5.1 Technology

JAVA

Java is a high-level, versatile, and object-oriented programming language that was initially developed by Sun Micro systems and later acquired by Oracle Corporation. It was first released in 1995 and has since become one of the most widely used programming languages globally. Java's popularity is driven by its portability, strong community support, and its use in a wide range of applications, including web development, mobile app development, enterprise software, scientific computing, and more.Java is designed to be platform-independent, meaning that Java programs can run on various operating systems without requiring modifications. This is achieved through the use of a virtual machine called the Java Virtual Machine (JVM). When you compile a Java program, it is converted into byte code, which is a platform-neutral intermediate form of the code. This byte code is then executed by the JVM, which translates it into machine-specific instructions.

WHY CHOOSE JAVA

If you're going to write programs, there are literally dozens of commonly used languages to choose from. Why choose JAVA? Here are some of the features that make JAVA an appealing choice.

Object-Oriented:

Java is a fully object-oriented language, which means that everything in Java is an object. It promotes modular and reusable code by allowing developers to create classes and objects that encapsulate data and behavior.

Platform Independence:

Java's "Write Once, Run Anywhere" capability is made possible by compiling Java source code into byte code, which is then executed by the Java Virtual Machine (JVM).

This allows Java programs to run on any platform with a compatible JVM.

Strongly Typed:

Java is a strongly typed language, meaning that every variable and expression has a specific data type that is known at compile time. This helps catch type-related errors early in the development process.

Rich Standard Library:

Java provides a comprehensive standard library with classes and methods for a wide range of tasks, from basic input/output operations to networking, data manipulation, and more.

Multi-threading Support: Java offers built-in support for multithreading, allowing developers to create and manage multiple threads of execution within a single program.
This is essential for building concurrent and responsive applications.

Security:

Java includes security features such as the ability to run code in a sandboxed environment and control access to system resources. This helps create secure
applications and applets.

Exception Handling:

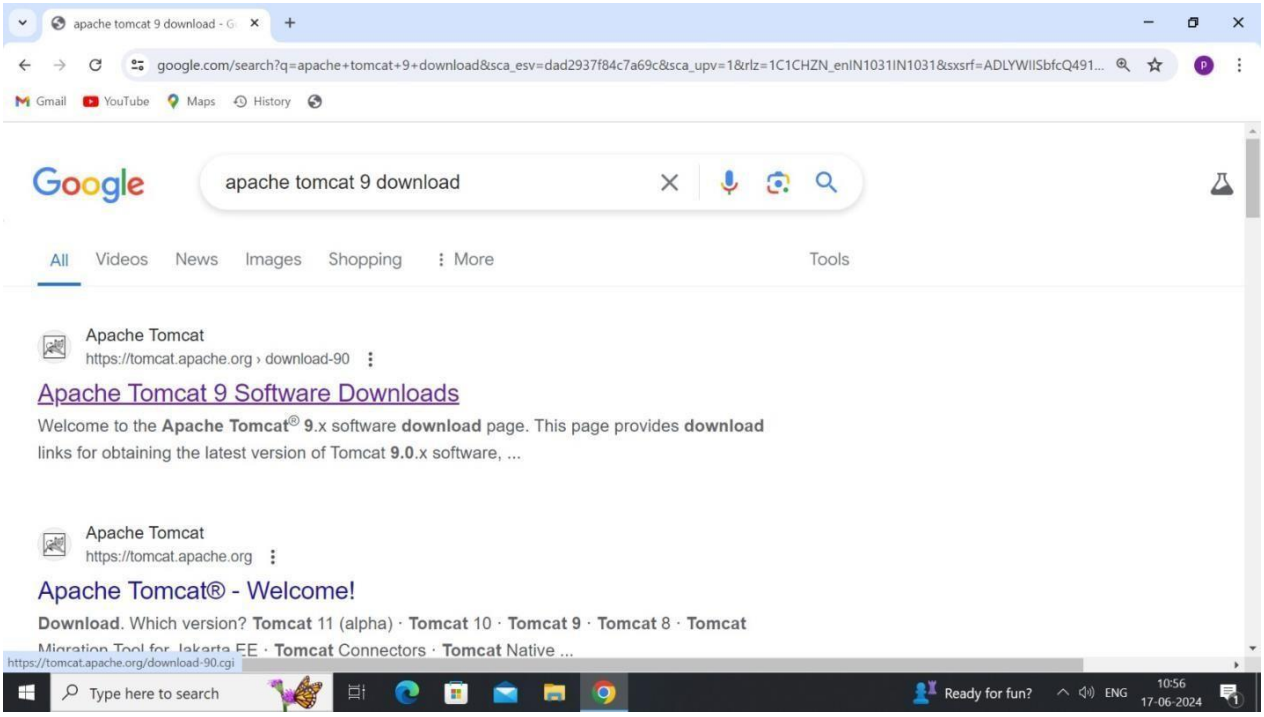
Java has a robust exception handling mechanism that allows developers to handle and recover from errorsand exceptions gracefully, improving the reliability of applications.

