

Instalarea și configurarea Oracle Database 19c Docker ARM

Pasul 1

Creare cont Oracle <https://profile.oracle.com/myprofile/account/create-account.jspx>

Observatii:

- **Ocupație:** student
- **Telefon serviciu:** +4021 314 3508 (tel. FMI de pe site <https://fmi.unibuc.ro/>) sau numărul personal
- **Denumire companie:** Facultatea de Matematică și Informatică, Universitatea din București
- **Oraș:** București
- **Adresă:** Str. Academiei nr. 14, Sector 1, București
- **ZIP/cod poștal:** 010014

Creare cont Oracle

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Adresă de e-mail*
Adresa de e-mail este numele de utilizator.

Parolă*
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Tară*

Nume*

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Făcând clic pe butonul „Creare cont” de mai jos, înțelegeți și sunteți de acord că utilizarea site-ului web Oracle se supune [Condițiilor de utilizare Oracle.com](#). Detalii suplimentare cu privire la colectarea și utilizarea de către Oracle a informațiilor dvs. personale, inclusiv a informațiilor despre acces, păstrare, corectare, ștergere, securitate, transferuri transfrontaliere și alte subiecte, sunt disponibile în [Politica de confidențialitate Oracle](#).

Creare cont

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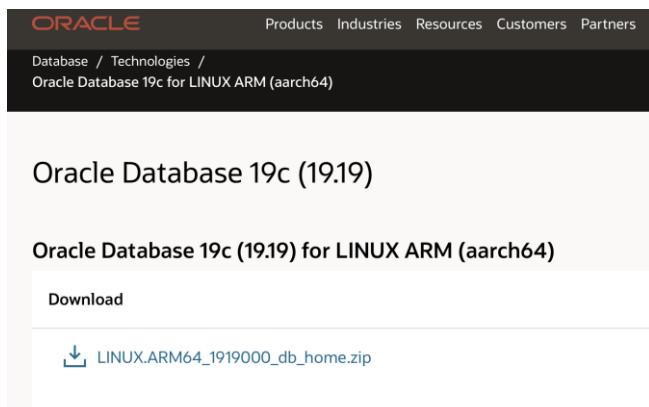
Pasul 2

Download kit **Oracle Database 19c (19.3) for LINUX ARM (aarch64)**

<https://www.oracle.com/database/technologies/oracle19c-linux-arm64-downloads.html>

Observatii:

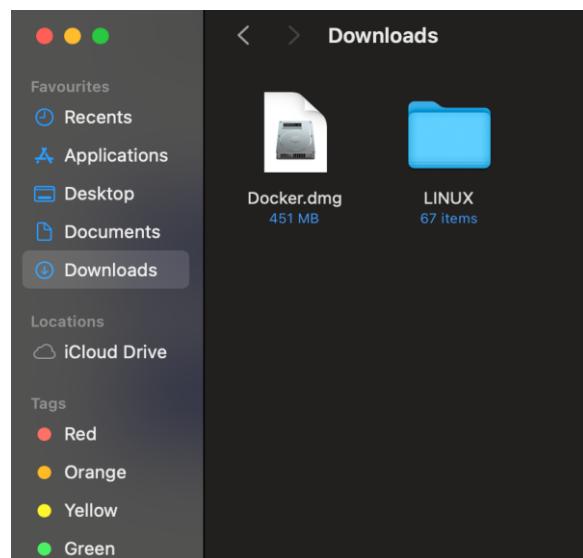
- Trebuie să acceptați Acordul pentru licență al produsului software.
- Produsele software ale Companiei Oracle pot fi utilizate gratuit în scop educativ. Mai mult, facultatea are contract cu Compania Oracle ceea ce vă permite acces gratuit la o gamă mai mare de produse. Pentru detalii suplimentare puteți adresa întrebări pe adresa de email gabriela.mihai@fmi.unibuc.ro.



Pasul 3

Instalare Docker

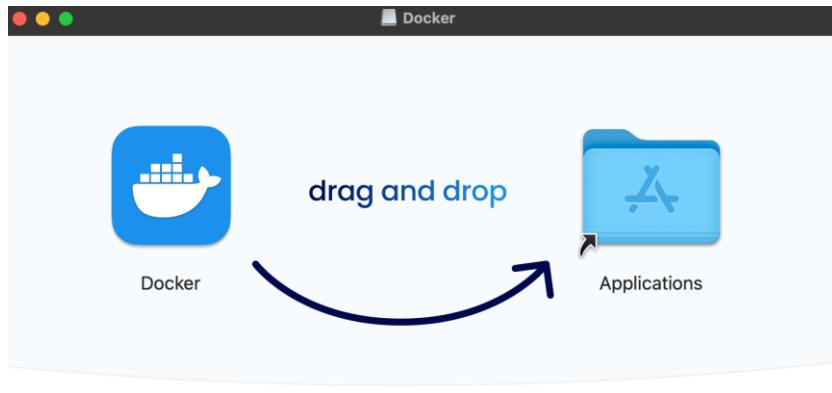
- **Pasul 3.1** Accesați <https://www.docker.com/> și selectați opțiunea Download Docker Desktop for Mac - Apple Silicon
- **Pasul 3.2** Deschideți fișierul *Docker.dmg*.



- **Pasul 3.3** Selectați *ok*.



- **Pasul 3.3** Din interfață mutați aplicația în folderul *Applications*.



- **Pasul 3.4** Rulați Docker.
- **Pasul 3.5** Apăsați pe butonul de *Sign in* și urmăriți pași din *browser*.

Observații:

- Dacă doriți să instalați Docker într-o VM puteți primi de eroarea “*Hypervisor check failed*”. Chiar dacă macOS 15 introduce *nested virtualization*, acest *feature* nu este încă disponibil în aplicații precum UTM și VMware Fusion.

Pasul 4

Crearea containerului.

