

# The Oracle 21c system



# The Oracle system

**Oracle** is an integrated Object-Relational DBMS

Being the Oracle system of considerable complexity, we will just present an overview of Oracle products and then we will focus on the general features of the Oracle Server DBMS and on the support tools related to it.

# The Oracle system

In particular we will discuss:

- The main aspects of the DBMS and design of a relational database;
- Object-relational
- Physical aspects
- Introduction to PL / SQL;
- Use and definition of triggers;

Please refer any further information to the documentation.

# The Oracle products

## 1. Oracle Database

Tool for server-side database administration: creation, modification and deletion of the database (*Database Configuration Assistant*), Network services (*Net Configuration Assistant*), Software based servers (*Enterprise managers*, *SQL Plus*), the server documentation.

# The Oracle products

## 2. Oracle Client

Tool for client-side database administration (*Enterprise Manager Console (11g) / SQL Developer-dba section (19c)*), Network services (*Net Manager, Net Configuration Assistant*), basic client software (*SQL Plus, SQL Plus Worksheet*), the client documentation.

# The Oracle tools of our interest

The Oracle tool that we will use are:

## Server Side:

- *Database Configuration Assistant*: For creating, editing and deleting Oracle database.
- *Net Configuration Assistant*: For remote connections to the Oracle database.
- *Oracle Enterprise Manager/ SQL Developer (dba section)*: For the management of the schemes, the instance of the database, users, and other server-side tools (accessible via http).
- *SQL Plus*: For the management of the schemas, the instance of the database, users, and to formulate queries using SQL.

# The Oracle tools of our interest

## Client Side:

- *Net Configuration Assistant*: For the management of remote connections to the Oracle database.
- *Oracle Enterprise Manager /SQL Developer (dba section)*: For the management of the schemas, the instance of the database, users, and other server-side tool (accessible via http).
- *SQL Plus*: For the management of the schemas, the instance of the database, users, and to formulate queries using SQL.
- *SQL developer*: Development and testing of queries (recommended)

# The Oracle Database Users

The users of the Oracle database can be created, managed (giving them privileges) or deleted using *Enterprise Manager Console* (Client) or *Enterprise Manager* (Via http) or *SQL Developer - dba section*; in any case only users who have appropriate privileges can create others.

The default Administrator users are:

- **sys**: Not recommended by Oracle experts because it allows you to perform dangerous operations for the database, without a minimum of protection.
- **system**: Comes with many privileges, you can create new users, assign roles, privileges or even delete users, or change its profile.

# Some terminology

## ***Database***

set of physical files that exist on the permanent memory. This database continues to exist even if we stop the system.

## ***Instance***

additional software processes and shared memory structures necessary for the use of the database.

In normal operations a database is associated with an instance and typically have the same name.

# Some terminology

An Oracle database can exist without an instance. Less intuitively, one instance can exist without a database: when we create a database, the administrator before initializes the instance and then launches the CREATE DATABASE command.

## ***schema***

is a partition of the database associated with a user or a group of users. It consists of all the objects listed in the figure.

# Some terminology

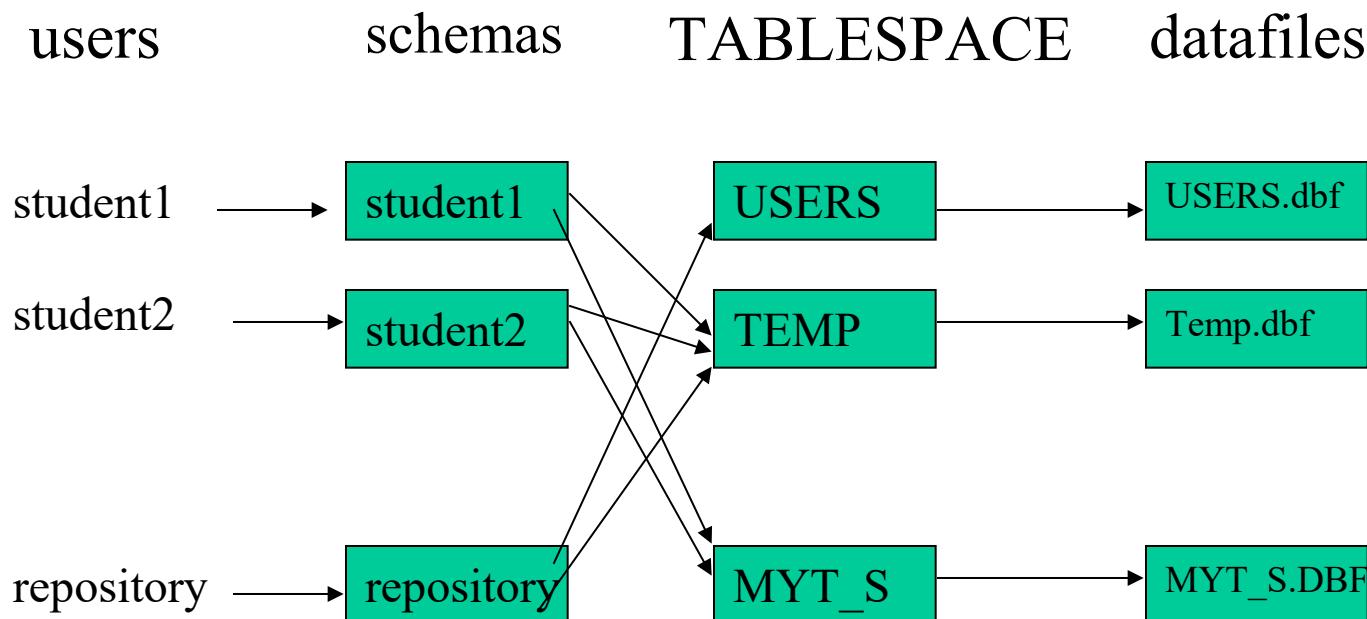
## ***Listener***

A process that resides on the server as an NT service, in charge of listening for connection requests from clients and managing traffic to the server.

Every time a client requests a network session with a server, a listener catches the actual request. If the client information matches that of the listener, this assigns a connection to the server.

Usually available on the 1521 port.

# Oracle Organization

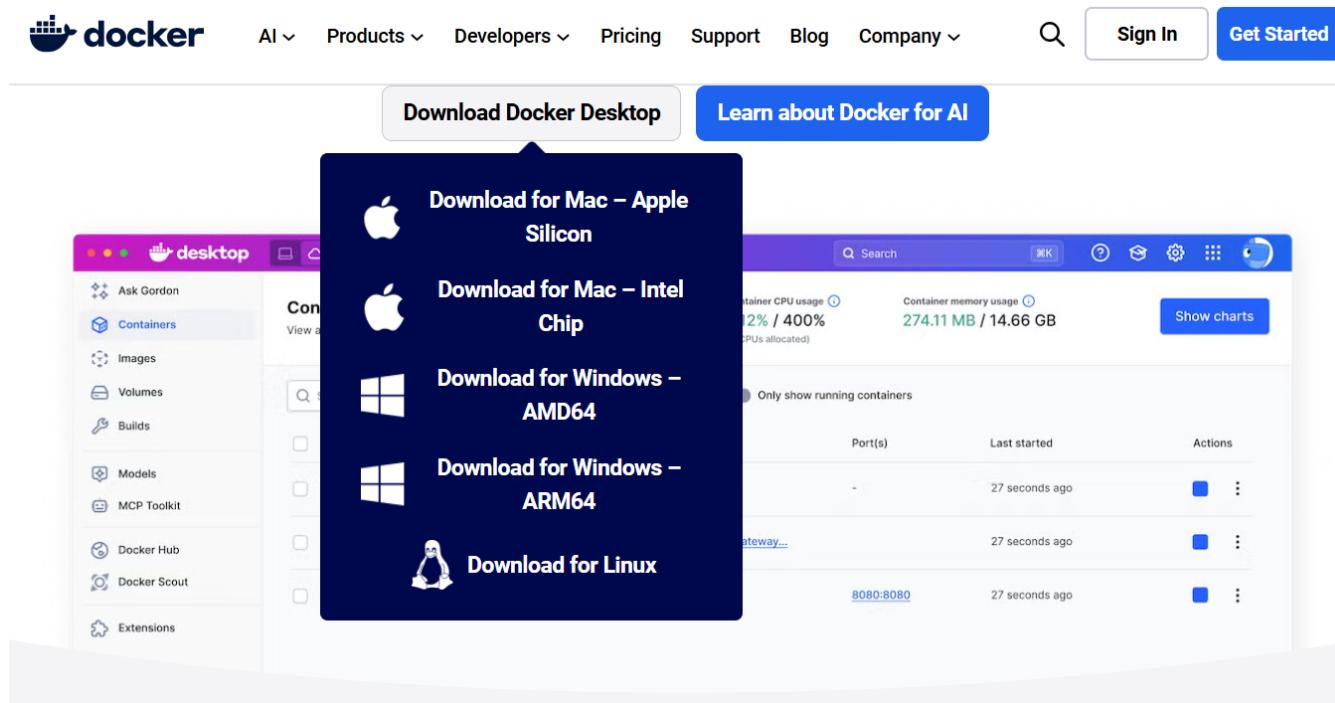


# Obtain Oracle 21c through Docker

# Install Docker Desktop

Download Docker Desktop for your operative system

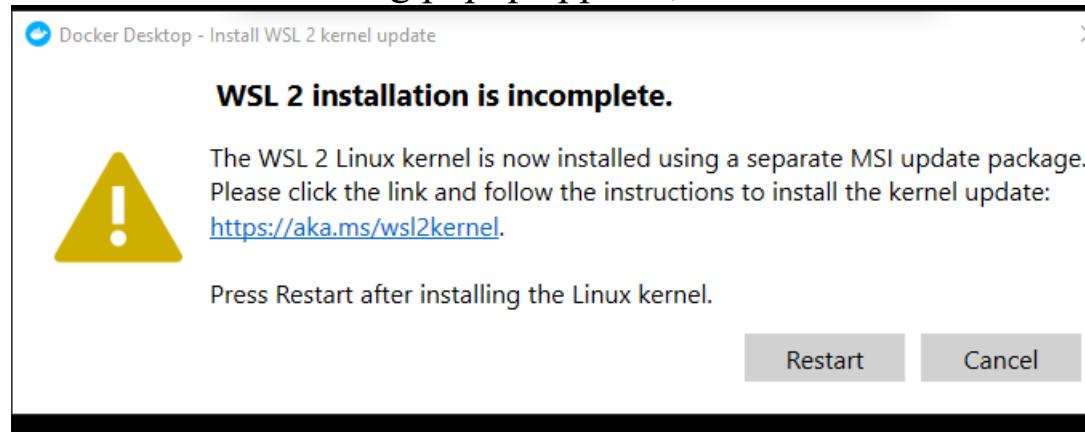
<https://www.docker.com/>



# Setup Docker Desktop

Once Docker Desktop is installed then

- 1) restart your machine;
- 2) Run Docker Desktop;
- 3) Wait for a minute until the following popup appears;



- 4) If the popup in 3 appears then click on the link <https://aka.ms/wsl2kernel>
- 5) Click on “WSL2 Linux kernel update package for x64 machines” link to download the missing package
- 6) Run the downloaded file in order to install the WSL2 and then restart again the machine
- 7) Run Docker Desktop

## Start the service

Once Docker Desktop is running

Run as administrator a terminal and execute the following commands

- `git clone https://github.com/root-hunter/oracle-db.git`
- `cd oracle-db`
- `docker compose up -d`

# What are we doing?

We are starting the service defined in the **docker-compose.yml** file:

```
version: '3'
services:
  oracle-xe:
    image: container-registry.oracle.com/database/express:21.3.0-xe
    volumes:
      - oracle-data:/opt/oracle/oradata
    ports:
      - 1521:1521
      - 5500:5500
    environment:
      - ORACLE_SID=XE
      - ORACLE_PWD=password123
volumes:
  oracle-data:
```

# What are we doing?

We are starting the service defined in the **docker-compose.yml** file:

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version: '3'          Docker-compose file format version
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      - 1521:1521  
      - 5500:5500  
    environment:  
      - ORACLE_SID=XE  
      - ORACLE_PWD=password123  
volumes:  
  oracle-data:
```

Declares the start of the services section - where you define all containers that will run.



# What are we doing?

We are starting the service defined in the **docker-compose.yml** file:

Names your service "oracle-xe". You can reference it by this name in Docker commands like  
docker compose logs oracle-xe

version: '3'

services:

oracle-xe:

image: container-registry.oracle.com/database/express:21.3.0-xe

volumes:

- oracle-data:/opt/oracle/oradata

ports:

- 1521:1521

- 5500:5500

environment:

- ORACLE\_SID=XE

- ORACLE\_PWD=password123

volumes:

oracle-data:

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    environment:
      - ORACLE_SID=XE
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volumes:
  oracle-data:
```

Specifies the Docker image to use -  
Oracle Database Express Edition  
version 21.3.0 from Oracle's official  
container registry.



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    environment:
      - ORACLE_SID=XE
      - ORACLE_PWD=password123
volumes:
  oracle-data:
```

Declares port mappings between your host machine and the container.

- Maps port 1521 on your host to port 1521 in the container.  
This is Oracle's default database listener port.
- Maps port 5500 on your host to port 5500 in the container.  
This is for Oracle Enterprise Manager Express (web-based admin interface).

# What are we doing?

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    volumes:
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    ports:
      - 1521:1521
      - 5500:5500
    environment:
      - ORACLE_SID=XE
      - ORACLE_PWD=password123
volumes:
  oracle-data:
```

Declares environment variables to pass into the container:

- the Oracle System Identifier (XE)
- the password for the SYS and SYSTEM admin accounts



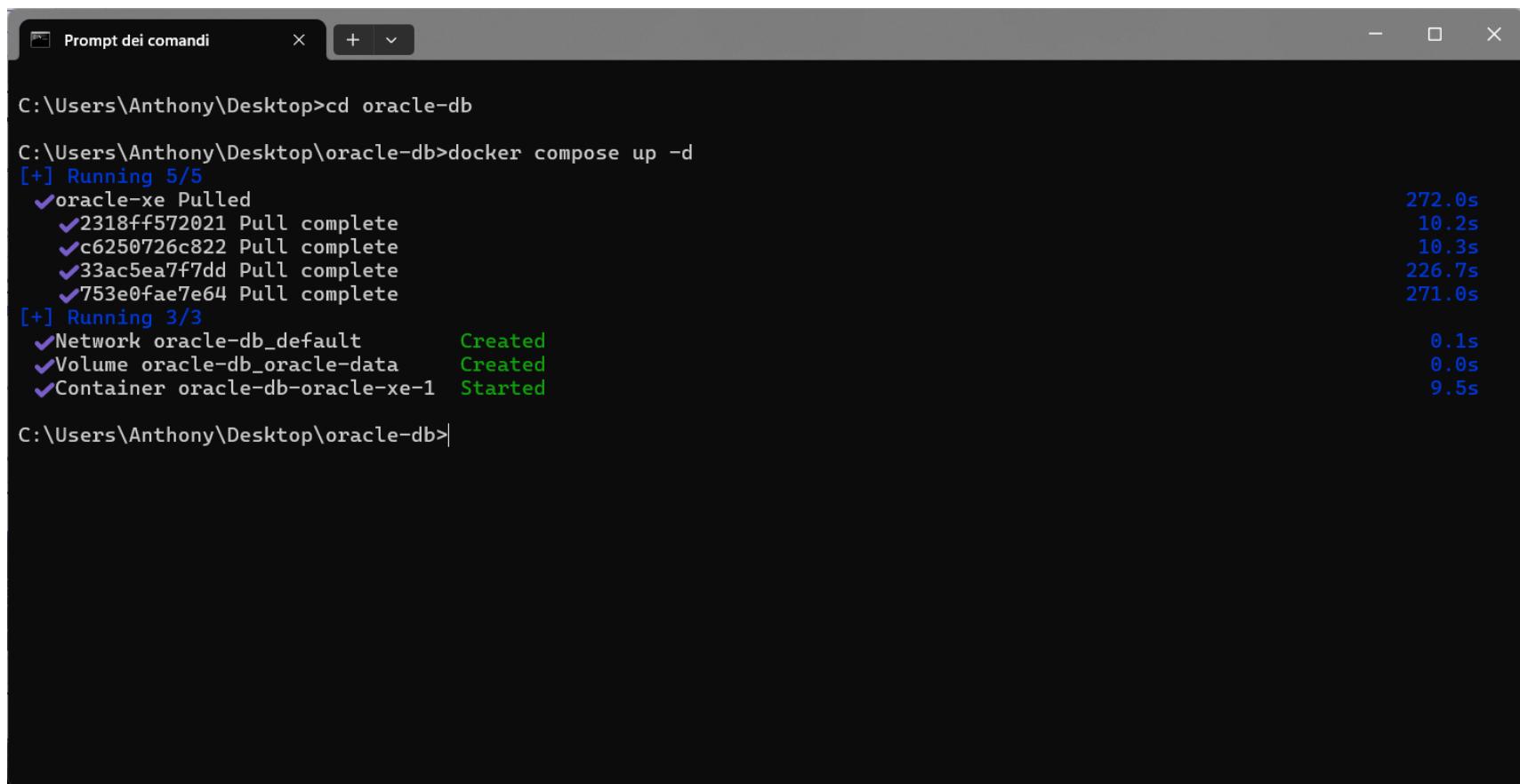
# What are we doing?

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      - 5500:5500
    environment:
      - ORACLE_SID=XE
      - ORACLE_PWD=password123
volumes:
  oracle-data:
```

Creates a named volume called "oracle-data" that Docker will manage. This is where your actual database files are stored persistently.Riprova

# Start the service

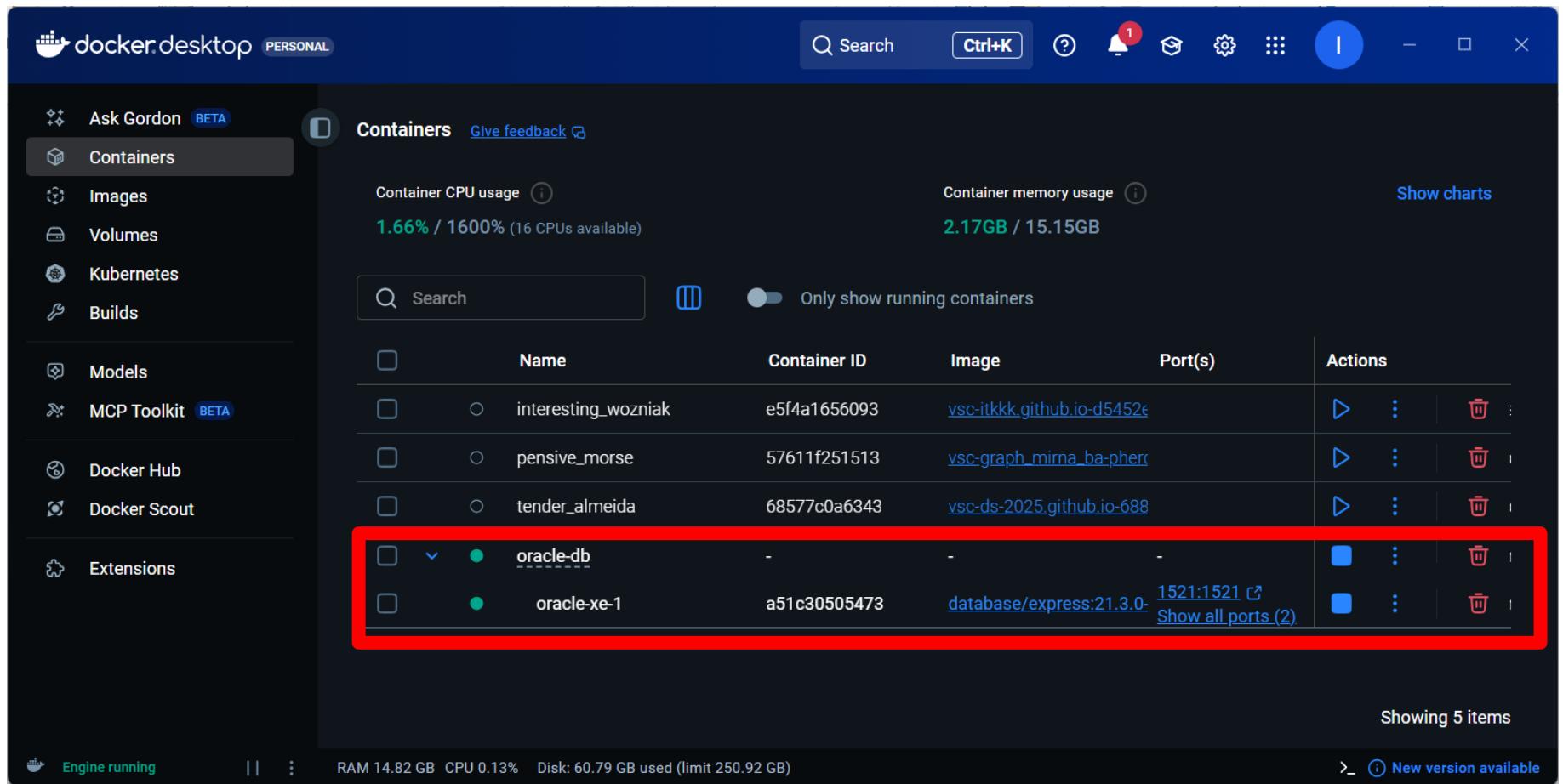


```
Prompt dei comandi

C:\Users\Anthony\Desktop>cd oracle-db
C:\Users\Anthony\Desktop\oracle-db>docker compose up -d
[+] Running 5/5
✓ oracle-xe Pulled
  ✓ 2318ff572021 Pull complete          272.0s
  ✓ c6250726c822 Pull complete          10.2s
  ✓ 33ac5ea7f7dd Pull complete          10.3s
  ✓ 753e0fae7e64 Pull complete          226.7s
  ✓ 2318ff572021 Pull complete          271.0s
[+] Running 3/3
✓ Network oracle-db_default      Created   0.1s
✓ Volume oracle-db_oracle-data  Created   0.0s
✓ Container oracle-db-oracle-xe-1 Started  9.5s

C:\Users\Anthony\Desktop\oracle-db>
```

# Check if everything is ok

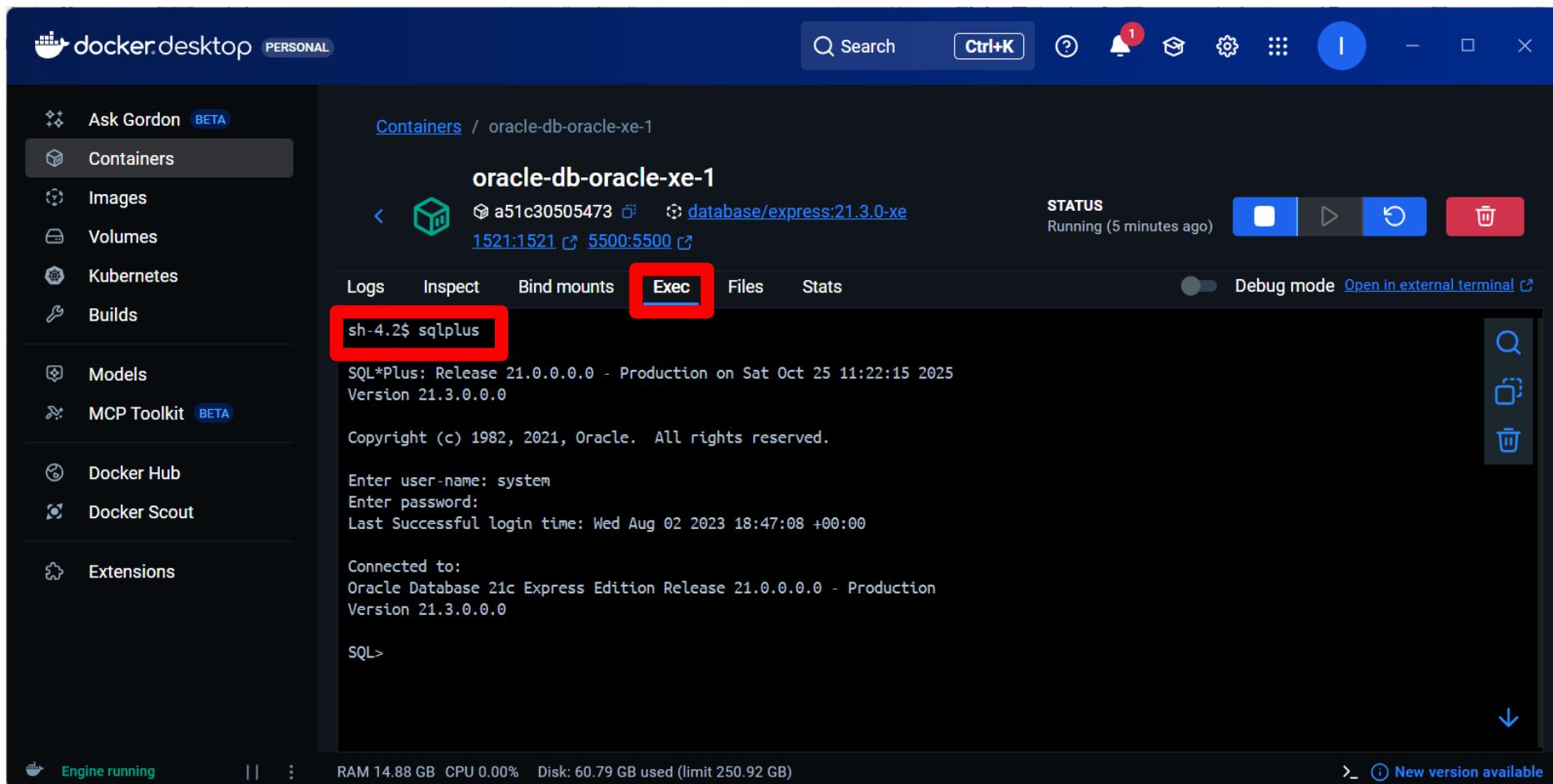


The screenshot shows the Docker Desktop interface. The left sidebar has 'Containers' selected. The main area displays container statistics and a list of running containers. A red box highlights the second row, which contains two Oracle database containers: 'oracle-db' and 'oracle-xe-1'. The 'Actions' column for 'oracle-xe-1' shows a link to 'Show all ports (2)'.

	Name	Container ID	Image	Port(s)	Actions
interesting_wozniak	e5f4a1656093	vsc-itk.github.io-d5452e			<a href="#">View</a> <a href="#">More</a> <a href="#">Delete</a>
pensive_morse	57611f251513	vsc-graph_mirna_ba-pherc			<a href="#">View</a> <a href="#">More</a> <a href="#">Delete</a>
tender_almeida	68577c0a6343	vsc-ds-2025.github.io-688			<a href="#">View</a> <a href="#">More</a> <a href="#">Delete</a>
oracle-db	-	-	-		<a href="#">View</a> <a href="#">More</a> <a href="#">Delete</a>
oracle-xe-1	a51c30505473	database/express:21.3.0	1521:1521 ↗ Show all ports (2)		<a href="#">View</a> <a href="#">More</a> <a href="#">Delete</a>

- Click on oracle-xe-1

# Check if everything is ok



# Setup some DB parameters

```
sh-4.2$ sqlplus

SQL*Plus: Release 21.0.0.0.0 - Production on Sat Oct 25 11:53:00 2025
Version 21.3.0.0.0

Copyright (c) 1982, 2021, Oracle. All rights reserved.