Versatility:

Java can be used to develop a wide range of applications, including desktop applications, web applications, mobile applications (through Android development), server-side applications, embedded systems, and more.

Open Source Implementation:

While Java itself is not fully open source, the OpenJDK project provides an opensource implementation of the Java SE platform, ensuring transparency and community involvement.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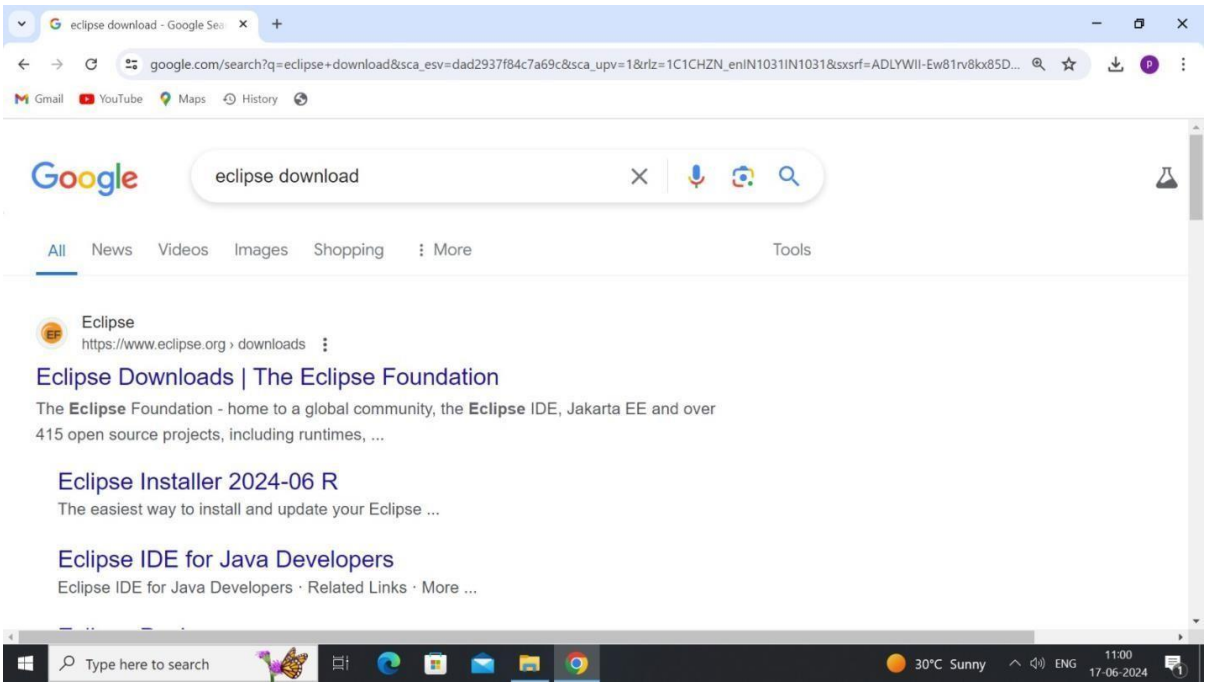
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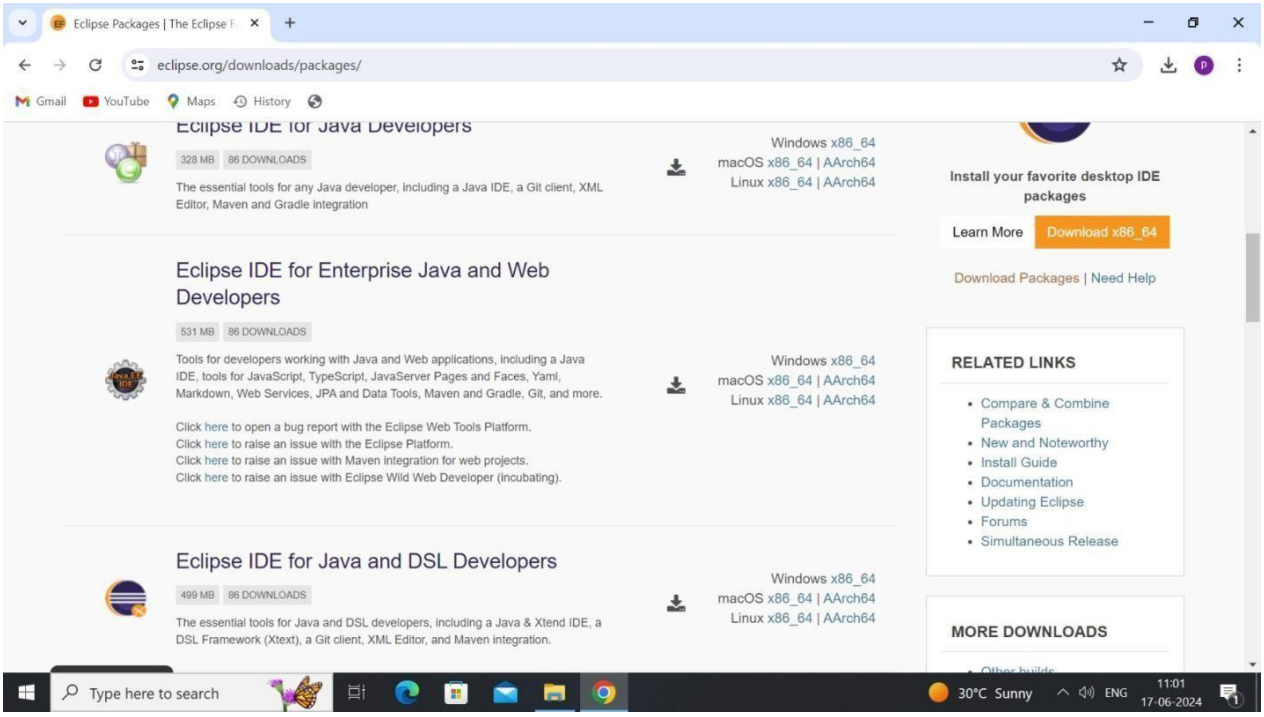
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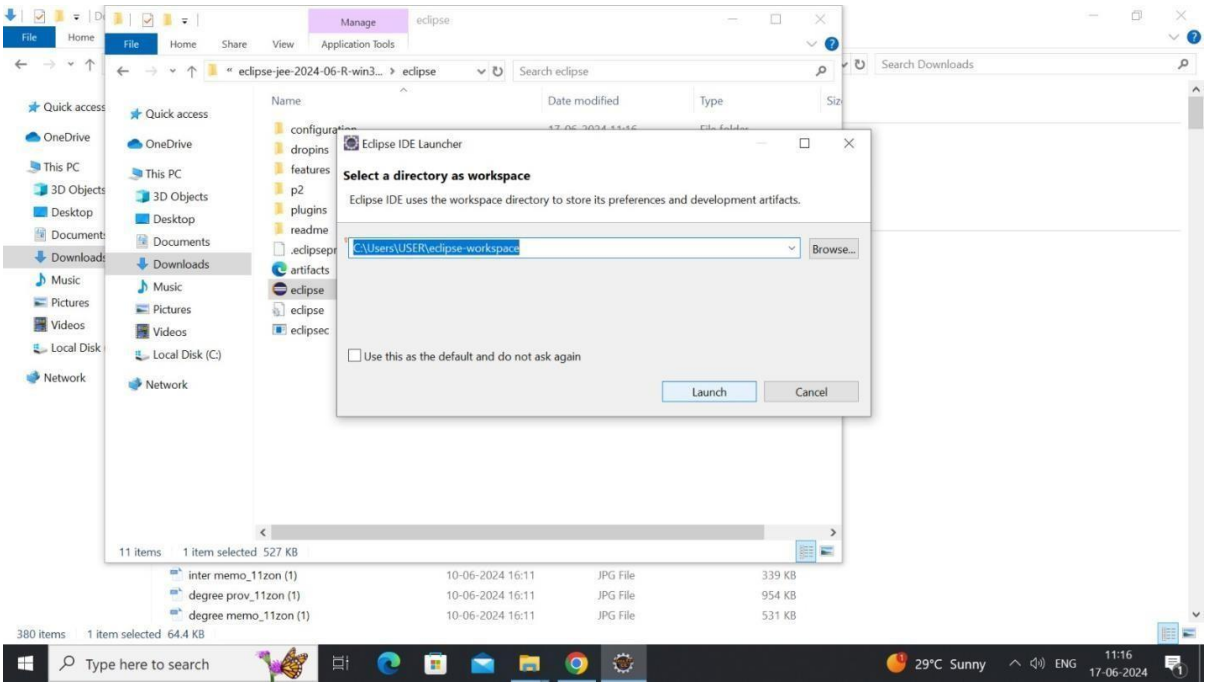
Eclipse IDE Launcher
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Eclipse IDE uses the workspace directory to store its preferences and development artifacts.
