

دوره آموزشی دیتابیس

SQL

مدرس: اسماعیل صادقی

JavaTarFoundation ↗



JavaTar

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Database Relation



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Install Oracle

<https://www.oracle.com/database/technologies/112010-win64soft.html>

Step 1: Go to oracle.com and Click on **Options** Menu.

The screenshot shows the Oracle website homepage with a dark background. At the top, there is a navigation bar with icons for user profile, search, and account management. Below the navigation bar, the main content area is organized into several sections:

- Generation 2 Cloud Infrastructure**: Includes links for Autonomous Database, Data Management, Analytics, Compute, Cloud@Customer, Application Development, MarketPlace, and All Cloud Infrastructure.
- On-Premise Infrastructure**: Includes links for Oracle Database, Java, Software, and Hardware.
- Cloud Applications**: Includes links for Enterprise Resource Planning, Human Capital Management, Supply Chain Management, Sales, Service, Marketing, Data Cloud, NetSuite Application Suite, and All Cloud Applications.
- Government Cloud**
- Industry Applications**
- On-Premise Applications**
- Our Company**: Includes links for Careers, Customer References, Developer Center, Investor Relations, Oracle PartnerNetwork, and News and Events.
- Product Help**: Includes links for Downloads, Cloud Readiness, Documentation, Support, Training, Community Forums, and Consulting.



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Install Oracle

Step 2: Click the **Download** Button and Scroll Down to **Database** Section.

Database	Database 19c Enterprise/Standard Editions Database 18c Enterprise/Standard Editions Database 12c Enterprise/Standard Editions Database 11g Enterprise/Standard Editions Database 18c Express Edition Audit Vault and Database Firewall Berkeley DB Big Data Connectors Cluster Verification Utility Database Mobile Server	Grid Infrastructure Instant Client MySQL NoSQL Database Oracle Blockchain Platform Enterprise Edition Rdb Products R Distribution Secure Backup Secure Backup Cloud Module for Amazon S3 TimesTen In-Memory Database
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Step 3: Click **Database 11g Enterprise/Standard Editions**, after which you'll find different versions of Oracle for different OS. Download the Files according to your OS.

(11.2.0.1.0)	Name	Download	Note
	Microsoft Windows (32-bit)	File 1 , File 2 (2GB)	See All
	<u>Microsoft Windows (x64)</u>	File 1 , File 2 (2GB)	See All
	Linux x86	File 1 , File 2 (2GB)	See All



Install Oracle

Step 4: After Clicking the **Download** Button, the page will be directed to *Login Screen* where you'll need to *Sign In Oracle Account*. If you don't have one, then you must *Sign Up*, because without that you won't be able to download the Files.

You must accept the [Oracle License Agreement](#) to download this software.

I accept the Oracle License Agreement

[Download win64_11gR2_database_1of2.zip](#)

All the content on this site is provided as samples and is not supported as a product by Oracle.

Oracle account sign in

Username i

Password i

[Sign in](#)

[Need help?](#)

Don't have an Oracle Account?

[Create Account](#)

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Install Oracle

Step 5: Repeat the same steps for both the Files and Download them.

(G:) > ORACLE 11g > GeeksForGeeks

Name	Date modified	Type	Size
 <u>win64_11gR2_database_1of2</u>	06-02-2020 00:47	WinRAR ZIP archive	11,85,061 ...
 <u>win64_11gR2_database_2of2</u>	06-02-2020 11:10	WinRAR ZIP archive	9,84,365 KB



Extraction of Downloaded Files

Step 5: Repeat the same steps for both the Files and Download them.

Downloads > GeeksForGeeks > Oracle Database 11g

Name	Date modified	Type	Size
database	07-02-2020 11:20	File folder	
<u>Main Database</u>	31-03-2010 06:48	File folder	

Step 2: Go to Folder **database** -> **Stage** -> **Components** Copy all the content of this Folder

Downloads > GeeksForGeeks > Oracle Database 11g > database > stage > Components

Name	Date modified	Type
oracle.ctx	30-03-2010 19:21	File folder
oracle.owb.rsf	30-03-2010 19:54	File folder
oracle.rdbms.install.seeddb	30-03-2010 21:47	File folder
oracle.sysman.console.db	30-03-2010 19:38	File folder

Step 3: Go to **Main Database** -> **Stage** Paste the copied content in **Components** Folder



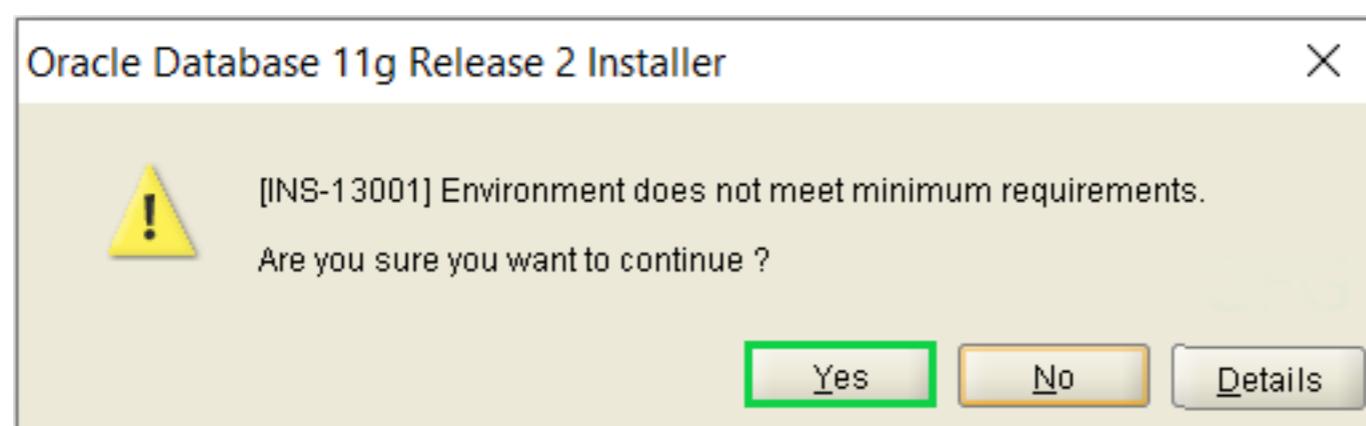
Installation of Oracle Database

Step 1: Go to **Main Database** Folder where you'll find **Setup**. Right click the **setup.exe** file and choose **Run as Administrator**.

Downloads > GeeksForGeeks > Oracle Database 11g > Main Database

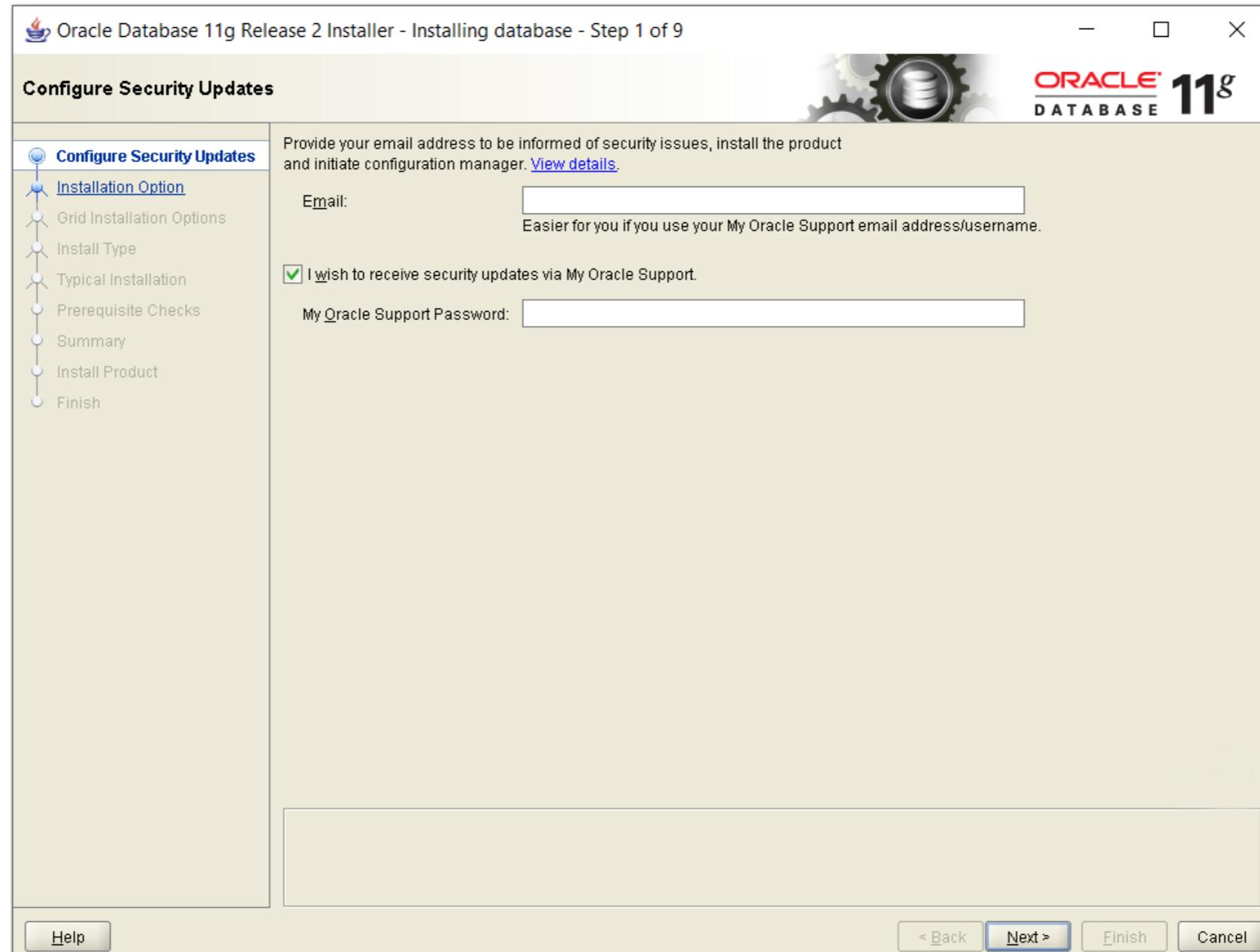
Name	Date modified	Type	Size
doc	24-03-2010 12:45	File folder	
install	30-03-2010 20:35	File folder	
response	30-03-2010 22:01	File folder	
stage	30-03-2010 22:01	File folder	
setup	12-03-2010 14:41	Application	334 KB
welcome	17-03-2010 02:12	Chrome HTML Do...	6 KB