- **Pasul 4.1** Deschideți terminalul și alegeti un folder în care veți instala imaginea bazei de date folosind comanda:

```
git clone https://github.com/oracle/docker-images
```

```
andreineagu@Andreiis-MacBook-Pro development % cd github_repos
andreineagu@Andreiis-MacBook-Pro github_repos % git clone https://github.com/oracle/docker-images
Cloning into 'docker-images'...
remote: Enumerating objects: 18362, done.
remote: Counting objects: 100% (403/403), done.
remote: Compressing objects: 100% (207/207), done.
remote: Total 18362 (delta 176), reused 344 (delta 159), pack-reused 17959 (from 1)
Receiving objects: 100% (18362/18362), 15.44 MiB | 7.69 MiB/s, done.
Resolving deltas: 100% (10772/10772), done.
andreineagu@Andreiis-MacBook-Pro github_repos %
```

- **Pasul 4.2** Mutați baza de date descărcată la Pasul 2 în folderul *19.3.0* din path-ul *docker-images/OracleDatabase/SingleInstance/dockerfile/19.3.0*. Puteți folosi Finder sau rulând următoarea comandă în terminal:

```
mv ~/Downloads/LINUX.ARM64_1919000_db_home.zip ./docker-
images/OracleDatabase/SingleInstance/dockerfiles/19.3.0
```

- **Pasul 4.3** Din terminal, navigați către folderul *dockerfile* din path-ul menționat la pasul anterior și rulați următoarea comandă:

```
./buildContainerImage.sh -v 19.3.0 -e
```

```
andreineagu@Andreiis-MacBook-Pro github_repos % cd docker-images/OracleDatabase/SingleInstance
andreineagu@Andreiis-MacBook-Pro SingleInstance % cd dockerfiles
andreineagu@Andreiis-MacBook-Pro dockerfiles % ./BuildContainerImage.sh -v 19.3.0 -e
WARNING: daemon is not using the default seccomp profile
Checking Docker version.
Dockerfile
Checking if required packages are present and valid...
LINUX.ARM64_1919000_db_home.zip: OK
=====
Container runtime info:
Client:
  Version: 27.2.0
  Context: desktop-linux
  Debug Mode: false
  Plugins:
    buildx: Docker Buildx (Docker Inc.)
      Version: v0.16.2-desktop.1
      Path: /Users/andreineagu/.docker/cli-plugins/docker-buildx
    compose: Docker Compose (Docker Inc.)
      Version: v2.29.2-desktop.2
      Path: /Users/andreineagu/.docker/cli-plugins/docker-compose
    debug: Get a shell into any image or container (Docker Inc.)
      Version: 0.0.34
      Path: /Users/andreineagu/.docker/cli-plugins/docker-debug
    desktop: Docker Desktop commands (Alpha) (Docker Inc.)
      Version: v0.0.15
      Path: /Users/andreineagu/.docker/cli-plugins/docker-desktop
    dev: Docker Dev Environments (Docker Inc.)
      Version: v0.1.2
      Path: /Users/andreineagu/.docker/cli-plugins/docker-dev
    extension: Manages Docker extensions (Docker Inc.)
      Version: v0.2.25
      Path: /Users/andreineagu/.docker/cli-plugins/docker-extension
    feedback: Provide feedback, right in your terminal! (Docker Inc.)
      Version: v1.0.5
      Path: /Users/andreineagu/.docker/cli-plugins/docker-feedback
    init: Creates Docker-related starter files for your project (Docker Inc.)
      Version: v1.3.0
      Path: /Users/andreineagu/.docker/cli-plugins/docker-init
    sbom: View the packaged-based Software Bill Of Materials (SBOM) for an image (Anchore Inc.)
      Version: 0.6.0
      Path: /Users/andreineagu/.docker/cli-plugins/docker-sbom
    scout: Docker Scout (Docker Inc.)
      Version: v1.13.0
      Path: /Users/andreineagu/.docker/cli-plugins/docker-scout

Server:
  Containers: 1
  Running: 0
```

- **Pasul 4.4** După ce script-ul a fost rulat verificați dacă imaginea a fost creată:

docker images

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
oracle/database	19.3.0-ee	c65108f2350a	6 minutes ago	8.58GB
gvenzl/oracle-free	23.5-slim-faststart	3b3029e83650	3 weeks ago	5.78GB
ubuntu	latest	b359f1067efa	4 weeks ago	139MB
andreineagu@Andrei's-MacBook-Pro dockerfiles %				

- **Pasul 4.5** Creați containerul:

```
docker run -d --name homedb1 -e ORACLE_PWD=Admin#DB1 -e ORACLE_SID=homedb1 -e ORACLE_PDB=homedb1pdb -p 1521:1521 oracle/database:19.3.0-ee
```

```
andreineagu@Andrei's-MacBook-Pro dockerfiles % docker images
REPOSITORY          TAG           IMAGE ID        CREATED         SIZE
oracle/database     19.3.0-ee    c65108f2350a   7 months ago   8.58GB
gvenzl/oracle-free  23.5-slim-faststart 3b3029e83650   8 months ago   5.78GB
ubuntu              latest        b359f1067efa   8 months ago   139MB
andreineagu@Andrei's-MacBook-Pro dockerfiles % docker run -d --name homedb1 -e ORACLE_PWD=Admin#DB1 -e ORACLE_SID=homedb1 -e ORACLE_PDB=homedb1pdb -p 1521:1521 oracle/database:19.3.0-ee
c728c1fd56f942a9b55a94609c3ab1fa6ab0a044dc9ed1900f82073eb14ca2ed
andreineagu@Andrei's-MacBook-Pro dockerfiles %
```

Observații:

- Asigurați-vă că parametrul *name* este scris cu 2 dash-uri (*--name*).
- *homedb1* este numele containerului, iar *Admin#DB1* este parola cu care vă veți conecta la baza de date.
- Configurarea containerului durează aproximativ 5-6 minute.

- **Pasul 4.6** Verificați că statusul containerului se schimba din *starting* în *healthy*.

docker ps

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
c728c1fd56f9	oracle/database:19.3.0-ee	"/bin/bash -c 'exec ..."	3 minutes ago	Up 3 minutes (health: starting)	0.0.0.0:1521->1521/tcp	homedb1
andreineagu@Andrei's-MacBook-Pro dockerfiles %						
CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
c728c1fd56f9	oracle/database:19.3.0-ee	"/bin/bash -c 'exec ..."	7 minutes ago	Up 7 minutes (unhealthy)	0.0.0.0:1521->1521/tcp	homedb1
andreineagu@Andrei's-MacBook-Pro dockerfiles %						
CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
c728c1fd56f9	oracle/database:19.3.0-ee	"/bin/bash -c 'exec ..."	8 minutes ago	Up 8 minutes (healthy)	0.0.0.0:1521->1521/tcp	homedb1
andreineagu@Andrei's-MacBook-Pro dockerfiles %						

Pasul 5

În acest moment baza de date *homedb1* a fost creată.