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Browse...
Use this as the default and do not ask again
Launch
Cancel
eclipse-jee-2024-06-R-win3... › eclipse
Search eclipse
Search Downloads
Quick access
OneDrive
This PC
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Desktop
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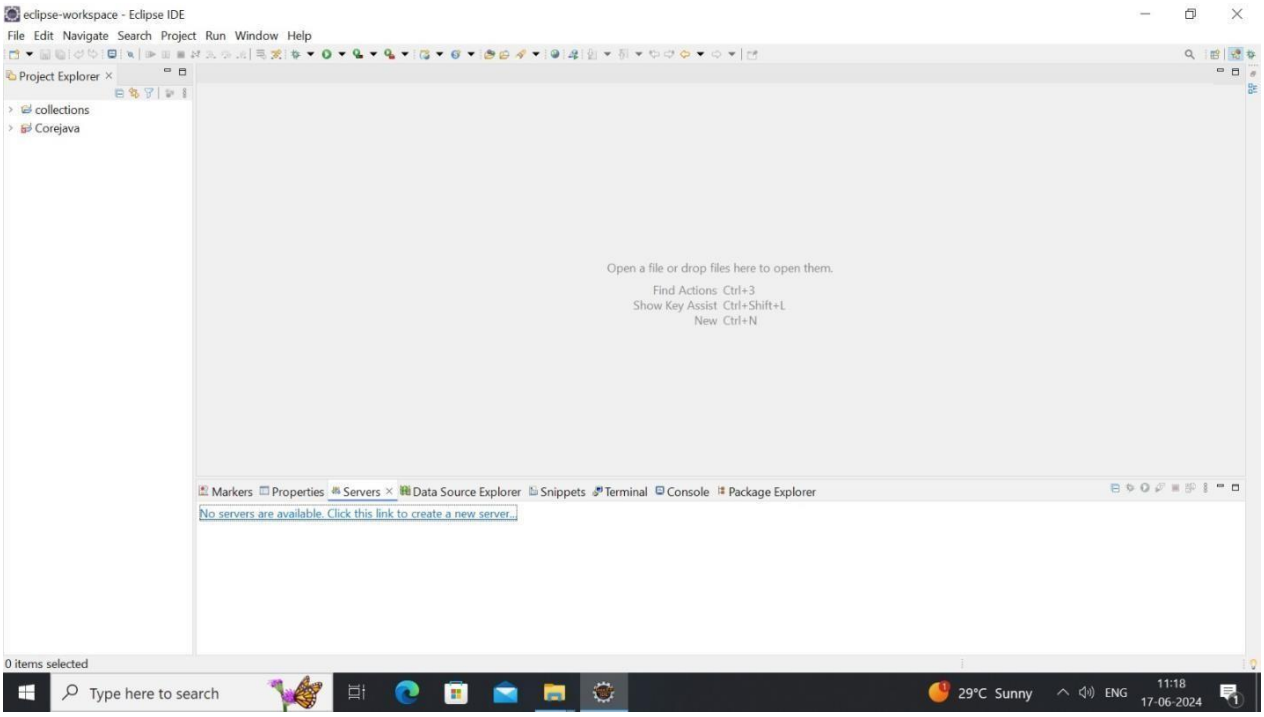


