

# VARIOUS DATABASE APPLICATIONS WITH JAVA DATABASE CONNECTIVITY

1.PRASHANT CHOWDHARY, 2.Dr. DEVESH KATIYAR, 3.Mr. GAURAV GOEL,  
1 Student of DSMNRU,  
2,3 Assistant Professor DSMNRU  
Computer Science Department  
DSMNRU, LUCKNOW

**ABSTRACT:-**As the development takes place, quantity of data increases which is in excess amount. Out of them some data and files are important for its users. So it is necessary to store, arrange and secure the data from suspicious users. For performing such tasks we can use various techniques. Out of them, one is DBMS. It helps in maintaining data and records. There are lots of DBMS tools like MariaDB, Oracle, MySQL, Sqlite, etc. are available and these DBMS tools have the requirement of a connectivity with data base of Java (JDBC). According to this study each tool has their own working, platforms, languages, features and particular JDBC drivers for making a linkage with DBMS. When we studied about these tools, we notice that they behave better and unique in the terms of features and ability after compared with the other tools. Therefore user can prefer a DBMS tool according to user's requirement. Hence the basic goal of this paper is to improve the knowledge of users about those data base tools and their features, which are unaware of the new technologies in the field of DBMS using JDBC and they can choose a better tool or software, as their purpose and need.

**Keyword:-** *JDBC, DBMS, CHARLES BACHMAN, MySQL, SQLite, MS Access, MsServer PostgresSQL, MongoDB, and Oracle RDBMS, OrientDB, MariaDB, Cassandra.*

## I. INTRODUCTION:-

This study tells about some best softwares of the data base connect with Java program. For this approach we can use connectivity of data bases to java by using JDBC. it is helpful for bringing the Connectivity of Data base of Java. In the DBMS we observe that if there is the need of making the linkage between java applications and DBMS then we required an interface of application programming as JDBC. Database Management technology becomes established global fame because of extreme dependency on the business group on online record maintenance like services (electricity, gas, water, etc), education field, commerce field, hospitality, transport field, culture, leisure (theater, concerts), etc.

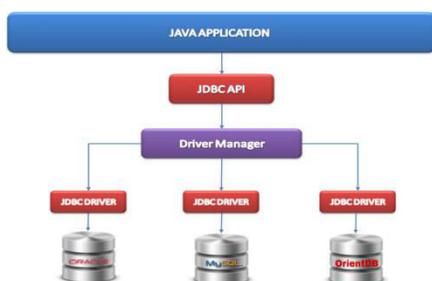
Technologies of Database connection serve as a boon which is used for managing the work efficiently and easily. We adopt a DBMS to set up its data on principles of its own structure. On the bases of their requirement, various agents produced distinctive kinds of DBMS. Any written application to approach a DBMS of one agent cannot be approach the DBMS of another agent.

DBMS such as MySQL, SQLite, MS Access, PostgresSQL, MongoDB, and Oracle RDBMS. There is various trending DBMS software. It demonstrates each software.

## II. DBMS:-

Firstly, CHARLES BACHMAN had introduced the phenomenon of the DBMS in the year 1960s. the gathering of multiple varieties of data, various files or records are arranged into a systematic way that are stored into a tabular form is only possible for data base. Hence in the DBMS, the system software uses a standard method to store and organize data. DBMS is developed to work with different kinds of data. These various types of data is processed, modified, added, traversed or deleted by using multiple standard algorithms and commands. it is only possible in DBMS to create own databases according as the needs of its users arise. It has many programs that establish an interface among various databases and manages the whole working of databases. It includes the users of the database and other application programs.

DBMS Software keeps the data secured and provides ease of accessing the data. Currently in the field of application programming, DBMS has multiple varieties of tools used by



This study illustrates various softwares of

various organizations. It maintains the data efficiency and reducing copied data.

According to their features, few of them are publically available tools and few are commercial tools use by authorized organizations. The tool's selection is fully dependent on needs of users and organizations based on their working.