Enter user-name: system
Enter password:
Last Successful login time: Wed Aug 02 2023 18:47:08 +00:00

Connected to:
Oracle Database 21c Express Edition Release 21.0.0.0.0 - Production
Version 21.3.0.0.0

SQL> ALTER SYSTEM SET COMMON_USER_PREFIX=' ' SCOPE=SPFILE;

System altered.

SQL>
```

# Setup some DB parameters

```
ALTER SYSTEM SET COMMON_USER_PREFIX=' '
SCOPE=SPFILE;
```

We are changing the `COMMON_USER_PREFIX` parameter, which impose us to have a prefix ('C##') before every username in a CDB (Container Database)

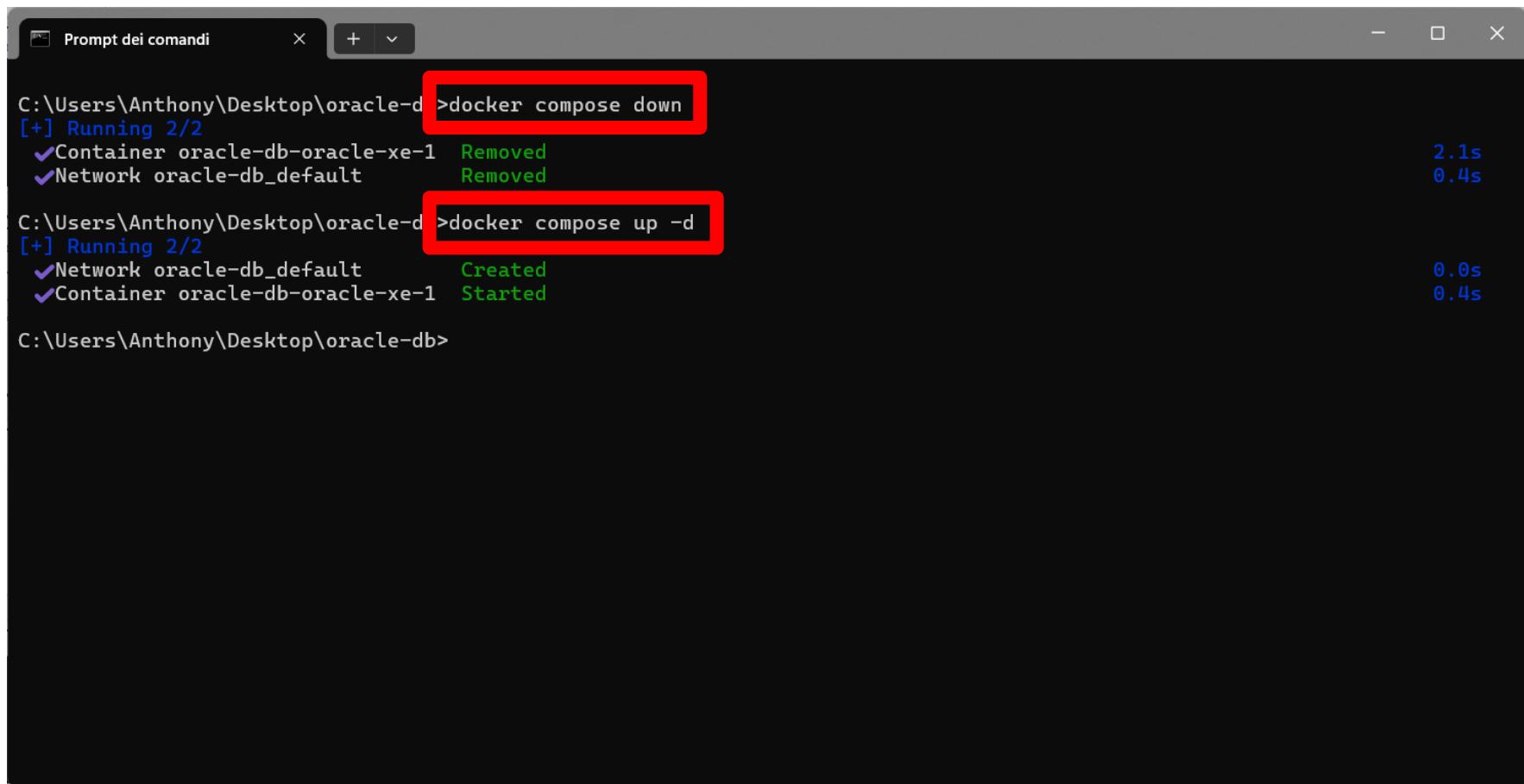
After this change you must **restart the service**. To do this, open a terminal and write:

- `docker compose down`

Then you can **restart the service**:

- `docker compose up -d`

# Setup some DB parameters



A screenshot of a Windows Command Prompt window titled "Prompt dei comandi". The window shows two commands being run:

```
C:\Users\Anthony\Desktop\oracle-db>docker compose down
[+] Running 2/2
✓ Container oracle-db-oracle-xe-1  Removed          2.1s
✓ Network oracle-db_default       Removed          0.4s

C:\Users\Anthony\Desktop\oracle-db>docker compose up -d
[+] Running 2/2
✓ Network oracle-db_default      Created          0.0s
✓ Container oracle-db-oracle-xe-1 Started          0.4s

C:\Users\Anthony\Desktop\oracle-db>
```

The first command, "docker compose down", is highlighted with a red rectangle. The second command, "docker compose up -d", is also highlighted with a red rectangle.

# Create a User

Let's login again into SQLPlus and let's write these two DDL statement:

```
CREATE USER "YELLOWCOM"  
    PROFILE "DEFAULT"  
    IDENTIFIED BY "yellowcom"  
    DEFAULT TABLESPACE "USERS"  
    TEMPORARY TABLESPACE "TEMP"  
    QUOTA UNLIMITED ON USERS  
    ACCOUNT UNLOCK;  
  
GRANT "CONNECT" TO "YELLOWCOM";
```

# Create a User

Let's login again into SQLPlus and let's write these two DDL statement:

```
CREATE USER "YELLOWCOM"  
    PROFILE "DEFAULT"  
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    QUOTA UNLIMITED ON USERS  
    ACCOUNT UNLOCK;  
  
GRANT "CONNECT" TO "YELLOWCOM";
```



This is the username

# Create a User

Let's login again into SQLPlus and let's write these two DDL statement:

```
CREATE USER "YELLOWCOM"
  PROFILE "DEFAULT"           ←
 IDENTIFIED BY "yellowcom"
 DEFAULT TABLESPACE "USERS"
 TEMPORARY TABLESPACE "TEMP"
 QUOTA UNLIMITED ON USERS
 ACCOUNT UNLOCK;

GRANT "CONNECT" TO "YELLOWCOM";
```

Assigns the "DEFAULT" profile to this user. Profiles control resource limits and password policies (like password expiration, failed login attempts, CPU time, etc.).

# Create a User

Let's login again into SQLPlus and let's write these two DDL statement:

```
CREATE USER "YELLOWCOM"
  PROFILE "DEFAULT"
  IDENTIFIED BY "yellowcom" ← This is the password
  DEFAULT TABLESPACE "USERS"
  TEMPORARY TABLESPACE "TEMP"
  QUOTA UNLIMITED ON USERS
  ACCOUNT UNLOCK;

GRANT "CONNECT" TO "YELLOWCOM";
```

# Create a User

Let's login again into SQLPlus and let's write these two DDL statement:

```
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    PROFILE "DEFAULT"  
    IDENTIFIED BY "yellowcom"  
    DEFAULT TABLESPACE "USERS"  
    TEMPORARY TABLESPACE "TEMP"  
    QUOTA UNLIMITED ON USERS  
    ACCOUNT UNLOCK;
```

Set the default and temporary tablespaces. This is where user's objects (tables, indexes, etc.) and temporary operations results (sorting, grouping, etc.) will be stored if no tablespace is explicitly specified during creation.

```
GRANT "CONNECT" TO "YELLOWCOM";
```

# Create a User

Let's login again into SQLPlus and let's write these two DDL statement:

```
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    PROFILE "DEFAULT"  
    IDENTIFIED BY "yellowcom"  
    DEFAULT TABLESPACE "USERS"  
    TEMPORARY TABLESPACE "TEMP"  
    QUOTA UNLIMITED ON USERS  
    ACCOUNT UNLOCK;
```

Grants unlimited storage space in the "USERS" tablespace. Without a quota, the user couldn't create any objects even if they have the CREATE TABLE privilege.

```
GRANT "CONNECT" TO "YELLOWCOM";
```

# Create a User

Let's login again into SQLPlus and let's write these two DDL statement:

```
CREATE USER "YELLOWCOM"  
    PROFILE "DEFAULT"  
    IDENTIFIED BY "yellowcom"  
    DEFAULT TABLESPACE "USERS"  
    TEMPORARY TABLESPACE "TEMP"  
    QUOTA UNLIMITED ON USERS  
    ACCOUNT UNLOCK;
```

Ensures the account is active and can log in immediately.

```
GRANT "CONNECT" TO "YELLOWCOM";
```

# Create a User

Let's login again into SQLPlus and let's write these two DDL statement:

```
CREATE USER "YELLOWCOM"  
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    DEFAULT TABLESPACE "USERS"  
    TEMPORARY TABLESPACE "TEMP"  
    QUOTA UNLIMITED ON USERS  
    ACCOUNT UNLOCK;
```

```
GRANT "CONNECT" TO "YELLOWCOM";
```

Gives permission to establish a database session

# Create a User

Version 21.3.0.0.0

Copyright (c) 1982, 2021, Oracle. All rights reserved.

Enter user-name: system

Enter password:

Last Successful login time: Sat Oct 25 2025 12:09:49 +00:00

Connected to:

Oracle Database 21c Express Edition Release 21.0.0.0.0 - Production  
Version 21.3.0.0.0

```
SQL> CREATE USER "YELLOWCOM"
  2 PROFILE "DEFAULT"
  3 IDENTIFIED BY "yellowcom"
  4 DEFAULT TABLESPACE "USERS"
  5 TEMPORARY TABLESPACE "TEMP"
  6 QUOTA UNLIMITED ON USERS
  7 ACCOUNT UNLOCK;
```

User created.

```
SQL> GRANT "CONNECT" TO "YELLOWCOM"
  2 ;
```

Grant succeeded.

SQL>



# Login into the newly create user

```
sh-4.2$ sqlplus

SQL*Plus: Release 21.0.0.0.0 - Production on Sat Oct 25 12:16:08 2025
Version 21.3.0.0.0

Copyright (c) 1982, 2021, Oracle. All rights reserved.

Enter user-name: system
Enter password:
Last Successful login time: Sat Oct 25 2025 12:15:26 +00:00

Connected to:
Oracle Database 21c Express Edition Release 21.0.0.0.0 - Production
Version 21.3.0.0.0

