Exercise-22
JDBC

Q1. Define database.

A database is an organized collection of structured information, or data, stored electronically in a computer system.

Q2. Define JDBC.

JDBC stands for Java Database Connectivity. JDBC is a Java API. It is a part of JavaSE (Java Standard Edition). JDBC helps you to write Java applications that manage these three programming activities:
1. Connect to a data source, like a database
2. Send queries and update statements to the database
3. Retrieve and process the results received from the database in answer to your query

Q3. List the types of JDBC drivers.

JDBC-ODBC Bridge Driver,
Native Driver,
Network Protocol Driver, and
Thin Driver

Q4. List the interfaces that are helpful to process queries.

Statement interface
PreparedStatement interface
ResultSet interface

Q5. List two methods of ResultSet Object.

public abstract boolean next() throws java.sql.SQLException
public abstract void close() throws java.sql.SQLException;

Q6. Write the steps the connect to the database and execute queries

Import JDBC packages.
Load and register the JDBC driver.
Open a connection to the database.
Create a statement object to perform a query.
Execute the statement object and return a query resultset.
Process the resultset.
Close the resultset and statement objects.

Programs

Q1. Write a program to open and close the connection to a database.

```java
import java.sql.*;
import java.util.*;
class Connect
{
public static void main(String[] strng) throws Exception
{
        Connection con =
DriverManager.getConnection("jdbc:mysql://localhost/shiva","root","069");
        System.out.println("Connection Succefull");
        System.out.println(con);

}
}
```

Output

```
D:\java\rec3>javac Connect.java

D:\java\rec3>java Connect
Connection Succefull
com.mysql.cj.jdbc.ConnectionImpl@149494d8
```

Q2. Write a program to perform to execute update and select query

```java
import java.sql.Connection;

import java.sql.DriverManager;

import java.sql.ResultSet;

import java.sql.SQLException;

import java.sql.Statement;

import java.sql.*;


public class DataAccess
{
  static final String DB_URL = "jdbc:mysql://localhost/shiva";

  static final String USER = "root";

  static final String PASS = "069";

  static final String UPDATE_QUERY = "UPDATE jex set pin= 3 WHERE pin=3";


  public static void main(String[] args) {


    try(Connection conn = DriverManager.getConnection(DB_URL, USER, PASS);

      Statement stmt = conn.createStatement();

      ) {


      int ret = stmt.executeUpdate(UPDATE_QUERY);

      System.out.println("Update result return value="+ret);

      ResultSet rs = stmt.executeQuery("SELECT pin , name FROM jex");

      while (rs.next()) {

      System.out.println(rs.getInt("pin")+"-"+rs.getString("name"));

      }

      rs.close();

      stmt.close();

      conn.close();
```

```
    } catch (SQLException e) {

        e.printStackTrace();

    }

  }

}
```

Output:

```
D:\java\rec3>javac DataAccess.java

D:\java\rec3>java DataAccess
Update result return value=0
2-asrit
5-sid
7-Man
24-vineel
25-Manoj
35-Shannu
52-surya
69-Shiv
73-Asp
99-vig reddy
100-ASR
101-abhuu
687-ufgyhb

D:\java\rec3>|
```

```
     MySQL 5.5 Command Line Cli   ×    +   ∨

mysql> select * from jex;
+-----+-----------+
| pin | name      |
+-----+-----------+
|   3 | asrit     |
|   5 | sid       |
|   7 | Man       |
|  24 | vineel    |
|  25 | Manoj     |
|  35 | Shannu    |
|  52 | surya     |
|  69 | Shiv      |
|  73 | Asp       |
|  99 | vig reddy |
| 100 | ASR       |
| 101 | abhuu     |
| 687 | ufgyhb    |
+-----+-----------+
13 rows in set (0.00 sec)

mysql> |
```

