



Database Foundations

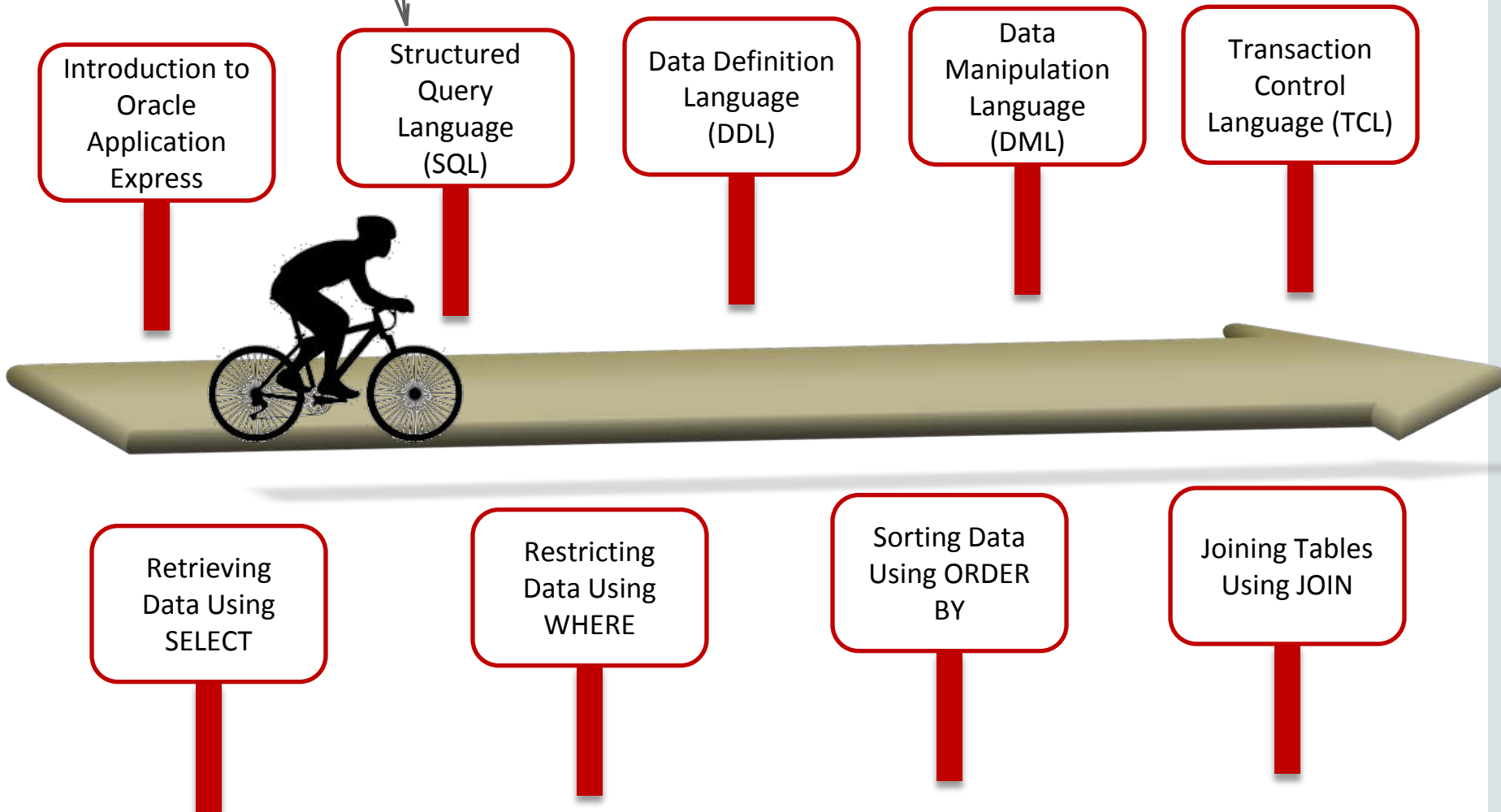
6-2

Structured Query Language (SQL)