SQL> CONNECT YELLOWCOM
Enter password:
Connected.
SQL>
```

RAM 2.44 GB CPU 0.25% Disk: 60.79 GB used (limit 250.92 GB) >\_ ⓘ New version available

# Useful Docker Commands

- start the service

**docker compose up -d**

- stop the service

**docker compose down**

- stop the service and remove the volume (THIS WILL ERASE ALL THE DATABASE DATA)

**docker compose down -v**

- access the container's terminal

**docker compose exec -it oracle-xe sh**

# Alternative to docker: native installation on Windows (Instruction for Oracle 19c)

These slides are just for your reference.  
In our course we will **ONLY** use the Docker-based solution.

# Install Oracle 19C (Windows)

## Installation requirements

<https://alekciss.com/oracle-database-19c-installation/>

## Download page

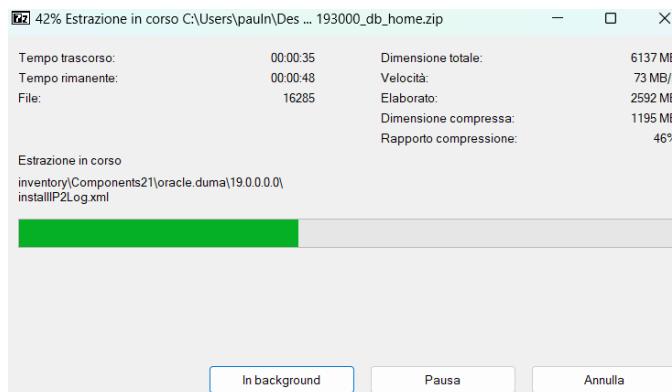
<https://www.oracle.com/database/technologies/oracle19c-windows-downloads.html>

[WINDOWS.X64\\_193000\\_db\\_home.zip](#)

(3,105,763,999 bytes) (sha256sum - 64d92018207829833bd4d00f1a7fb40c531c8a4a68ded9e430a5d6fbaedaca95)

# Install Oracle 19C (Windows)

Unzip the downloaded file  
C:\



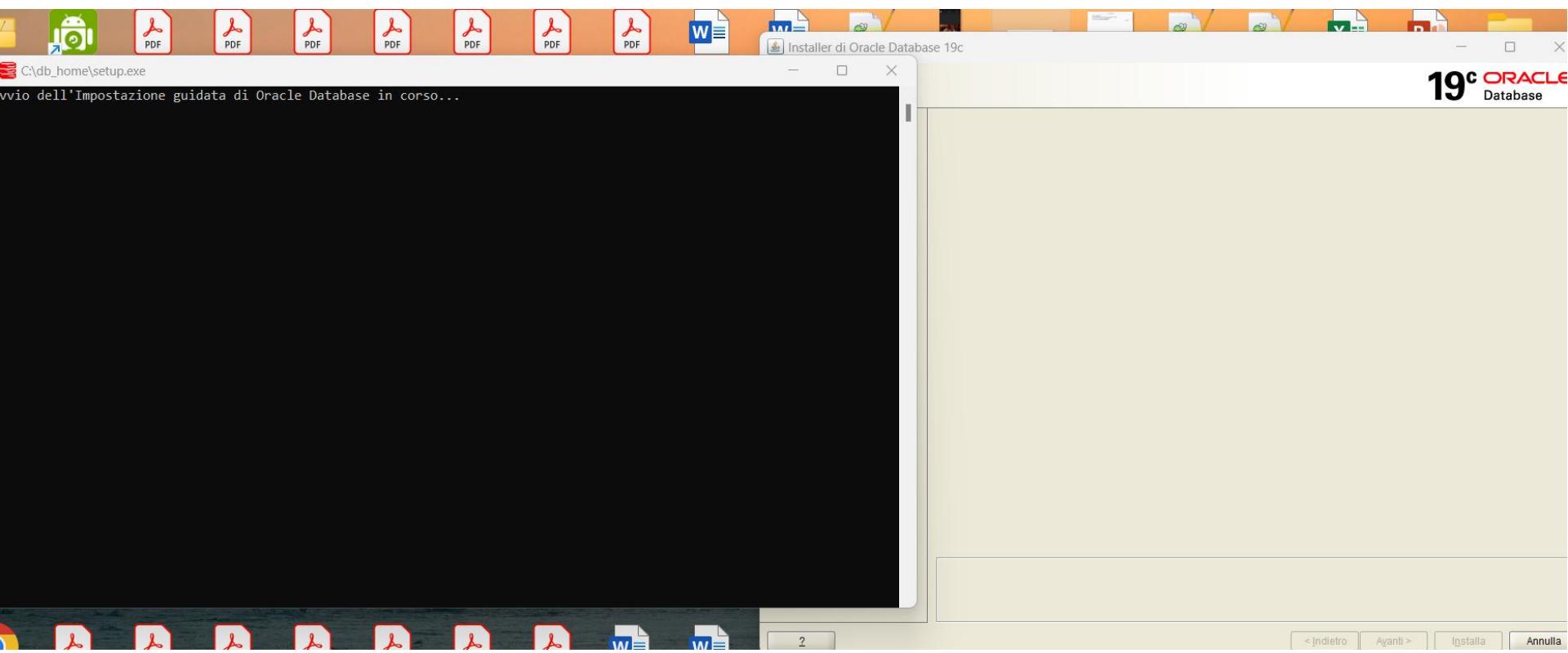
Rename the folder as  
"db\_home"

Launch the setup

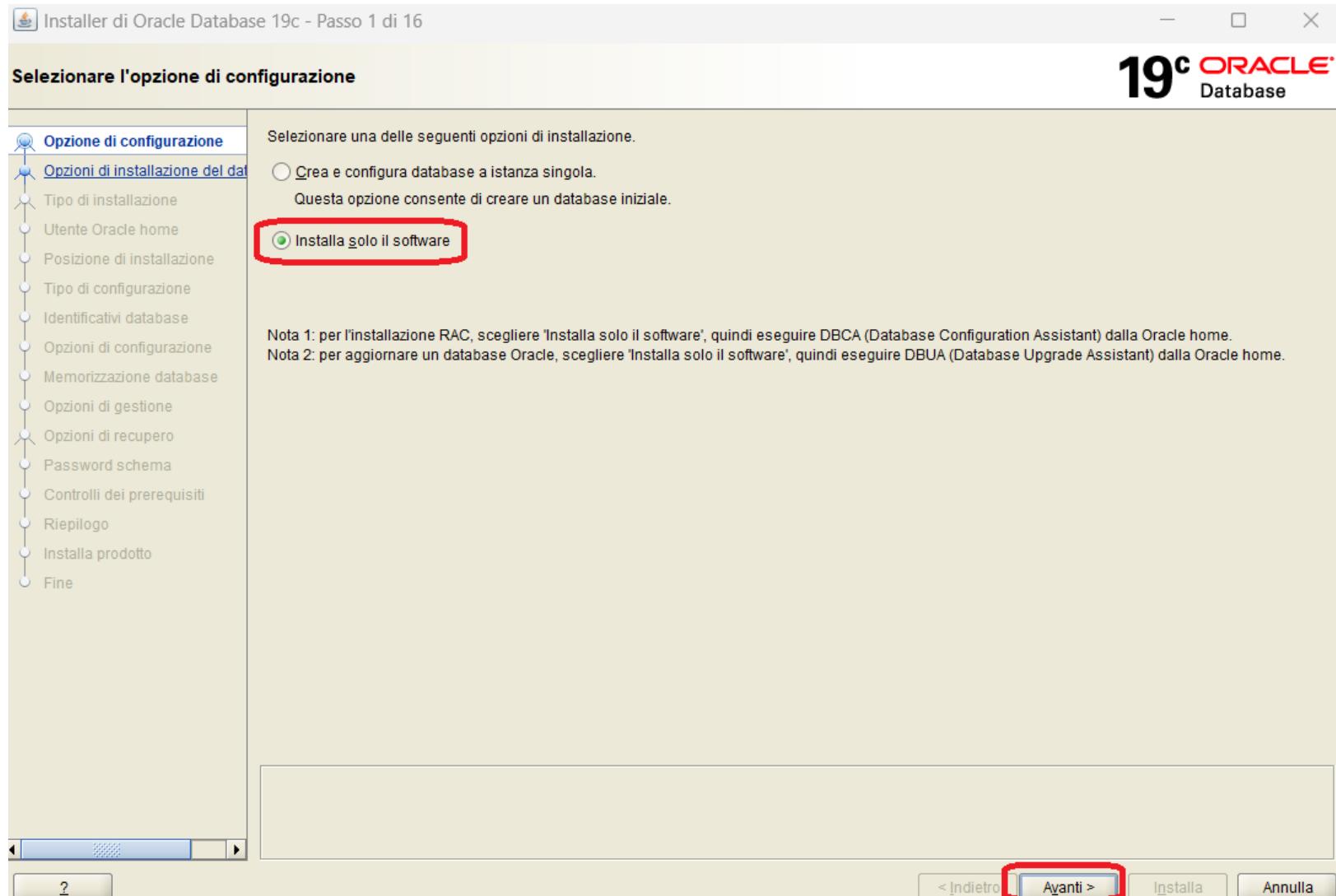
Nome	Ultima modifica	Tipo	Dimensione
racg	30/05/2019 17:03	Cartella di file	
rdbms	30/05/2019 17:03	Cartella di file	
relnotes	30/05/2019 17:03	Cartella di file	
siax	30/05/2019 17:03	Cartella di file	
sqldeveloper	30/05/2019 17:04	Cartella di file	
sqlj	30/05/2019 17:03	Cartella di file	
sqlpatch	30/05/2019 17:05	Cartella di file	
sqlplus	30/05/2019 17:03	Cartella di file	
srvm	30/05/2019 17:03	Cartella di file	
supertools	30/05/2019 17:03	Cartella di file	
ucp	30/05/2019 17:03	Cartella di file	
usm	30/05/2019 17:03	Cartella di file	
util	30/05/2019 17:04	Cartella di file	
wwg	30/05/2019 17:03	Cartella di file	
xdk	30/05/2019 17:03	Cartella di file	
env.ora	26/08/2015 04:26	File ORA	1 KB
schagent.conf	14/10/2016 12:50	File CONF	3 KB
setup.bat	28/09/2018 20:05	File batch Windows	2 KB
setup.exe	14/11/2018 16:42	Applicazione	282 KB

# Install Oracle 19C (Windows)

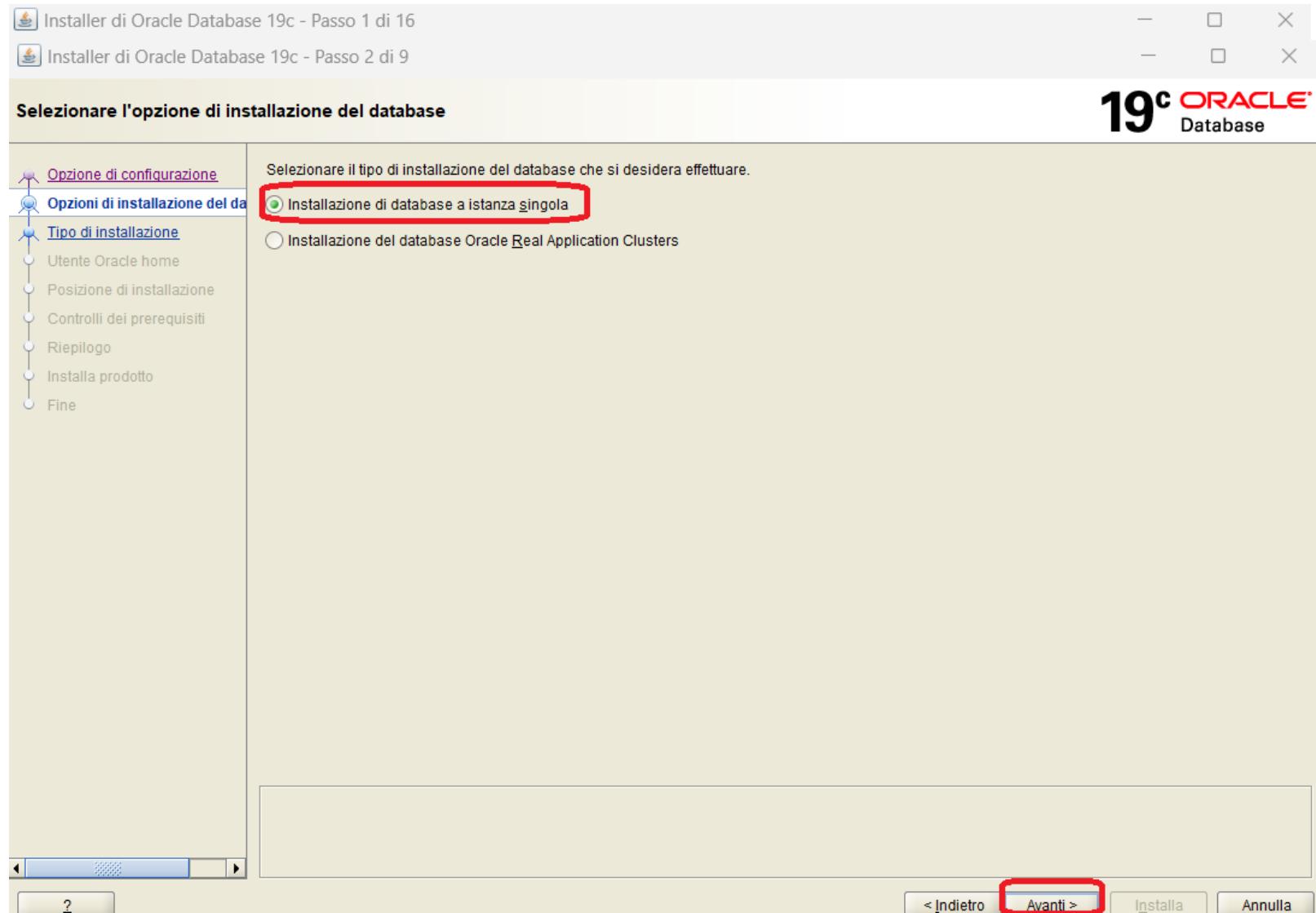
The installation wizard may take several minutes to open



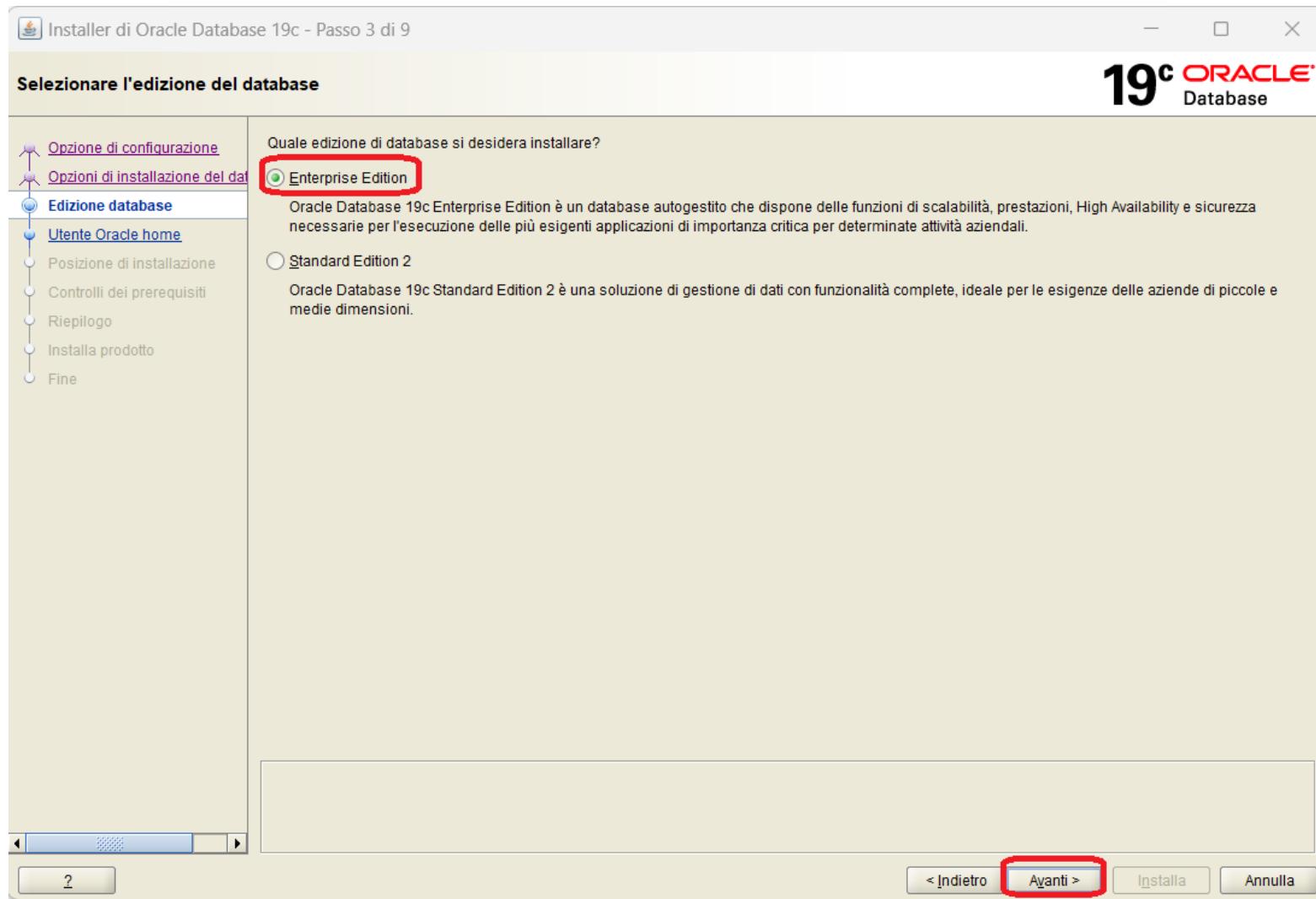
# Install Oracle 19C (Windows)



# Install Oracle 19C (Windows)



# Install Oracle 19C (Windows)



# Hint

Create a Windows local user  
For instance *OracleAccountDS*

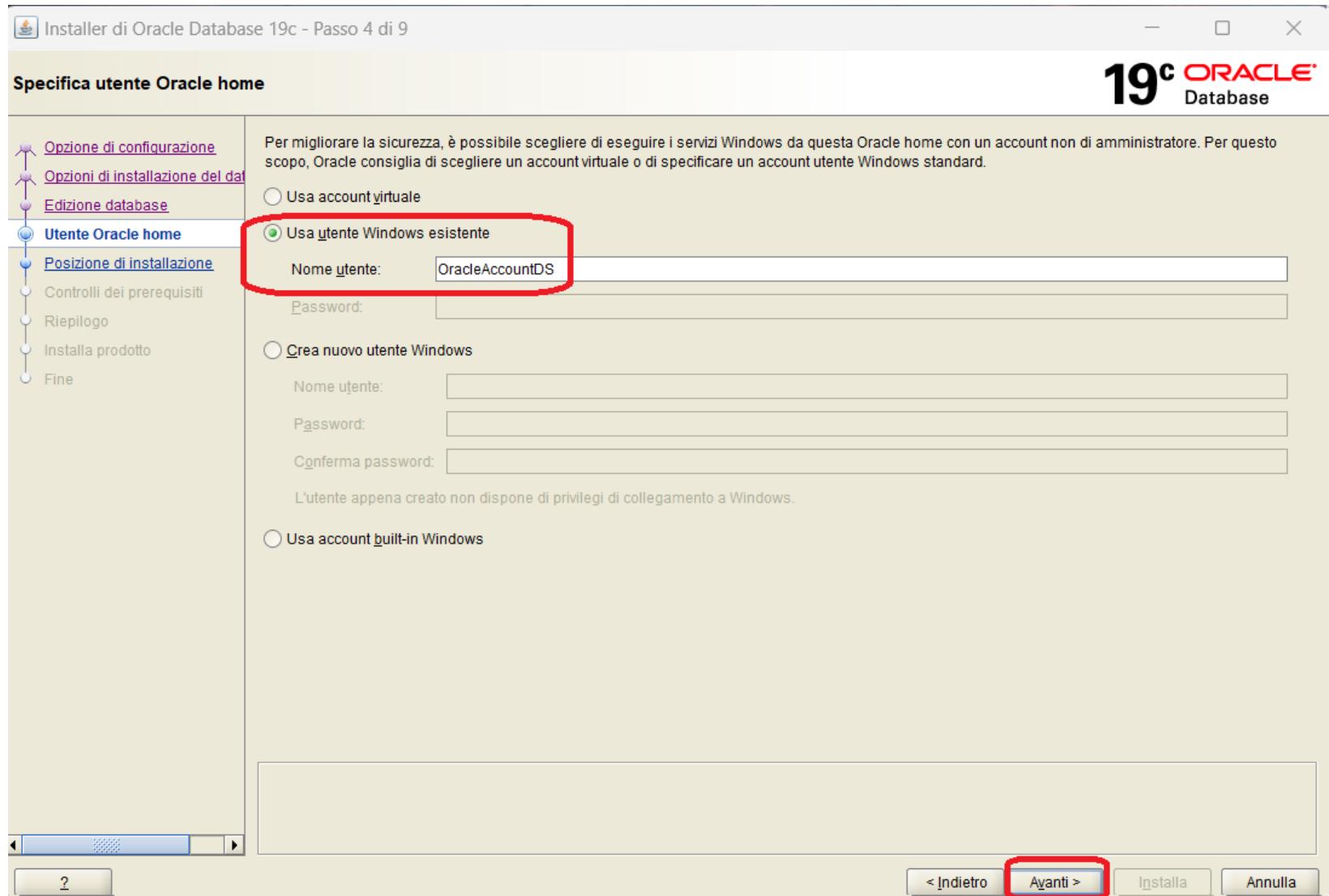
Account > Altri utenti

Altri utenti

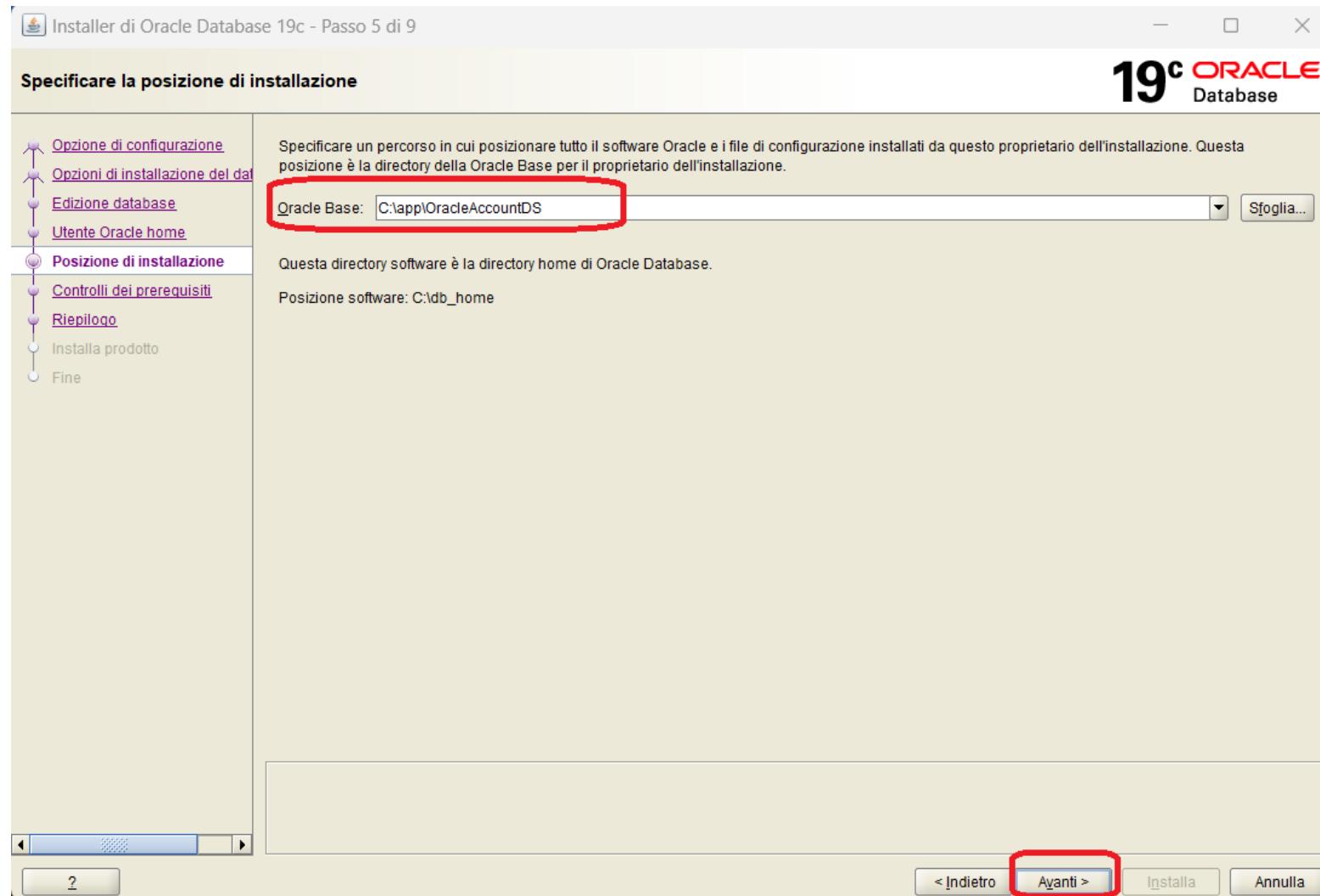
Aggiungi un altro utente Aggiungi account

 OracleAccountDS	Account locale	
---	----------------	---

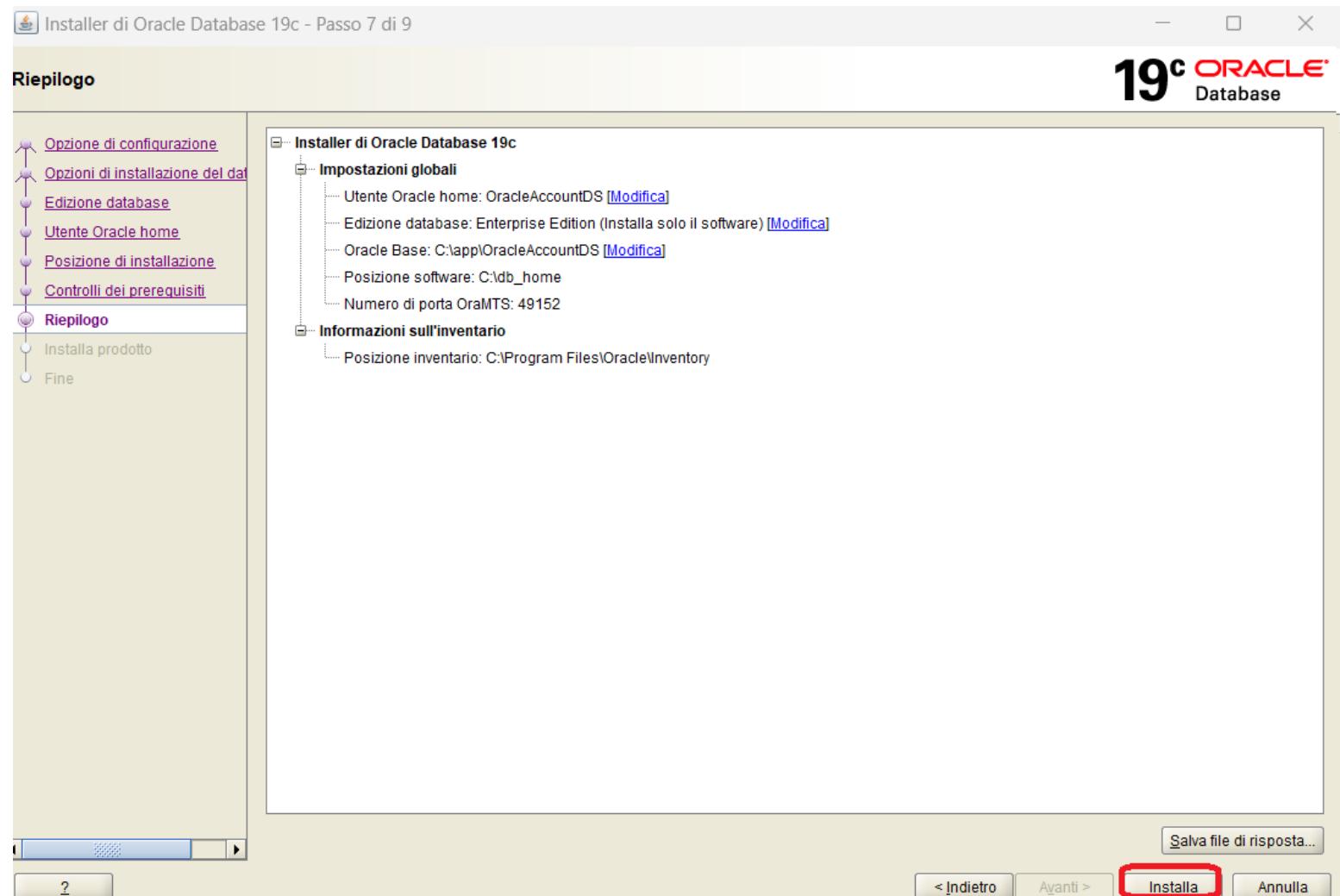
# Install Oracle 19C (Windows)



# Install Oracle 19C (Windows)

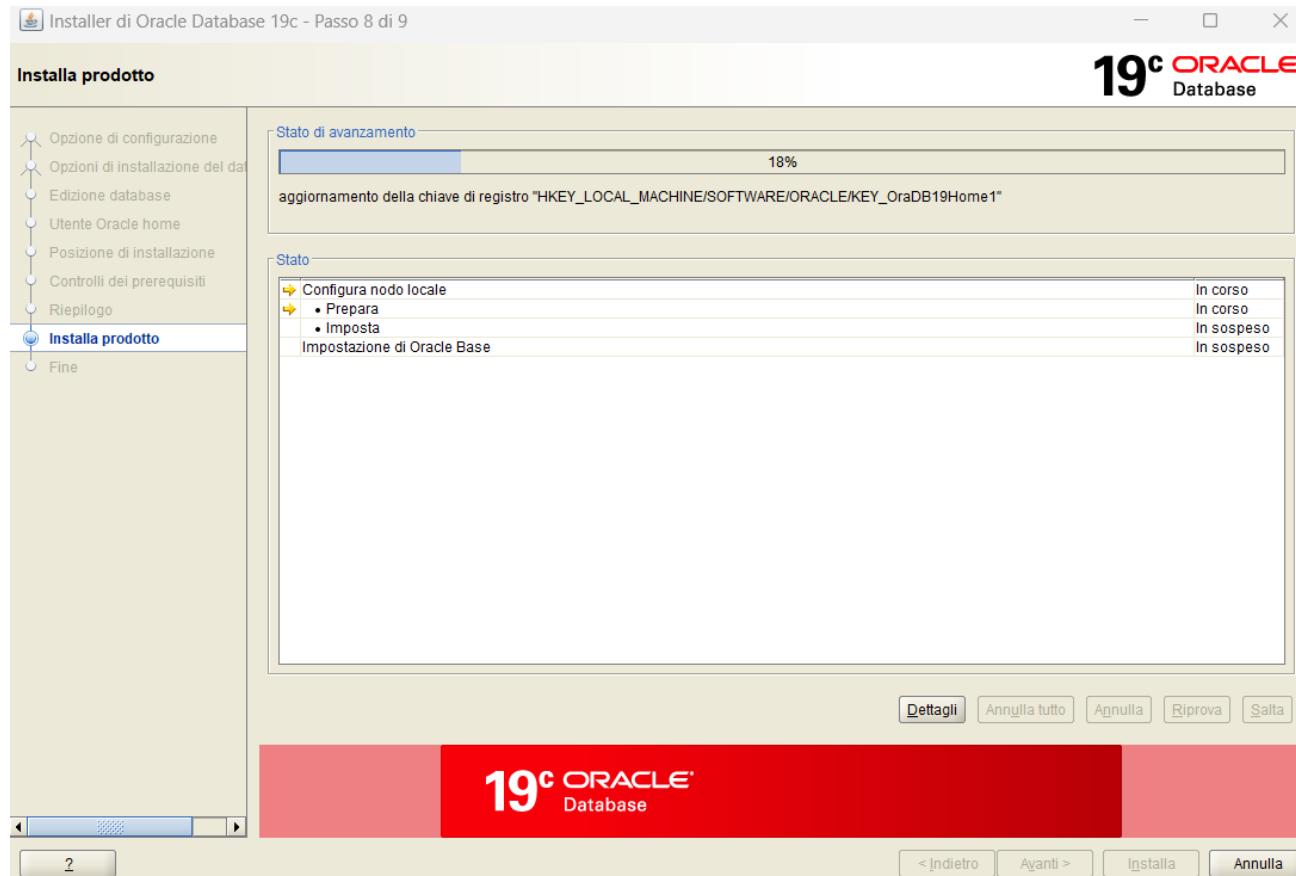


# Install Oracle 19C (Windows)

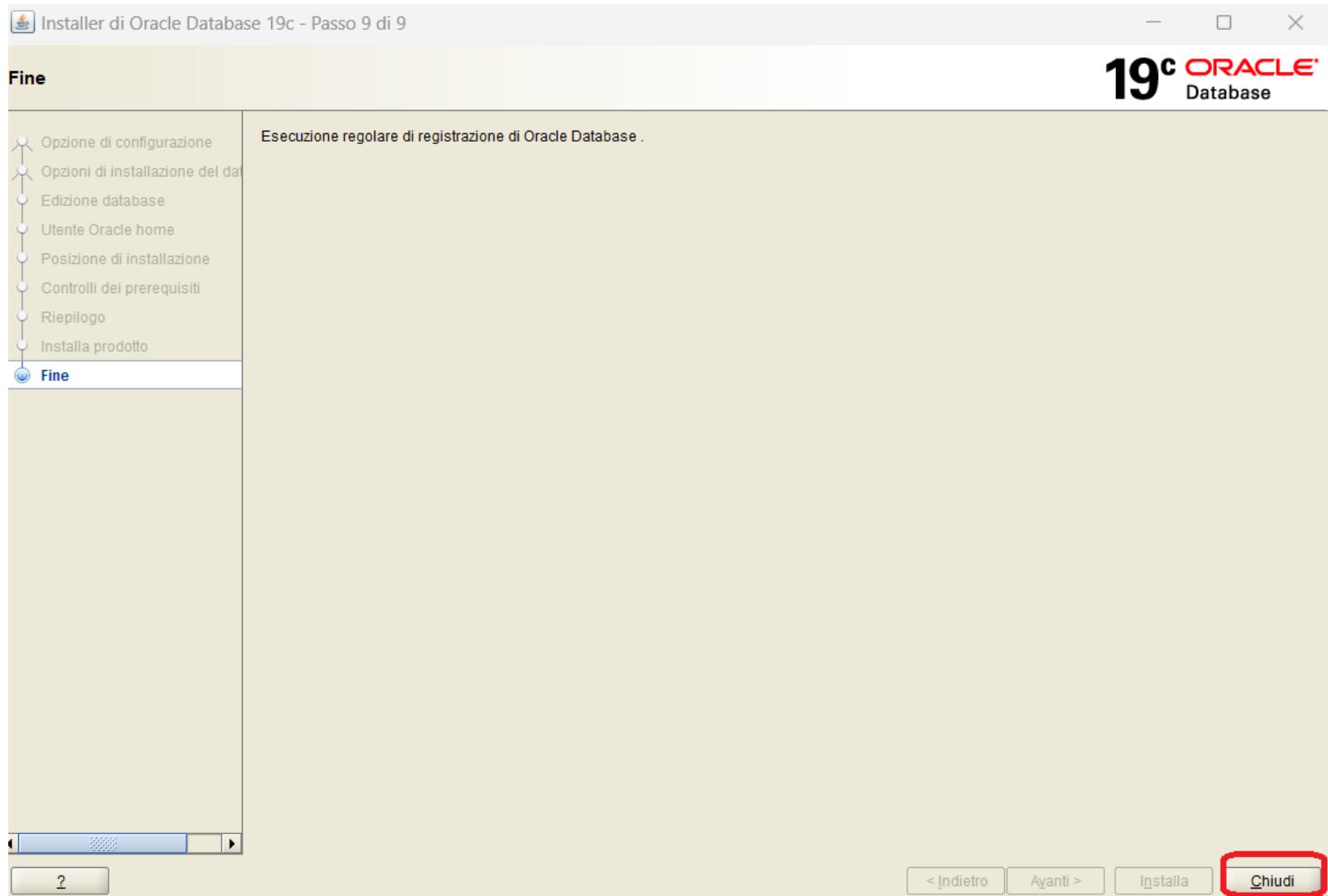


# Install Oracle 19C (Windows)

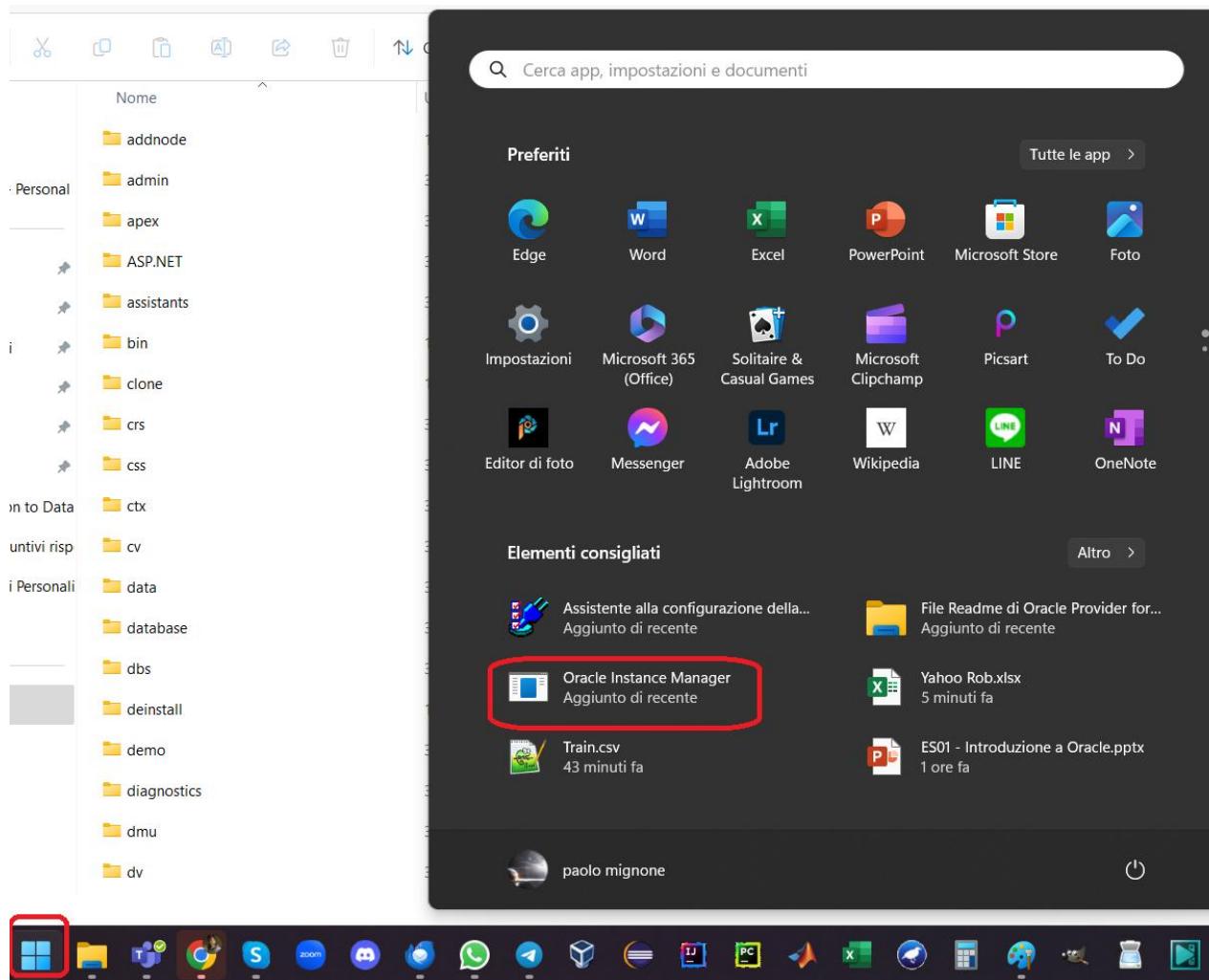
## Consent Java popup



# Install Oracle 19C (Windows)



# Install Oracle 19C (Windows)



# Run dbca

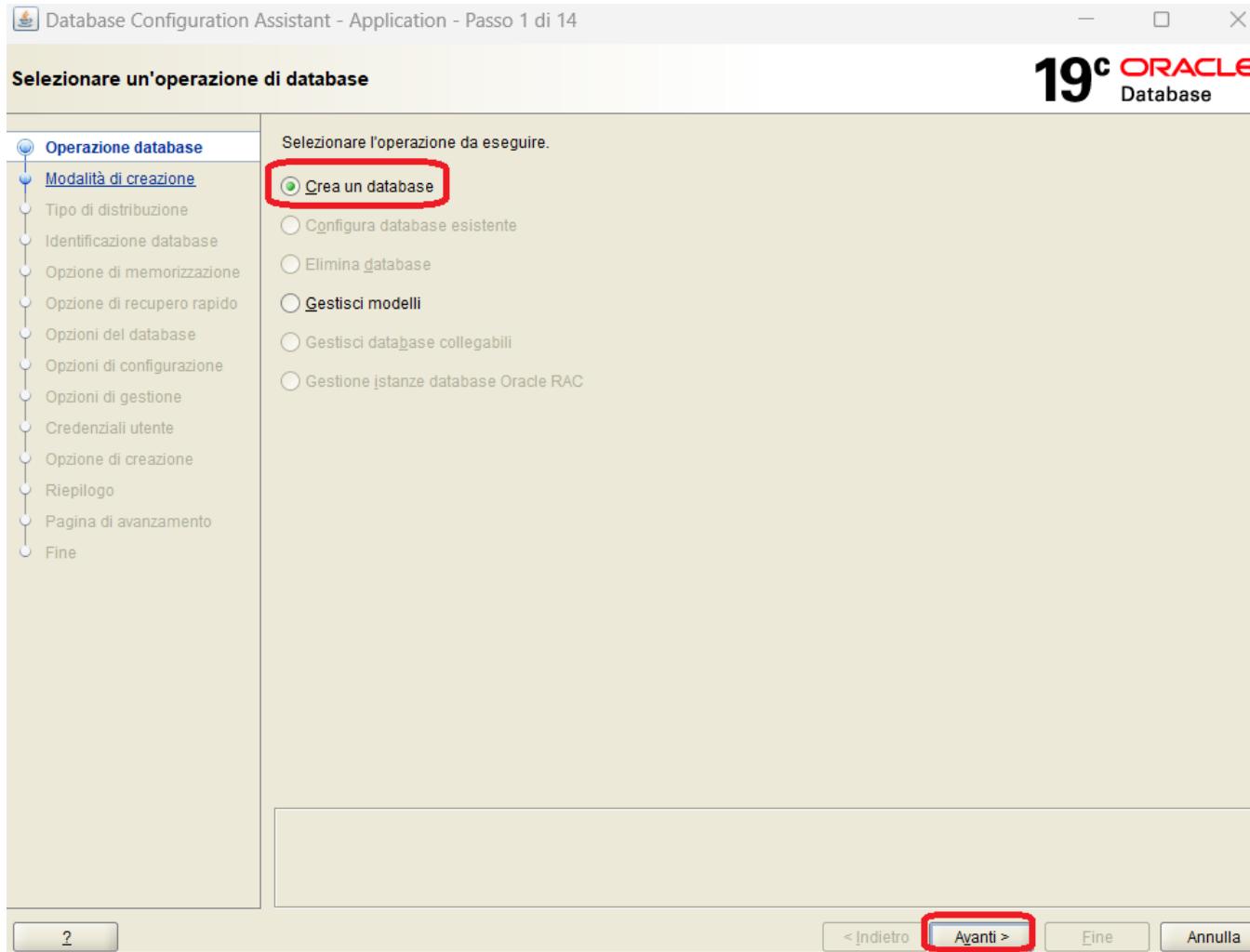
*Win + r* and run the following command

**dbca**

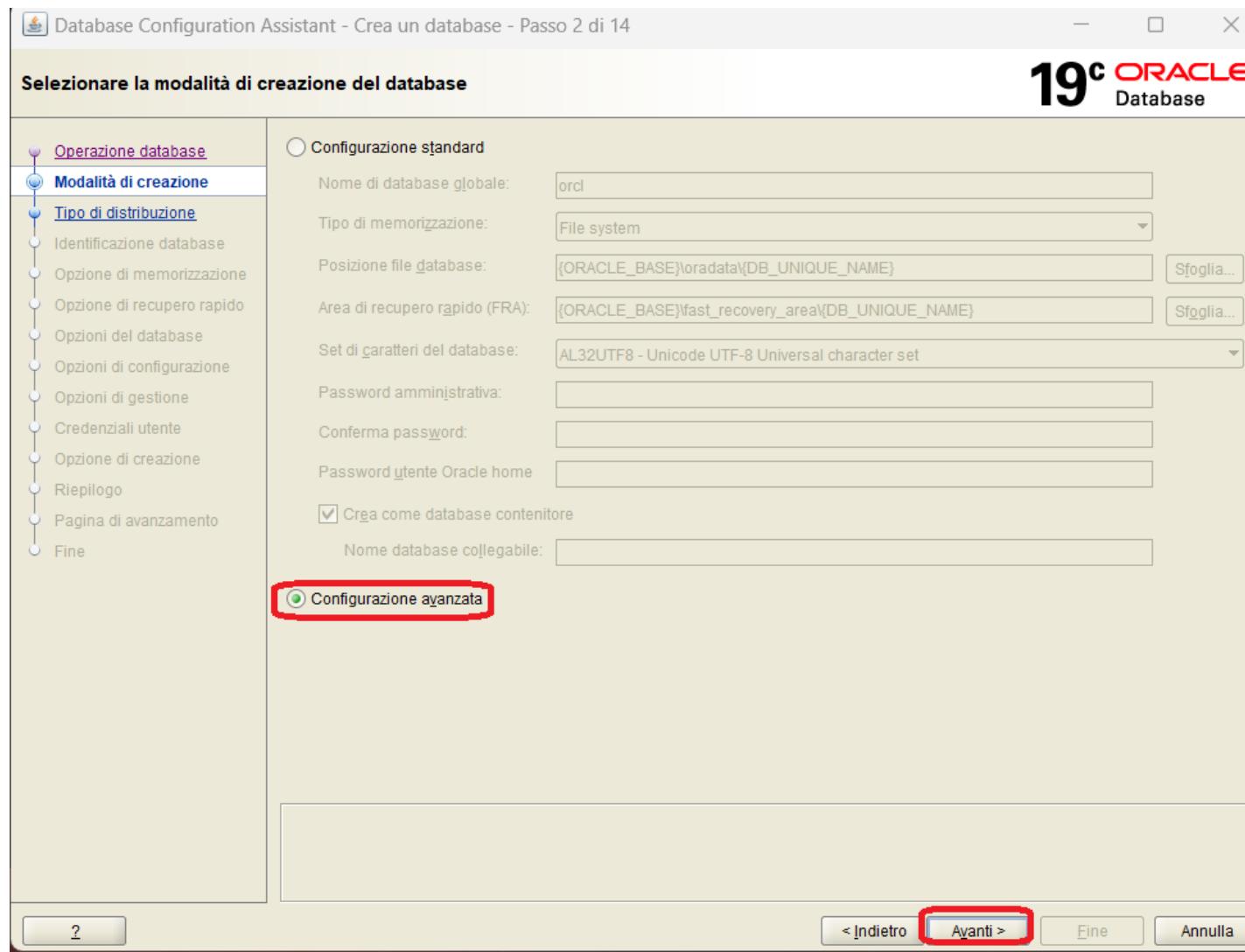
You could encounter a problem when automatic memory setting will occur. If this is the case you can use the following command instead

**dbca -J-Doracle.assistants.dbca.validate.ConfigurationParams=false**

# Create a database



# Create a database



# Create a database

Database Configuration Assistant - Crea un database - Passo 3 di 14