Q3. Write a java program to execute a insert statement using prepared statement.

```java
import java.sql.*;
import java.util.*;
class DeletePS
{
public static void main(String[] strng) throws Exception
{
        Connection con = DriverManager.getConnection("jdbc:mysql://localhost/shiva","root","069");
        Scanner sc= new Scanner(System.in);
        int choice=1;
         while(choice==1)
         {
        PreparedStatement pt = con.prepareStatement("insert into jex values(?,?) ");
        System.out.println("Enter the pin ");
        int n = sc.nextInt();
        pt.setInt(1,n);
        System.out.println("Enter the name ");
        sc.nextLine();
        String s = sc.nextLine();
        pt.setString(2,s);
        pt.executeUpdate();
        System.out.println("Want to continue ?(0-no/1-yes)");
        choice= sc.nextInt();


        }
        con.close();
}
}
```

Output :

Q4. Write a java program to perform update operation using prepared statement.
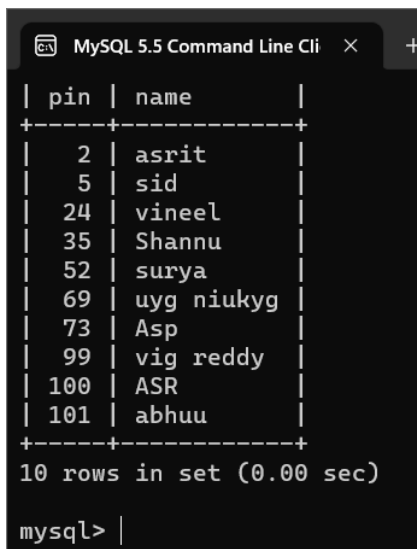
```
import java.sql.*;
import java.util.*;
class DeletePS
{
public static void main(String[] strng) throws Exception
{
        Connection con = DriverManager.getConnection("jdbc:mysql://localhost/shiva","root","069");
        Scanner sc= new Scanner(System.in);
        int choice=1;
         while(choice==1)
        {
        PreparedStatement pt = con.prepareStatement("update jex set name=? where pin=? ");
        System.out.println("Enter the pin ");
        int n = sc.nextInt();
        pt.setInt(2,n);
        System.out.println("Enter the name ");
        sc.nextLine();
        String s = sc.nextLine();
        pt.setString(1,s);
        pt.executeUpdate();
        System.out.println("Want to continue ?(0-no/1-yes)");
        choice= sc.nextInt();


        }
        con.close();
}
}
```
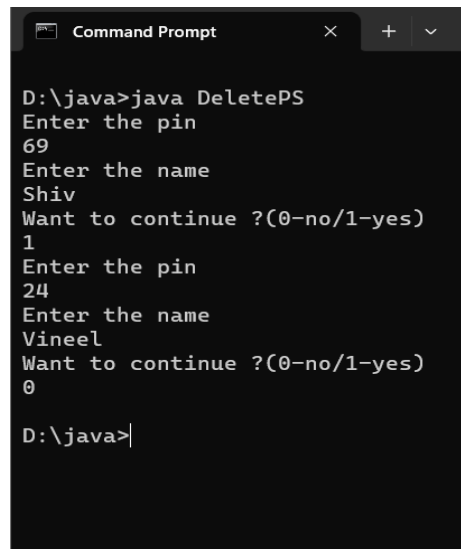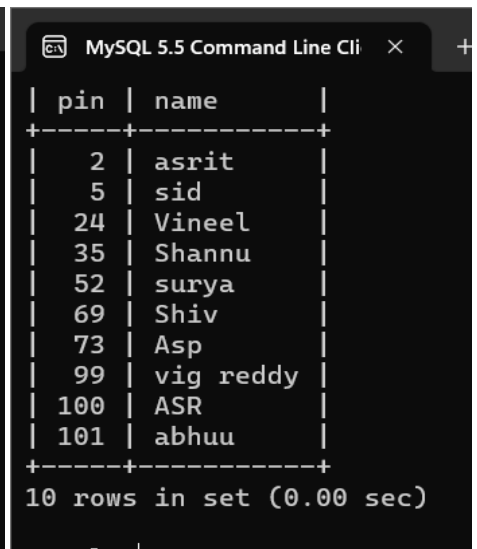**Output:**