JSP

JSP technology is used to create web application just like Servlet technology. It can be thought of as an extension to Servlet because it provides more functionality than servlet such as expression language, JSTL, etc.

A JSP page consists of HTML tags and JSP tags. The JSP pages are easier to maintain than Servlet because we can separate designing and development. It provides some additional features such as Expression Language, Custom Tags, etc.

There are many advantages of JSP over the Servlet. They are as follows:

1) Extension to Servlet

JSP technology is the extension to Servlet technology. We can use all the features of the Servlet in JSP. In addition to, we can use implicit objects, predefined tags, expression language and Custom tags in JSP, that makes JSP development easy.

2) Easy to maintain

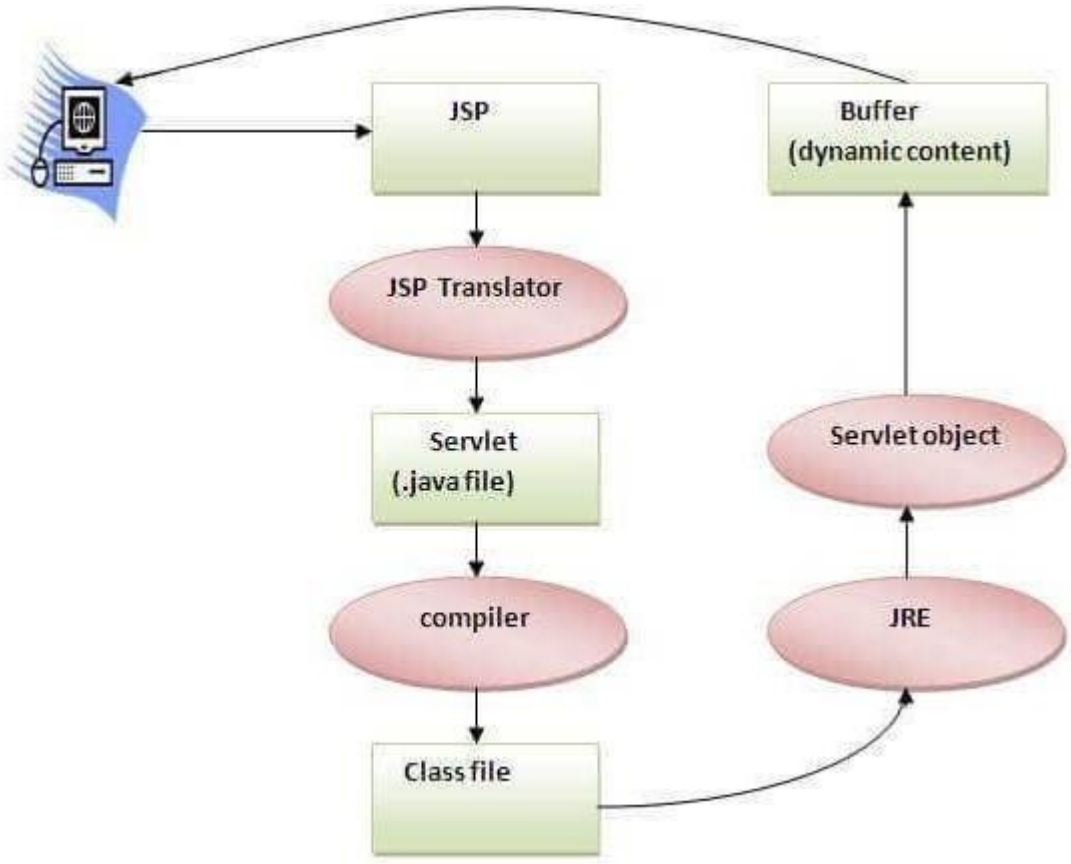
JSP can be easily managed because we can easily separate our business logic with presentation logic. In Servlet technology, we mix our business logic with the presentation logic.