Conecțarea la baza de date **container** ca Administrator folosind utilitarul SQL*Plus:

- **Pasul 5.1** Deschidem un bash în container

```
docker exec -it <id-ul containerului> bash
```

	Name	Container ID	Image	Port(s)	CPU (%)	Last Seen	Actions
	homedb1	c728c1fd56f9	oracle/database:1521:1521		1.89%	12 hours	

```
/Users/andreineagu/.zshrc:2: parse error near `}''
andreineagu@Andreis-MacBook-Pro ~ % docker exec -it c728c1fd56f9 bash
bash-4.4$
```

The terminal window shows a parse error in the user's .zshrc file. The command `docker exec -it` is running inside a container named `homedb1` which is based on the `oracle/database` image.

- **Pasul 5.2** Conectare la baza de date cu *user-ul sys și role-ul sysdba*:

```
sqlplus sys/Admin#DB1@localhost:1521/HOMEDB1 as sysdba
```

```
Terminal
bash-4.4$ sqlplus sys/Admin#DB1@localhost:1521/HOMEDB1 as sysdba
SQL*Plus: Release 19.0.0.0.0 - Production on Tue Jun 3 05:49:42 2025
Version 19.19.0.0.0

Copyright (c) 1982, 2023, Oracle. All rights reserved.

Connected to:
Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production
Version 19.19.0.0.0

SQL>
```

The terminal window shows a successful connection to an Oracle Database 19c instance using the sysdba privilege. The connection details include the release version (19.0.0.0.0), production date (Tue Jun 3 05:49:42 2025), and the database version (19.19.0.0.0).

- **Pasul 5.3** Verificare comandă *SQL*:

```
select user, database_name
from dual;
```

```
SQL> select user, database_name
  from dual;
  2
USER
-----
DATABASE_NAME
-----
SYS
HOMEDB1
```

- **Pasul 5.4** Verificare bloc *PL/SQL*:

```
set serveroutput on
begin
    dbms_output.put_line('Instalare cu succes!');
end;
/
```

```

SQL> set serveroutput on
begin
    dbms_output.put_line('Instalare cu succes!');
end;
/
SQL> 2   3   4  Instalare cu succes!
PL/SQL procedure successfully completed.

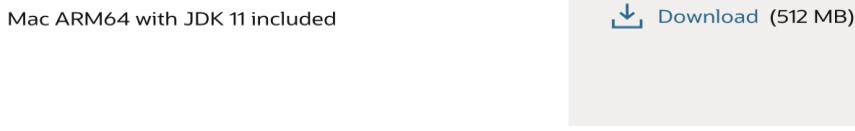
```

Pasul 6

Conecțarea la baza de date **container** ca Administrator folosind utilitarul *SQL Developer*:

- **Pasul 6.1** Download SQL Developer Mac ARM64 with JDK 11 included

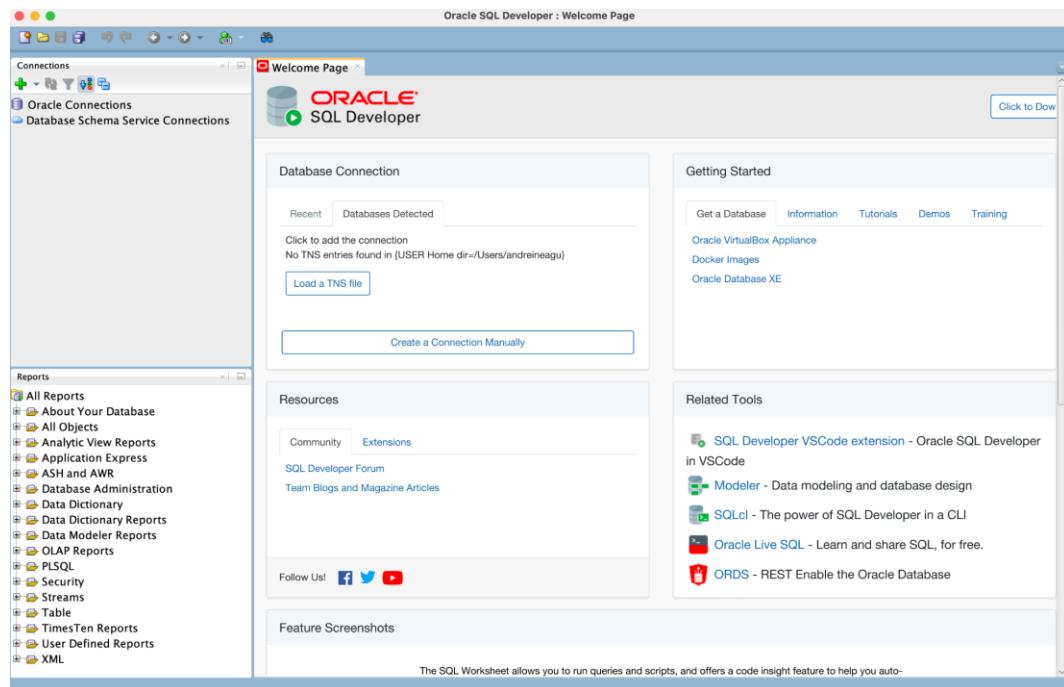
<https://www.oracle.com/database/sqldeveloper/technologies/download/>



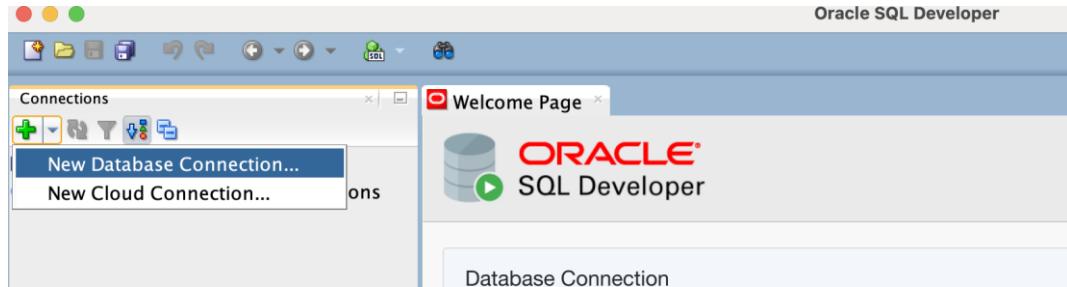
- **Pasul 6.2** Pornire utilitar *SQL Developer* (sqldeveloper.exe)

Observație:

➤ Acest utilitar este portabil. Nu necesită instalare.