Before :   After :

pin	name
2	asrit
5	sid
24	vineel
35	Shannu
52	surya
69	uyg niukyg
73	Asp
99	vig reddy
100	ASR
101	abhuu

10 rows in set (0.00 sec)

mysql>

```
D:\java>java DeletePS
Enter the pin
69
Enter the name
Shiv
Want to continue ?(0-no/1-yes)
1
Enter the pin
24
Enter the name
Vineel
Want to continue ?(0-no/1-yes)
0

D:\java>
```

pin	name
2	asrit
5	sid
24	Vineel
35	Shannu
52	surya
69	Shiv
73	Asp
99	vig reddy
100	ASR
101	abhuu

10 rows in set (0.00 sec)

Q5. Write a java program to delete the record using prepared statement.

```java
import java.sql.*;
import java.util.*;
class DeletePS
{
public static void main(String[] strng) throws Exception
{
        Connection con = DriverManager.getConnection("jdbc:mysql://localhost/shiva","root","069");
        Scanner sc= new Scanner(System.in);
        int choice=1;
         while(choice==1)
         {
        PreparedStatement pt = con.prepareStatement(" delete from jex where pin=? ");
        System.out.println("Enter the pin ");
        int n = sc.nextInt();
        pt.setInt(1,n);
        pt.executeUpdate();
        System.out.println("Want to continue ?(0-no/1-yes)");
        choice= sc.nextInt();


        }
        con.close();
}
}
}
```

Output

pin	name
2	asrit
5	sid
24	Vineel
35	Shannu
52	surya
69	Shiv
73	Asp
99	vig reddy
100	ASR
101	abhuu

10 rows in set (0.00 sec)

mysql>

```
D:\java>javac DeletePS.java

D:\java>java DeletePS
Enter the pin
3
Want to continue ?(0-no/1-yes)
1
Enter the pin
24
Want to continue ?(0-no/1-yes)
0

D:\java>
```

pin	name
2	asrit
5	sid
35	Shannu
52	surya
69	Shiv
73	Asp
99	vig reddy
100	ASR
101	abhuu

9 rows in set (0.00 sec)

mysql>

Q6. Write a java program using callable statement to call stored procedure.

Stored Procedure to be save in Mysql Database
```
delimiter $$
create procedure find_by_id(IN p_id int, OUT p_name varhcar(30))
begin
select name
into p_name
from student
where id=p_id;
END $$
```

Java Program
```
import java.sql.*;
import java.io.*;
class StoredProcedure{
public static void main(String args[]) throws Exception
{
Class.forName("com.mysql.cj.jdbc.Driver");

Connection con=DriverManager.getConnection("jdbc:mysql://localhost/college","root","cme");

CallableStatement cstmt=con.prepareCall("call find_by_id(?,?)");
cstmt.setInt(1,4);
cstmt.registerOutParameter(2, java.sql.Types.VARCHAR);
System.out.println("Executing Stored Procedure....");
cstmt.execute();
String name=cstmt.getString(2);
System.out.println("Student Name with Id:4 is "+name);
cstmt.close();
con.close();


}//main
}//class
```

Output

Exercise-23
Servlets

Q1. Define Servlet.
A Servlet is a class that handles requests, processes them and reply back with a response.

Q2. List the life cycle stages of the Servlet.
      Loading a Servlet.

Initializing the Servlet.
Request handling.
Destroying the Servlet.

Q3. What is the difference between Servlet and HttpServlet.