3) Fast Development: No need to recompile and redeploy

If JSP page is modified, we don't need to recompile and redeploy the project. The Servlet code needs to be updated and recompiled if we have to change the look and feel of the application.

4) Less code than Servlet

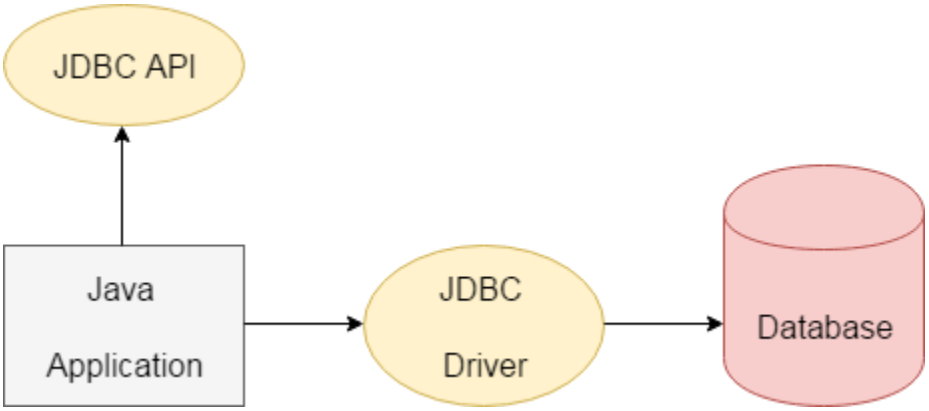
In JSP, we can use many tags such as action tags, JSTL, custom tags, etc. that reduces the code. Moreover, we can use EL, implicit objects, etc.



As depicted in the above diagram, JSP page is translated into Servlet by the help of JSP translator. The JSP translator is a part of the web server which is responsible for translating the JSP page into Servlet. After that, Servlet page is compiled by the compiler and gets converted into the class file. Moreover, all the processes that happen in Servlet are performed on JSP later like initialization, committing response to the browser and destroy.

JDBC

JDBC stands for Java Database Connectivity. JDBC is a Java API to connect and execute the query with the database. It is a part of JavaSE (Java Standard Edition). JDBC API uses JDBC drivers to connect with the database. We can use JDBC API to access tabular data stored in any relational database. By the help of JDBC API, we can save, update, delete and fetch data from the database. It is like Open Database Connectivity (ODBC) provided by Microsoft.



There are 5 steps to connect any java application with the database using JDBC. These steps are as follows:

- Register the Driver class
- Create connection
- Create statement
- Execute queries
- Close connection

HTML (Hypertext Markup Language):

- Standard markup language for creating web pages and web applications.
- Uses tags to structure content and define elements on web pages.
- Provides a basic structure for web documents, including text, images, links, and multimedia.
- Requires browsers to interpret and render web content as intended.

