

12-06-2020

Now, from today we will start learning - Advance Java - JDBC Programming

Introduction - In core java we have learned - Collection classes, multithreading, exceptions, File I/O. But we can develop only standalone apps using core java. The applications which are running on single machine are standalone applications. Such as - MS Paint, Editplus, MS Office, calculator etc.

Standalone applications are of two types -

- ① GUI Based application (Graphical User Interface)
eg - Calc, MSword, Paint, Video Games & Desktop apps
- ② CUI Based application (Character user interface)
eg:- D:\Java> java Test ← (also known as Console applications)

But user percentage of standalone application is not more than 5%. In day-to-day life we are using now web-applications

eg:- gmail application

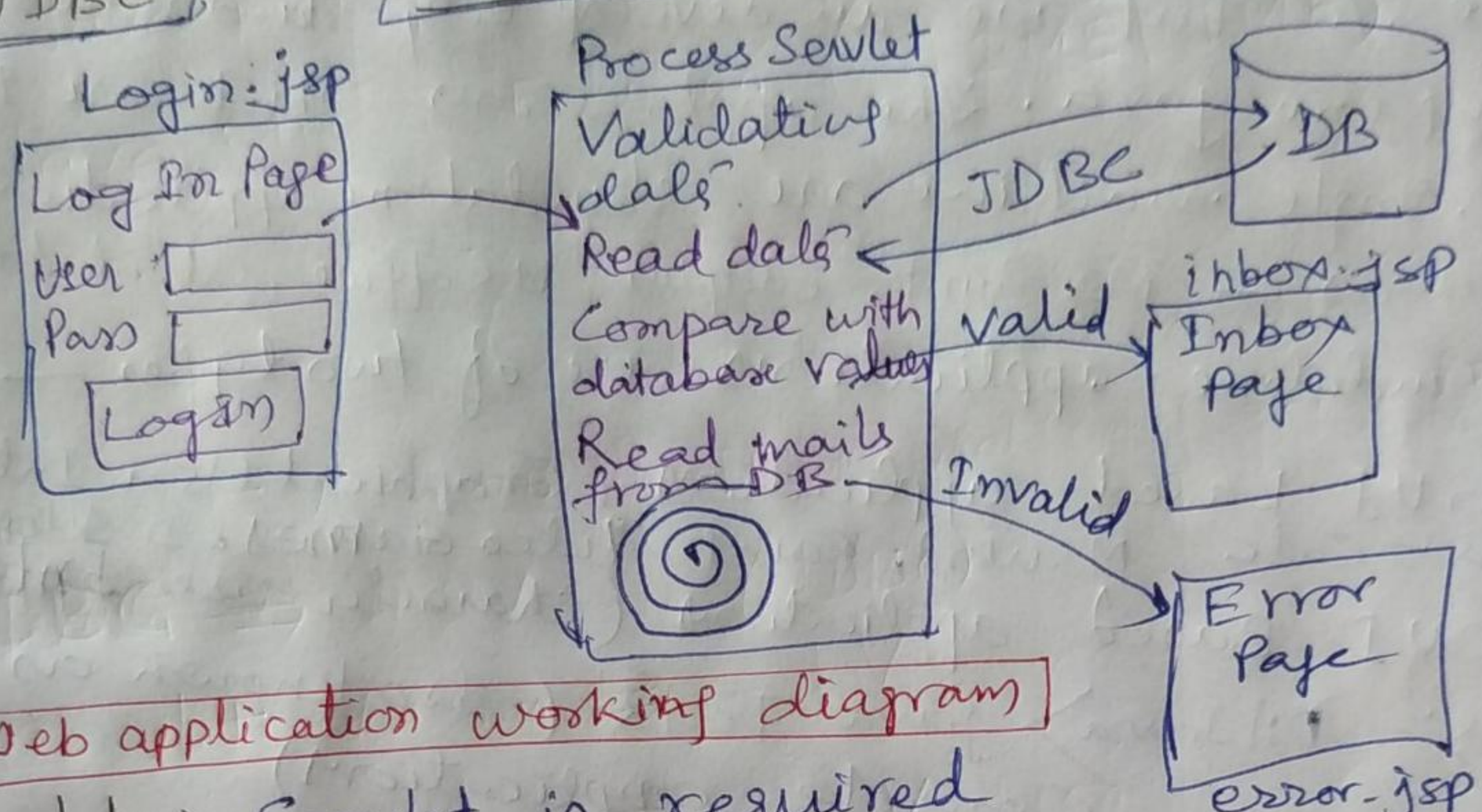
Now, to develop web-applications, we must have to use advance java. An application which can provide services over the web is called web-applications. eg:- gmail, facebook, any web-site.