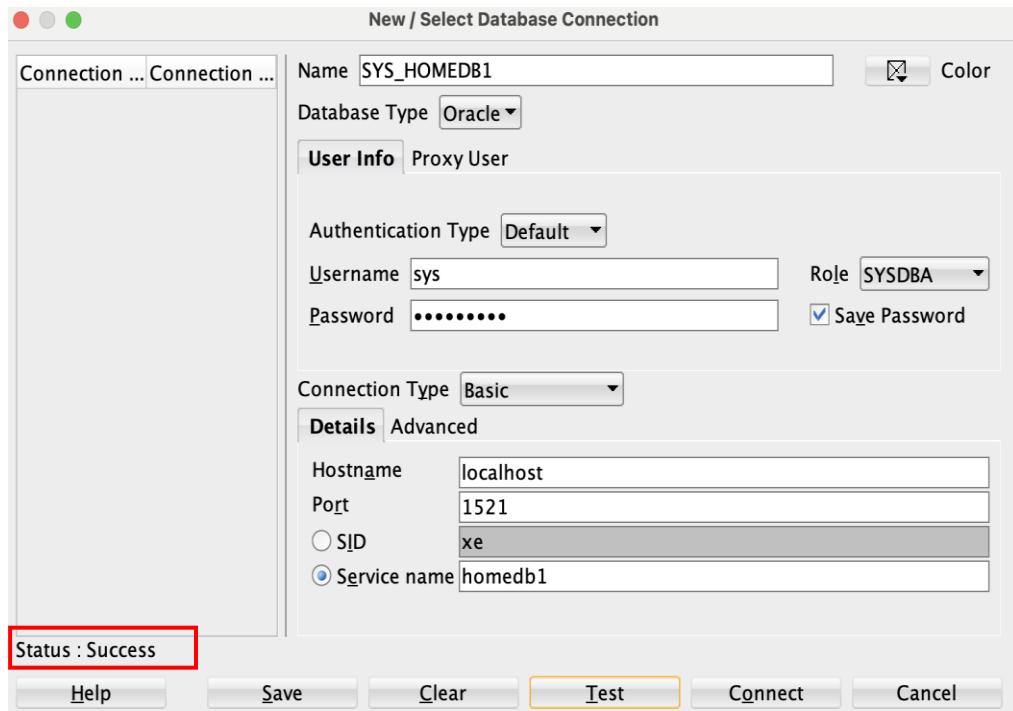
- **Pasul 7.3** Definirea unei noi conexiuni la baza de date pentru user-ul sys cu role-ul sysdba:



Name: SYS_HOMEDB1
Username: sys
Role: SYSDBA
Password: Admin#DB1
Connection Type: Basic
Hostname: localhost
Port: 1521
Service Name: homedb1

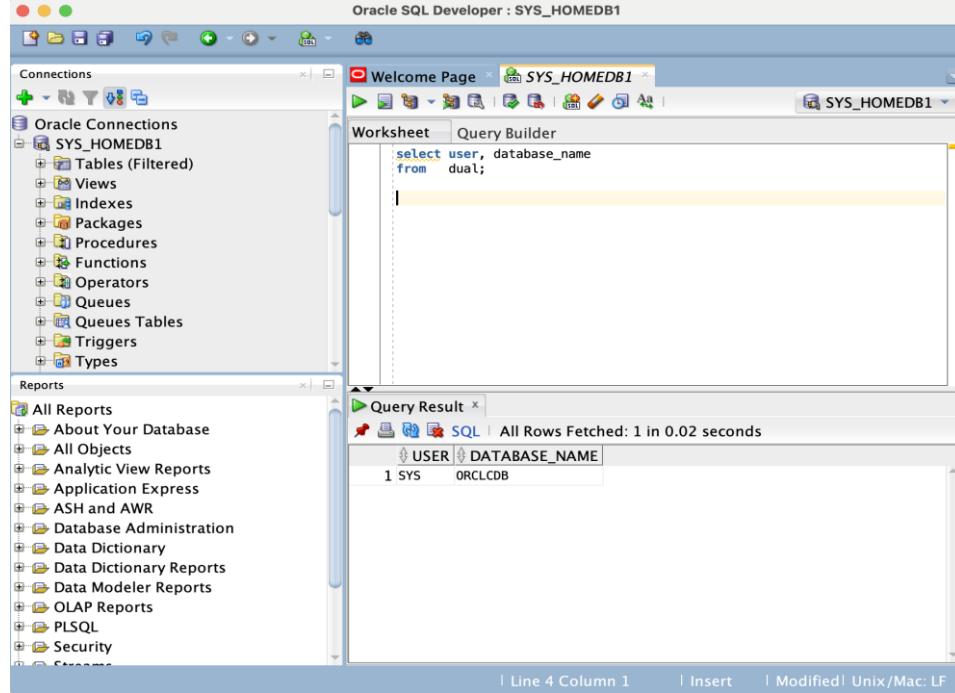
Observatie:

- După ce ati introdus toate informațiile apăsați butonul *Test*. Dacă în urma testului apare *Status : Succes*, atunci conexiunea este creată corect și puteți apăsa butonul *Save*, apoi butonul *Connect*.