CSS (Cascading Style Sheets):

- A style sheet language used for controlling the presentation and layout of web documents.
- Separates content (HTML) from its visual representation (CSS).
- Allows developers to define styles, fonts, colors, and positioning for web elements.
- Enhances consistency and maintainability of web design.

JavaScript:

- A versatile scripting language used for adding interactivity and behaviour to web pages.

- Runs in web browsers and enables dynamic client-side interactions.
- Supports event handling, DOM manipulation, and AJAX for asynchronous communication.
- Widely used for building web applications and enhancing user experiences.

5.2 SAMPLE CODE
DATA DICTIONARY(TABLES):

care_rent

_

- admin
- book
- car
- customer
- payment

admin

Fields

Field	Type	Collation	Null	Key	Default	Extra	Privileges	Comment
id	int	(NULL)	NO	PRI	(NULL)	auto_increment	select,insert,update,references	
email	varchar(222)	utf8mb4_0900_ai_ci	YES		(NULL)		select,insert,update,references	
password	varchar(222)	utf8mb4_0900_ai_ci	YES		(NULL)		select,insert,update,references	

Indexes

Table	Non unique	Key name	Seq in index	Column name	Collation	Cardinality	Sub part	Packed	Null	Index type	Comment	Index comment	Visible	Expression
admin	0	PRIMARY	1	id	A	1	(NULL)	(NULL)		BTREE			YES	(NULL)

Back

book

Fields

Field	Type	Collation	Null	Key	Default	Extra	Privileges	Comment
id	int	(NULL)	NO	PRI	(NULL)	auto_increment	select,insert,update,references	
email	varchar(999)	utf8mb4_0900_ai_ci	YES		(NULL)		select,insert,update,references	
phone	varchar(10)	utf8mb4_0900_ai_ci	YES		(NULL)		select,insert,update,references	
car_id	int	(NULL)	YES		(NULL)		select,insert,update,references	

Deposite_amount	varchar(999)	utf8mb4_0900_ai_ci	YES		(NULL)		select,insert,update,references	
book_date	varchar(999)	utf8mb4_0900_ai_ci	YES		(NULL)		select,insert,update,references	
pickUp_point	varchar(999)	utf8mb4_0900_ai_ci	YES		(NULL)		select,insert,update,references	
dropping_point	varchar(999)	utf8mb4_0900_ai_ci	YES		(NULL)		select,insert,update,references	
address	varchar(999)	utf8mb4_0900_ai_ci	YES		(NULL)		select,insert,update,references	
today_date	varchar(999)	utf8mb4_0900_ai_ci	YES		(NULL)		select,insert,update,references	
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Indexes

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Back

car

Fields

Field	Type	Collation	Null	Key	Default	Extra	Privileges	Comment
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cartype	varchar(999)	utf8mb4_0900_ai_ci	YES		(NULL)		select,insert,update,references	
brand	varchar(999)	utf8mb4_0900_ai_ci	YES		(NULL)		select,insert,update,references	
model	varchar(999)	utf8mb4_0900_ai_ci	YES		(NULL)		select,insert,update,references	
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excost	double	(NULL)	YES		(NULL)		select,insert,update,references	
depositcost	double	(NULL)	YES		(NULL)		select,insert,update,references	
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image	longblob	(NULL)	YES		(NULL)		select,insert,update,references	
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Indexes

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Back

customer

Fields

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name	varchar(999)	utf8mb4_0900_ai_ci	YES		(NULL)		select,insert,update,references	
email	varchar(999)	utf8mb4_0900_ai_ci	YES		(NULL)		select,insert,update,references	
password	varchar(999)	utf8mb4_0900_ai_ci	YES		(NULL)		select,insert,update,references	
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drivingLicense	longblob	(NULL)	YES		(NULL)		select,insert,update,references	

Indexes

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Back

payment

Fields

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