The main difference between GenericServlet and HttpServlet is that the GenericServlet is protocol independent and can be used with any protocol such as HTTP, SMTP, FTP, and, CGI while HttpServlet is protocol dependent and only used with HTTP protocol.

Q4. List the arguments of service method.

ServletRequest type object
ServletReponse type object

## Q5. Name two servers that can host Servlets.

Apache Tomcat
Websphere

Q6. What is use of web.xml?

The Web Application Deployment Descriptor for your application. This is an XML file describing the servlets and other components that make up your application, along with any initialization parameters.

Q7. Name two packages that are used to work with Servlets.

import javax.servlet.*;
import javax.servlet.http.*;

Q8. Draw the Directory organization of web application in apache tomcat server.
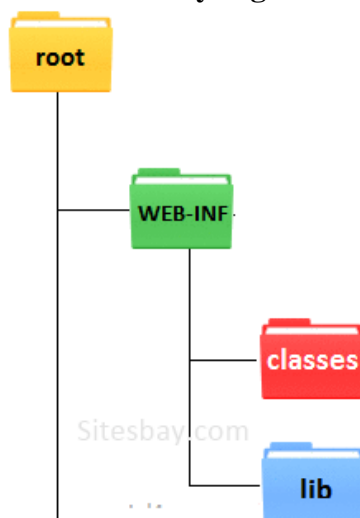
Programs

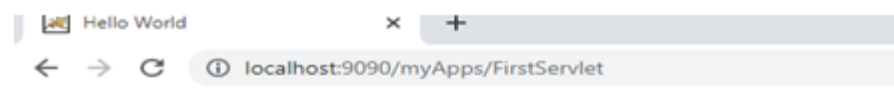## Q1. Write a Java program to display Hello and HelloWorld

Program

```
import java.util.*;
import java.io.*;
import javax.servlet.*;
import javax.servlet.http.*;
public class FirstServlet extends HttpServlet
{       String msg="Hello";
        String msg2="Hello World";
        public void doGet(HttpServletRequest request, HttpServletResponse
response)throws ServletException,IOException{
```

```
        response.setContentType("text/html");
        PrintWriter out=response.getWriter();
        out.println("<html><head><title>Hello
World</title><body><h1>"+msg+"</h1><br><h1>"+msg2+"</h1></body></head></htm
l>");
}
}
```

web.xml
```
<web-app>
<servlet>
<servlet-name> FirstServlet </servlet-name>
<servlet-class> FirstServlet </servlet-class>
</servlet>
<servlet-mapping>
<servlet-name> FirstServlet </servlet-name>
<url-pattern>/ FirstServlet </url-pattern>
</servlet-mapping>
</web-app>
```

Output

Q2. Write a Java program to handle HTTP requests and responses using doGet() method

Program

```java
import java.io.*;
import javax.servlet.*;
import javax.servlet.http.*;
public class CheckboxServlet extends HttpServlet
{
      public void doGet(HttpServletRequest request,HttpServletResponse response)
                  throws IOException,ServletException
      {
            response.setContentType("text/html");
            PrintWriter pw=response.getWriter();
            String[] favPhones=request.getParameterValues("favPhone");
            pw.println("Your Fav Phone Is:");
            for(String s:favPhones)
            {
            pw.print(s+" ");
            }
      }}
```

HTMLfile
FavPhone.html

```html
<html>
<form action="http://localhost:9090/20BatchS2/CheckboxServlet">
<h>Plz Select Ur Fav Phone..</h><br>
<input type="checkbox" name="favPhone" value="oneplus">One Plus+</input><br>
<input type="checkbox" name="favPhone" value="redmi">Redmi</input><br>
<input type="checkbox" name="favPhone" value="realme">Realme</input><br>
<input type="checkbox" name="favPhone" value="poco">Poco</input><br>
<input type="checkbox" name="favPhone" value="oppo">Oppo</input><br>
<input type="checkbox" name="favPhone" value="vivo">Vivo</input><br>
<input type="checkbox" name="favPhone" value="Infinix">Infinix+</input><br>
<input type="submit">
</html>
```