Step 2: Click **Yes** to continue. This will start **Oracle Universal Installer**.



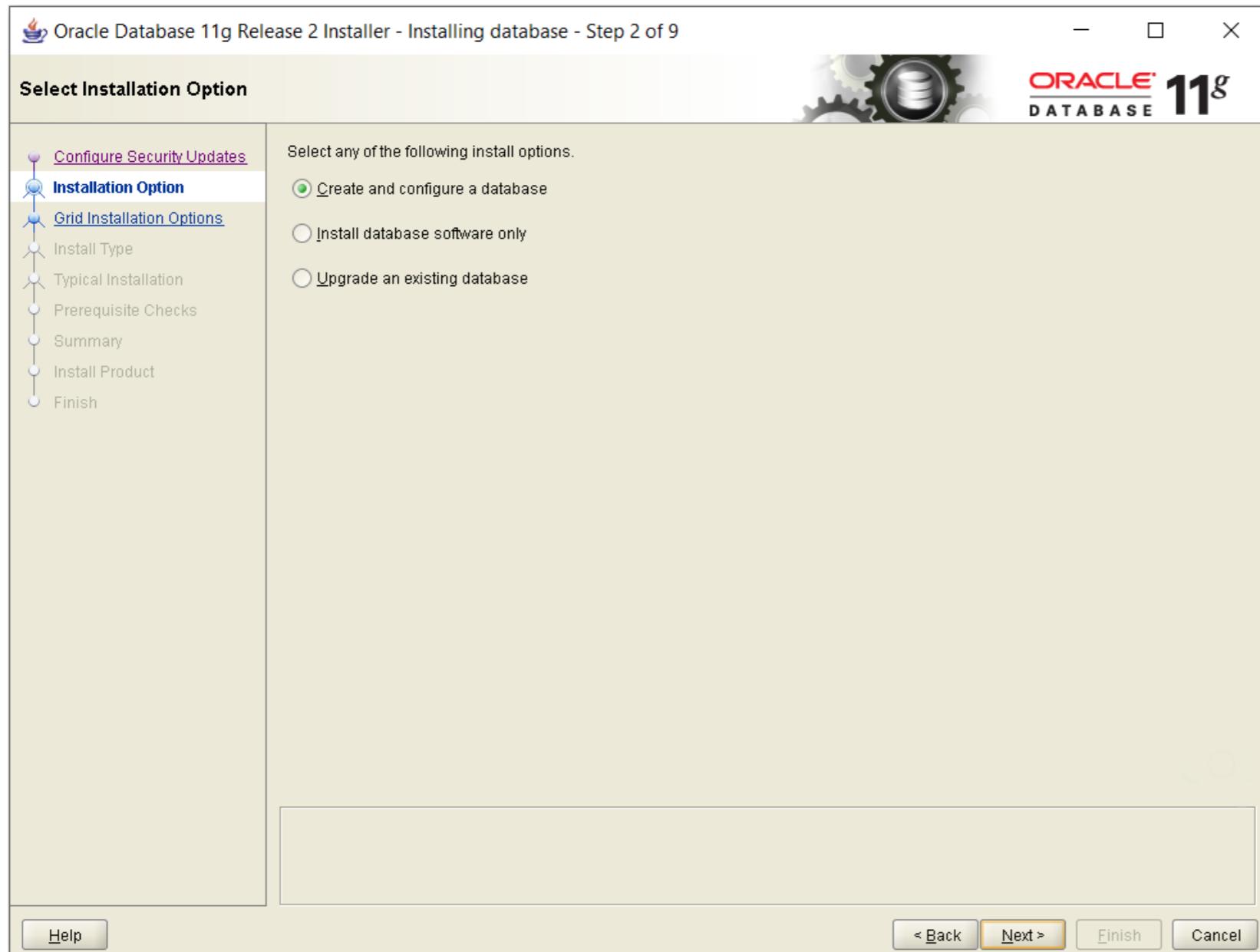
Installation of Oracle Database

Step 3: Provide your *Email Address* to receive all the Notifications and News Alerts from Oracle.



Installation of Oracle Database

Step 4: Select any of the three different *Installation Options* according to your needs.

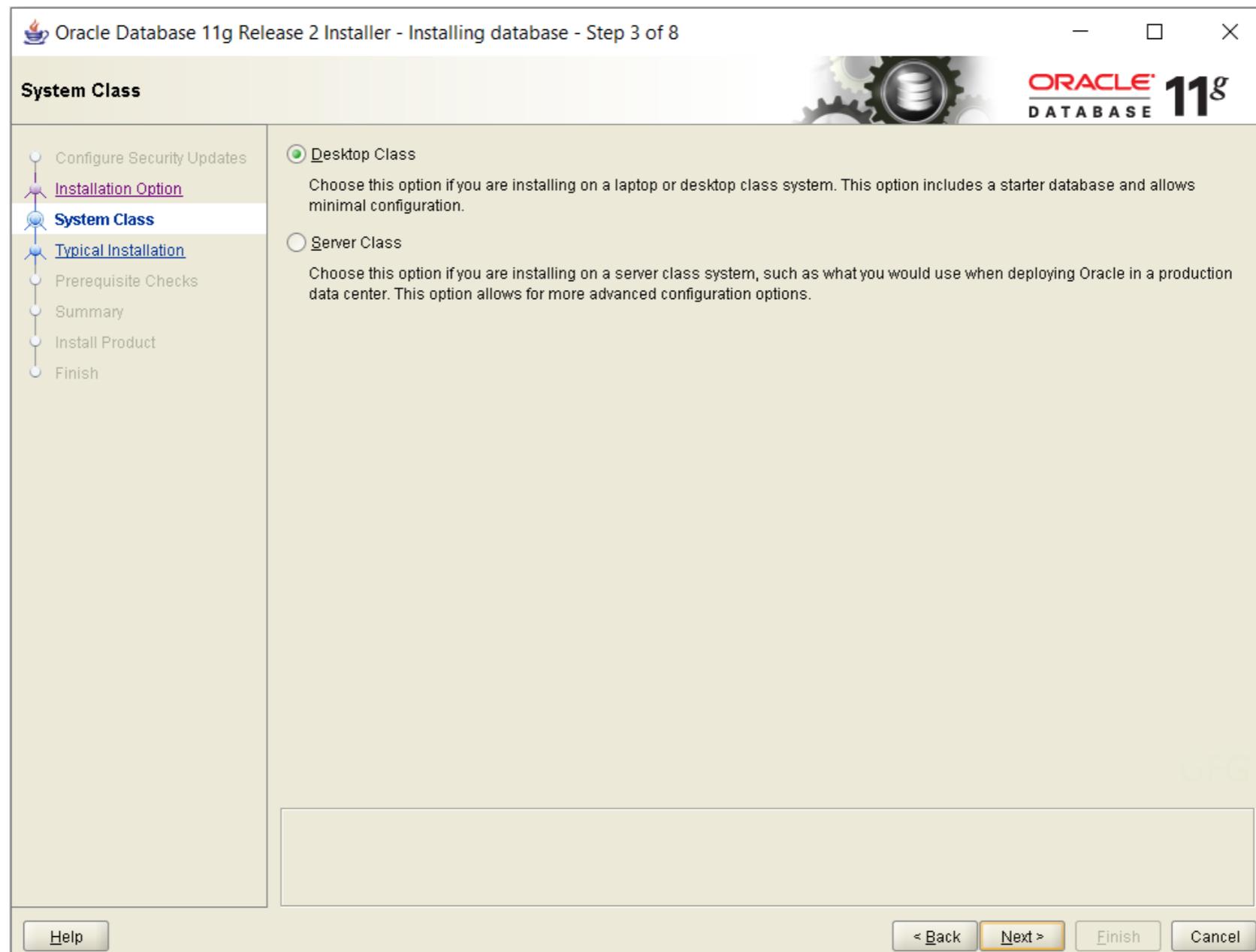


- **Option 1** – If you want to Install Oracle Server Software and want to Create Database also.
- **Option 2** – If you want to Install Oracle Server only.
- **Option 3** – If you want to Upgrade your Existing Database.