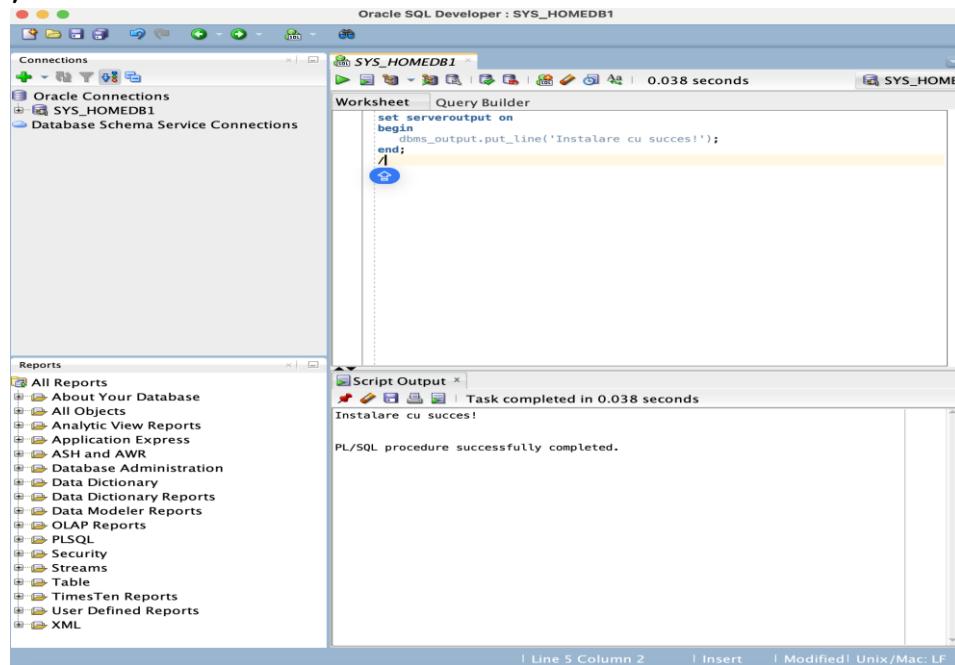


Pasul 6.4 Verificare comandă SQL:

```
select user, database_name
from dual;
```

**Pasul 6.5 Verificare comandă PL/SQL:**

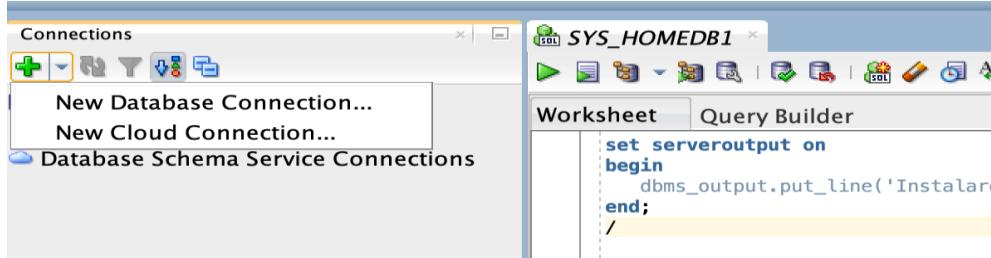
```
set serveroutput on
begin
    dbms_output.put_line('Instalare cu succes!');
end;
/
```



Pasul 7

Conectarea la baza de date **pluggable** ca Administrator folosind utilitarul *SQL Developer*:

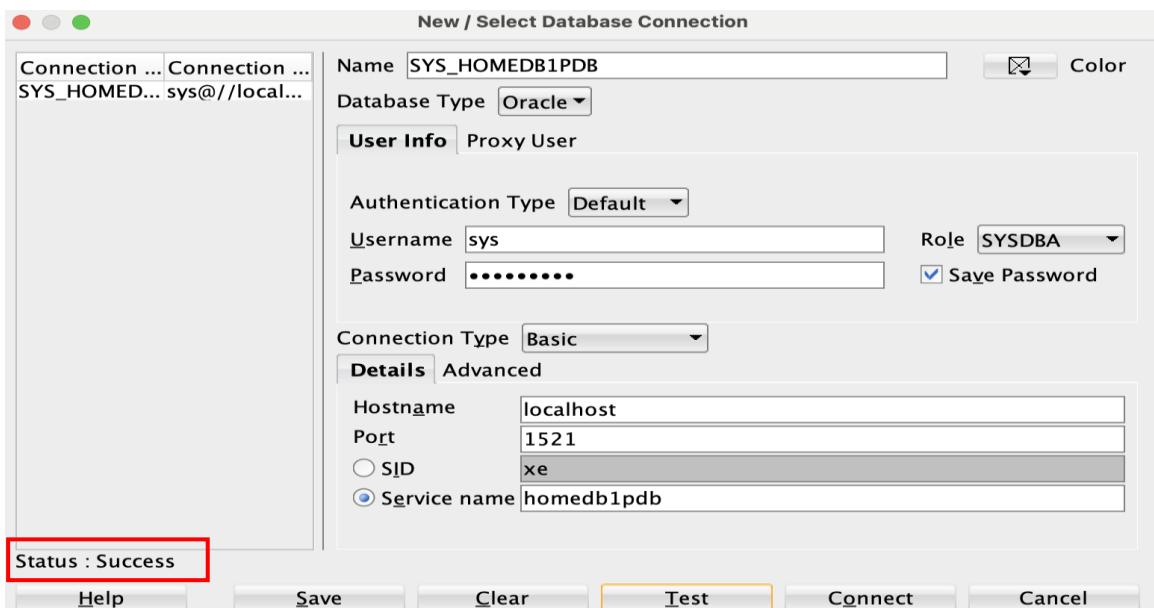
- **Pasul 7.1** Definirea unei noi conexiuni la baza de date pentru *user*-ul *sys* cu *role*-ul *sysdba*:



Name: SYS_HOMEDB1PDB
Username: sys
Role: SYSDBA
Password: Admin#DB1
Connection Type: Basic
Hostname: localhost
Port: 1521
Service Name: homedb1pdb

Observatie:

- După ce ați introdus toate informațiile apăsați butonul *Test*. Dacă în urma testului apare *Status : Succes*, atunci conexiunea este creată corect și puteți apăsa butonul *Save*, apoi butonul *Connect*.



- **Pasul 7.2** Verificați dacă baza de date *pluggable* este montată și avem reguli de WRITE

```
SELECT name, open_mode
FROM v$pdbs;
```

NAME	OPEN_MODE
HOME...	READ WRITE

Pasul 8

Testarea conexiunii pentru un utilizator comun, fără drepturi de administrare. Pentru aceasta se va folosi utilizatorul *hr*.

Observatii:

- Schema *hr* trebuie creată manual.
- Contul este implicit blocat => este necesară conectarea cu *sys* și deblocarea acestuia.
- Parola pentru utilizatorul *hr* va fi resetată cu valoarea *oracle*.