Roadmap

You are here



Objectives

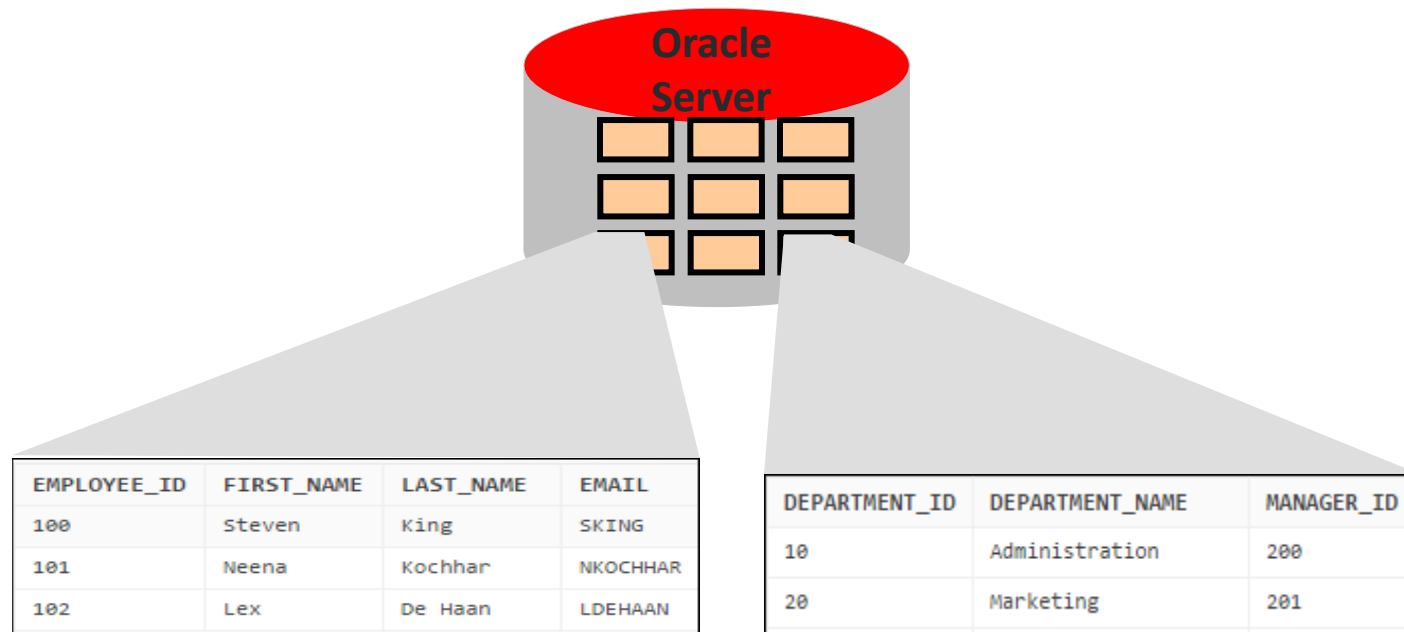
This lesson covers the following objectives:

- Describe how data is organized in a relational database
- Explain the various relational database terminologies
- Define the structured query language and its functions
- Describe how SQL processing takes place
- Identify the tools used to access the relational database



How Is Data Organized in Relational Databases?

- Data is stored in a two-dimensional matrix known as a table.
- RDBMS software is used to manage reading and manipulating data.



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Relational Database Terminology

3

2	EMPLOYEE_ID	FIRST_NAME	LAST_NAME	SALARY	COMMISSION_PCT	DEPARTMENT_ID	4
	100	Steven	King	24000	-	90	
	101	Neena	Kochhar	17000	-	90	
	102	Lex	De Haan	17000	-	90	5
	103	Alexander	Hunold	9000	6	60	
	104	Bruce	Ernst	6000	-	60	
	105	David	Austin	4800	-	60	
	106	Valli	Pataballa	4800	-	60	
	107	Diana	Lorentz	4200	-	60	
	108	Nancy	Greenberg	12008	-	100	
	109	Daniel	Faviet	9000	-	100	
1	110	John	Chen	8200	-	100	
	111	Ismael	Sciarra	7700	-	100	
	112	Jose Manuel	Urman	7800	-	100	

Relating Multiple Tables

- Each row of data in a table can be uniquely identified by a primary key.
- You can logically relate data from multiple tables using foreign keys.

Table name: EMPLOYEES

EMPLOYEE_ID	FIRST_NAME	LAST_NAME	DEPARTMENT_ID
100	Steven	King	90
101	Neena	Kochhar	90
102	Lex	De Haan	90
103	Alexander	Hunold	60
104	Bruce	Ernst	60
105	David	Austin	60
106	Valli	Pataballa	60
107	Diana	Lorentz	60
...			