Installation of Oracle Database

Step 5: Choose between **Server Class** and **Desktop Class** as per your requirement and click on **Next**.



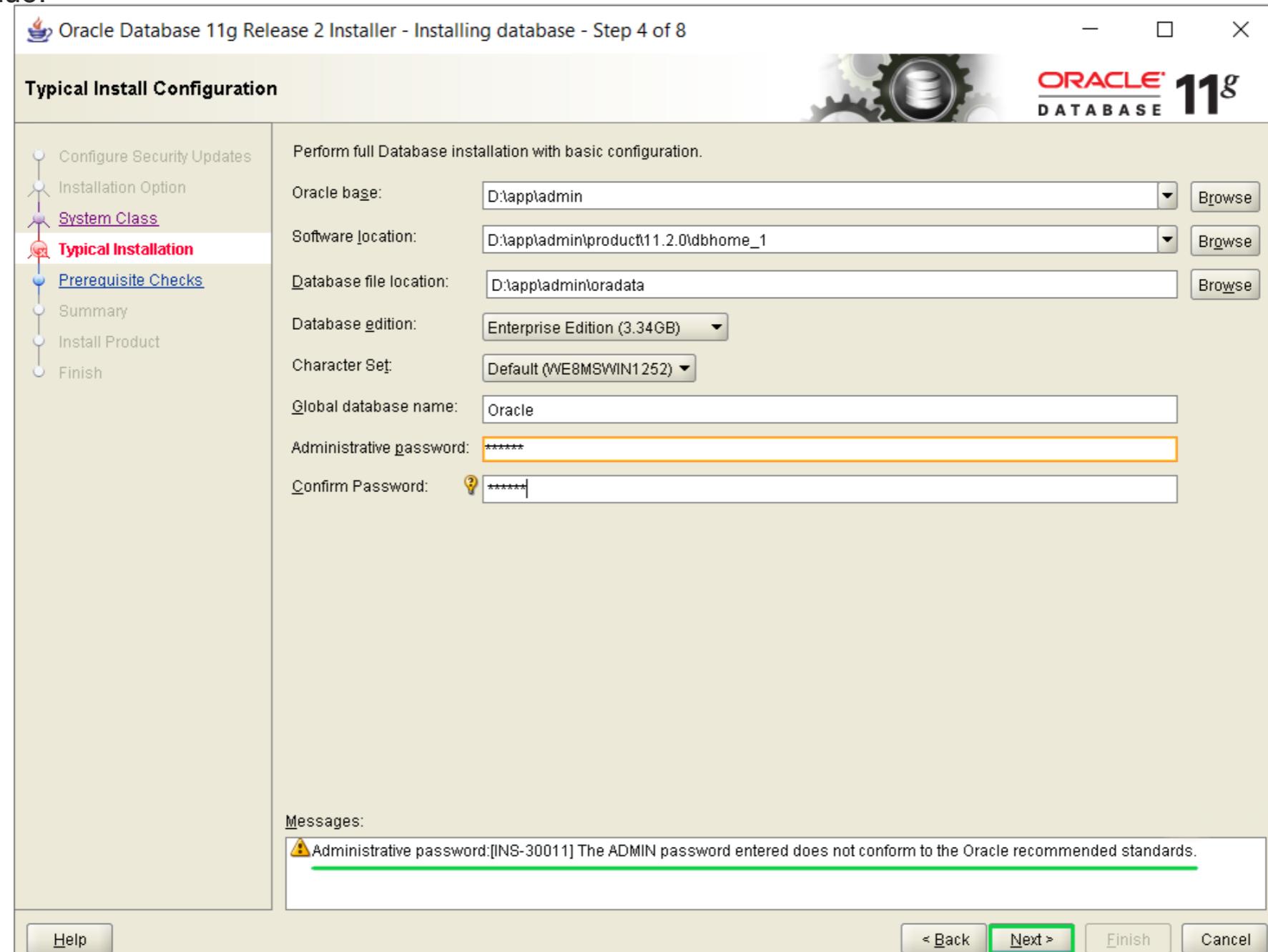
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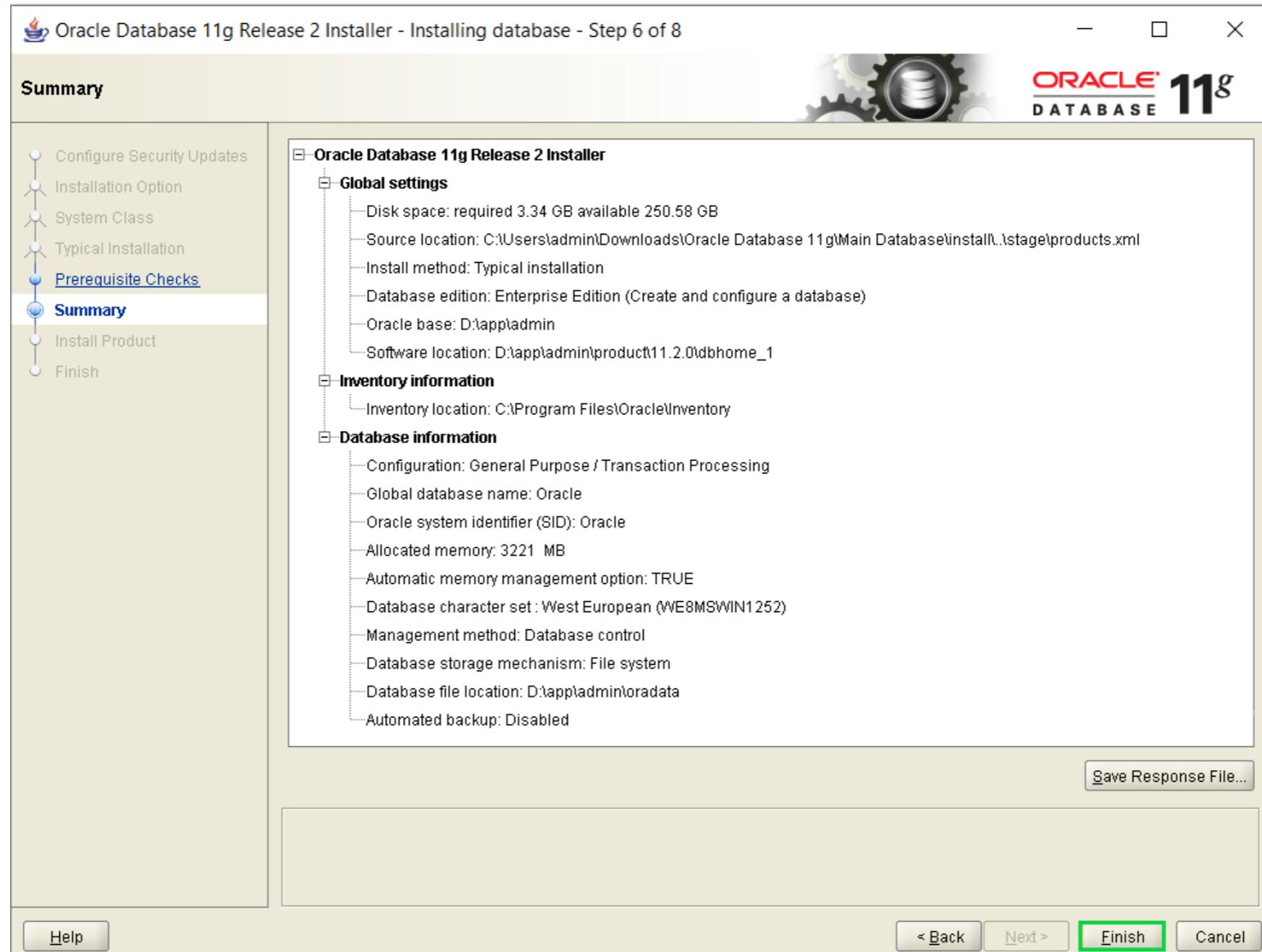
Installation of Oracle Database

Step 6: Configure the basic settings and create a Password for your database. Once the configuration is done click on **Next** to continue.