**19c ORACLE Database**

**Selezionare il tipo di distribuzione del database**

Operazione database  
Modalità di creazione  
**Tipo di distribuzione**  
Identificazione database  
Opzione di memorizzazione  
Opzione di recupero rapido  
Opzioni del database  
Opzioni di configurazione  
Opzioni di gestione  
Credenziali utente  
Opzione di creazione  
Riepilogo  
Pagina di avanzamento  
Fine

Selezionare il tipo di database che si desidera creare.

**Tipo di database:** Database a istanza singola Oracle

Tipo di configurazione: Gestito tramite amministratore

Selezionare un modello per il database.

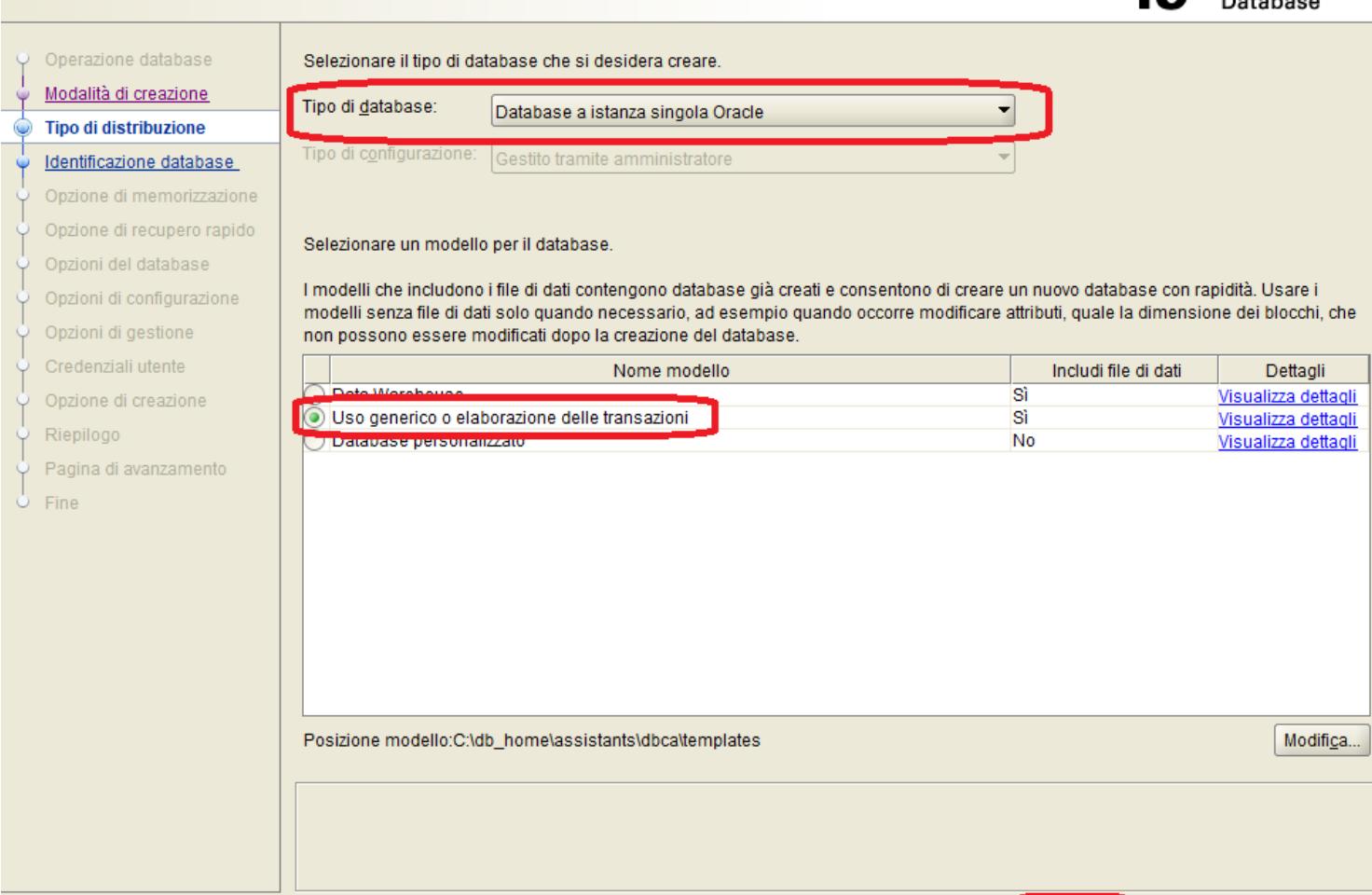
I modelli che includono i file di dati contengono database già creati e consentono di creare un nuovo database con rapidità. Usare i modelli senza file di dati solo quando necessario, ad esempio quando occorre modificare attributi, quale la dimensione dei blocchi, che non possono essere modificati dopo la creazione del database.

Nome modello	Includi file di dati	Dettagli
Data Warehouse	Si	<a href="#">Visualizza dettagli</a>
<b>Uso generico o elaborazione delle transazioni</b>	Si	<a href="#">Visualizza dettagli</a>
Database personalizzato	No	<a href="#">Visualizza dettagli</a>

Posizione modello:C:\db\_home\assistants\dbcaltemplates

Modifica...

< Indietro Avanti > Fine Annulla



# Create a database

Database Configuration Assistant - Crea un database - Passo 4 di 14

**Specificare i dettagli di identificazione del database**

**19<sup>c</sup> ORACLE Database**

Operazione database  
Modalità di creazione  
**Tipo di distribuzione**  
**Identificazione database**  
Opzione di memorizzazione  
Opzione di recupero rapido  
Opzioni del database  
Opzioni di configurazione  
Opzioni di gestione  
Credenziali utente  
Opzione di creazione  
Riepilogo  
Pagina di avanzamento  
Fine

Fornire le informazioni dell'identificativo univoco del database. Un database Oracle viene identificato in modo univoco da un nome di database globale, in genere nel formato "nome.dominio".

Nome di database globale: orcl

SID: orcl

Nome servizio:

Crea come database contenitore

Un database contenitore può essere usato per il consolidamento di più database in un unico database e consente la virtualizzazione dei database. Un database contenitore (CDB) può avere zero o più database collegabili (PDB).

Usa tablespace di undo locale per i PDB

Crea come database contenitore vuoto

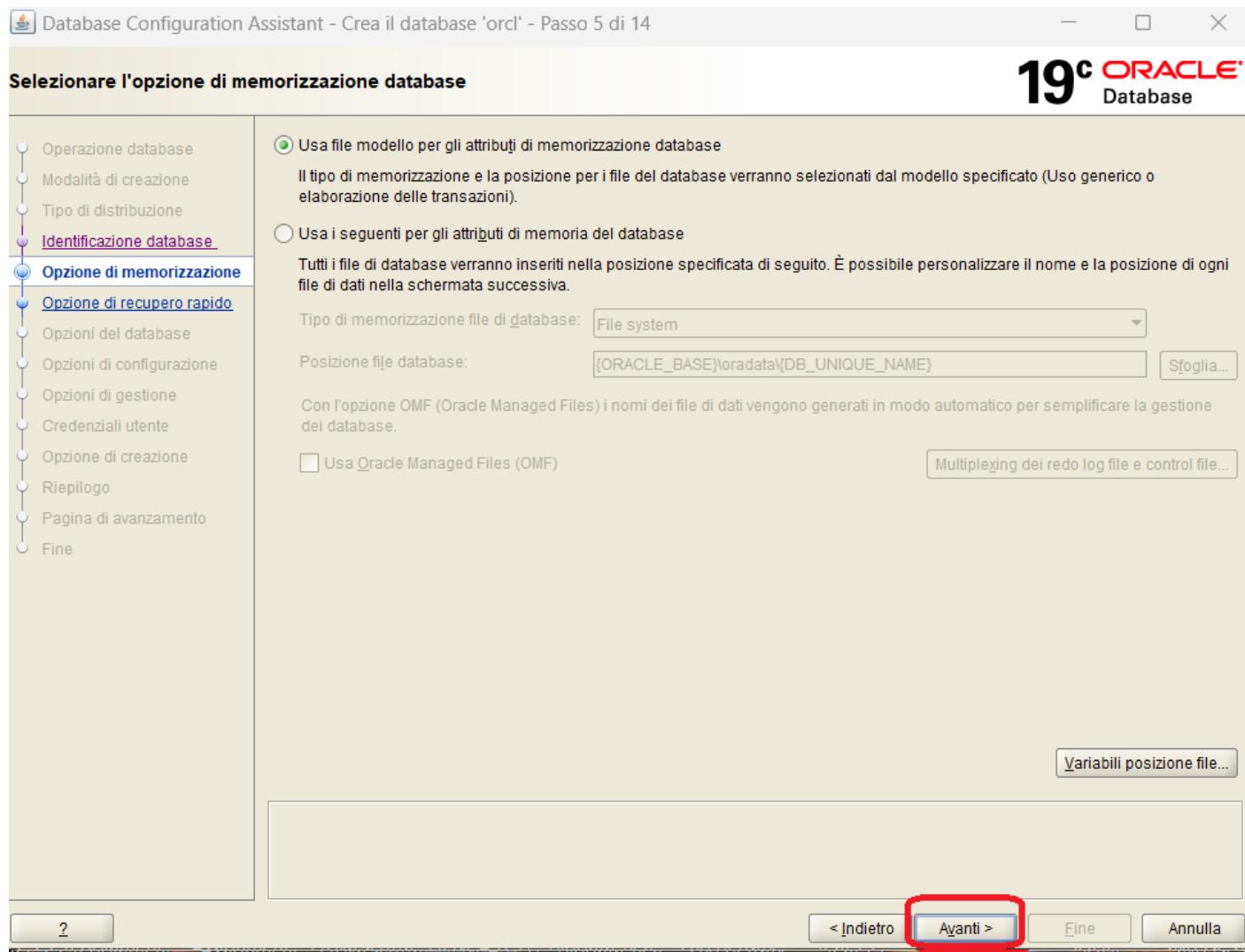
Crea database contenitore con uno o più PDB

Numero di PDB: 1

Nome PDB: pdb

< Indietro **Avanti >** Fine Annulla

# Create a database



# Fast recovery

The fast recovery is an essential component of your database. In fact, it allows you to recover your data if a system failure occurs. It is a location in which Oracle Database can store and manage files related to backup and recovery.

Check “Specify Fast Recovery Area” to specify a backup and recovery area and its directory location, file storage type and size.

You can also enable the archiving of database online redo log files, which Oracle uses to recover a database with the “Enable archiving” option.

# Fast recovery

Database Configuration Assistant - Crea il database 'orcl' - Passo 6 di 14

**Selezionare l'opzione di recupero rapido**

**19c ORACLE Database**

Scegliere le opzioni di recupero per il database.

Specificare l'area di recupero rapido

Tipo di memorizzazione file di recupero: **File system**

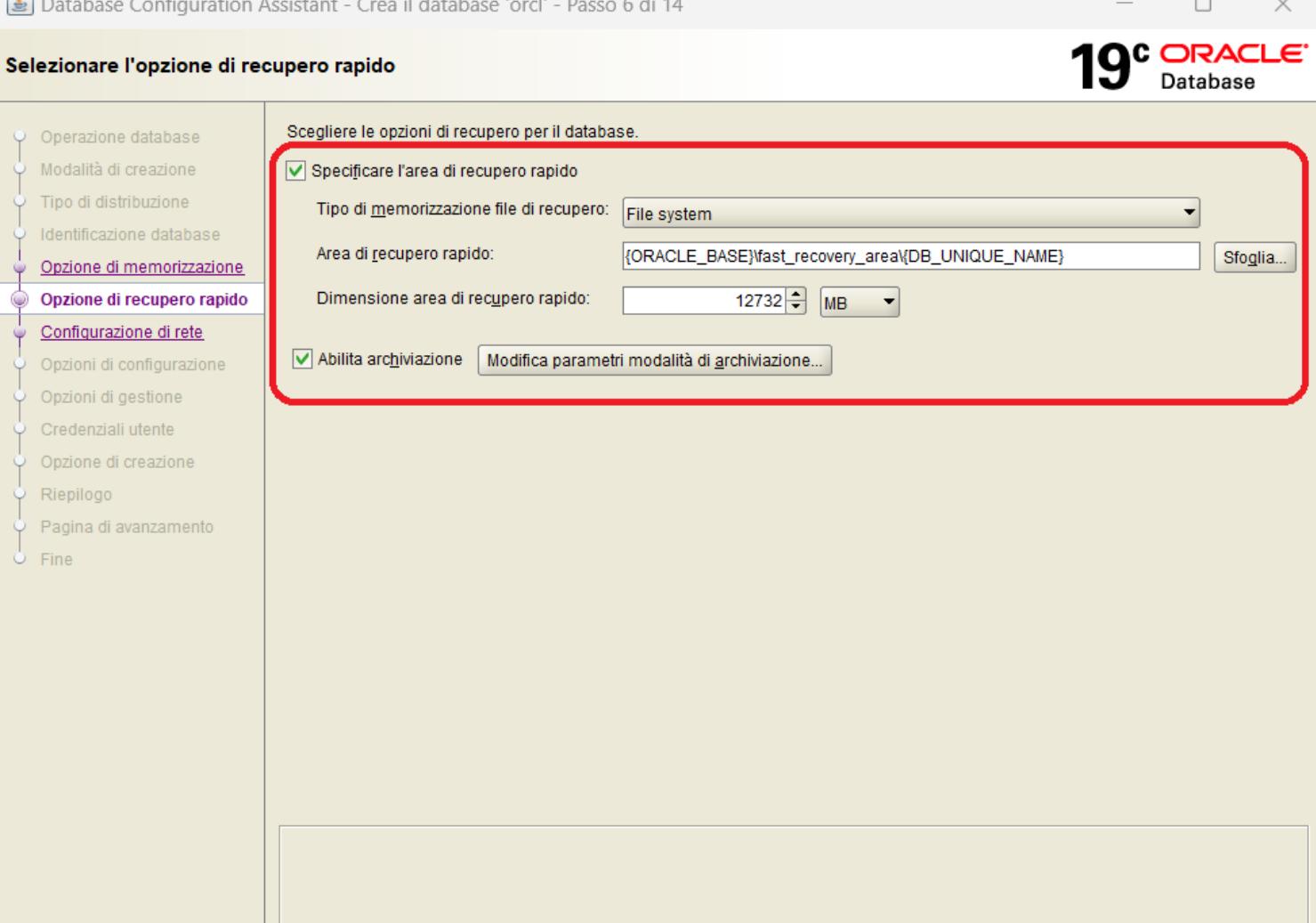
Area di recupero rapido: **{ORACLE\_BASE}\fast\_recovery\_area\{DB\_UNIQUE\_NAME}** **Sfoglia...**