Now, using the three different technologies, we are able to make web-applications -

- JDBC (Java Database Connectivity)
- Servlets
- JSPs (Java Server Pages)

In java we can able to develop web application

using the three technologies —
JDBC, Servlets and JSPs



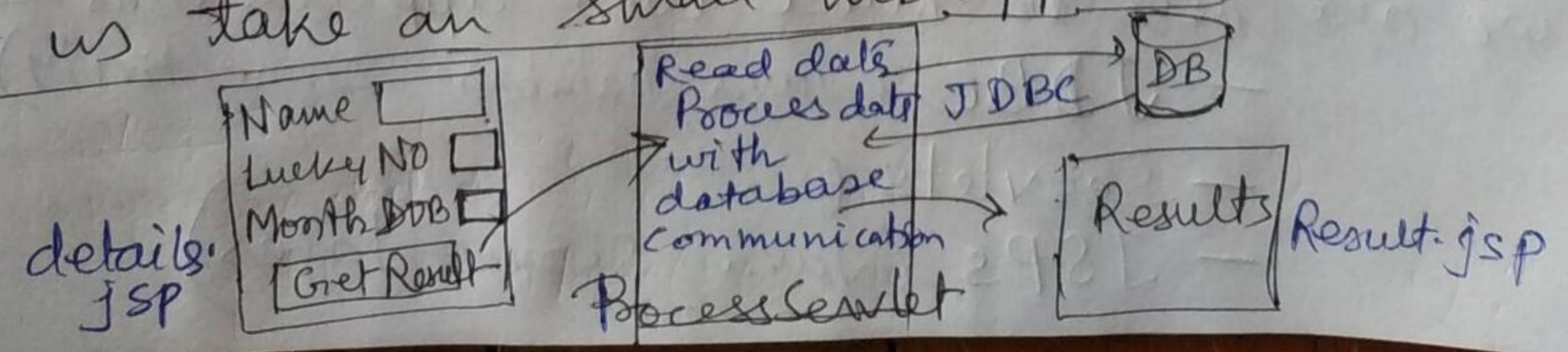
Web application working diagram

Servlet → Servlet is required where internal processing logic is required. Servlet can take help with normal Java classes for processing logic.

JSPs → Wherever presentation logic is required that means if we want to present (display) some information to the end-user then there JSPs are required.

JDBC → From java application, if we want to communicate with database then we need to use JDBC.

Let us take an small web application demo :-



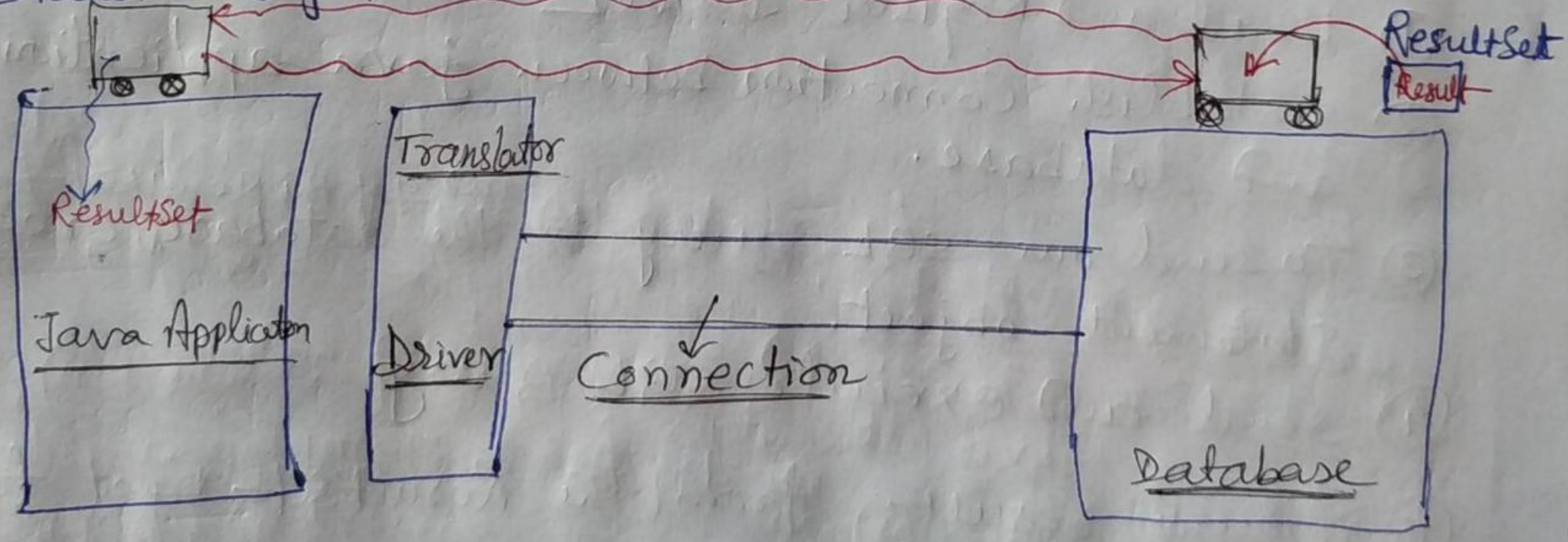
comes in three editions -

- ① Java Standard Edition (J2SE | JSE) ⇒ Core + JDBC
- ② Java Enterprise Edition (Web applications) (J2EE | JEE) ⇒ Servlets + JSPs
- ③ Java Micro Edition (Mobile Applications & Embedded Applications) (J2ME | JME)
 - (Remote Control Applications)
 - (Washing machine Applications)

Current versions of JDBC we will going to use -

JDBC ⇒ 4.2 Version (JDBC)
 Servlet Version ⇒ 3.1 Version
 JSP's Version ⇒ 2.3 Version

Statement object



(Components of JDBC Application)

Basic Components of JDBC Application →

- ① Driver :- It is translator to convert java calls into database specific calls and database specific calls into java calls.