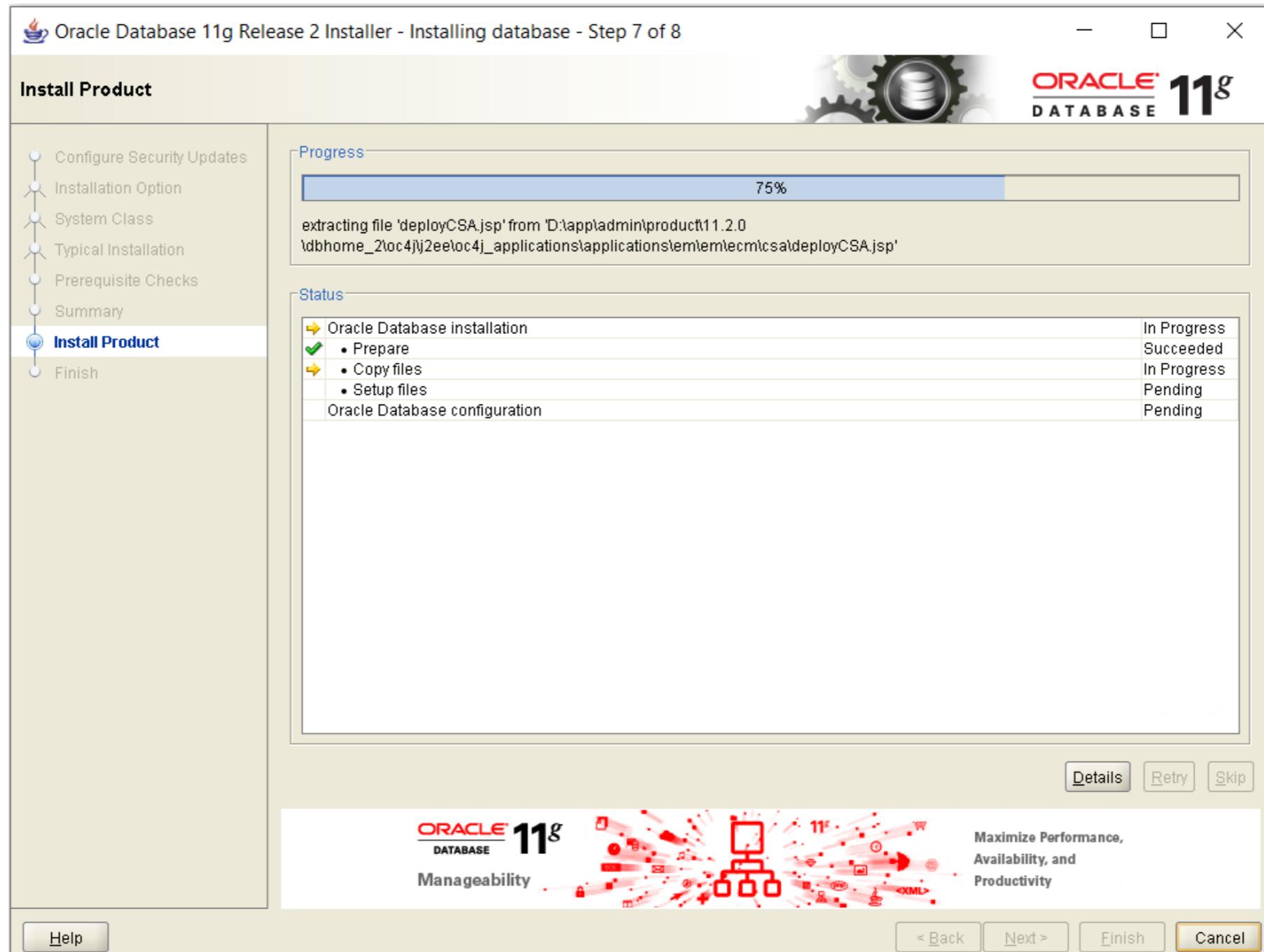
Installation of Oracle Database

Step 7: Here, *Oracle Universal Installer(OUI)* will check for the Prerequisites such as Hardware compatibility.

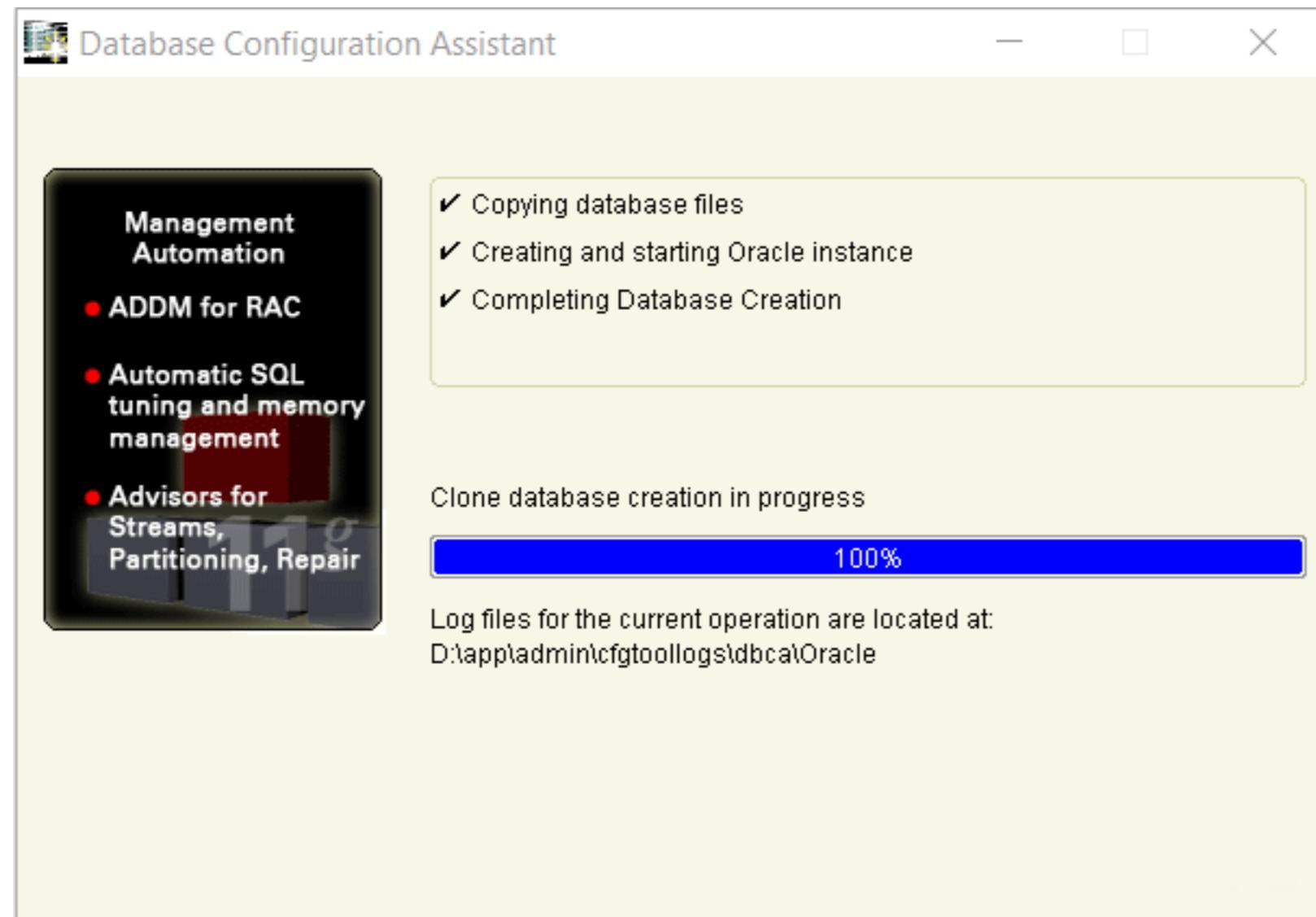


Installation of Oracle Database

Step 8: Click on **Finish** to start the **Installation** process. This installation might take some time depending on your Hardware.