web.xml

```xml
<web-app>
```

```
<servlet>
<servlet-name>CheckboxServlet</servlet-name>
<servlet-class>CheckboxServlet</servlet-class>
</servlet>
<servlet-mapping>
<servlet-name> CheckboxServlet </servlet-name>
<url-pattern>/ CheckboxServlet </url-pattern>
</servlet-mapping>
</web-app>
```
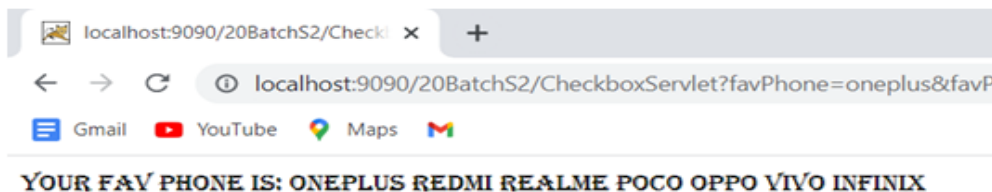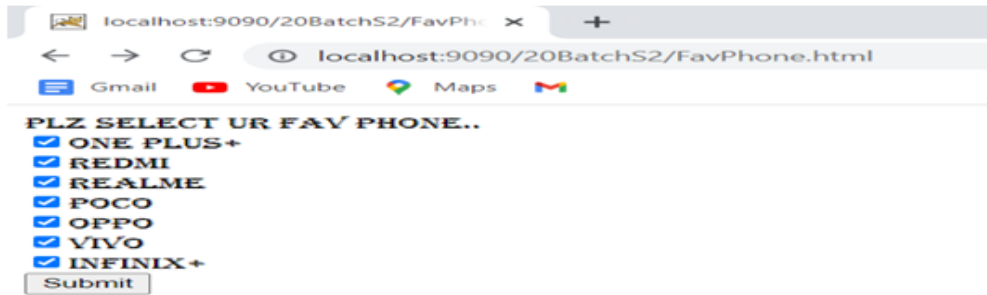
Output

Q3. Write a Java program to handle HTTP requests and responses using doPost() method

HTML page
```
<HTML>
      <BODY>
          <CENTER>
              <FORM NAME="Form1" METHOD="post"
ACTION="http://localhost:8080/website/ServletPostExample">
        <B>Login ID</B> <INPUT TYPE="text" NAME="loginid" SIZE="30">
                <P>
        <B>Password</B> <INPUT TYPE="password" NAME="password" SIZE="30">
                </P>
                <P>
                <INPUT TYPE=submit VALUE="Submit".>
                </P
      </BODY>
</HTML>
```

Java Program
```
import java.io.*;
import javax.servlet.*;
import javax.servlet.http.*;

public class ServletPostExample extends HttpServlet
```

```
{

  public void doPost(HttpServletRequest req, HttpServletResponse res) throws ServletException,
IOException

  {

    PrintWriter out = res.getWriter();

    String login= req.getParameter("loginid");

    String password= req.getParameter("password");

    out.println("Your login ID is: ");

    out.println(login);

    out.println("Your password is: ");

    out.println(password);

    out.close();

  }

}
```

web.xml
```
<web-app>
<servlet>
<servlet-name>ServletPostExample</servlet-name>
<servlet-class>ServletPostExample</servlet-class>
</servlet>
<servlet-mapping>
<servlet-name> ServletPostExample </servlet-name>
<url-pattern>/ServletPostExample</url-pattern>
</servlet-mapping>
</web-app>
```

Output
First Screen

← → C ⓘ localhost:8080/website/Login.html

Login ID abcd
Password ••••
Submit

Second Screen

← → C ⓘ localhost:8080/website/ServletPostExample

```
Your login ID is:
abcd
Your password is:
abcd
```