Dimensione area di recupero rapido: **12732 MB**

Abilita archiviazione **Modifica parametri modalità di archiviazione...**

Operazione database  
Modalità di creazione  
Tipo di distribuzione  
Identificazione database  
**Opzione di memorizzazione**  
**Opzione di recupero rapido**  
Configurazione di rete  
Opzioni di configurazione  
Opzioni di gestione  
Credenziali utente  
Opzione di creazione  
Riepilogo  
Pagina di avanzamento  
Fine

< Indietro **Ayanti >** Fine Annulla



# Configure the listener

Configuring a listener is mandatory if you want to access your database remotely. A listener receives incoming client connection requests and manages the traffic of these requests to the database server.

In this step, you can select among the listeners in the current Oracle home or create a new one by providing the listener name and a port number

# Configure the listener

Database Configuration Assistant - Crea il database 'orcl' - Passo 7 di 14

**Specificare i dettagli di configurazione della rete**

**19c ORACLE Database**

Operazione database  
Modalità di creazione  
Tipo di distribuzione  
Identificazione database  
Opzione di memorizzazione  
Opzione di recupero rapido  
**Configurazione di rete**  
Opzioni di configurazione  
Opzioni di gestione  
Credenziali utente  
Opzione di creazione  
Riepilogo  
Pagina di avanzamento  
Fine

Selezione listener

Di seguito sono elencati i listener della Oracle home. Per creare un nuovo listener nella Oracle home corrente, specificarne il nome e la porta.

	Nome	Porta	Oracle home	Stato

Crea nuovo listener

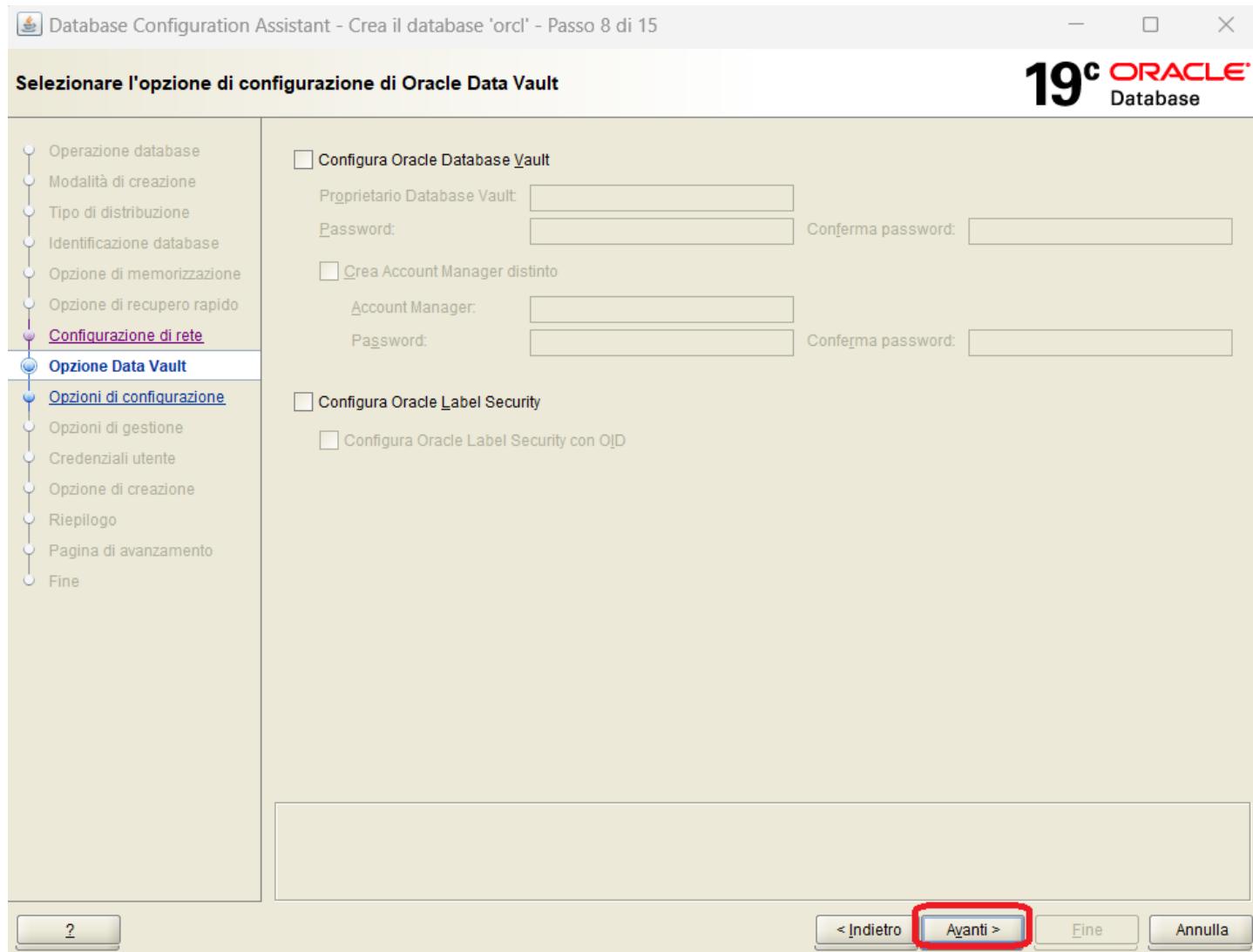
Nome listener:

Porta listener:

Oracle home:

< Indietro **Avanti >** Fine Annulla

# Create a database



# Memory

Database Configuration Assistant - Crea il database 'orcl' - Passo 9 di 15

19c ORACLE Database

Specificare le opzioni di configurazione

Memoria Dimensionamento Set di caratteri Modalità di connessione Schemi di esempio

Usa gestione automatica memoria condivisa

Dimensione SGA: 4850 MB 390 6467 16168

Dimensione PGA: 1617 MB

Usa gestione manuale memoria condivisa

Dimensioni shared pool: 0 MB

Dimensione buffer cache: 0 MB

Dimensione Java pool: 0 MB

Dimensione Large pool: 0 MB

Dimensione PGA: 0 MB

Memoria totale per il database: 0 MB

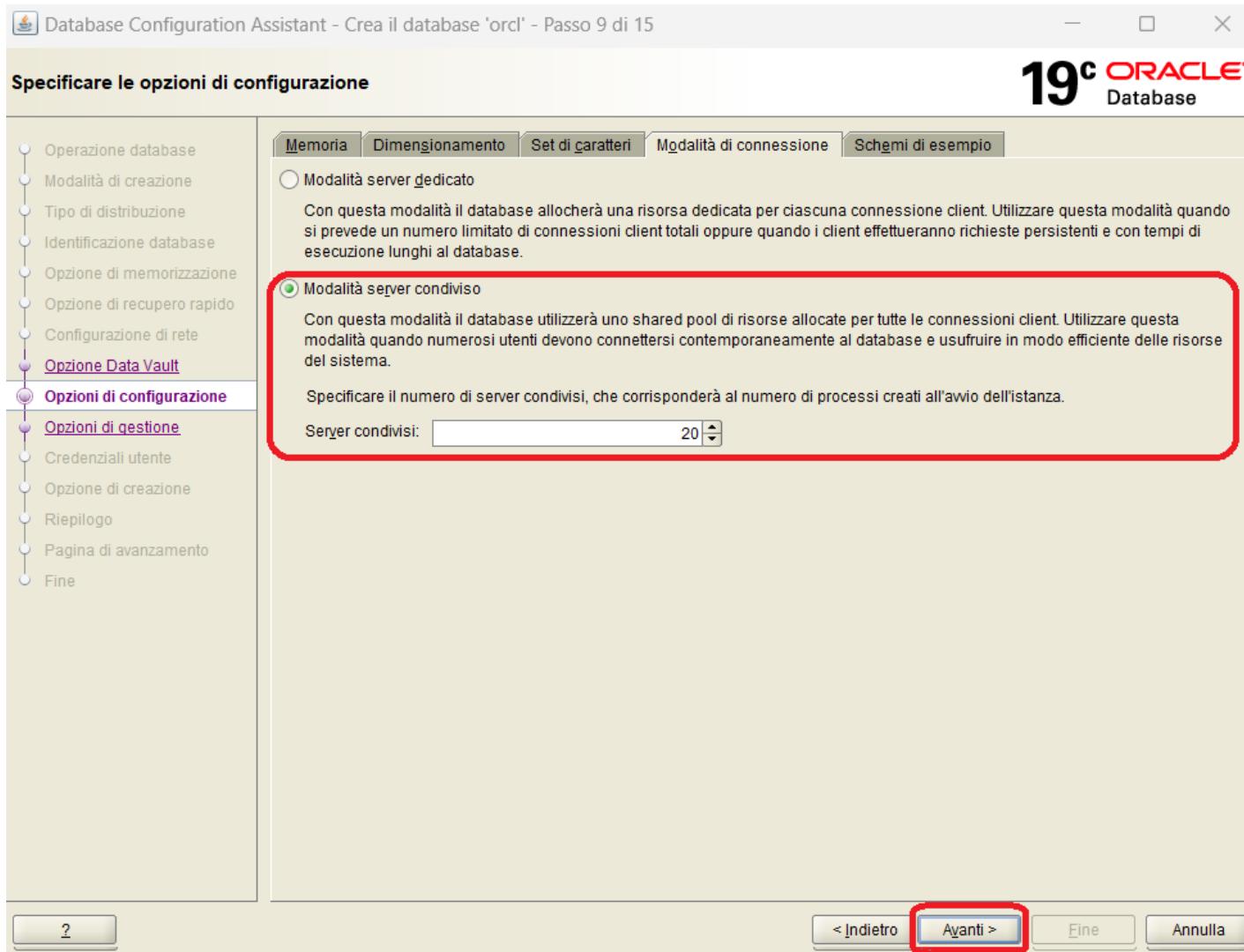
Usa gestione automatica della memoria

Destinazione memoria: 6467 MB 390 6467 16168 39%

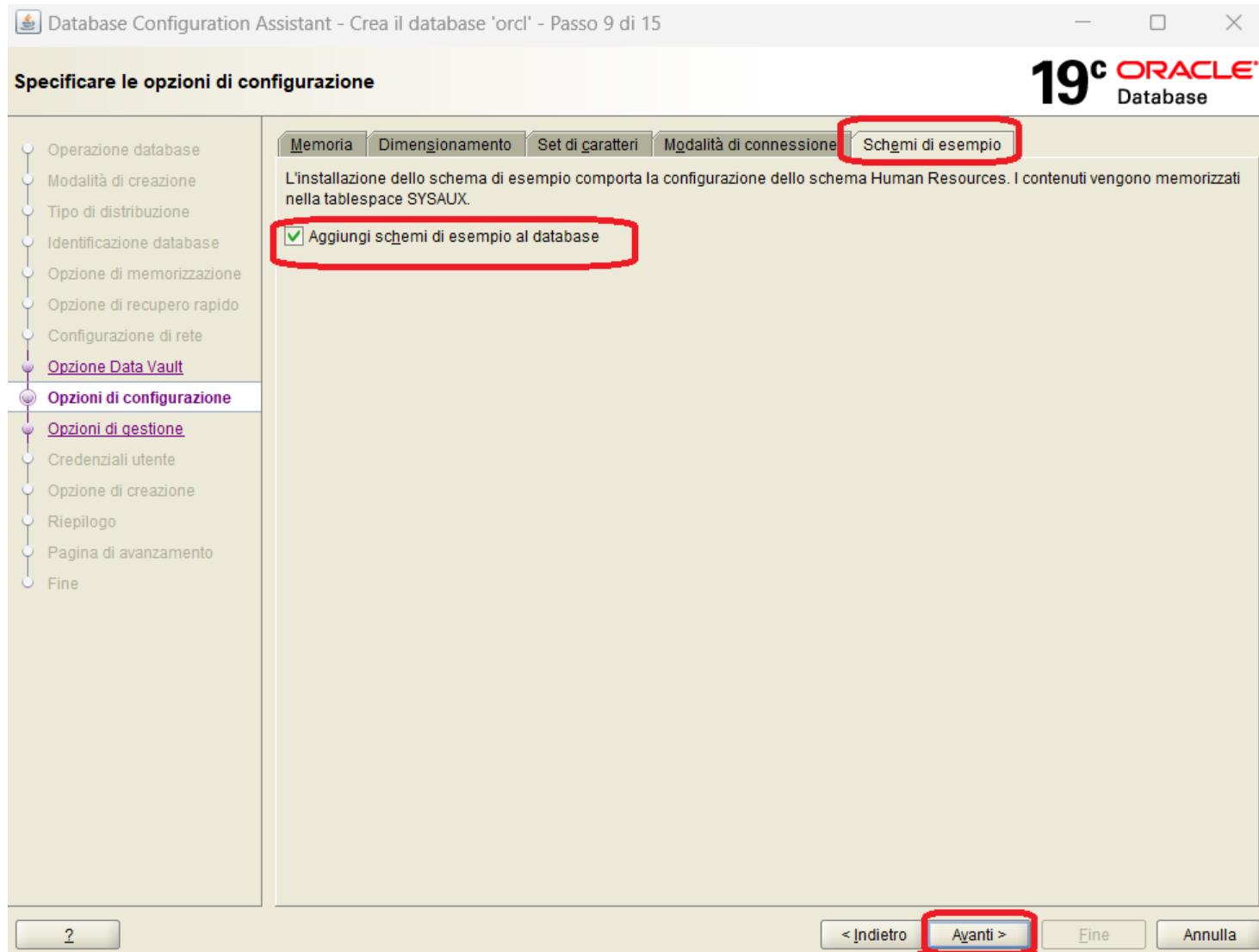
? < Indietro Avanti > Fine Annulla

The screenshot shows the Oracle Database Configuration Assistant interface for creating a database named 'orcl'. The current step is 'Passo 9 di 15'. The main window title is 'Database Configuration Assistant - Crea il database 'orcl' - Passo 9 di 15'. The top right corner displays '19c ORACLE Database'. The left sidebar lists configuration steps, with 'Opzioni di configurazione' and 'Opzioni di gestione' currently selected. The main panel is titled 'Memoria' and contains tabs for 'Memoria', 'Dimensionamento', 'Set di caratteri', 'Modalità di connessione', and 'Schemi di esempio'. Under 'Memoria', there are two sections: 'Usa gestione automatica memoria condivisa' and 'Usa gestione manuale memoria condivisa'. The 'Usa gestione automatica della memoria' section is selected and highlighted with a red box. It includes fields for 'Dimensione SGA' (4850 MB) and 'Dimensione PGA' (1617 MB). Below this, under 'Usa gestione automatica della memoria', is a section for 'Memoria totale per il database' (0 MB), which is also highlighted with a red box. The 'Destinazione memoria' field shows '6467 MB'. At the bottom of the window, the 'Avanti >' button is also highlighted with a red box.