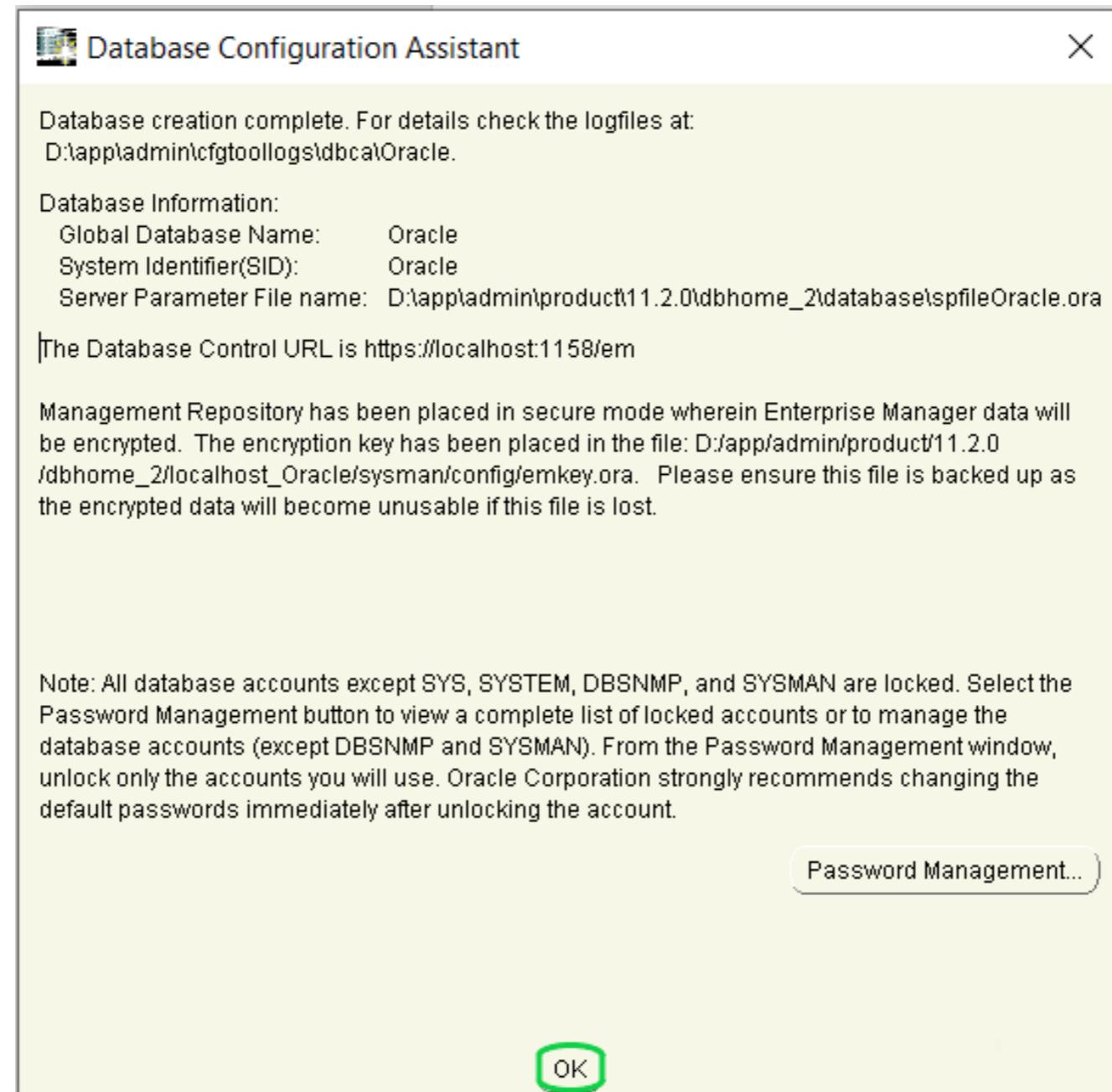


Installation of Oracle Database



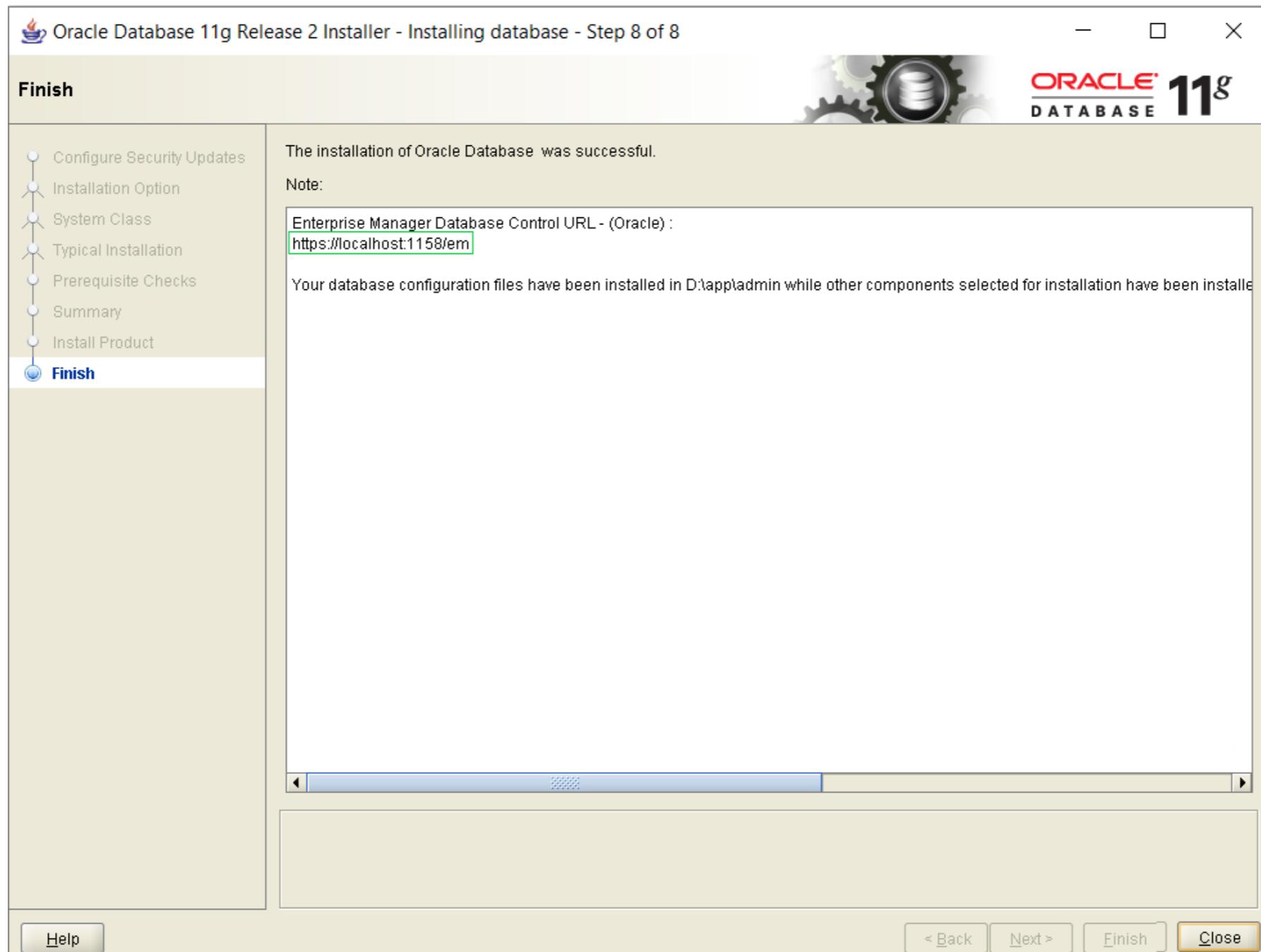
Installation of Oracle Database

Step 9: Click **OK** to finish the installation.