② Connection - From java application to reach database application, a connection is required. This network socket is called Connection.

③ Statement - Statement object is required to send our SQL query ^{from java application} to database and database to java application.

④ ResultSet - ResultSet is holding the results of SQL Query. By using ResultSet, java application can get the result got from database after processing the query.

Now, consider the steps to develop a JDBC application -

Steps - To develop JDBC application -

- ① Load and Register Driver
- ② Establish Connection between java application and database.
- ③ To send our SQL query to the database, ^{and get the ResultSet from there} create Statement object.
- ④ Send and execute SQL Query
- ⑤ Process result from the ResultSet - got from the database.
- ⑥ Close the Connection.

Let us convert these steps into a demo program:-

```

import java.sql.*;
class JdbcDemo {
    public static void main (String [] args) throws Exception
    { Class.forName("Oracle.jdbc.OracleDriver");
  
```

```

String url = "jdbc:oracle:thin:@localhost:1521:XE";
String user = "System"; String pass = "xranjan";
Connection con = DriverManager.getConnection(url, user, pass);
Statement st = con.createStatement();
ResultSet rs = st.executeQuery("select * from emp1");
while (rs.next())
{
System.out.println(rs.getInt(1) + " --- " + rs.getString(2) + " --- " +
rs.getDouble(3) + " --- " + rs.getString(4));
}
con.close();
}
}

```

In my database there is a table - **emp1** whose structure is as follows:-

ENO	ENAME	EBASIC	EADDRESS	Field Names
number	varchar2(20)	number	varchar2(50)	Data types

~~we can~~ we can create it by opening oracle SQL

Prompt :- create table emp1
(ENO number Primary key,
ENAME varchar2(20),
EBASIC number,
EADDRESS varchar2(50)
);

Insert some data to it by -

```

Insert into emp1 values(100, 'Sunny', 5000, 'Mumbai');
Insert into emp1 values(200, 'Harendra', 6000, 'Sasaram');
Insert into emp1 values(300, 'Mohan', 7000, 'Mohania');
Insert into emp1 values(400, 'Dharmendra', 5500, 'Dehri');

```

Compile & Run the Program as:-

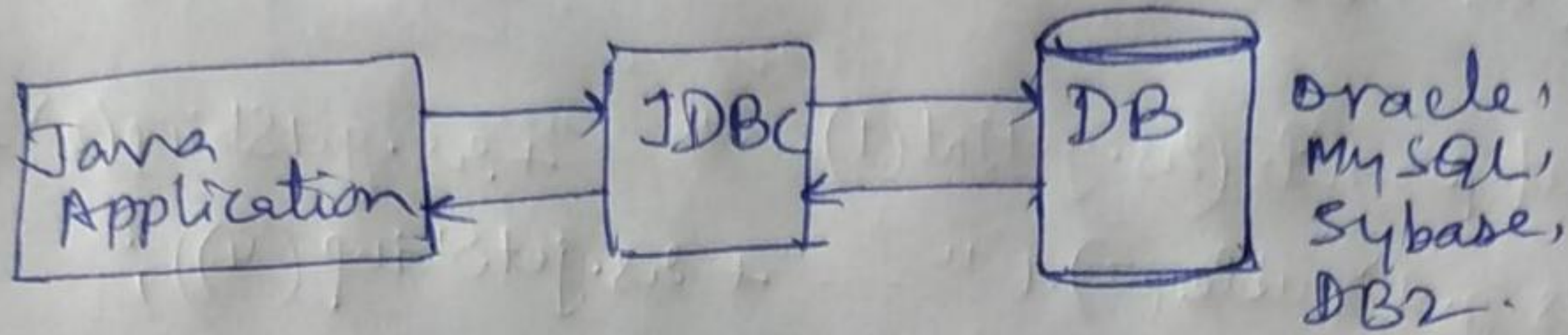
```

javac JdbcDemo.java ←
java JdbcDemo ←

```

JDBC :-

- ★ JDBC is a technology which can be used to communicate with database from java application.



- ★ JDBC is part of Java Standard Edition (J2SE/JSE)
- ★ JDBC is a Specification (Guidelines) defined by Java vendor ^(Sun Microsystems) and implemented by Database vendor
- ★ Database ~~to~~ vendor provided information is called Driver Software.

Features of JDBC -

- ① Standard API, never going to change from database to database. i.e., same for any type of database. Hence it is database independent API.
- ② Most of the drivers are developed using java language. Hence JDBC is platform independence, works in any operating systems.
- ③ C - Create (insert)
R - Retrieve (select)
U - Update
D - Delete
We can perform basic operations easily by using JDBC API.

④ Industry support for JDBC

www.oracle.com/technetwork/java/index-136695.html ↙

You can open this link and see the list of companies supporting JDBC based products.