# Shared server



# Schema example



# Enterprise Manager

Database Configuration Assistant - Crea il database 'orcl' - Passo 10 di 15

19c ORACLE Database

**Specificare le opzioni di gestione**

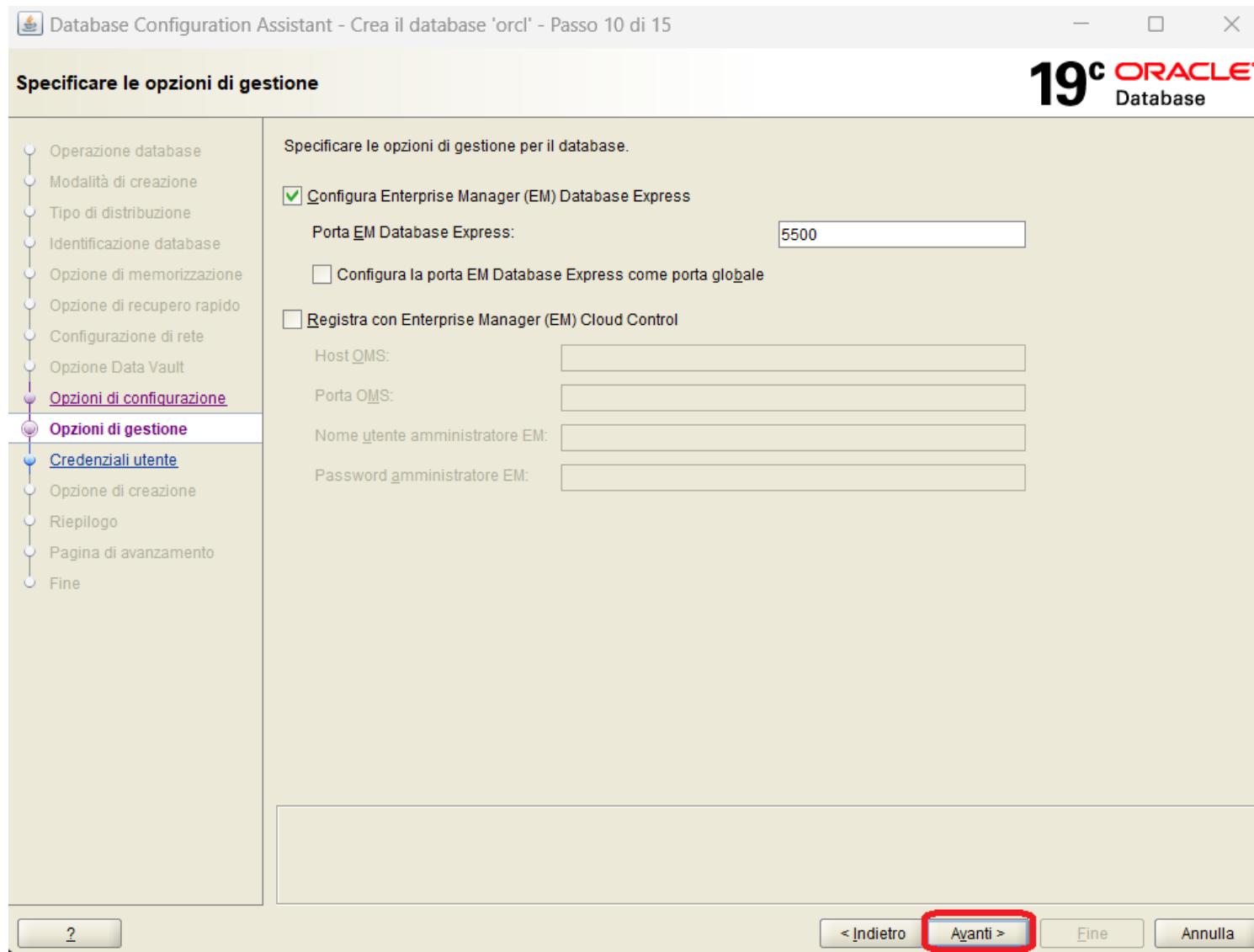
Operazione database  
Modalità di creazione  
Tipo di distribuzione  
Identificazione database  
Opzione di memorizzazione  
Opzione di recupero rapido  
Configurazione di rete  
Opzione Data Vault  
**Opzioni di configurazione**  
**Opzioni di gestione**  
Credenziali utente  
Opzione di creazione  
Riepilogo  
Pagina di avanzamento  
Fine

Specificare le opzioni di gestione per il database.

Configura Enterprise Manager (EM) Database Express  
Porta EM Database Express: 5500  
 Configura la porta EM Database Express come porta globale

Registra con Enterprise Manager (EM) Cloud Control  
Host OMS:  
Porta OMS:  
Nome utente amministratore EM:  
Password amministratore EM:

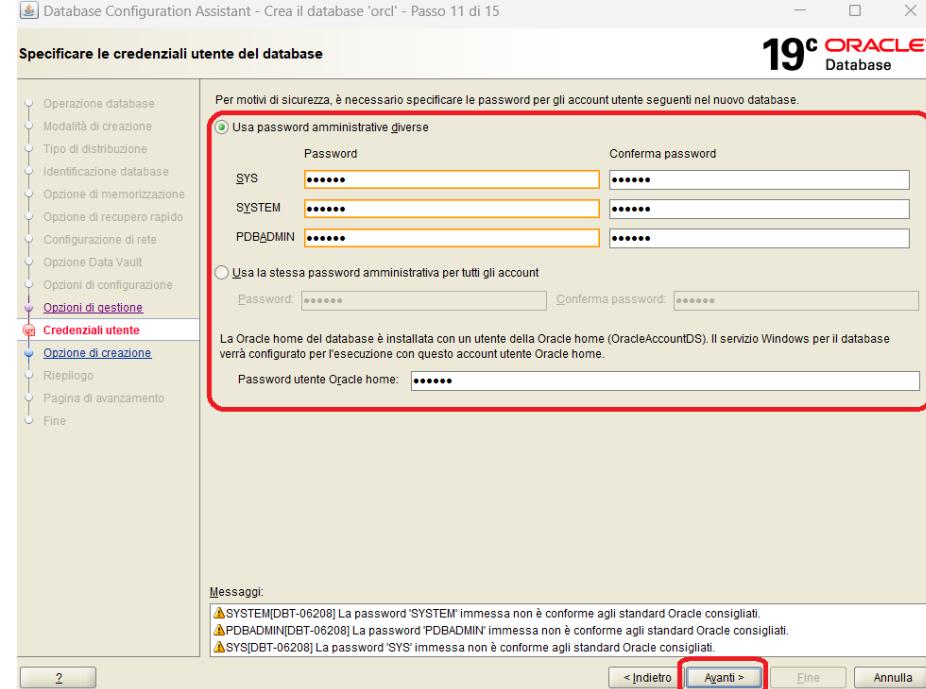
< Indietro **Avanti >** Fine Annulla



# Skip password security

Use a simple password (oracle for each user) for simplicity

In real applications, use different complex passwords



# Create database

Database Configuration Assistant - Crea il database 'orcl' - Passo 12 di 15

**Selezionare l'opzione di creazione del database**

**19c ORACLE Database**

Operazione database  
Modalità di creazione  
Tipo di distribuzione  
Identificazione database  
Opzione di memorizzazione  
Opzione di recupero rapido  
Configurazione di rete  
Opzione Data Vault  
Opzioni di configurazione  
Opzioni di gestione  
Credenziali utente  
**Opzione di creazione**  
Riepilogo  
Pagina di avanzamento  
Fine

Selezionare le opzioni di creazione del database.

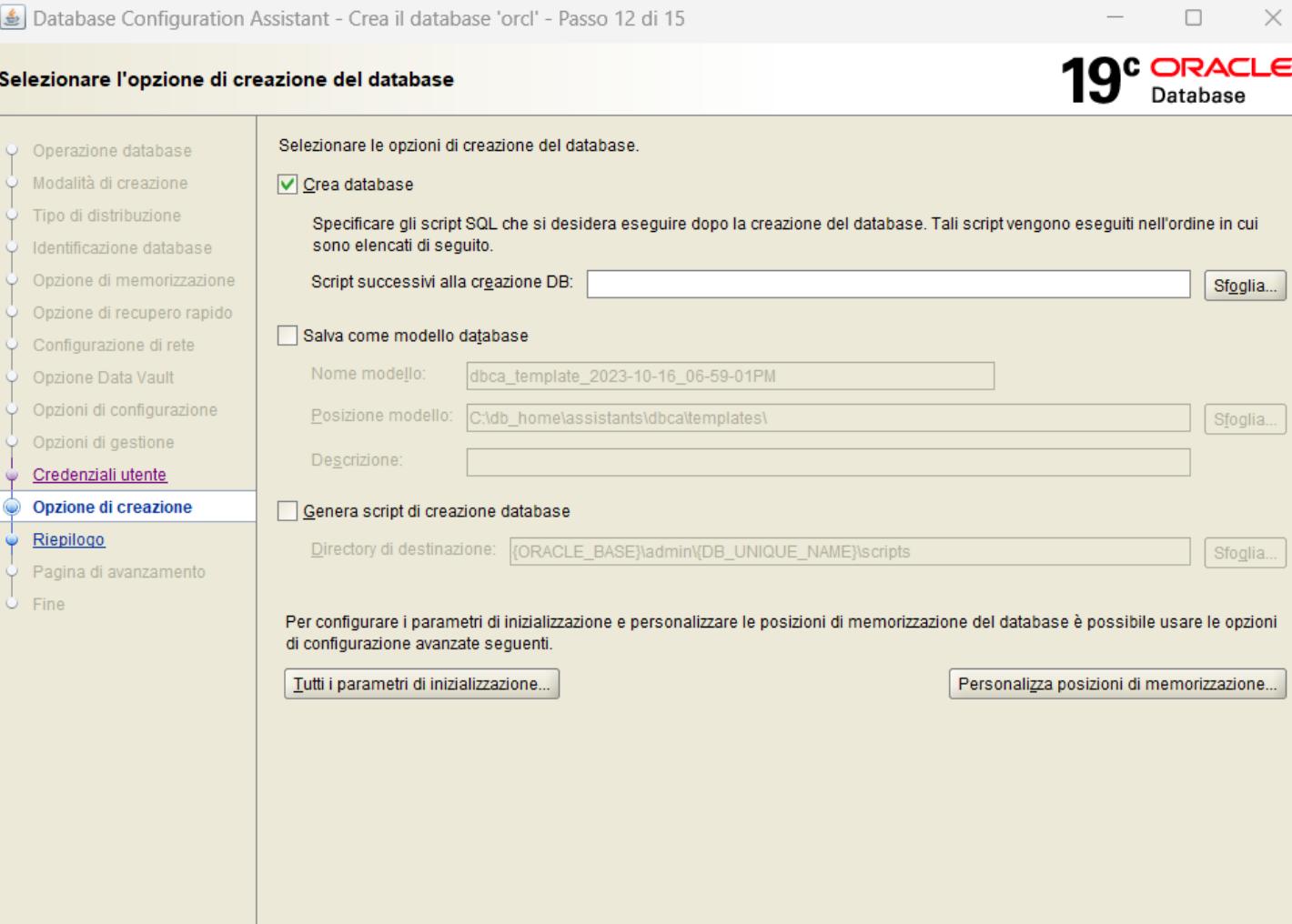
**Crea database**  
Specificare gli script SQL che si desidera eseguire dopo la creazione del database. Tali script vengono eseguiti nell'ordine in cui sono elencati di seguito.  
Script successivi alla creazione DB:

**Salva come modello database**  
Nome modello:   
Posizione modello:    
Descrizione:

**Genera script di creazione database**  
Directory di destinazione:

Per configurare i parametri di inizializzazione e personalizzare le posizioni di memorizzazione del database è possibile usare le opzioni di configurazione avanzate seguenti.

< Indietro **Avanti >** Fine Annulla



# Create database

Database Configuration Assistant - Crea il database 'orcl' - Passo 13 di 15

**19c ORACLE Database**

**Riepilogo**

- [Operazione database](#)
- [Modalità di creazione](#)
- [Tipo di distribuzione](#)
- [Identificazione database](#)
- [Opzione di memorizzazione](#)
- [Opzione di recupero rapido](#)
- [Configurazione di rete](#)
- [Opzione Data Vault](#)
- [Opzioni di configurazione](#)
- [Opzioni di gestione](#)
- [Credenziali utente](#)
- [Opzione di creazione](#)
- Riepilogo**

Pagina di avanzamento

Fine

**Assistente alla configurazione del database**

- Impostazioni globali**
  - Nome di database globale: orcl
  - Tipo di configurazione: Database a istanza singola Oracle
  - SID: orcl
  - Crea come database contenitore: Si
  - Nome del database collegabile: pdb
  - Numero di database collegabili: 1
  - Usa tablespace di undo locale per i PDB: Si
  - Tipo di configurazione memoria: Gestione automatica della memoria
  - Nome modello: General Purpose
- Parametri di inizializzazione**
  - audit\_file\_dest: {ORACLE\_BASE}\admin\{DB\_UNIQUE\_NAME}\adump
  - audit\_trail: db
  - compatible: 19.0.0