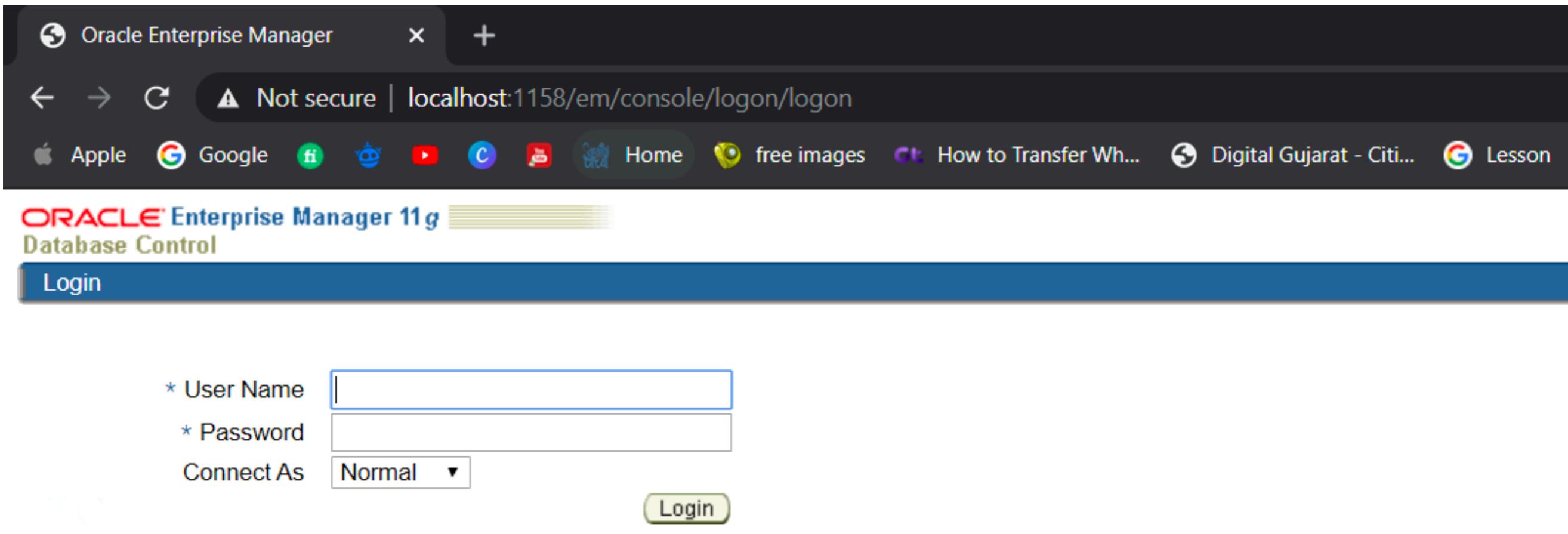
Installation of Oracle Database

Step 10: Copy the localhost link provided to open your **Enterprise Manager**.



Installation of Oracle Database

<http://192.168.50.150:1158/em/console/logon/logon>



The screenshot shows the Oracle Enterprise Manager 11g Database Control login interface. At the top, the browser title bar reads "Oracle Enterprise Manager" and the address bar shows "localhost:1158/em/console/logon/logon". Below the address bar is a toolbar with various icons and links, including "Apple", "Google", "free images", "How to Transfer Wh...", "Digital Gujarat - Citi...", and "Lesson". The main header says "ORACLE Enterprise Manager 11g Database Control". A blue navigation bar at the top has the word "Login" in white. The login form consists of three fields: "User Name" (with an asterisk), "Password" (with an asterisk), and "Connect As" (set to "Normal"). To the right of these fields is a "Login" button. The entire page has a light beige background.

* User Name

* Password

Connect As Normal

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SQL

Standard language for querying and manipulating data

Stuctured **Q**uery **L**anguage

Many standards out there:

ANSI SQL,
SQL92 (a.k.a. SQL2),
SQL99 (a.k.a. SQL3)



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SQL

Data Definition Language (DDL)

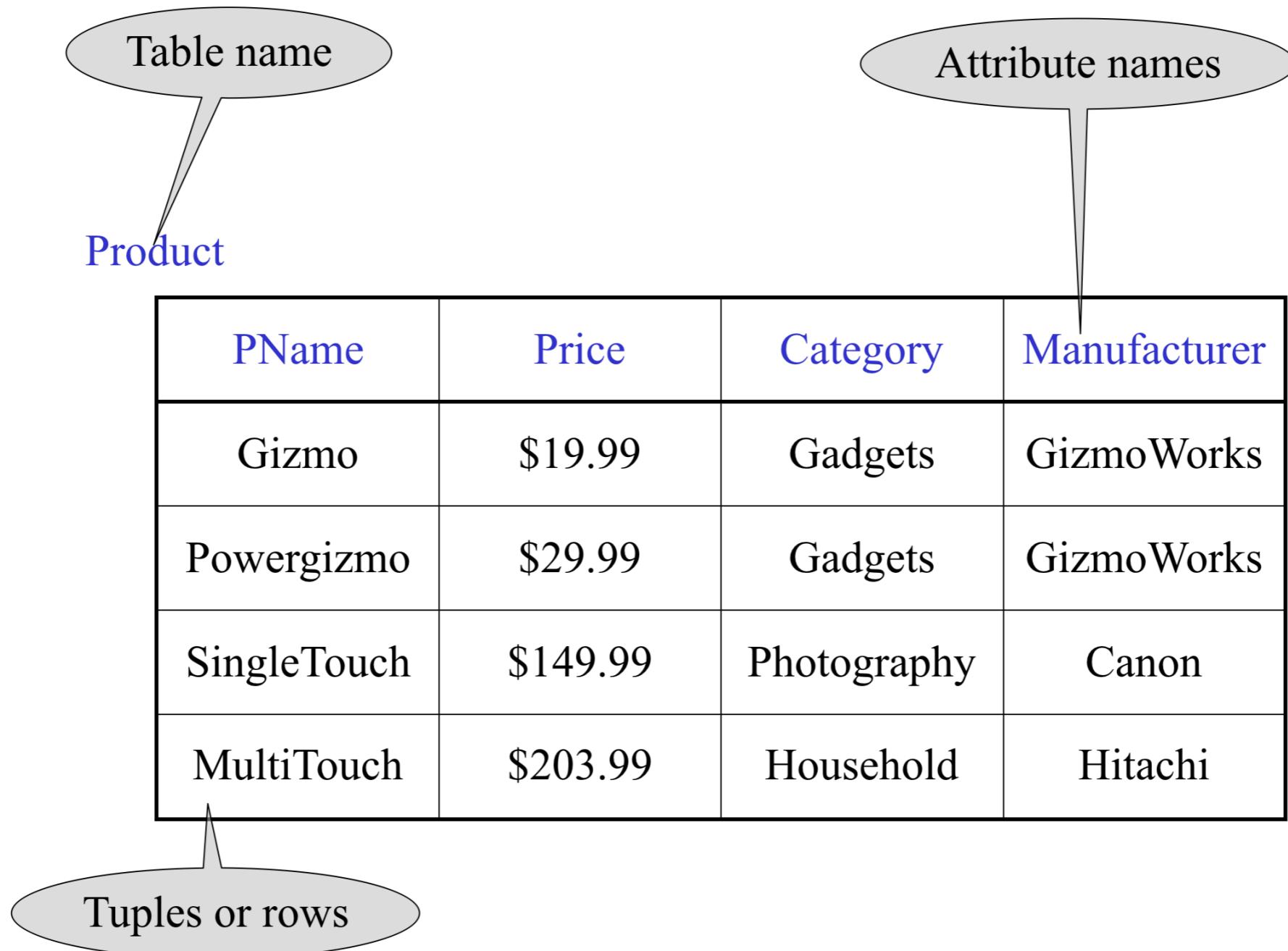
- Create/alter/delete tables and their attributes
- Following lectures...

Data Manipulation Language (DML)