- **Pasul 8.1** Creare schemă *hr* folosind utilitarul *SQL*Plus*

```
--conectare ca sys

--navigare in containerul PDB ca sys
alter session set container= homedb1pdb;

--rularea scriptului
@?/demo/schema/human_resources/hr_main.sql
```

```

bash-4.4$ sqlplus sys/Admin#DB1@localhost:1521/HOMEDB1 as sysdba

SQL*Plus: Release 19.0.0.0.0 - Production on Tue Jun 3 06:15:38 2025
Version 19.19.0.0.0

Copyright (c) 1982, 2023, Oracle. All rights reserved.

Connected to:
Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production
Version 19.19.0.0.0

SQL> alter session set container=homedb1pdb;

Session altered.

SQL> @?/demo/schema/human_resources/hr_main.sql

specify password for HR as parameter 1:
Enter value for 1: oracle

specify default tablespace for HR as parameter 2:
Enter value for 2: users

specify temporary tablespace for HR as parameter 3:
Enter value for 3: temp

specify log path as parameter 4:
Enter value for 4: $ORACLE_HOME/demo/schema/log/

```

- **Pasul 8.2** Conexiunea la *hr* folosind utilitarul *SQL*Plus*

```

--conectare ca sys
alter user hr identified by oracle account unlock;

--conectare in schema hr
connect hr/oracle@homedb1pdb

select table_name from user_tables;
SQL> alter user hr identified by oracle account unlock;

User altered.

SQL> connect hr/oracle@homedb1pdb;
Connected.
SQL> select table_name from user_tables;

TABLE_NAME
-----
COUNTRIES
REGIONS
LOCATIONS
DEPARTMENTS
JOBS
EMPLOYEES
JOB_HISTORY

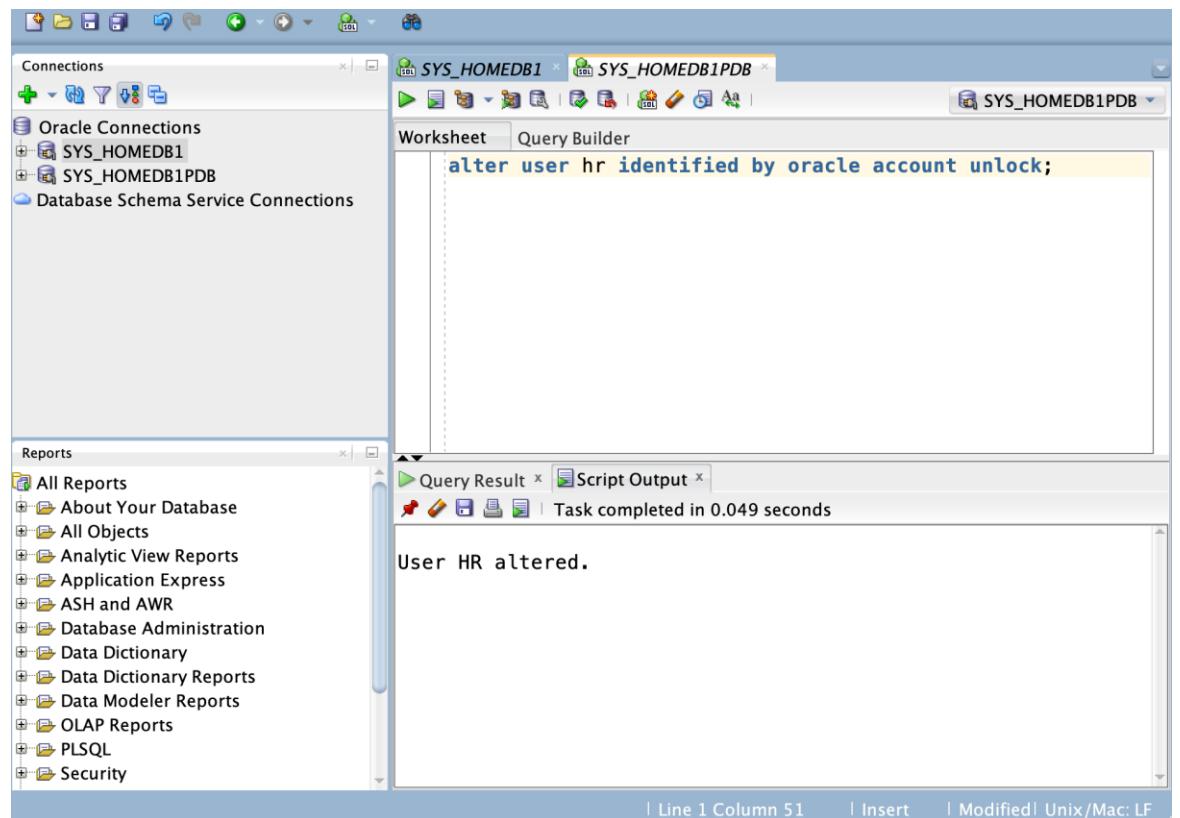
7 rows selected.

SQL>

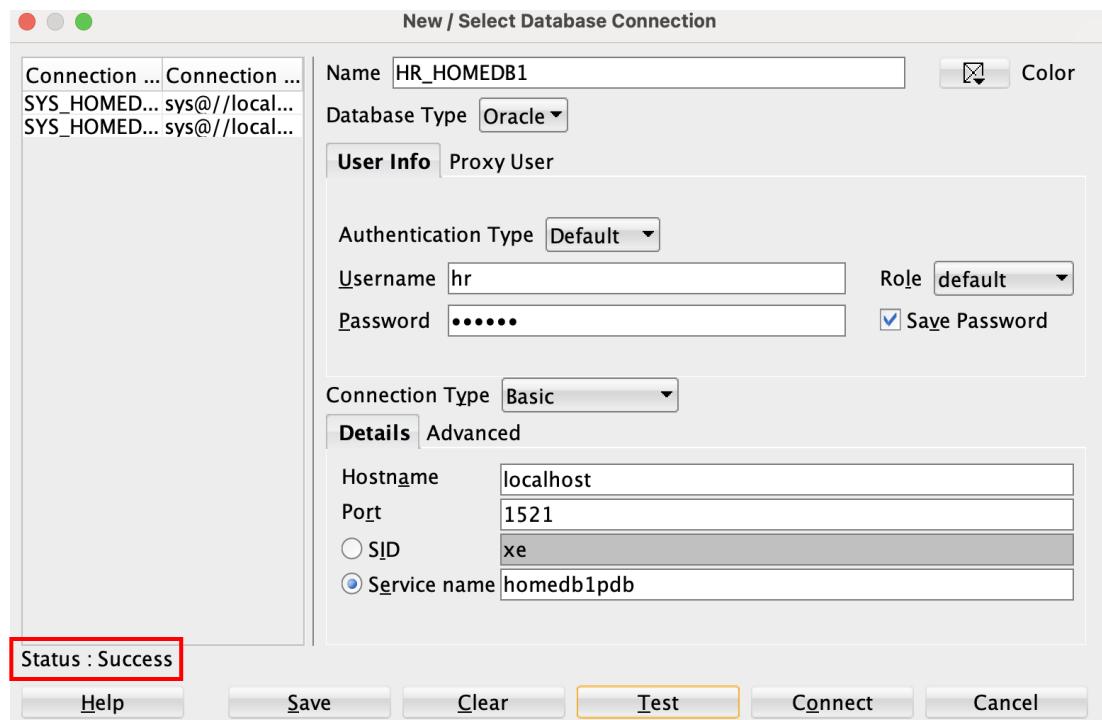
```