### III. THE TOP DBMS SOFTWARES:-

List of few most prominent DBMS softwares are described below:-

- A. MySQL.
- B. Oracle RDBMS
- C. PostgresSQL
- D. SQLite
- E. Microsoft Access
- F. MsSQL Server
- G. MongoDB
- H. OrientDB
- I. MariaDB
- J. Cassandra

#### A. MySQL :-



The huge collection of the relationals data bases is available. Out of them, MySQL is a data base that is publically available and run on various platforms like MacOS, Linux, Windows, etc.

**Platform:** Windows, Mac and Linux.

**Languages:** C, PHP, SQL, Java C++, Python and Perl etc.

**JDBCdriver:** com.mysql.jdbc.Driver

**JDBC URL:**

`jdbc:mysql://localhost/high_performance_java_persistence`

**Features:-**

- The tool provides Scalability and Flexibility
- The tool has strengths of data warehouse and web.
- It provide huge Performance.
- It has Support of Robust Transactions.

**Verdict:** MySQL can be used for packaged software, and business-critical systems and high-volume websites.

**Link:** <https://www.mysql.com/>

#### B. Oracle:-



Oracle is a part of RDBMS which is based on objects. It is basically a secured, self-driven and developed for eliminating management of data manually. It is an intelligent, secure, and extremely available database over cloud that helps us to expand our business.

**Platform:** Linux and Windows

**Languages:** C++, C, Java, COBOL, Visual Basic (VB), and PL/SQL.

**Version of cloud:** Yes

**JDBC driver:**

`oracle.jdbc.driver.OracleDriver`

**JDBC URL:**

`jdbc:oracle:thin:@localhost:1521:orclpdb1`

**Features:**

- Oracle includes high-performance on data processing, wide-scale of data, streaming work load etc.
- It is possible in Oracle to migrate on the Cloud.
- The Oracle provides numerous services based on how we operate in a way to run on Oracle's cloud in data center.

**Verdict:** Oracle database stores and retrieve information. Database server solves the problem related to information management.

**Link:** <https://www.oracle.com/in/database/>

#### C. PostgresSQL-



PostgreSQL remains a highly dependable public source DBMS platform. It offers two types of structures called object-oriented structures and relational structures within the same database system. The JDBC driver of PostgreSQL in short we can be called PgJDBC, allows programs of java to connect with the PostgreSQL database using standard, database independent Java code. This is a publically available driver of JDBC which is completely based on Java and communicates in the PostgreSQL native network protocol. It is the reason that JDBC drivers are platform independency. Once the compilation process is completed, anyone can used this driver on that any device.

The modern version of the driver should be appropriate with PostgreSQL8.2 and updated version 3.0 of the PostgreSQL protocol, and it's suitable with Java 6 (JDBC driver4.0), Java 7 (JDBC driver4.1) and Java 8 (JDBC driver4.2)

**Platform:** Mac, Windows, and Linux.

**Languages:** PL/Python, PL/Tcl, PL/pgSQL, and PL/Perl.

**Version of Cloud:** No.

**JDBC driver:**

org.postgresql.Driver

**JDBC URL:**

jdbc:postgresql://localhost/high\_performance\_java\_persistence

**Features:**

- Consistent with numerous platforms using the all major middleware and languages.
- Standby server and large availability.
- The tool allows sophisticated servers-side programming functionality.
- It allows a most sophisticated locking technique.
- It provide for multiple forms of consistency management.
- It provides support for client's side server network architecture.
- PostgreSQL provides connection with distinct data source like NoSQL, which carry out as a federated hub for polyglot databases.

**Verdict:** PostgreSQL allows us to construct custom data types and a range of query methods. We can run a saved procedure in different programming languages.

**Link:** <https://www.postgresql.org/>

#### D. SQLite:-



SQLite is a RDBMS, public source, embedded, circa 2000. The SQLite is a data base of zero configuration and no requirements of any server or any installation. Despite its integrity, it is laden with suitable attributes of DBMS.