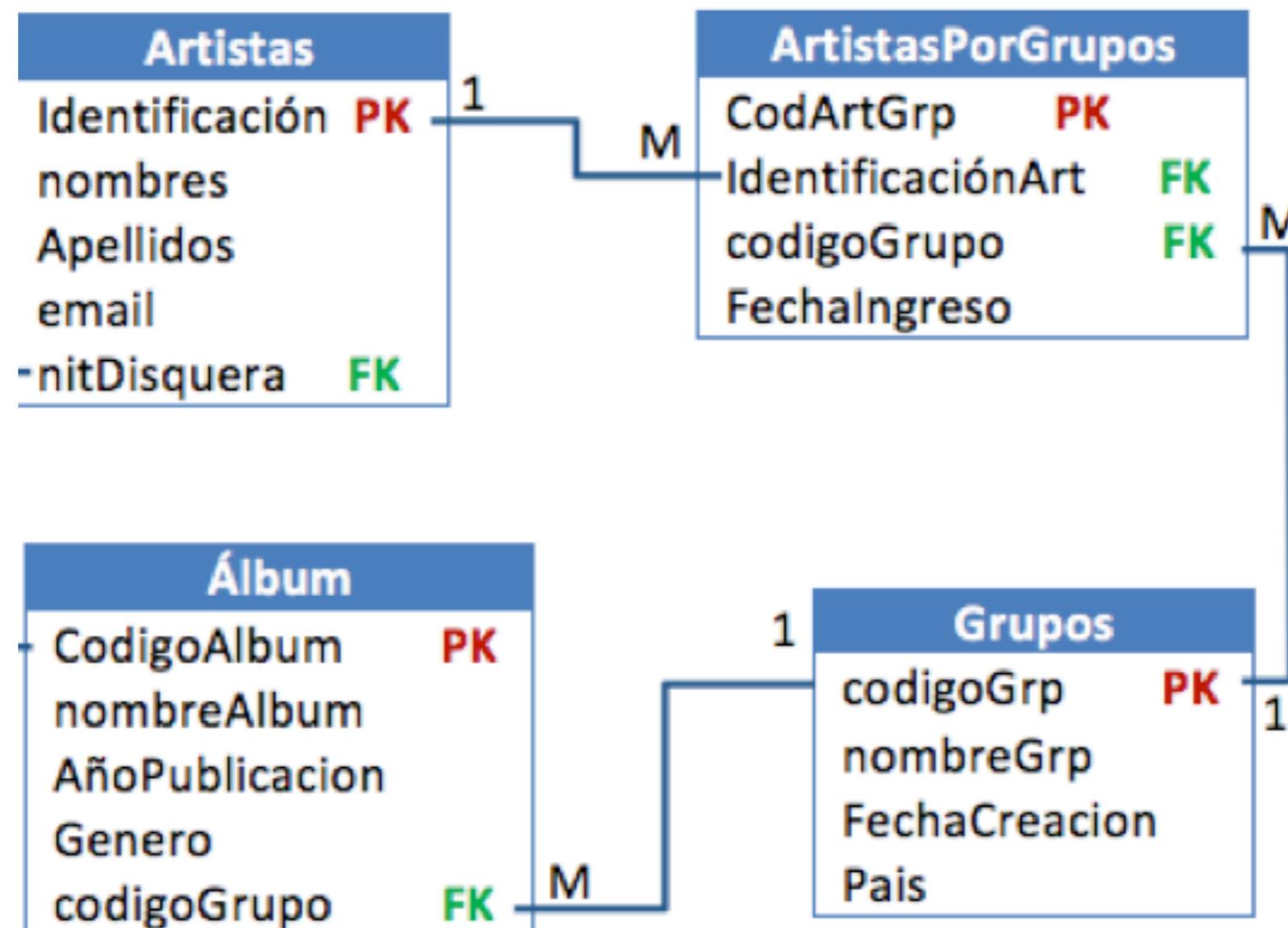
- Query one or more tables – discussed next !
- Insert/delete/modify tuples in tables



Tables in SQL



Tables in SQL



SQL

Table

SELECT

INNER JOIN

Column

FROM

INSERT

Row/Record

WHERE

UPDATE

Relation

GROUP BY

DELETE

PK

ORDER BY

DISCONNECT

FK

CONNECT

SHOW



Tables Exp

The *schema* of a table is the table name and its attributes:

Product(PName, Price, Category, Manfacturer)

A *key* is an attribute whose values are unique;
we underline a key



SQL Query

Basic form: (plus many many more bells and whistles)

```
SELECT <attributes>
FROM   <one or more relations>
WHERE  <conditions>
```

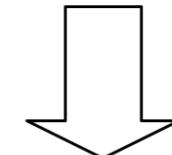


Simple SQL Query

Product

PName	Price	Category	Manufacturer
Gizmo	\$19.99	Gadgets	GizmoWorks
Powergizmo	\$29.99	Gadgets	GizmoWorks
SingleTouch	\$149.99	Photography	Canon
MultiTouch	\$203.99	Household	Hitachi

```
SELECT *
FROM Product
WHERE category='Gadgets'
```



PName	Price	Category	Manufacturer
Gizmo	\$19.99	Gadgets	GizmoWorks
Powergizmo	\$29.99	Gadgets	GizmoWorks



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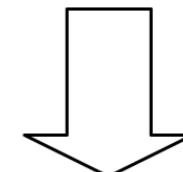


Simple SQL Query

Product

PName	Price	Category	Manufacturer
Gizmo	\$19.99	Gadgets	GizmoWorks
Powergizmo	\$29.99	Gadgets	GizmoWorks
SingleTouch	\$149.99	Photography	Canon
MultiTouch	\$203.99	Household	Hitachi

```
SELECT PName, Price, Manufacturer  
FROM Product  
WHERE Price > 100
```

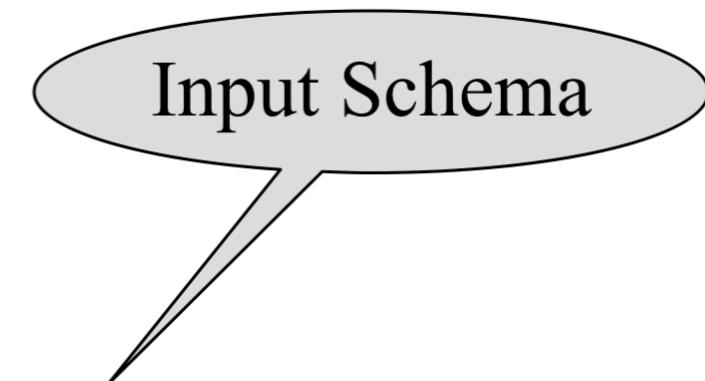


“selection” and
“projection”

PName	Price	Manufacturer
SingleTouch	\$149.99	Canon
MultiTouch	\$203.99	Hitachi

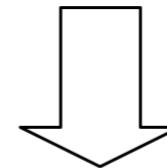


Notation

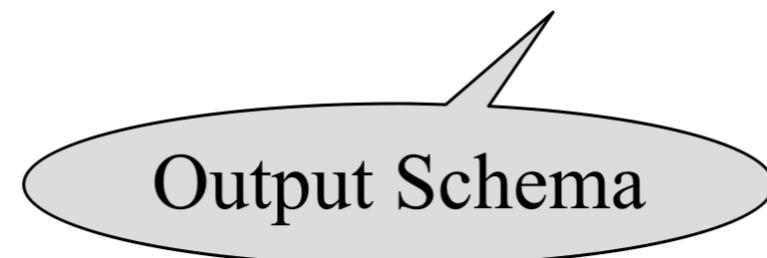


Product(PName, Price, Category, Manfacturer)

```
SELECT PName, Price, Manufacturer  
FROM Product  
WHERE Price > 100
```



Answer(PName, Price, Manfacturer)



Details

- Case insensitive:
 - Same: SELECT Select select
 - Same: Product product
 - Different: ‘Seattle’ ‘seattle’
- Constants:
 - ‘abc’ - yes
 - “abc” - no



Connect to Oracle DB via JDBC driver

```
public static void main(String[] args) {
    try (Connection conn = DriverManager.getConnection(
        url: "jdbc:oracle:thin:@192.168.50.150:1521:db11g", user: "CUSTOMER", password: "CUSTOMER")) {
        if (conn != null) {
            System.out.println("Connected to the database!");
        } else {
            System.out.println("Failed to make connection!");
        }
    } catch (SQLException e) {
        System.err.format("SQL State: %s\n%s", e.getSQLState(), e.getMessage());
    } catch (Exception e) {
        e.printStackTrace();
    }
}
```



Data Type

JDBC Method	SQL Type	Java Type
getBit()	BIT	boolean
getByte()	TINYINT	Byte
getShort()	SMALLINT	Short
getInt()	INTEGER	Int
getLong()	BIGINT	Long
getFloat()	REAL	Float
getDouble()	DOUBLE	Double
getString()	CHAR	String
getString()	VARCHAR	String
getString()	LONGVARCHAR	String
getDate()	DATE	Java.sql.Date()
getTimeStamp()	TIME	Java.sql.Date()
getObject()	BLOB	Object

<https://www.cis.upenn.edu/~bcpierce/courses/629/jdkdocs/guide/jdbc/getstart/mapping.doc.html#:~:text=The%20JDBC%20type%20DOUBLE%20represents,supported%20by%20the%20major%20databases.>



The LIKE operator

```
SELECT *
FROM   Products
WHERE  PName LIKE '%gizmo%'
```

- **s LIKE p:** pattern matching on strings
- p may contain two special symbols:
 - % = any sequence of characters
 - _ = any single character



Eliminating Duplicates

```
SELECT DISTINCT category  
FROM Product
```

Category
Gadgets
Photography
Household

Compare to:

```
SELECT category  
FROM Product
```

Category
Gadgets
Gadgets
Photography
Household



Ordering the Results

```
SELECT pname, price, manufacturer  
FROM Product  
WHERE category='gizmo' AND price > 50  
ORDER BY price, pname
```

Ties are broken by the second attribute on the ORDER BY list, etc.

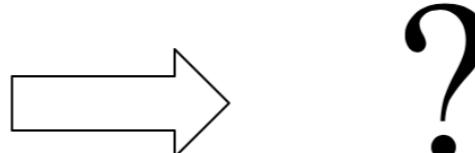
Ordering is ascending, unless you specify the DESC keyword.