- **Pasul 8.3** Conexiunea la *hr* folosind utilitarul *SQL Developer*.

```
--conexiunea utilizatorului sys
alter user hr identified by oracle account unlock;
```



```
--definirea conexiunii pentru utilizatorul hr
--Name:          HR_HOMEDB1
--Username:      hr
--Role:          default
--Password:      oracle
--Connection Type: Basic
--Hostname:      localhost
--Port:          1521
--Service Name: homedb1pdb
```



```
--conectare in schema hr
select table_name from user_tables;
```

TABLE_NAME
1 COUNTRIES
2 REGIONS
3 LOCATIONS
4 DEPARTMENTS
5 JOBS
6 EMPLOYEES
7 JOB_HISTORY

Pasul 9

Definirea unui nou utilizator comun, fără drepturi de administrare. Acordarea de privilegii și *role*-uri necesare pentru operațiile uzuale.

- **Pasul 9.1** Definirea utilizatorului folosind utilitarul *SQL*Plus*

```
--conectare ca sys

--navigare in containerul PDB ca sys

--definire role
create role sgbd_role;create role sgbd_role;

--atribuire privilegii si role-uri nouului role
grant connect to sgbd_role;
grant resource to sgbd_role;
grant create table to sgbd_role;
grant create view to sgbd_role;
grant create materialized view to sgbd_role;
grant create synonym to sgbd_role;
grant create procedure to sgbd_role;
grant create sequence to sgbd_role;
grant create trigger to sgbd_role;
grant create type to sgbd_role;
grant query rewrite to sgbd_role;
grant select_catalog_role to sgbd_role;
grant alter session to sgbd_role;
grant select any dictionary to sgbd_role;
grant create public database link to sgbd_role;
grant create public synonym to sgbd_role;

bash-4.4$ sqlplus sys/Admin#DB1@localhost:1521/HOMEDB1 as sysdba
SQL*Plus: Release 19.0.0.0.0 - Production on Tue Jun 3 06:30:28 2025
Version 19.19.0.0.0
Copyright (c) 1982, 2023, Oracle. All rights reserved.

Connected to:
Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production
Version 19.19.0.0.0

SQL> alter session set container=homedb1pdb;
Session altered.

SQL> create role sgbd_role;
Role created.

SQL> grant connect to sgbd_role;
grant resource to sgbd_role;
grant create table to sgbd_role;
grant create view to sgbd_role;
grant create materialized view to sgbd_role;
grant create synonym to sgbd_role;
grant create procedure to sgbd_role;
grant create sequence to sgbd_role;
grant create trigger to sgbd_role;
grant create type to sgbd_role;
grant query rewrite to sgbd_role;
grant select_catalog_role to sgbd_role;
```

```
grant select_catalog_role to sgbd_role;
grant alter session to sgbd_role;
grant select any dictionary to sgbd_role;
grant create public database link to sgbd_role;
grant create public synonym to sgbd_role;

Grant succeeded.

SQL>
Grant succeeded.

--definire utilizator
create user sgbd_homedb1 identified by oracle
profile default
default tablespace users
quota unlimited on users
account unlock;

--atribuire role nou definit utilizatorului
grant sgbd_role to sgbd_homedb1;

--atribuire privilegiu unlimited tablespace utilizatorului
grant unlimited tablespace to sgbd_homedb1;

SQL> create user sgbd_homedb1 identified by oracle
profile default
default tablespace users
quota unlimited on users
account unlock;
      2      3      4      5
User created.

SQL> grant sgbd_role to sgbd_homedb1;

Grant succeeded.

SQL> grant unlimited tablespace to sgbd_homedb1;

Grant succeeded.

SQL> █
```

```
--conectare in schema utilizatorului sgbdb_homedb1
connect sgbdb_homedb1/oracle@homedb1pdb

--definirea unui obiect de test
create table test (a number(2), b varchar2(20), c date);
insert into test values (1,'test 1',null);
commit;
select count(*) as cardinalitate_totala from test;

SQL> connect sgbdb_homedb1/oracle@homedb1pdb
Connected.
SQL> create table test (a number(2), b varchar2(20), c date);

Table created.

SQL> insert into test values (1, 'test 1', null);

1 row created.

SQL> commit;

Commit complete.

SQL> select count(*) as cardinalitate_totala from test;

CARDINALITATE_TOTALA
-----
1

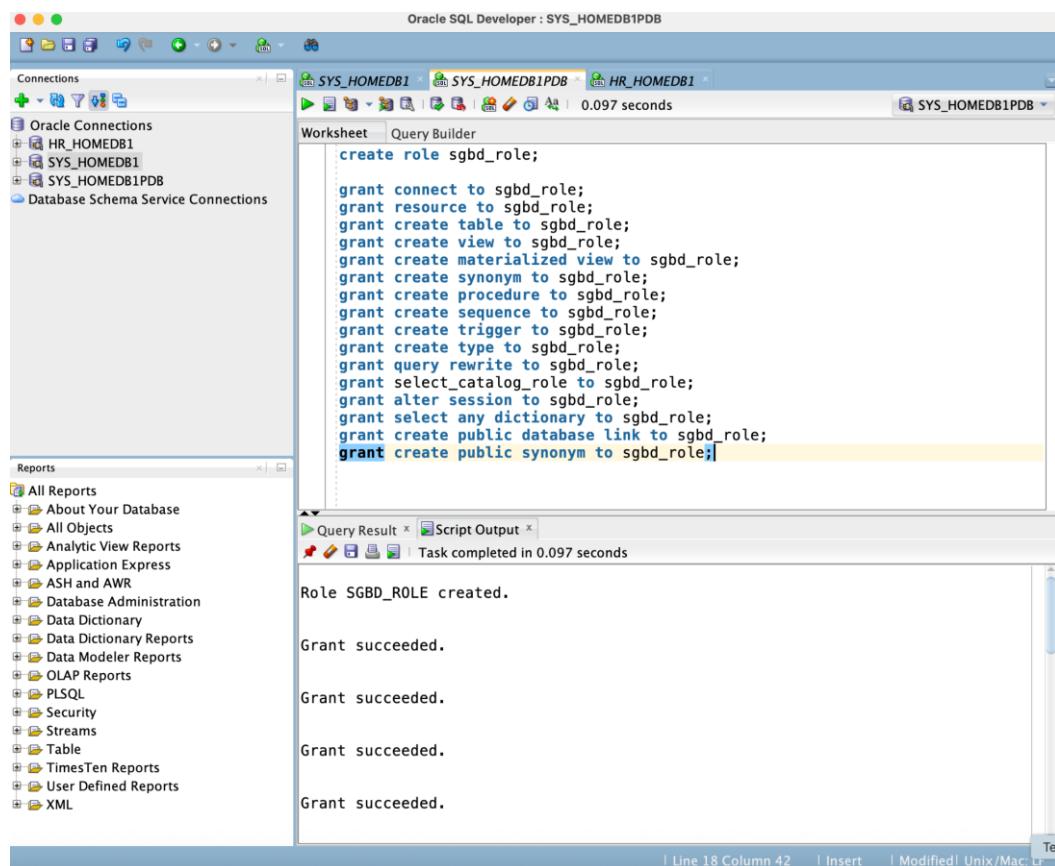
SQL>
```