  - control\_files: ("{ORACLE\_BASE}\oradata\{DB\_UNIQUE\_NAME}\control01.ctl", "{ORACLE\_BASE}\fast\_recovery\_area\{DB\_UNIQUE\_NAME}\control02.ctl")
  - db\_block\_size: 8192 BYTES
  - db\_name: orcl
  - db\_recovery\_file\_dest: {ORACLE\_BASE}\fast\_recovery\_area\{DB\_UNIQUE\_NAME}
  - db\_recovery\_file\_dest\_size: 12732 MB
  - diagnostic\_dest: {ORACLE\_BASE}
  - dispatchers: (PROTOCOL=TCP)
  - local\_listener: LISTENER\_ORCL
  - log\_archive\_format: %t\_%s\_%r.dbf
  - memory\_target: 6467 MB

Salva file di risposta...

< Indietro Avanti > Fine Annulla

# Create database

Database Configuration Assistant - Crea il database 'orcl' - Passo 14 di 15

**Pagina di avanzamento**

**19c ORACLE Database**

Operazione database

Modalità di creazione

Tipo di distribuzione

Identificazione database

Opzione di memorizzazione

Opzione di recupero rapido

Configurazione di rete

Opzione Data Vault

Opzioni di configurazione

Opzioni di gestione

Credenziali utente

Opzione di creazione

Riepilogo

**Pagina di avanzamento**

Fine

**Stato di avanzamento**

Copia dei file di database : In corso

8%

**Stato**

Creazione DB	In corso
Prepara per l'operazione DB	Riuscito
Copia dei file di database	In corso
Creazione e avvio dell'istanza Oracle	In sospeso
Completamento della creazione del database	In sospeso
Creazione dei database collegabili	In sospeso
Esecuzione delle azioni di postconfigurazione	In sospeso

**Dettagli** **Annulla tutto** **Annulla** **Riprova** **Salta**

Posizione log DBCA:  
C:\app\OracleAccount\DS\cfgtoollogs\dbcal\orcl\trace.log\_2023-10-16\_06-59-01PM

< Indietro Avanti > Annulla

# SQL Developer

# Installation

- Download SQLDeveloper from its official website (<https://www.oracle.com/database/sqldeveloper/technologies/download/>)
- We will use SQL Developer 24.3.1



Platform	Download	Notes
SQL Developer Extension for VSCode	 <a href="#">Download</a>	<ul style="list-style-type: none"><li>• Requires 1</li><li>• Available 1 (intel/arm)</li></ul>
Windows 64-bit with JDK 17 included	 <a href="#">Download (555 MB)</a>	<ul style="list-style-type: none"><li>• MD5: bb9</li><li>• SHA1: 5295a49d</li><li>• Installation</li></ul>

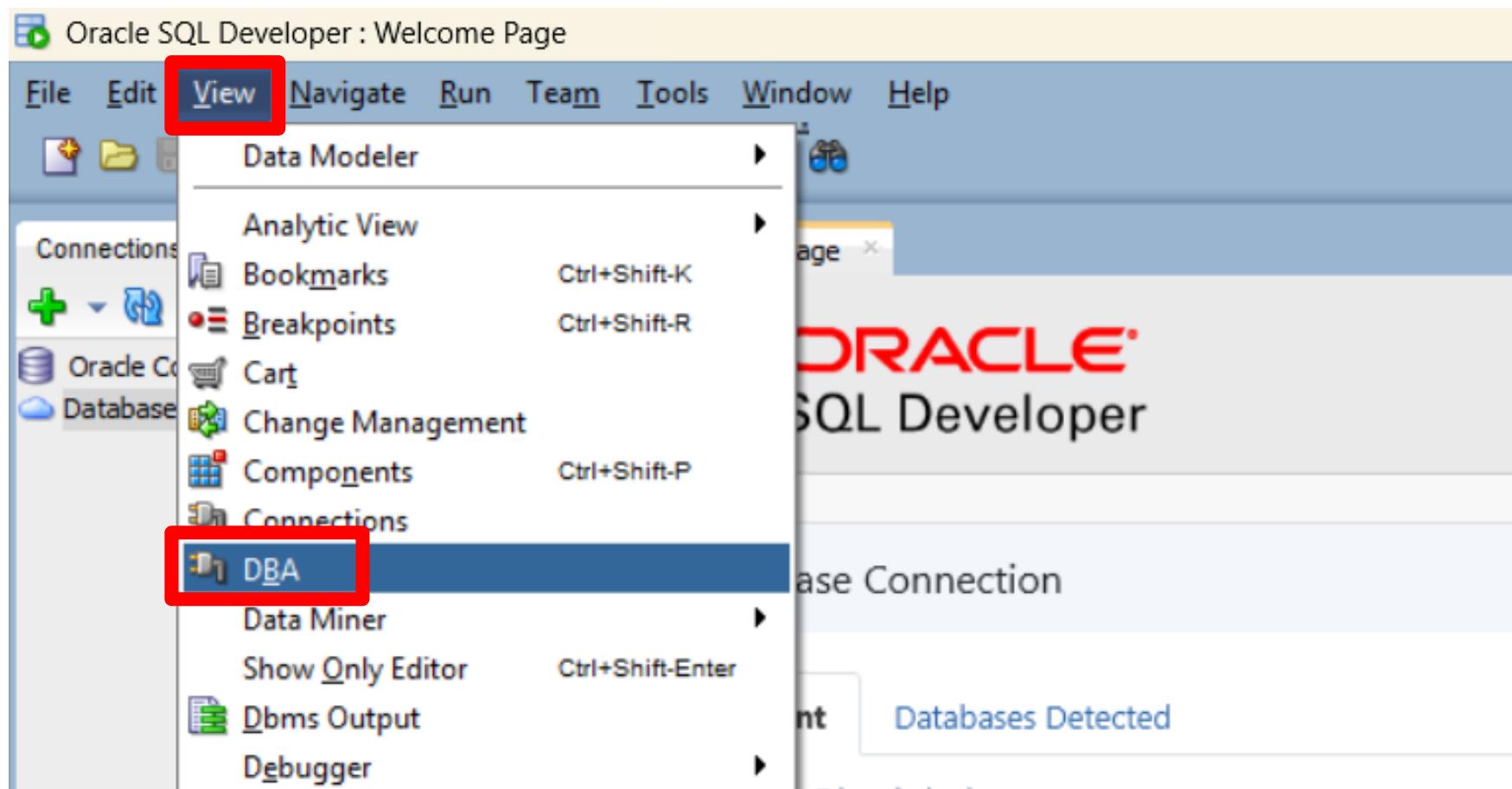
# Start the application

Extract the archive you downloaded and click on the “sqldeveloper.exe” file that you will find into the folder.

📁	jviews	07/10/2025 14:51	Cartella di file
📁	modules	07/10/2025 14:51	Cartella di file
📁	netbeans	07/10/2025 14:52	Cartella di file
📁	rdbms	07/10/2025 14:52	Cartella di file
📁	sleepycat	07/10/2025 14:52	Cartella di file
📁	sqldeveloper	07/10/2025 14:52	Cartella di file
📁	sqlj	07/10/2025 14:52	Cartella di file
📁	svnkit	07/10/2025 14:52	Cartella di file
📅	icon.png	12/12/2024 18:26	File PNG 2 KB
📄	LICENSE.txt	12/12/2024 18:26	Documento di testo 1 KB
📄	NOTICES.txt	12/12/2024 18:26	Documento di testo 3 KB
▶	sqldeveloper.exe	12/12/2024 18:48	Applicazione 92 KB
✳️	sqldeveloper.sh	12/12/2024 18:26	Shell Script 1 KB

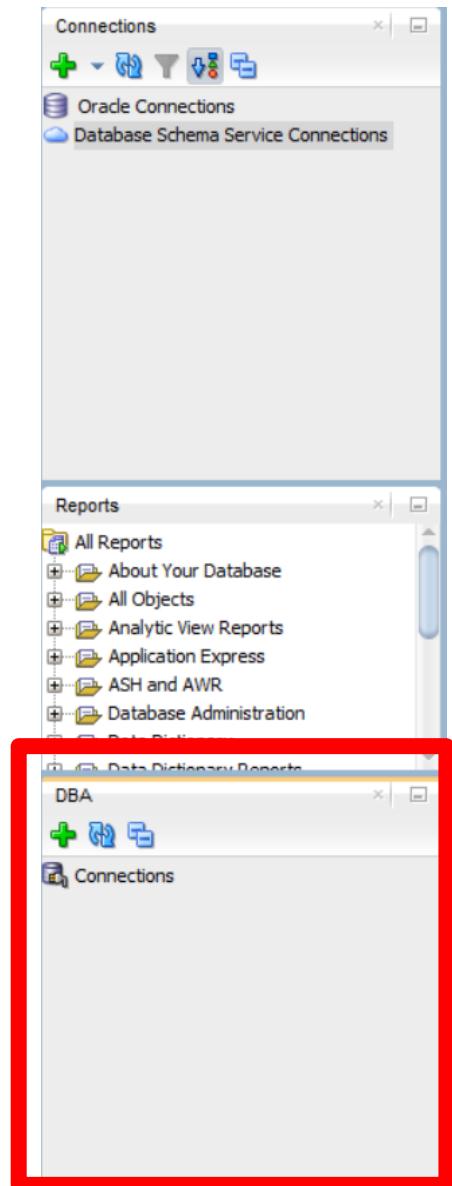
# SQL Developer: DBA section

The first step is to enable the DBA (Database Administrator) section:



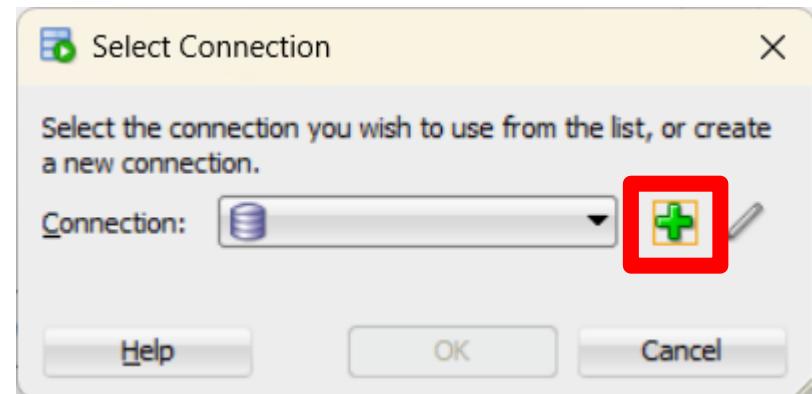
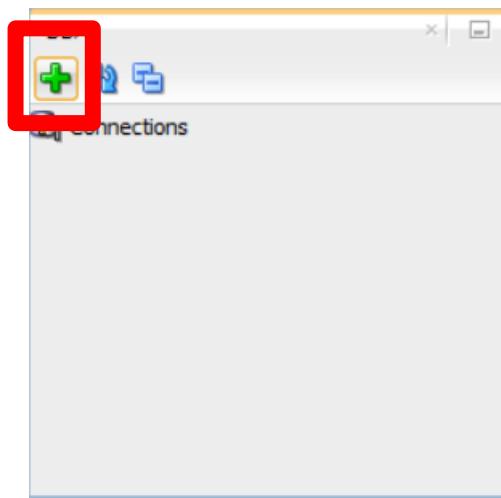
# SQL Developer: DBA section

The first step is to enable the DBA (Database Administrator) section:



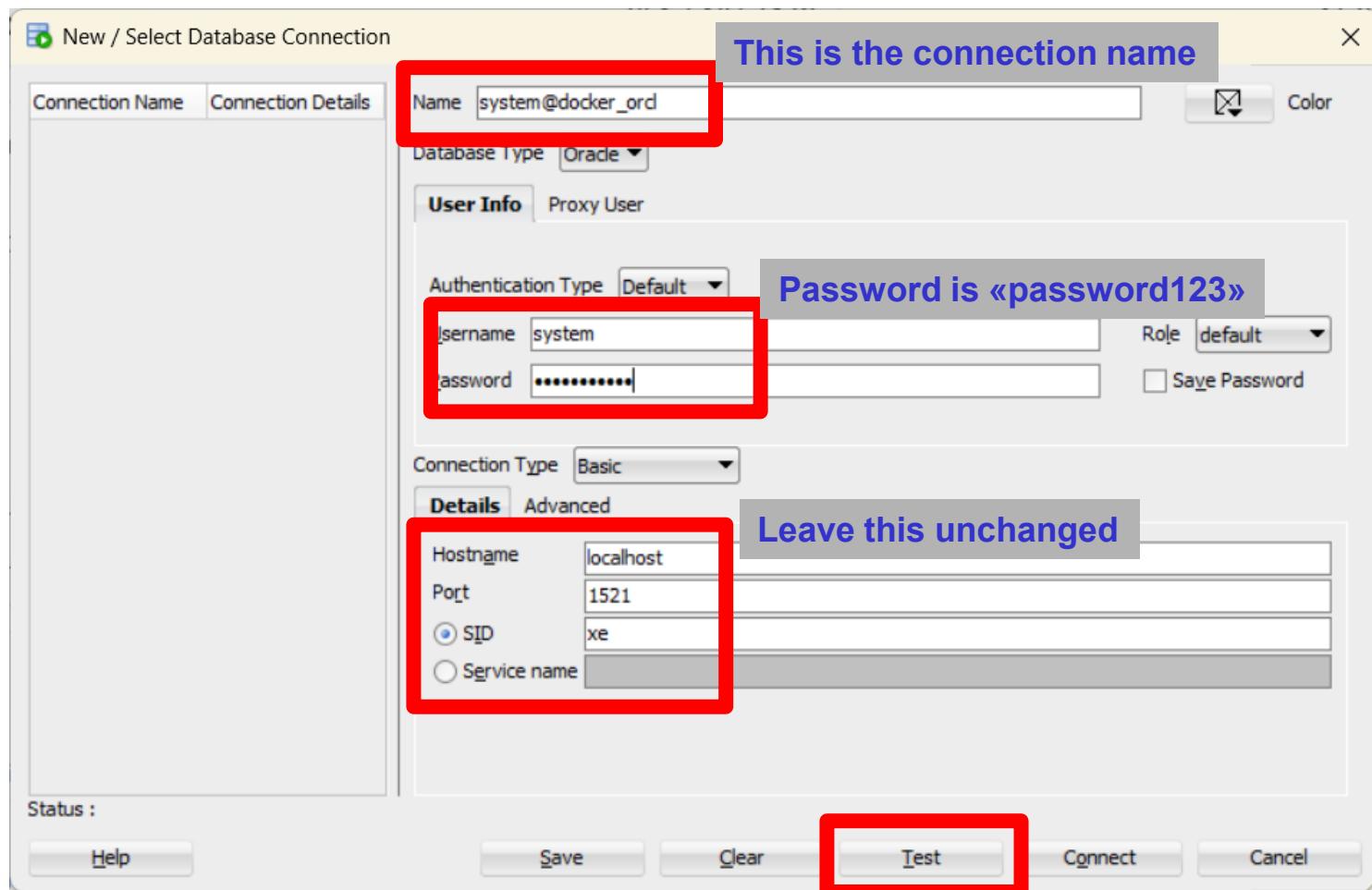
# DBA section: create a connection

You can connect as the *system* user into the DBA section



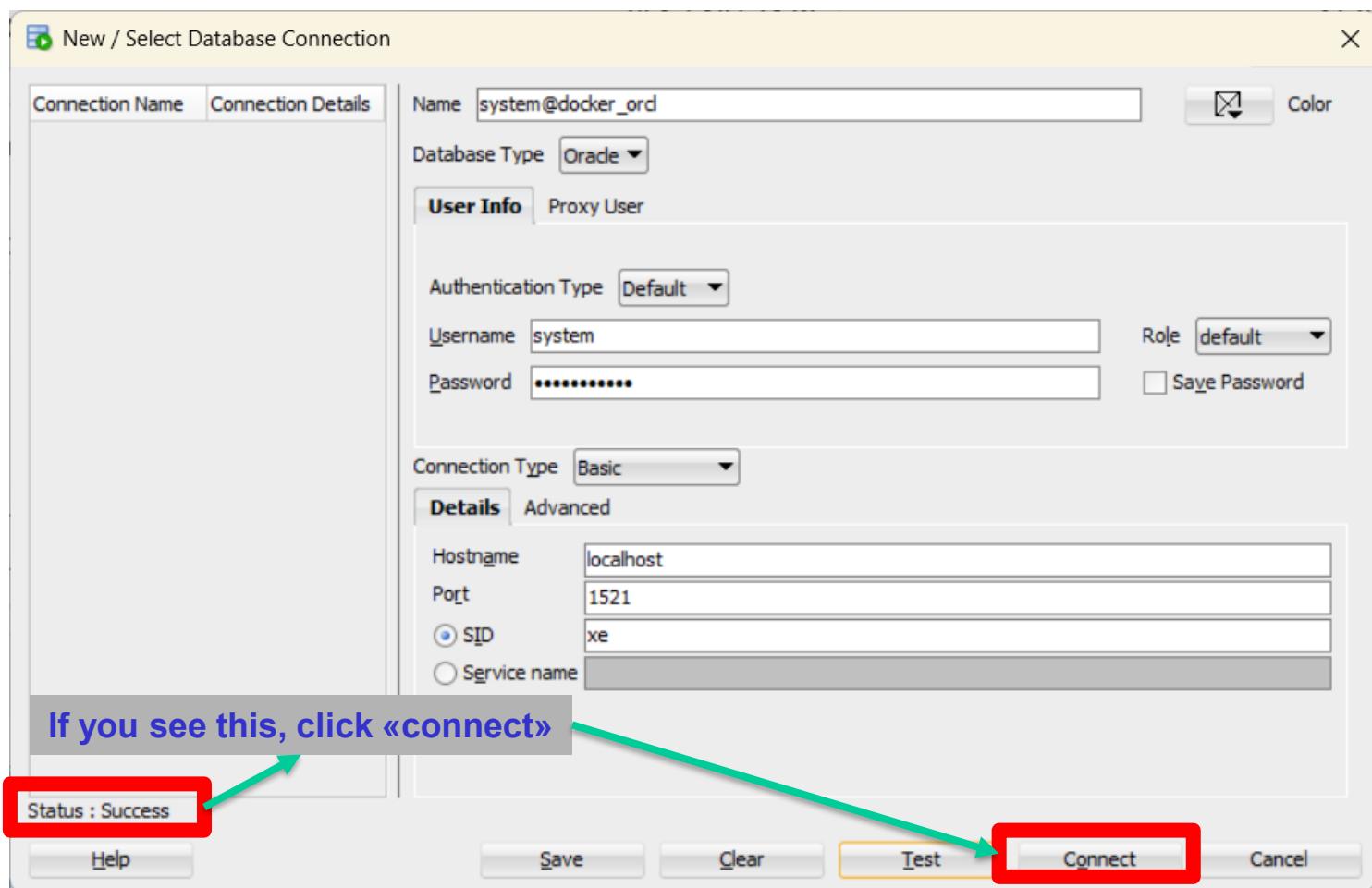
# DBA section: create a connection

You can connect as the *system* user into the DBA section