**Platform:** Blackberry, Symbian, Maemo, Android, MeeGo, WebOS, NetBSD, FreeBSD, illumos, Solaris 10, Windows, and Tizen.

**Languages:** C, C#, C++, Java, PHP, Python, Ruby, etc.

**Version of Cloud:** Yes

**JDBC driver:**

org.sqlite.JDBC

**JDBC URL:**

jdbc:sqlite:C:/sqlite/JTP.db

jdbc:sqlite:C:/sqlite/db/chinook.db

**Features:**

- SQLite is light weighted as compared with other DBMS such as Oracle or SQL Server.
- It has an inbuilt-memory library that anyone can call and use directly without installation or configuration.
- It is not required that any dedicated to server for storing data bases. The data base is stored in the computer's hard disk.

**Verdict:** SQLite has a library of C-language which offers self-contained, reliable and full-featured SQL database engine.

**Link:** <<https://www.sqlite.org/index.html>>

#### E. Microsoft Access:-



Microsoft Access (or MsAccess) is clustered a kind of MS Office software. It is only applicable on the PC version. MsAccess has commonly been recognized as a desktop data base system because its functions are expected to be execute from a special computer (like denied to client/server software where the data base application is installed on server, then it can be accessed from various client machines) over a network.

Yet, MsAccess also consists of a web solution (for constructing custom web apps") that is combined with SQLServer<[https://www.quackit.com/sql\\_server/tutorial/](https://www.quackit.com/sql_server/tutorial/)>

**Latest stable version:** 16.0.6741.2048.

**JDBC driver:**

net.ucanaccess.jdbc.UcanaccessDriver

**JDBC URL:**

jdbc:ucanaccess://e://Java//JavaSE//MsAccess//Contacts.accdb

**Features:**

- It is a cheap DBMS which is mostly used by e-commercial sites.

**Costs:** Ms Access is a commercial tool.

**Link:**

<https://products.office.com/enIN/access?legRedir=true&CorrelationId=43817cd4-8200-4706-a245-2366e3d2bb8a>

#### F. MsSQL Server:-



MsSQL Server is the RDBMS which is introduced by Microsoft. SqlServer support ANSI SQL related, which is the standarderized SQL language. Yet, SqlServer starts with the development of SQL language, T-SQL.

**Platform:**

- Server of SUSE of Linux Enterprise, Ubuntu, Red Hat Linux Enterprise.

**Languages:** C#, C, Java and c++.

**Version of cloud:** Yes

**JDBC driver:**

com.microsoft.sqlserver.jdbc.SQLServerDataSource

com.microsoft.sqlserver.jdbc.SQLServerXADatasource

**JDBC URL:**

jdbc:sqlserver://localhost;instance=SQLEXPRESS;databaseName=high\_performance\_java\_persistence

**Features:**

- It gives integration of organized and unorganized data with the strength of SqlServer and Spark.
- The tool allows availability, working, scalability for complex missions, intelligent applications, and data warehouses.
- It provides highly secured features to protect available data.
- Access to rich, interactive Power BI records, to conduct a quicker and stronger selection.

**Link:** <<https://www.microsoft.com/en-in/sql-server/sql-server-2019>>

### G. MongoDB



MongoDB depends on document-orientation, data base of NoSQL applied for large amount data repository. The used data base in MongoDB is relational which came nearly about mid-2000. It comes under the group of NoSQL data base.

**Platform:** Platform independent

**Languages:** Ruby, C++, C, Java, Perl, Scala, C#, etc.

**Version of cloud:** Yes

**JDBC driver:**

mongodb.jdbc.MongoDriver

**JDBC URL:**

jdbc:mongodb://[UserName]:[Password]@[Host]:[Port]/[Database]?[Property1]=[Value]&[Property2]=[Value]&...

