ex:

<%@include attribute=value %>

3) Standard Tags

<jsp:include>

<jsp:forward>

<jsp:useBean>

<jsp:setProperty>

<jsp:getProperty>

and etc.

5)Phases in JSP?

ANS:

Phases of JSP

There are two phases in JSP.

1)Translation phase

In this phase, our jsp program converts to JES class.

2)Request processing phase

In this phase ,our JES class will be executed and result will send to browser window/client.

6) Implicit objects in JSP?

ANS:

Implict objects in JSP

Object which can be used directly without any configuration is called implicit object.

Implicit objects created by the web container which are available for every JSP page.

JSP contains 9 implicit objects as follow.

ex:

Object	Type
out	JspWriter
request	HttpServletRequest
response	HttpServletResponse
config	ServletConfig
application	ServletContext
session	HttpSession
pageContext	pageContext
page	Object
exception	Throwable

7)What is MVC in jsp?

ANS:

MVC in JSP

MVC stands for Model View Controller.

It is a design pattern which seperates business logic, persistence logic and data.

Controller acts like a interface between model and view.

Controller is used to intercept all incoming request.

Model contains bussiness logic and data.

View contains presentation logic i.e UI.

Life cycle methods of JSP

We have following three life cycle methods in jsp.

1) _jspInit()

It is used for instantiation event.

This method will execute just before JES class creation.

JES stands for Java Equivalent Servlet.

2) _jspService()

It is used for request arrival event.

This method will execute when ever request goes to jsp program.

3) _jspDestroy()

It is used for destruction event.

This method will execute just before JES class destruction.