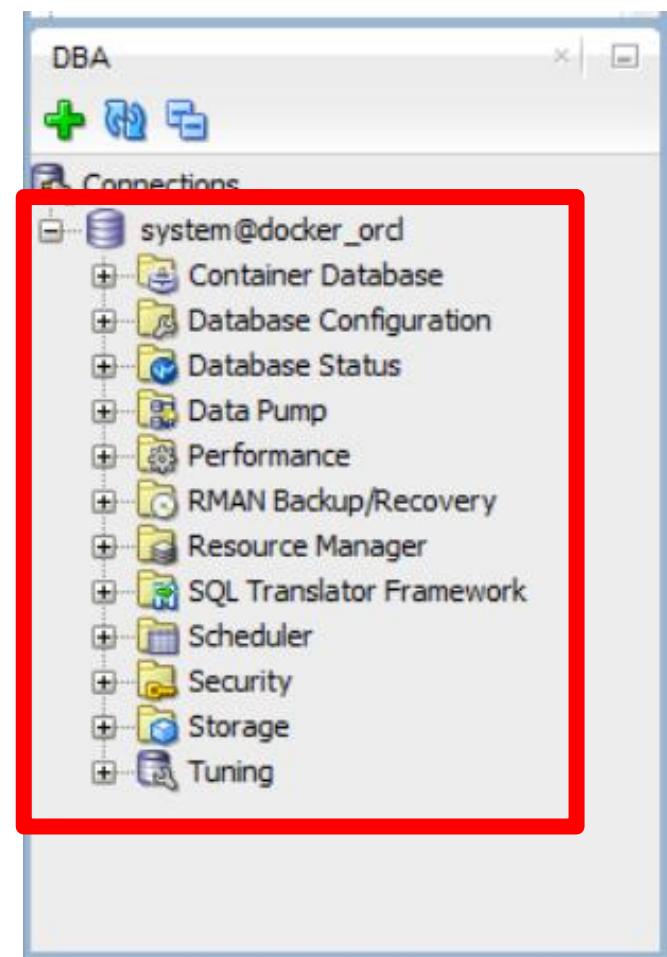
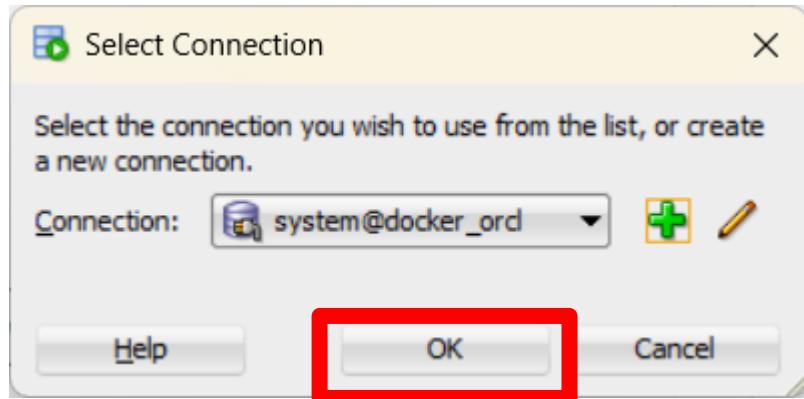
# DBA section: create a connection

You can connect as the *system* user into the DBA section

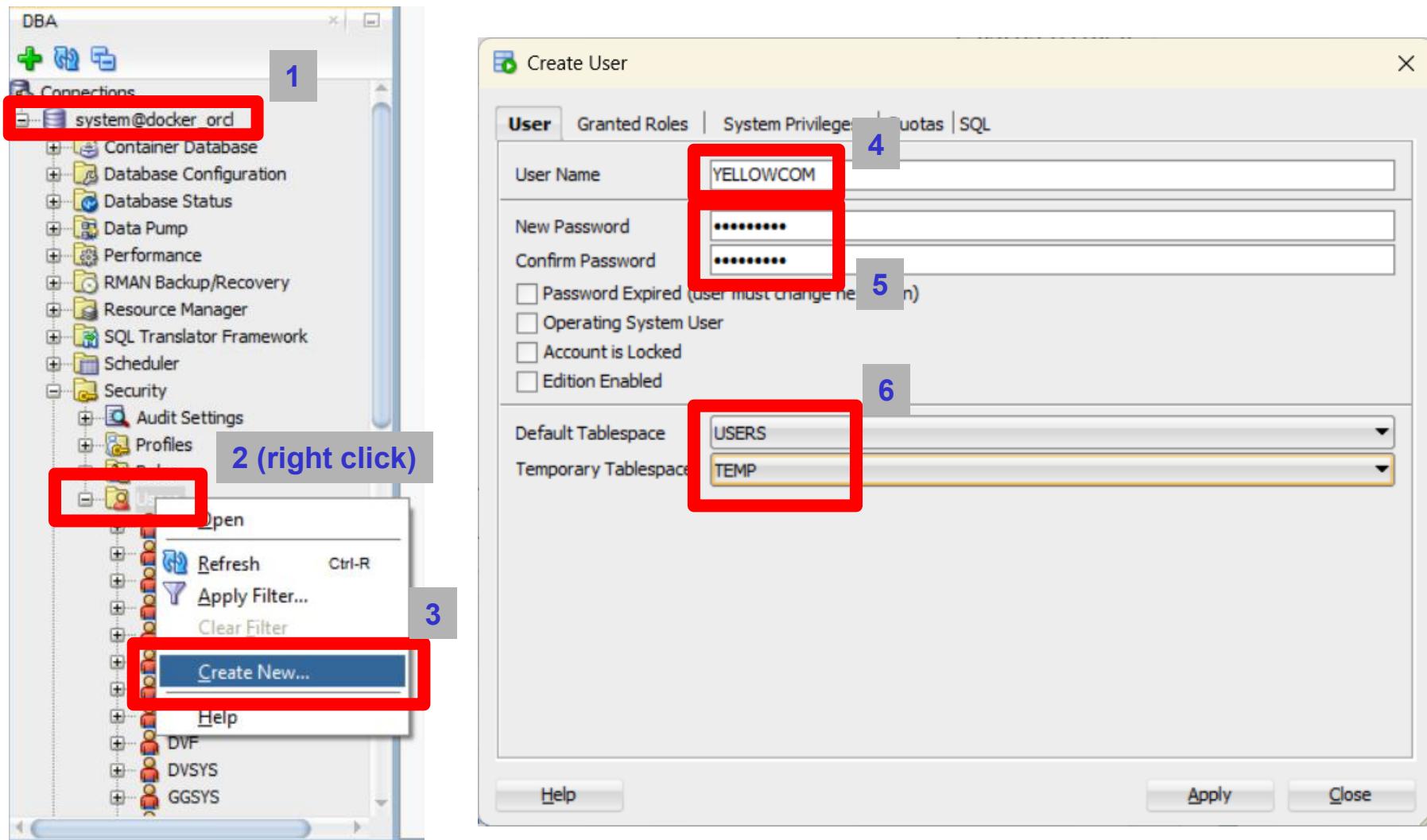


# DBA section: create a connection

You can connect as the *system* user into the DBA section

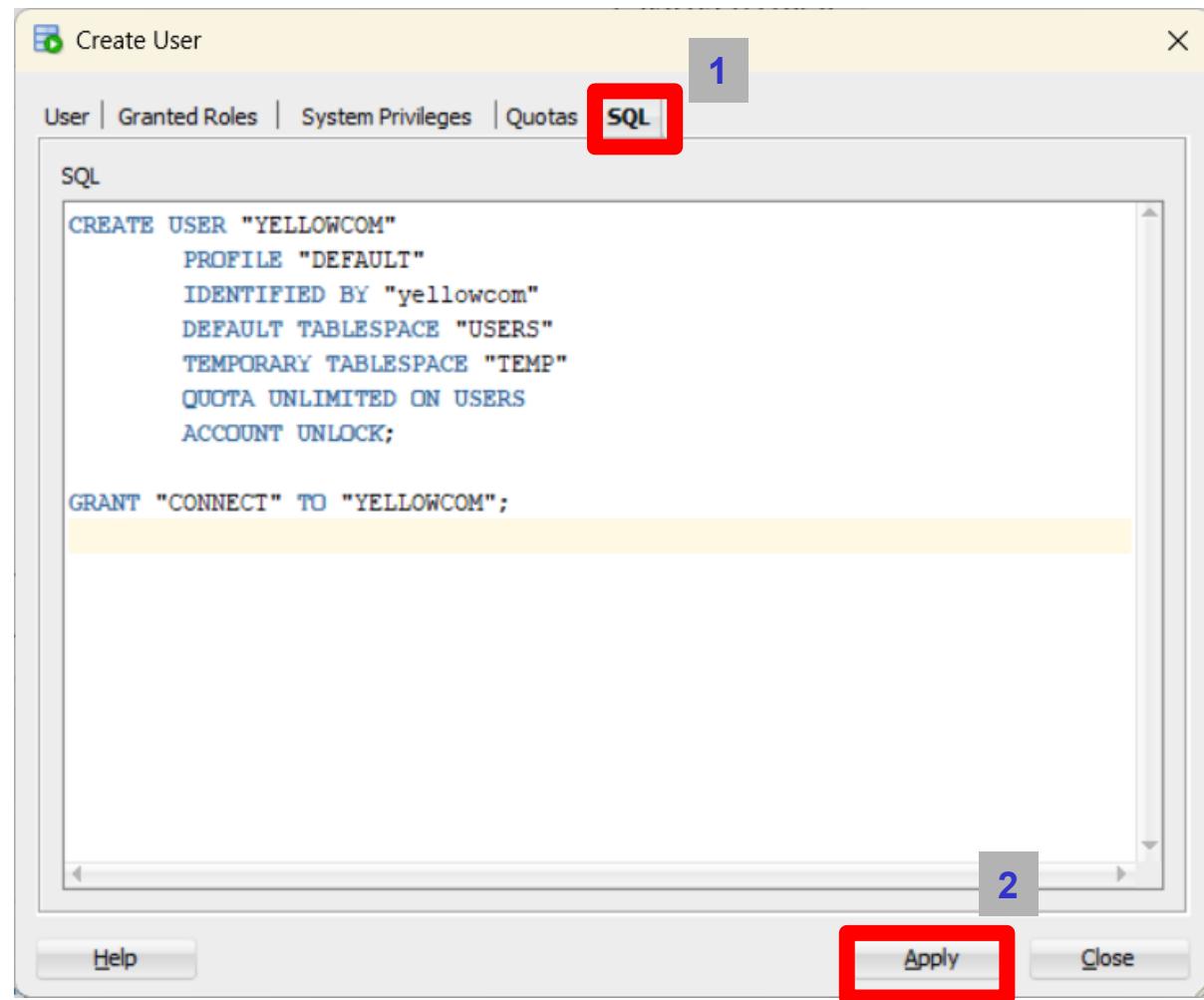


# DBA section: create a user



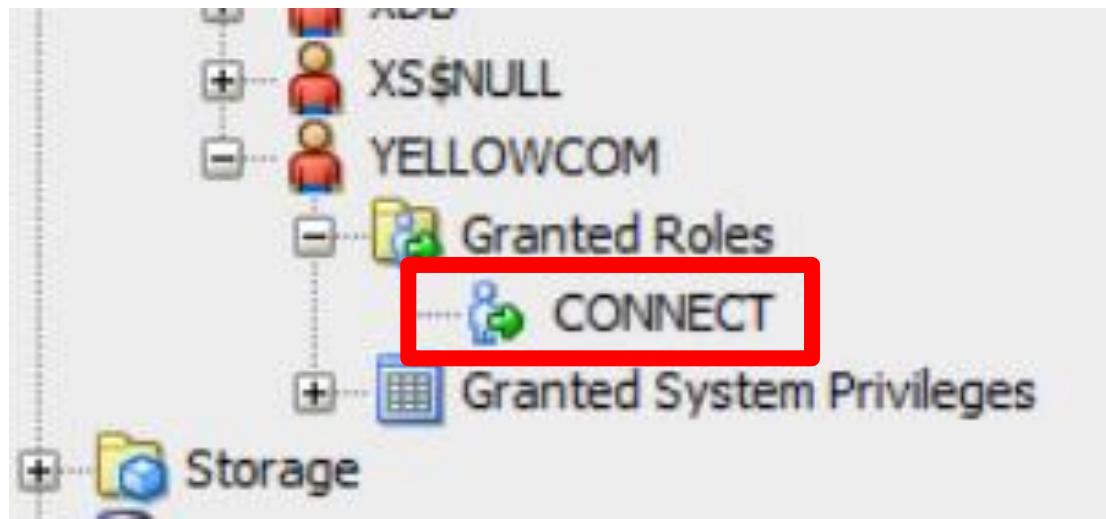
# DBA section: create a user

In alternative,  
use the SQL Tab



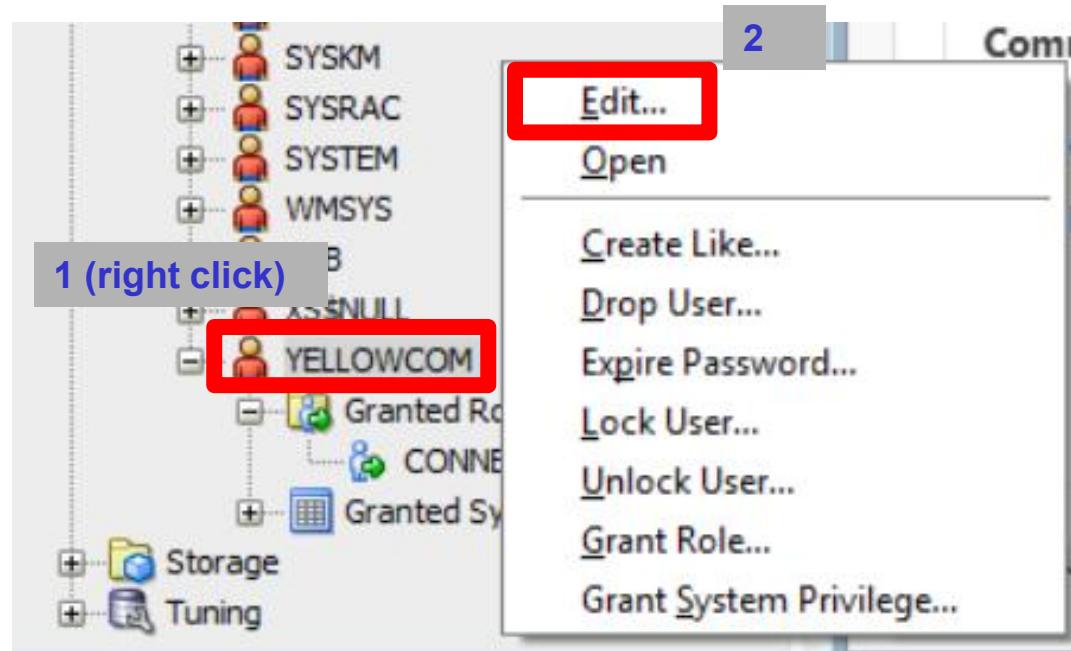
## DBA section

We already created a user named “YELLOWCOM”, let’s see its privileges

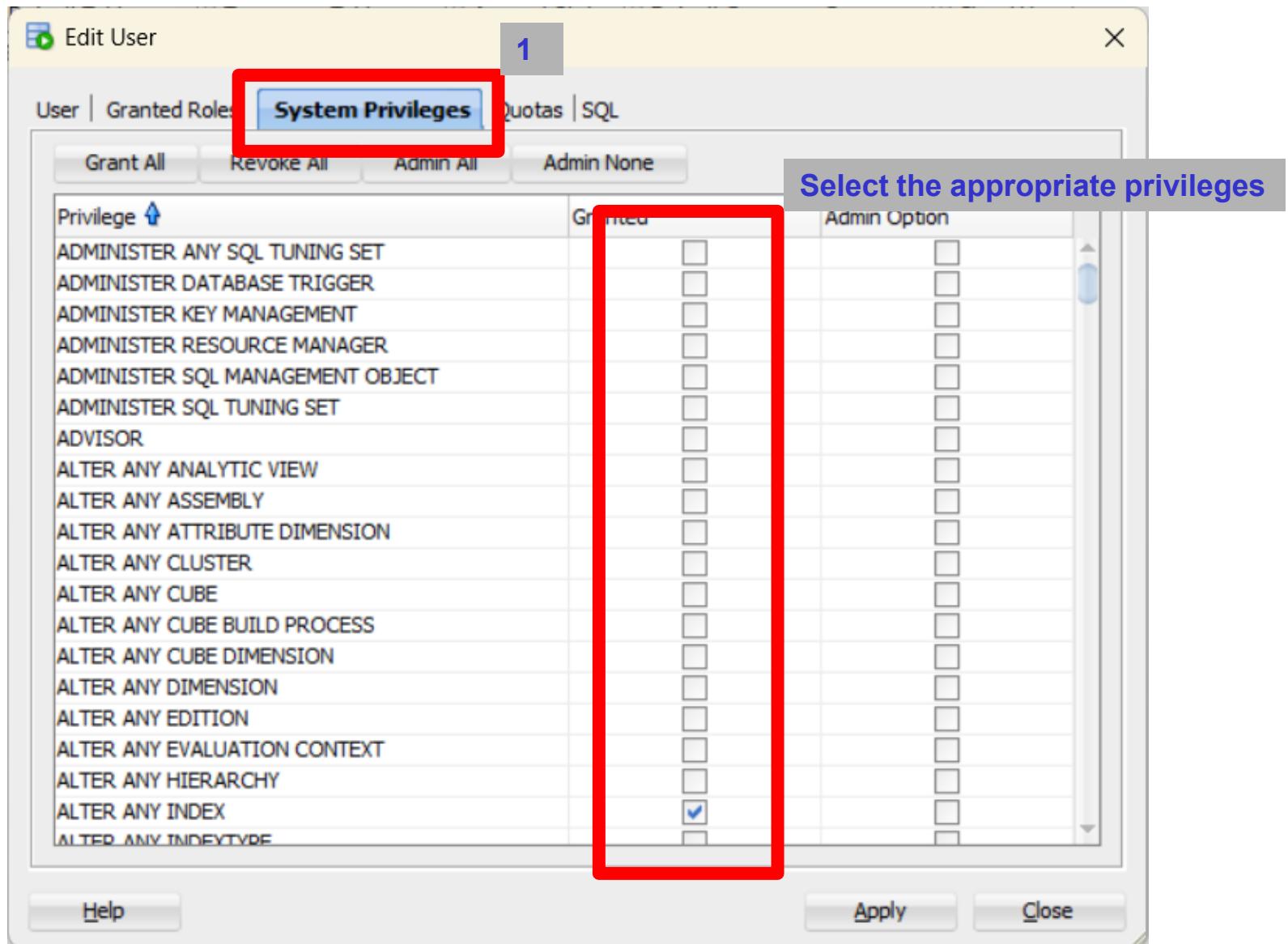


As expected it just as the “CONNECT” grant.

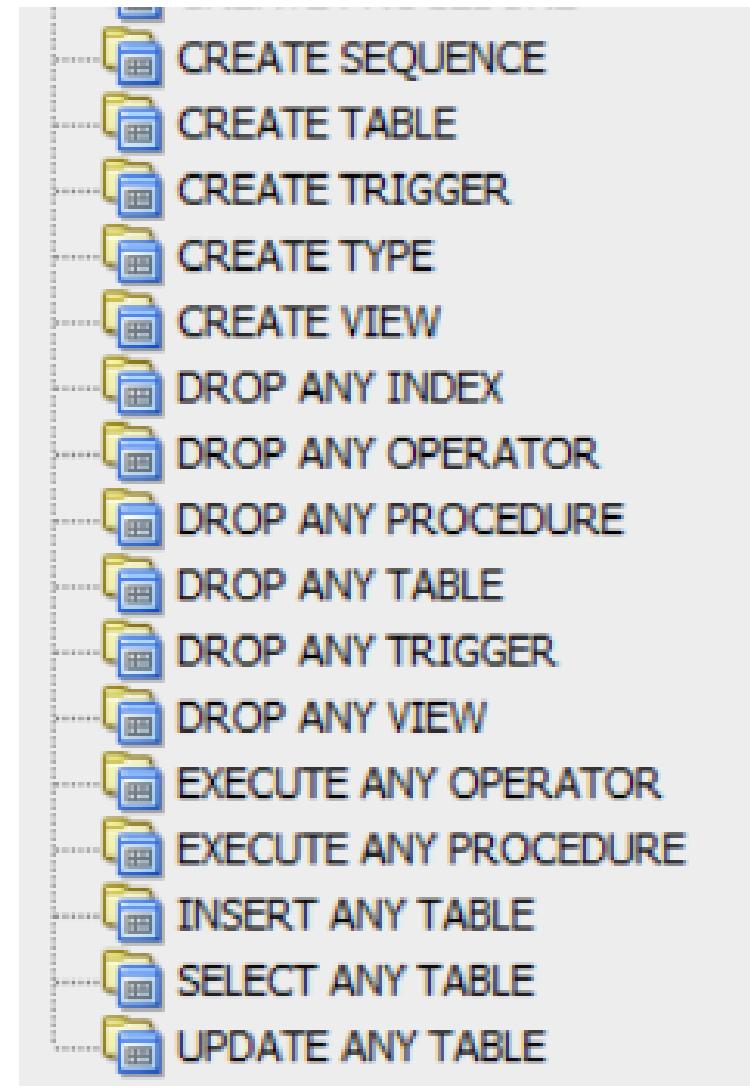
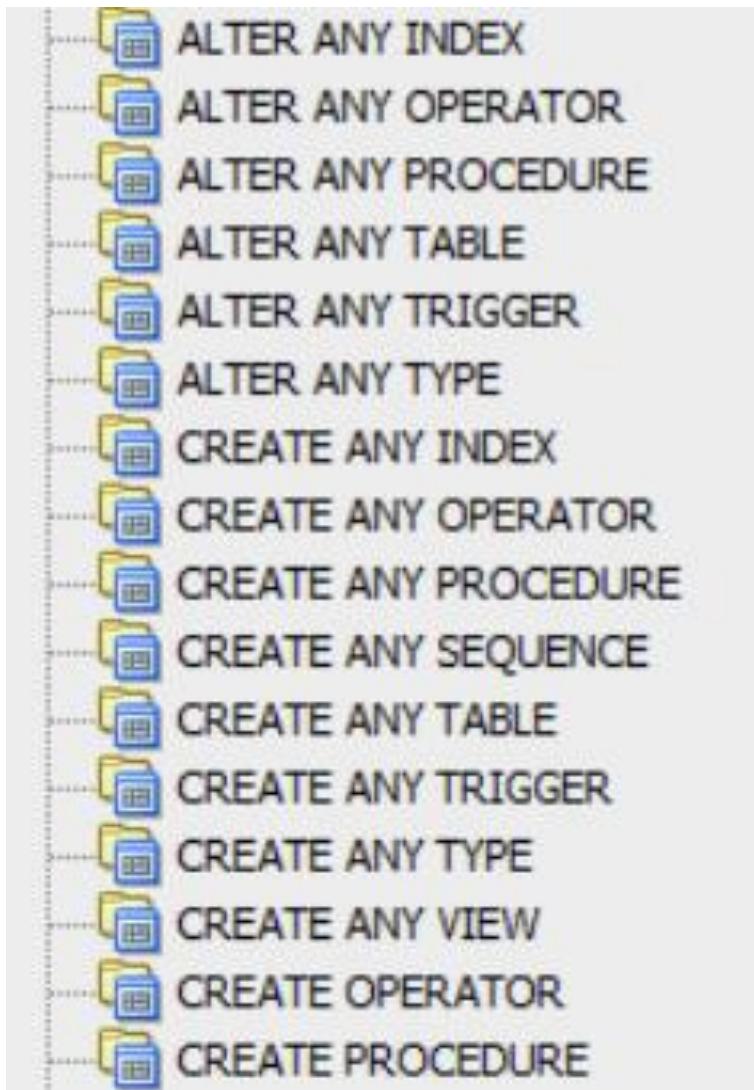
# DBA section: modify user GRANTS



# DBA section: modify user GRANTS

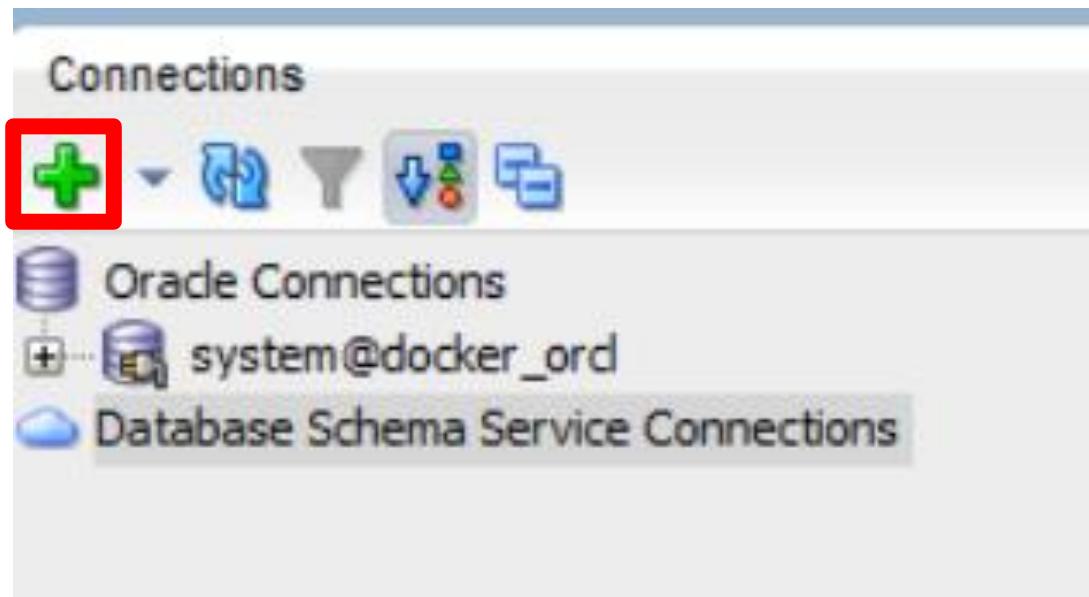


# Some useful privileges

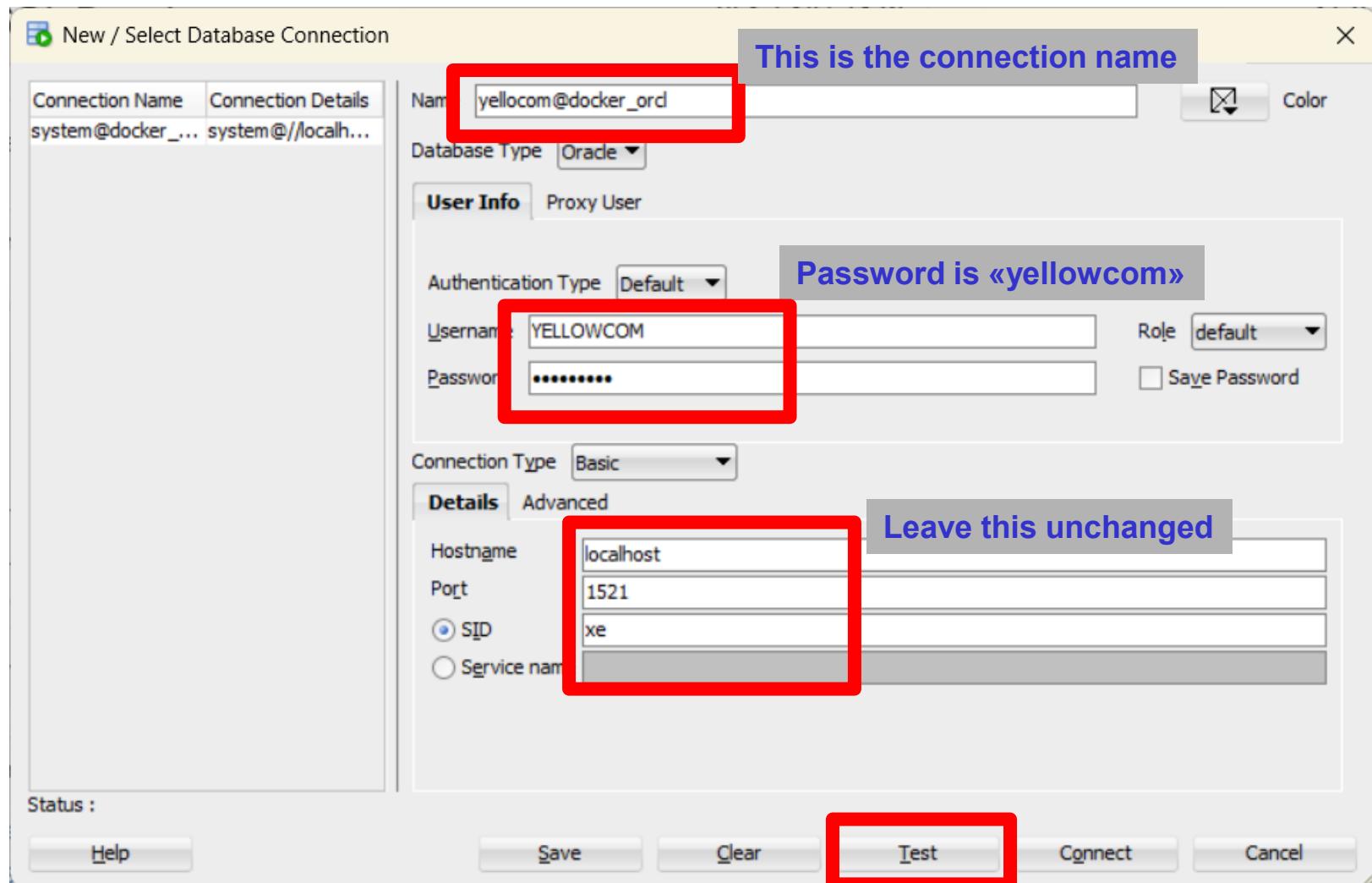


# Connect as YELLOWCOM

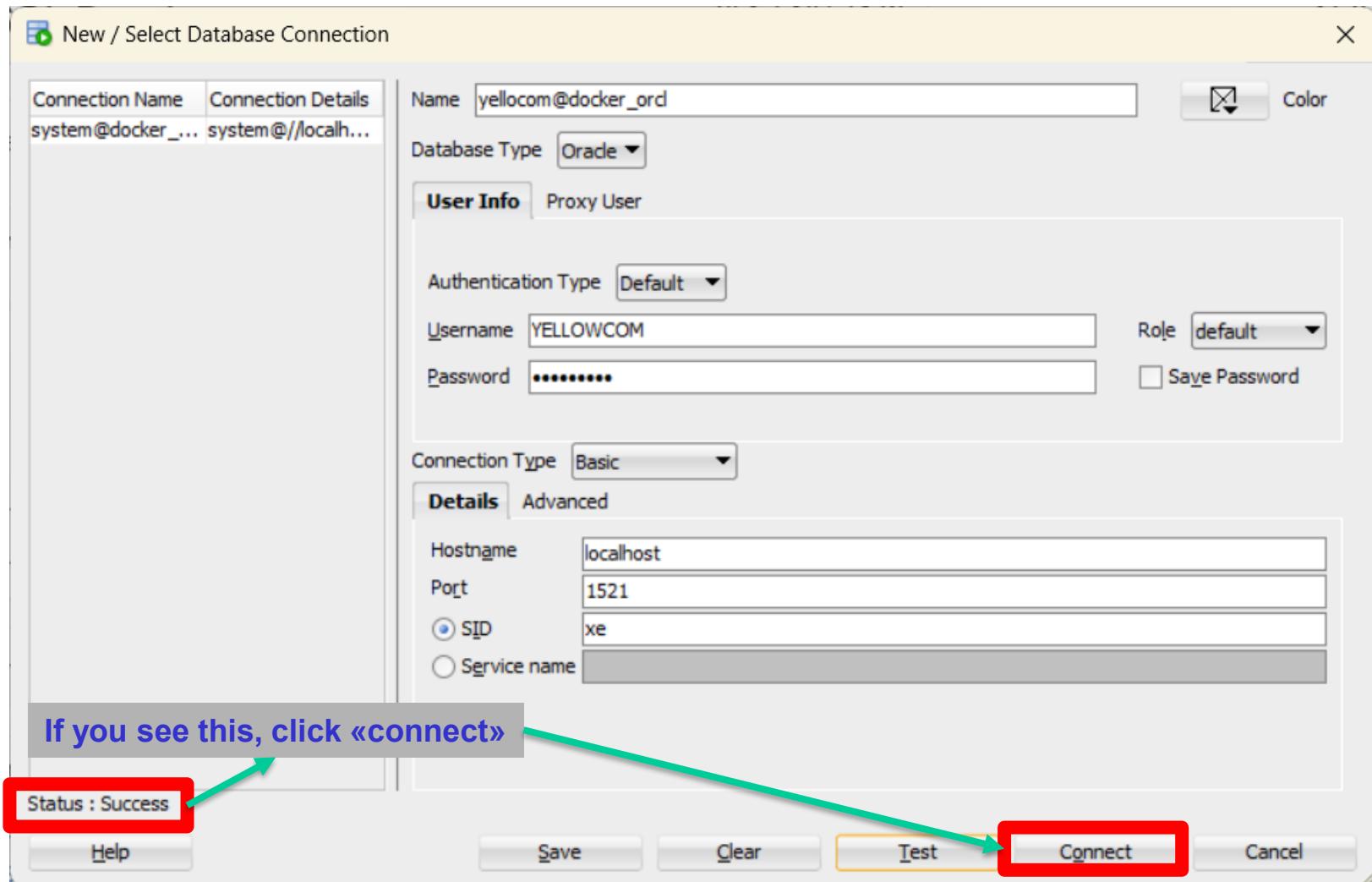
Let's focus on the top-left part of SQL Developer



# Connect as YELLOWCOM

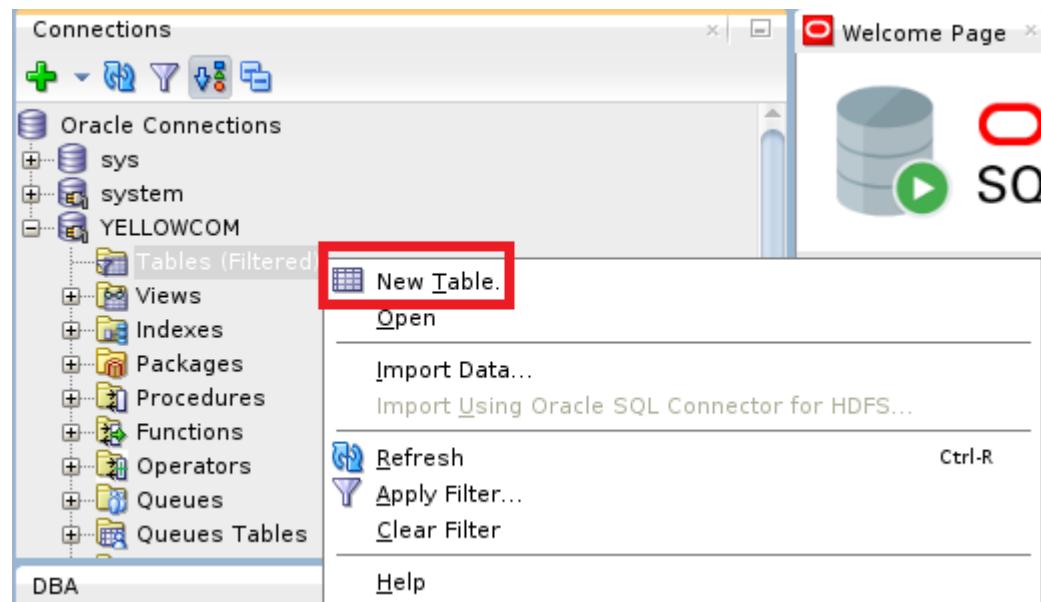


# Connect as YELLOWCOM

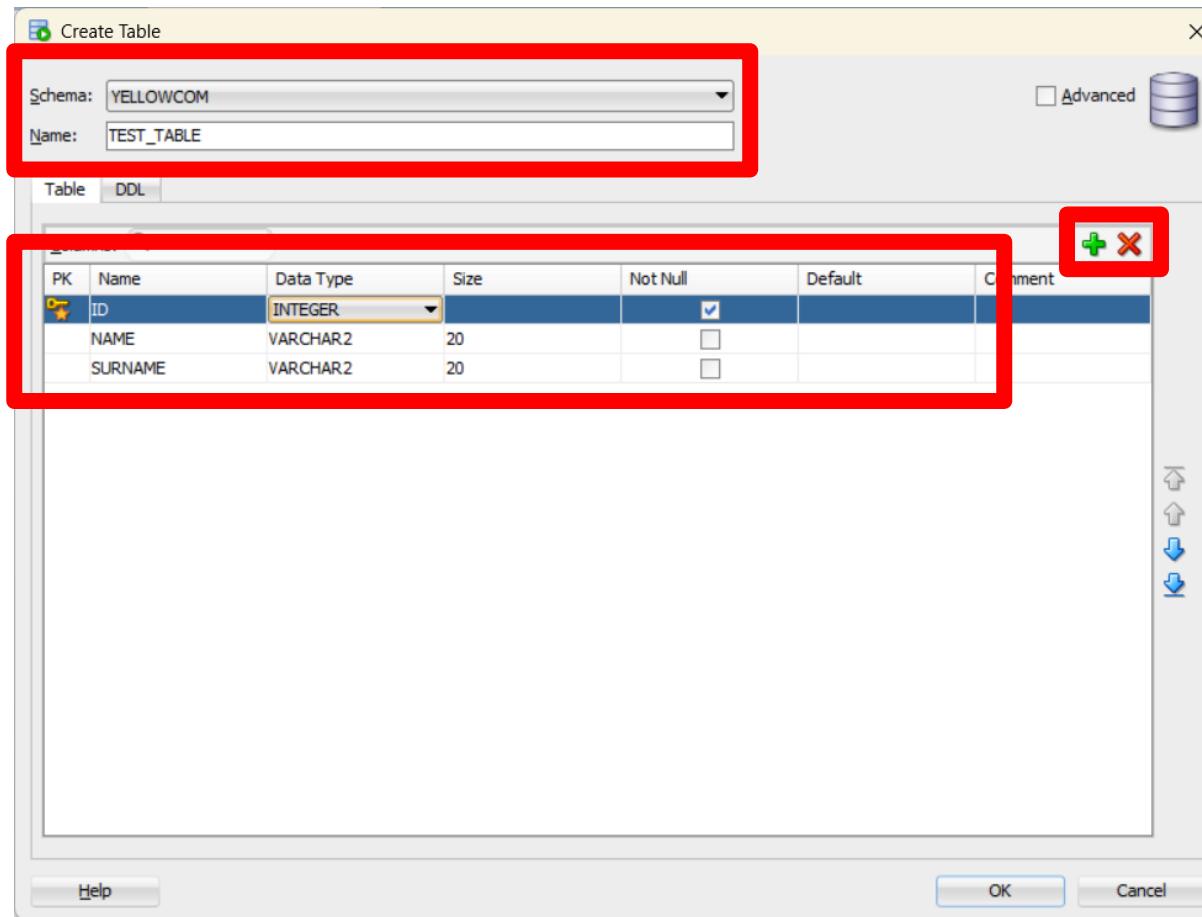


# Create a table with YELLOWCOM

Once connected as YELLOWCOM, it is possible to create a new table

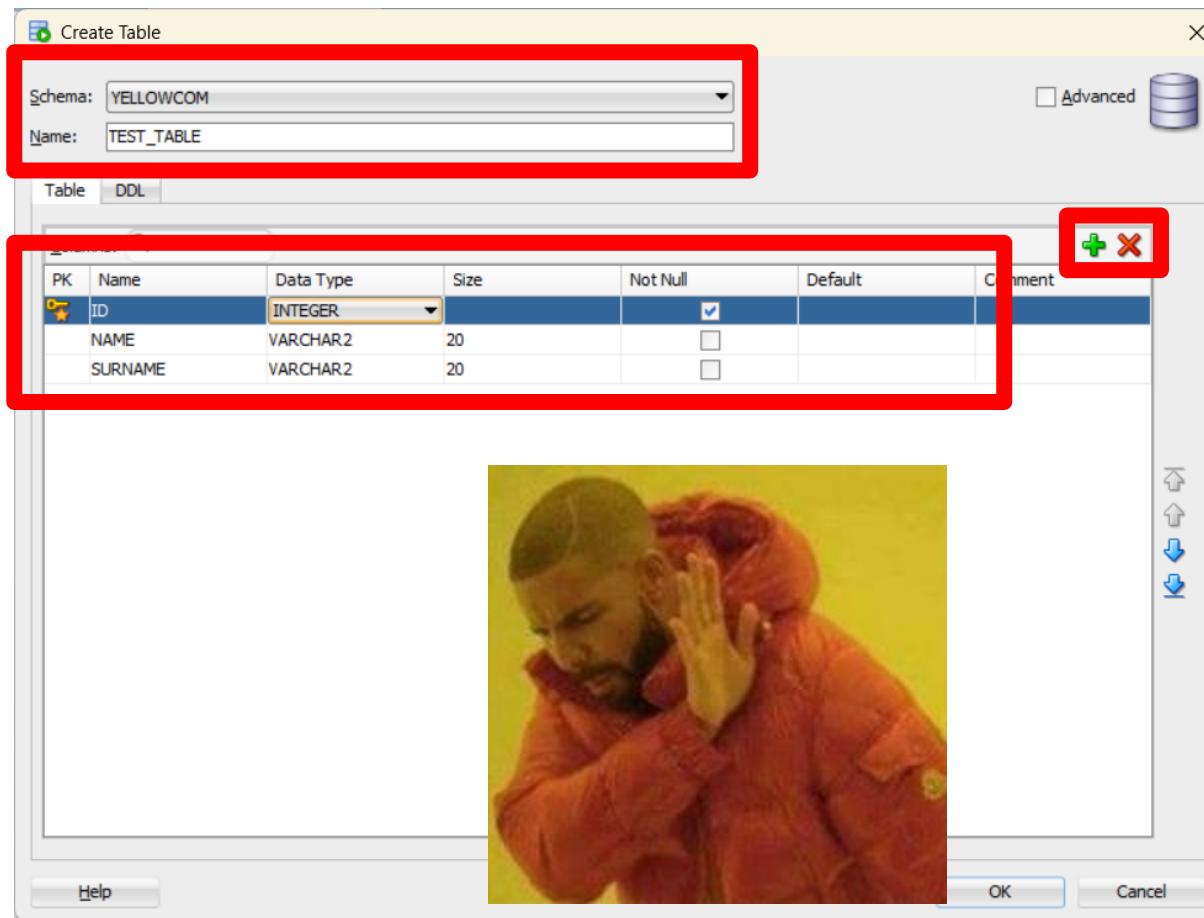


# Create a table with YELLOWCOM



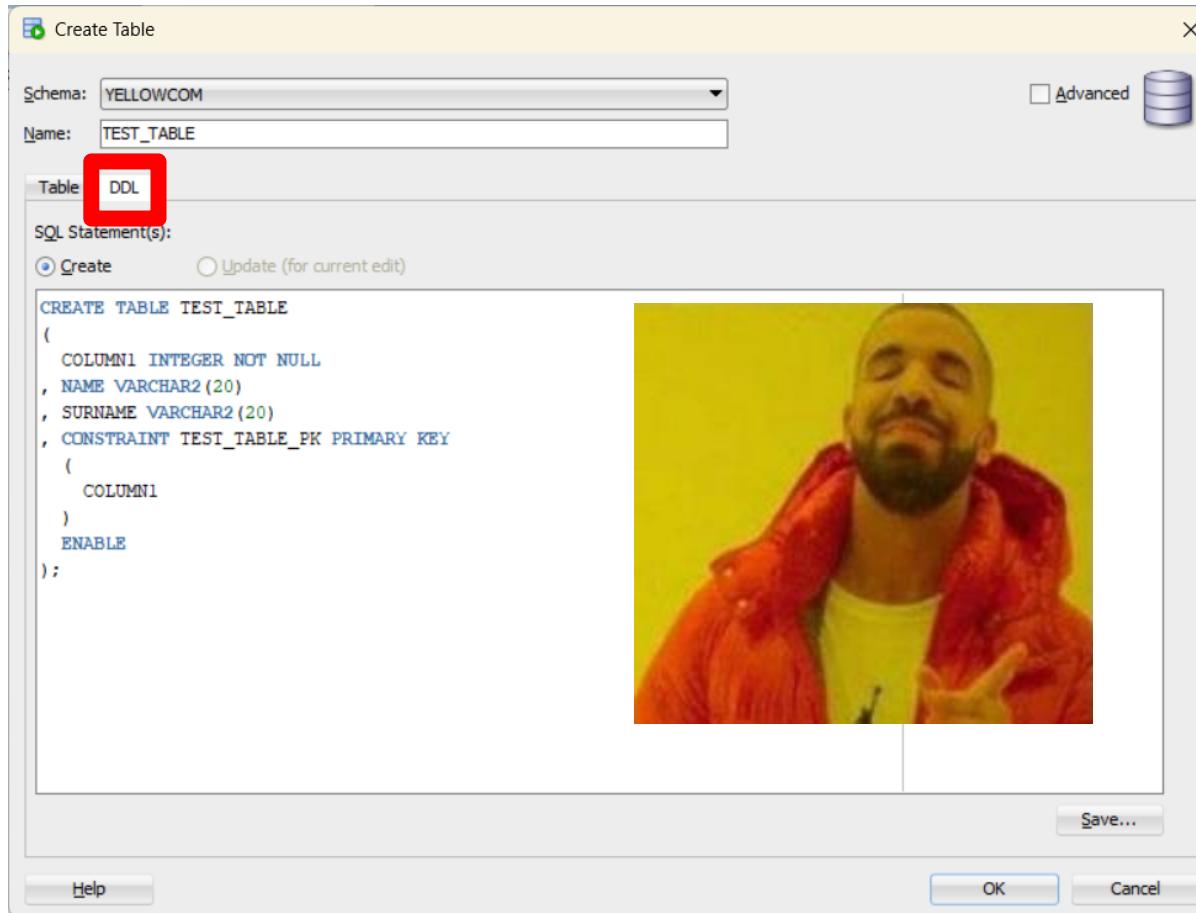
Note you can add columns with **+** and remove them with **x**. Furthermore you can set *primary keys* (PK) and *Not Null* fields

# Create a table with YELLOWCOM



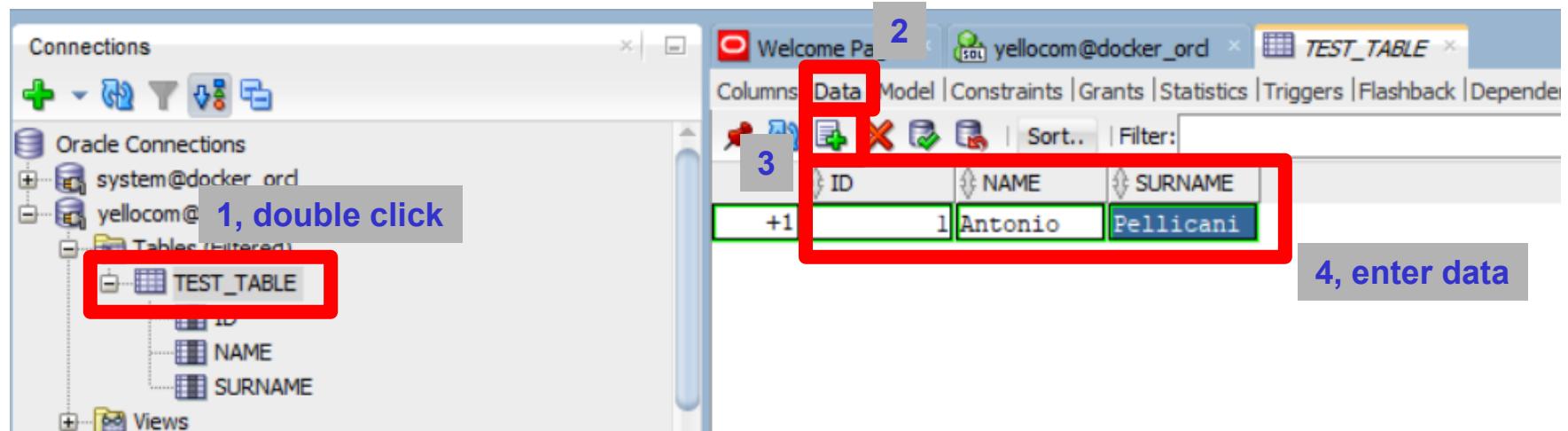
Note you can add columns with **+** and remove them with **x**. Furthermore you can set *primary keys* (PK) and *Not Null* fields

# Create a table with YELLOWCOM



# Insert an object

In order to add an object to the newly created table, double click on the table name and select *data* tab



# Insert an object

Remember to always commit the changes (F11)

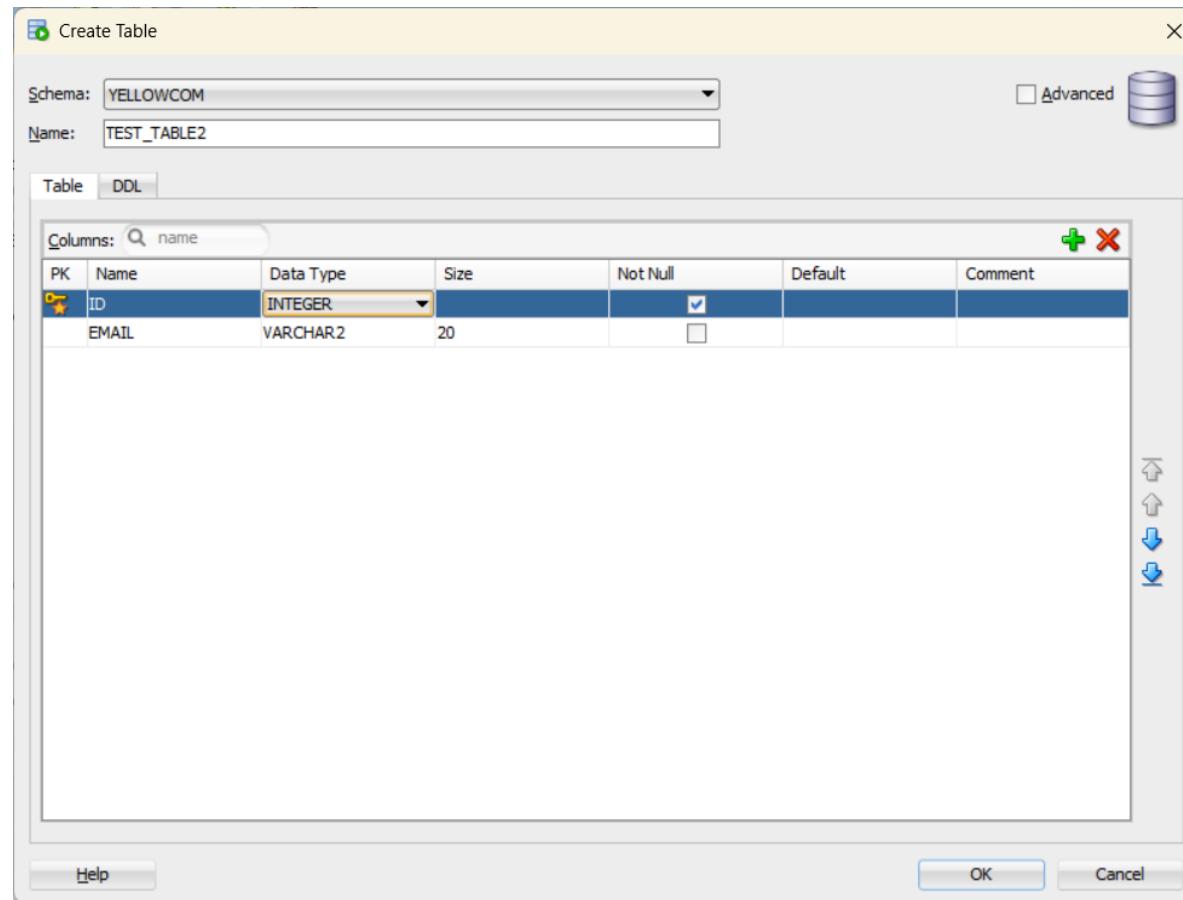
The screenshot shows the Oracle SQL Developer interface. At the top, there are three tabs: 'Welcome Page', 'yellowcom@docker\_ora', and 'TEST\_TABLE'. The 'TEST\_TABLE' tab is active. Below the tabs is a toolbar with various icons. The main area displays a table with three columns: ID, NAME, and SURNAME. A single row is present with values: ID=1, NAME='Antonio', and SURNAME='Pellicani'. To the right of the table is a context menu with the following options:

- Save Grid as Report...
- Publish to REST
- Single Record View...
- Count Rows...
- Find/Highlight...
- Duplicate Row
- Refresh Ctrl-R
- Insert Row Ctrl-I
- Commit Changes F11 (highlighted with a red box)
- Rollback Changes F12
- Export...

The bottom of the screen features a 'Messages - Log' pane. It contains the message 'Commit Successful' and the SQL command: 'INSERT INTO "YELLOWCOM"."TEST\_TABLE" (ID, NAME, SURNAME) VALUES ('1', 'Antonio', 'Pellicani')'. A red box highlights the 'Commit Successful' message in the log.

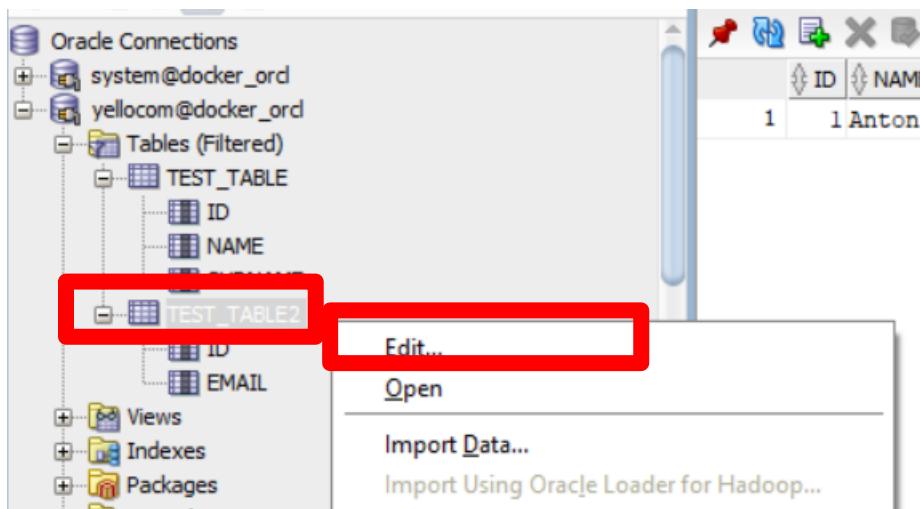
# Adding a foreign key constraint

Create another table

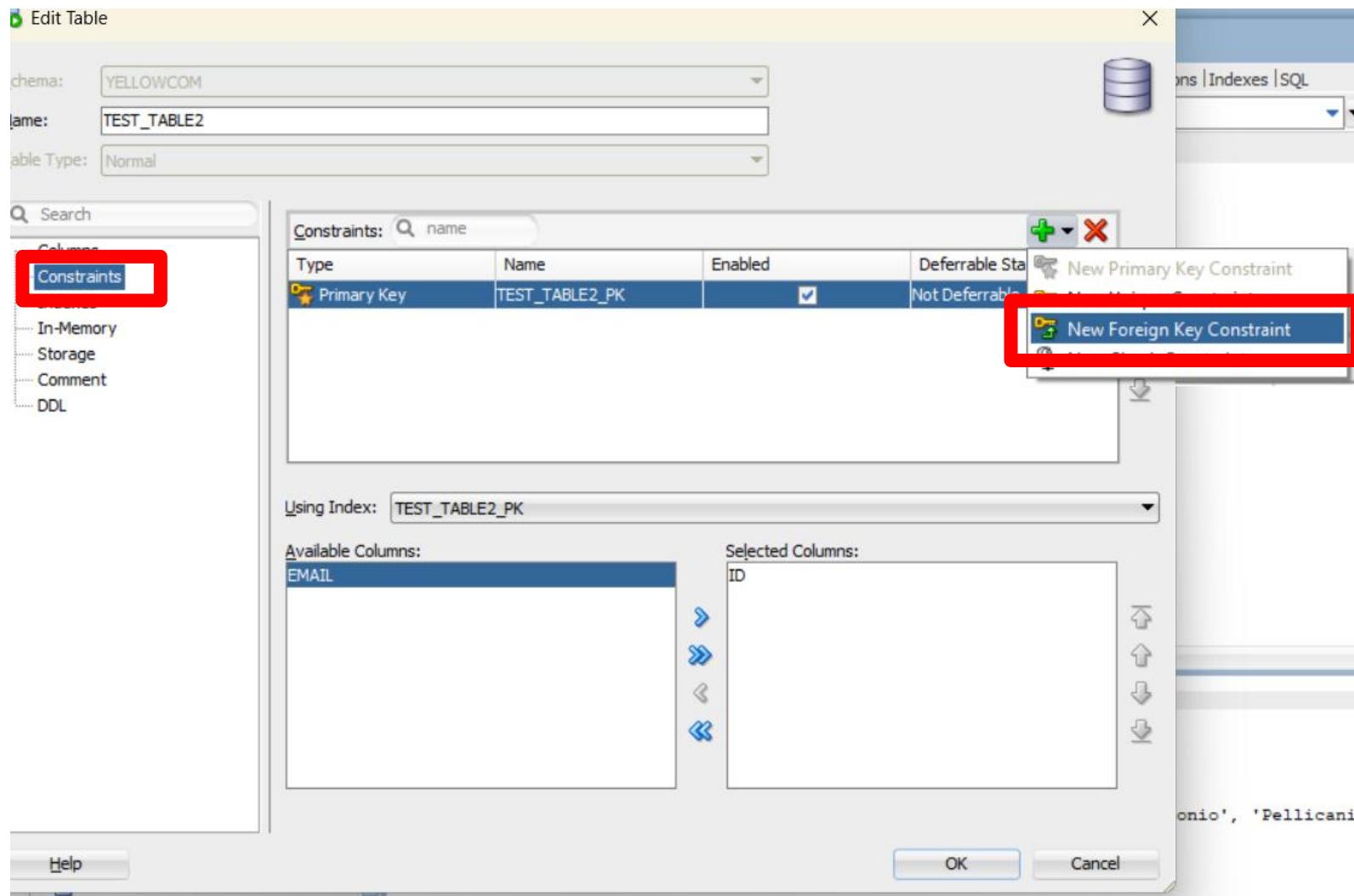


# Adding a foreign key constraint

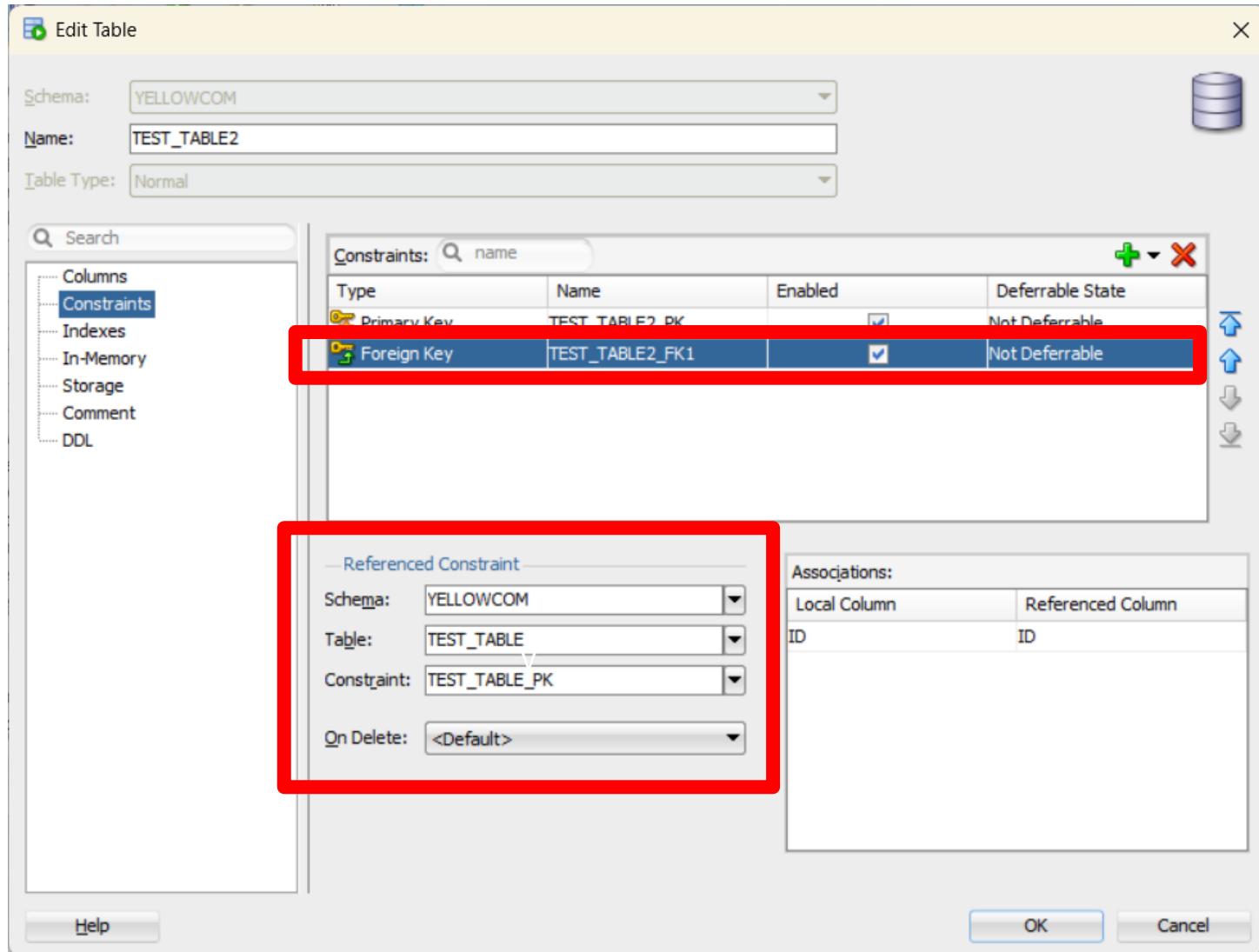
Edit the newly created table



# Adding a foreign key constraint

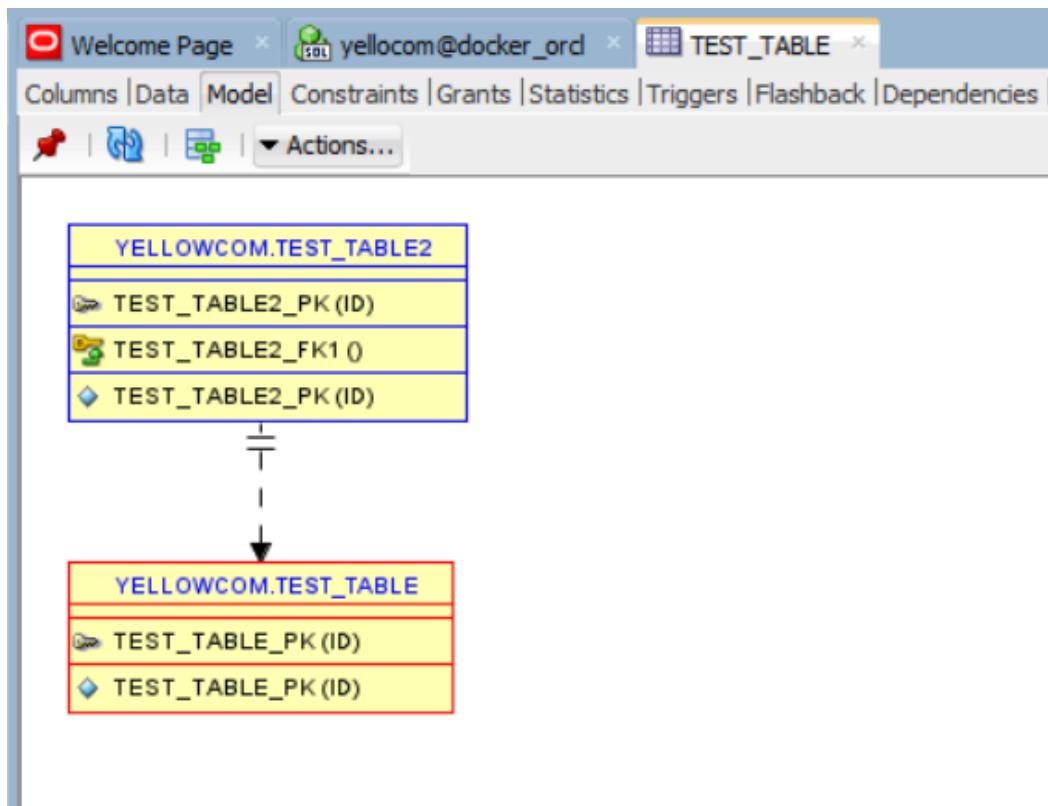


# Adding a foreign key constraint



# Model tab

Clicking on the *model* tab you can see the logical model including the constraints



# Drop the tables

To conclude the test, drop the created tables