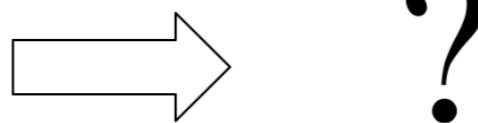
Ordering the Results

PName	Price	Category	Manufacturer
Gizmo	\$19.99	Gadgets	GizmoWorks
Powergizmo	\$29.99	Gadgets	GizmoWorks
SingleTouch	\$149.99	Photography	Canon
MultiTouch	\$203.99	Household	Hitachi

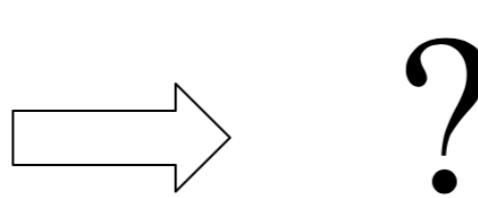
```
SELECT DISTINCT category  
FROM Product  
ORDER BY category
```



```
SELECT Category  
FROM Product  
ORDER BY PName
```



```
SELECT DISTINCT category  
FROM Product  
ORDER BY PName
```



Keys and Foreign Keys

Company

CName	StockPrice	Country
GizmoWorks	25	USA
Canon	65	Japan
Hitachi	15	Japan

Key

Product

PName	Price	Category	Manufacturer
Gizmo	\$19.99	Gadgets	GizmoWorks
Powergizmo	\$29.99	Gadgets	GizmoWorks
SingleTouch	\$149.99	Photography	Canon
MultiTouch	\$203.99	Household	Hitachi

Foreign key



Joins

Product (pname, price, category, manufacturer)
Company (cname, stockPrice, country)

Find all products under \$200 manufactured in Japan;
return their names and prices.

```
SELECT PName, Price  
FROM Product, Company  
WHERE Manufacturer=CName AND Country='Japan'  
      AND Price <= 200
```

Join
between Product
and Company



Joins

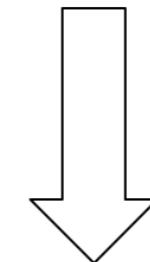
Product

PName	Price	Category	Manufacturer
Gizmo	\$19.99	Gadgets	GizmoWorks
Powergizmo	\$29.99	Gadgets	GizmoWorks
SingleTouch	\$149.99	Photography	Canon
MultiTouch	\$203.99	Household	Hitachi

Company

Cname	StockPrice	Country
GizmoWorks	25	USA
Canon	65	Japan
Hitachi	15	Japan

```
SELECT PName, Price
FROM Product, Company
WHERE Manufacturer=CName AND Country='Japan'
AND Price <= 200
```



PName	Price
SingleTouch	\$149.99



Updates

```
UPDATE PRODUCT
SET price = price/2
WHERE Product.name IN
    (SELECT product
     FROM Purchase
     WHERE Date ='Oct, 25, 1999');
```

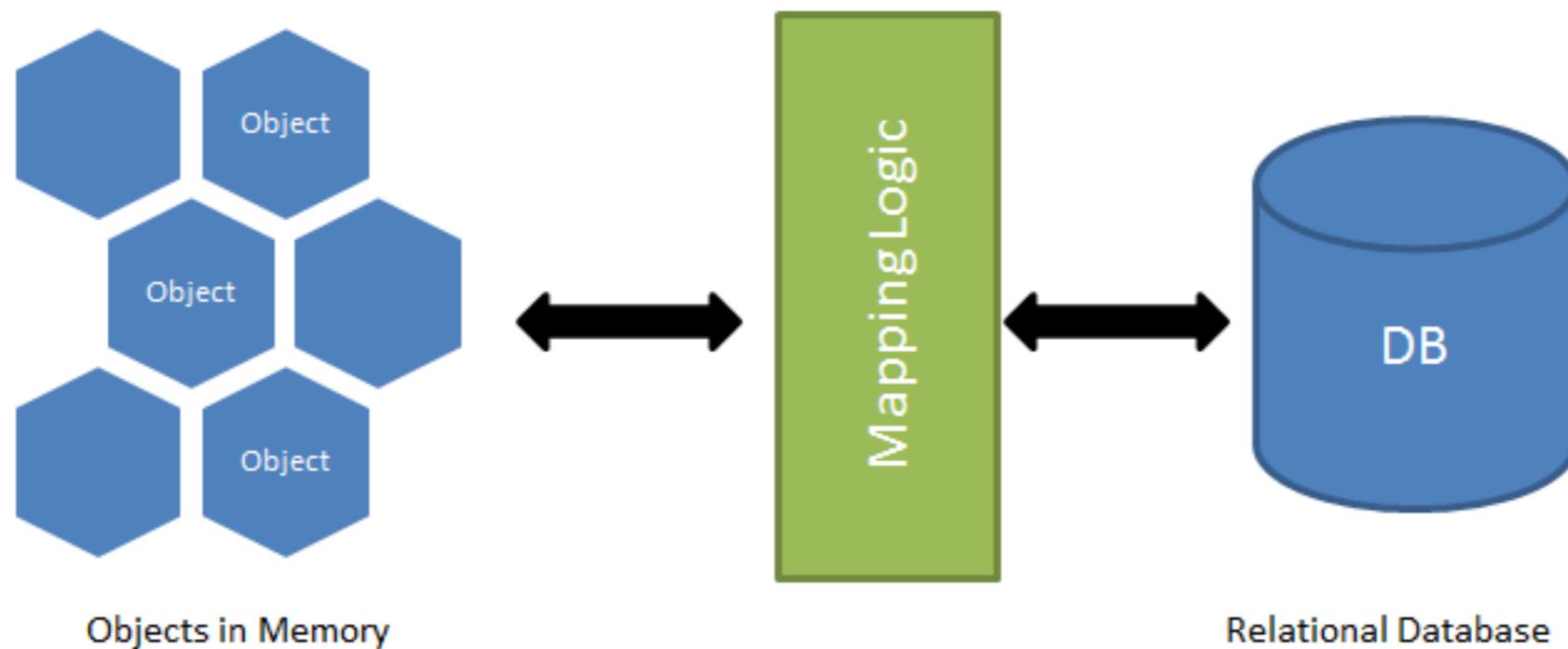




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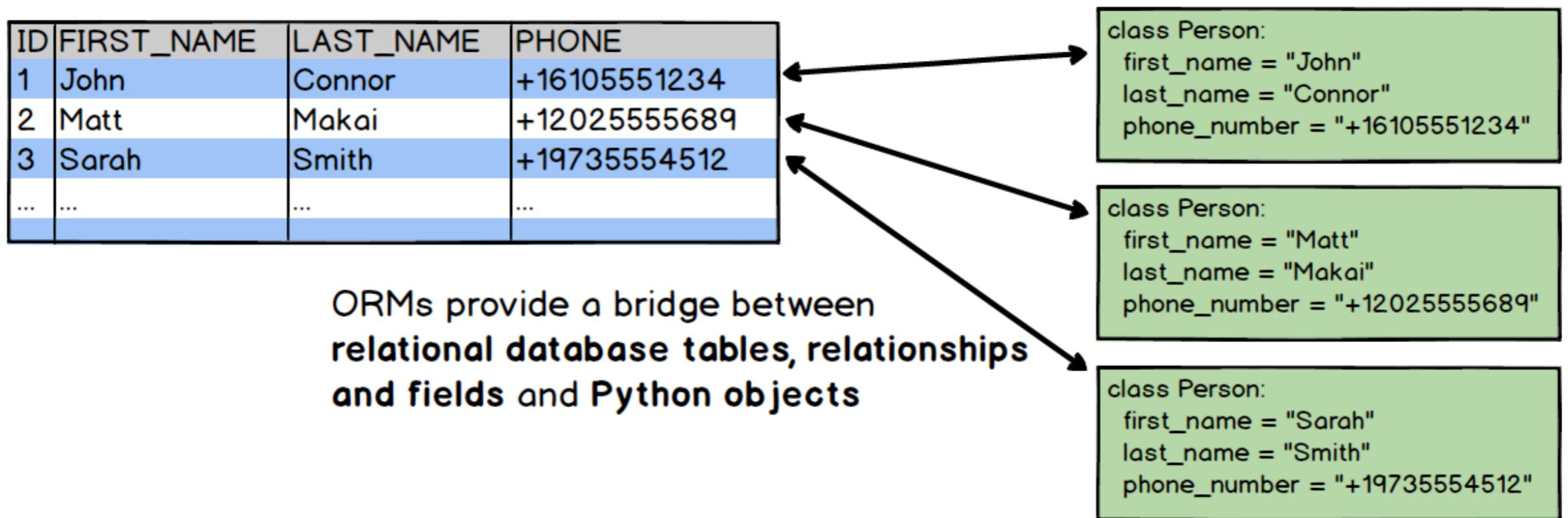
ORM

O/R Mapping



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ORM





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