- **Pasul 9.2** Definirea utilizatorului folosind utilitarul *SQL Developer*

```
--conectare ca sys pdb

--definire role
create role sgbdb_role;

--atribuire privilegi si role-uri nouului role
grant connect to sgbdb_role;
grant resource to sgbdb_role;
grant create table to sgbdb_role;
grant create view to sgbdb_role;
grant create materialized view to sgbdb_role;
grant create synonym to sgbdb_role;
grant create procedure to sgbdb_role;
grant create sequence to sgbdb_role;
grant create trigger to sgbdb_role;
grant create type to sgbdb_role;
grant query rewrite to sgbdb_role;
grant select_catalog_role to sgbdb_role;
grant alter session to sgbdb_role;
grant select any dictionary to sgbdb_role;
grant create public database link to sgbdb_role;
grant create public synonym to sgbdb_role;
```



```

--definire utilizator
create user sgbd_homedb1 identified by oracle
profile default
default tablespace users
quota unlimited on users
account unlock;

--atribuire role nou definit utilizatorului
grant sgbd_role to sgbd_homedb1;

--atribuire privilegiu unlimited tablespace utilizatorului
grant unlimited tablespace to sgbd_homedb1;

```

The screenshot shows the Oracle SQL Developer interface. In the top right, the connection is set to 'SYS_HOMEDB1PDB'. The 'Query Builder' tab in the center contains the following SQL code:

```

create user sgbd_homedb1 identified by oracle
profile default
default tablespace users
quota unlimited on users
account unlock;

grant sgbd_role to sgbd_homedb1;

grant unlimited tablespace to sgbd_homedb1;

```

The last two lines of the code ('grant unlimited tablespace to sgbd_homedb1;') are highlighted with a yellow background. Below the code, the 'Query Result' tab shows the execution results:

```

User SGBD_HOMEDB1 created.

Grant succeeded.

Grant succeeded.

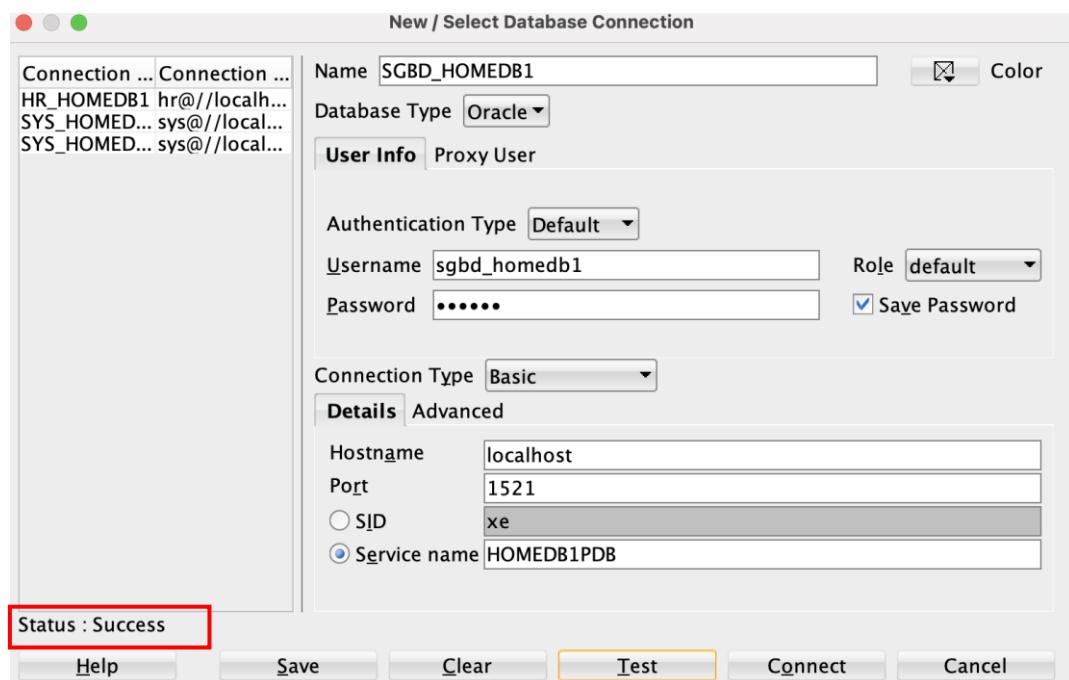
```

At the bottom of the interface, there are status indicators: 'Line 11 Column 44', 'Insert', 'Modified', and 'Unix/Mac LF'.

```

--definirea conexiunii pentru utilizatorul sgbd_homedb1
--Name:           SGBD_HOMEDB1
--Username:       sgbd_homedb1
--Role:           default
--Password:      oracle
--Connection Type: Basic
--Hostname:       localhost
--Port:           1521
--SID:            HOMEDB1PDB

```



```
--conectare in schema utilizatorului sgbd_homedb1
--definirea unui obiect de test
create table test (a number(2), b varchar2(20), c date);
insert into test values (1,'test 1',null);
commit;
select count(*) as cardinalitate_totala from test;
```