**Features:**

- MongoDB is fully measurable, automated, complex, highly applicable, multi-node cluster with easily API call.
- This tool supports users to establish globally scattered clusters.
- It is easy to reconstruct data when required.
- It provides visualization and modification on above 80 metrics that is used for visualizing cluster and monitoring solutions for integrating it with the third-party.
- The tool acquires a very strong query language.
- It uses high definition of JSON documents for storing tables and records in relational data base.
- It represents MongoDB Atlas that is a public cloud data base.

**Verdict:** MongoDB permits users to validate the document. It is not suitable for those applications having complex transactions.

**Link:** <https://www.mongodb.com/>

### H. OrientDB



OrientDB is a public-source NoSQL multi-model data base that facilitates organizations to unlock the potentiality of graph databases without using various systems to control alternative data types. This help to enhance security and performance while supporting scalability.

**Platform:** Windows, Linux, HP-UX, MacOS X, and Solaris.

**Languages:** Java, C, Python, JavaScript, PHP, Android, .NET, Nodejs, Ruby, Perl, Scala, .and Elixir.

**Version of Cloud:** Yes.

**JDBCdriver:** com.orienttechnologies.orient.jdbc.

OrientJdbcDriver

**JDBC URL:**

jdbc:orient:remote:localhost/Sensor\_Data

**Features:**

- Integrated Multiple Model based on API-for fast deployment.

- This tool concentrated on the presentation and scalability.
- This tool provides updated query planner.

**Verdict:** OrientDB has the ability to do multi-master replication, shared data using clusters, and automate distributed queries and transactions.

**Link:** <<https://orientdb.com/>>

#### I. MariaDB



MariaDB is a part of MySQL. It is constructed by its real developers. This tool provides data handling potentials for both short and organization tasks.

**Platform:** Windows, Mac and Linux.

**Languages:** C++, C#, Java, Python, etc.

**Version of Cloud:** Yes

**JDBC driver:**

org.mariadb.jdbc.Driver

**JDBC URL:**

`jdbc:mariadb://localhost/high_performance_java_persistence`

**Features:**

- It works under GPL, BSD or LGPL licenses.
- It appears with many storage tools, including huge-performance ones. It could combine with another RDBMS.
- It provides the Galera cluster technology.
- MariaDB doesn't depend on any particular platform so that it can be executed on various operating systems. It also supports various programming languages.

**Verdict:** MariaDB is an alternate software to MySQL. It provides high scalability through easy integration.

**Link:** <https://mariadb.org/>

#### J. CASSANDRA:-



Cassandra is a cost independent tool that is designed for the management of a bulk of data over a high range of servers. Tool gives assistance for simulating over various data centers.

**Platform:** Platform independent

**Languages:** C++SQL, Python, Node JS and Go

**Version of Cloud:** Yes

**JDBC driver:**

com.dbschema.CassandraJdbcDriver

**JDBC URL:**

`jdbc:cassandra://host1[:port1][,host2[:port2],...[,hostN[:portN]]][/[keyspace][?options]]`

**Features:**

- Data is replicated to various nodes to serve a system of fault-tolerance.
- Cassandra support for each types of services and contract from other tools.
- It supports to elect between synchronous or asynchronous replication for the update.

**Verdict:** Cassandra is for those people who want scalability and high availability without decreasing performance.

**Link:** <<http://cassandra.apache.org/>>

#### IV. CONCLUSION:-

According to above study we can determine that all the DBMS tools that support JDBC have some useful features and quality, some tools may be profitable or easy in implementation whereas other tool may not that suitable per specifications.

Present's time is the time of data and records, where a huge number of data should be stored, updated, and established daily at any secure location. There is the demand of DBMS tools is also high and rising exponentially as the years comes.

Every described tool behaves better and unique in the terms of features and ability as compared with the other tool, we can select a DBMS tools according to our requirements.

Hence this paper will improve the knowledge of users about those data bases tools and their features, which are unaware of the new technologies in the field of DBMS and JDBC

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