↑
Primary key

↑
Foreign key

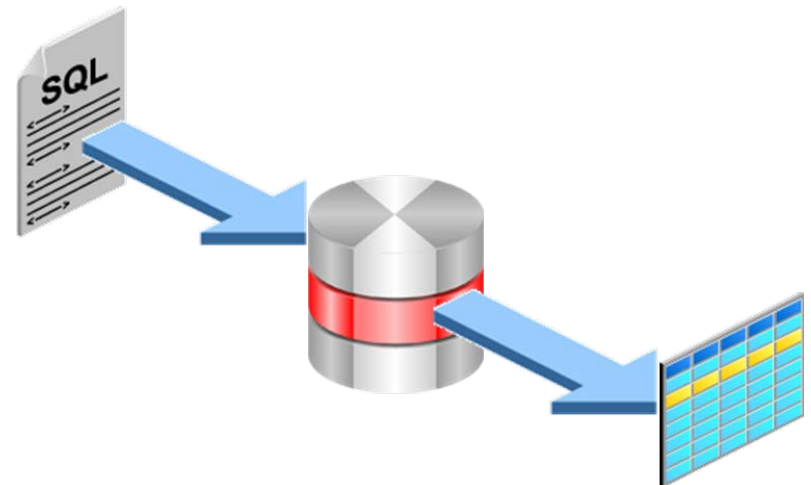
Table name: DEPARTMENTS

DEPARTMENT_ID	DEPARTMENT_NAME	MANAGER_ID	LOCATION_ID
10	Administration	200	1700
20	Marketing	201	1800
30	Purchasing	114	1700
40	Human Resources	203	2400
50	Shipping	121	1500
...			

↑
Primary key

What Is SQL?

- Structured query language (SQL) is the set-based, declarative language used to access data in an Oracle database.
- SQL provides an interface to a relational database and provides statements that help work with the database.



Functions of SQL

- Creating, replacing, altering, and dropping database objects
- Inserting, updating, and deleting rows in a table
- Querying data stored in the database
- Controlling access to the database and database objects
- Guaranteeing database consistency and integrity

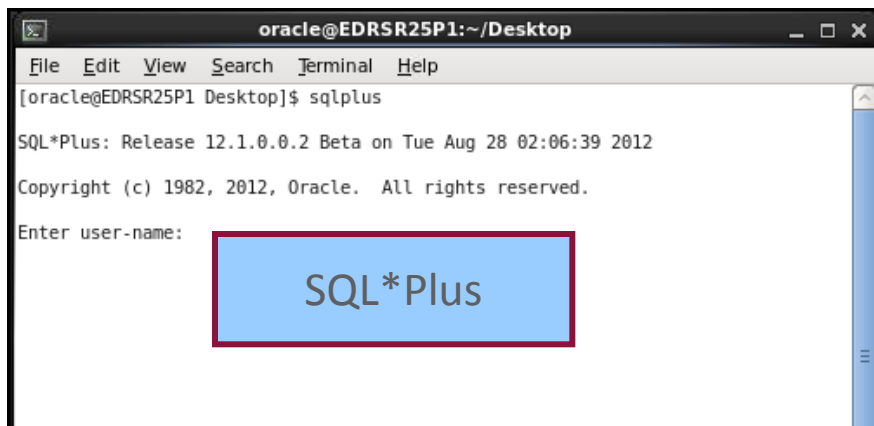


SQL Processing

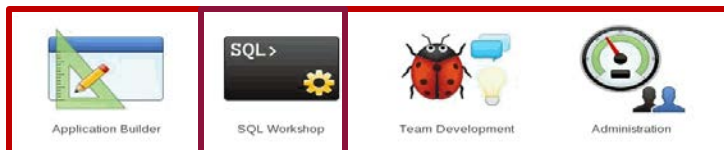
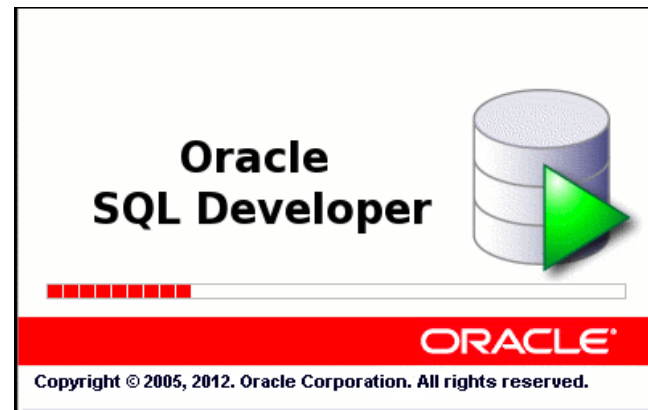
Stages of SQL processing



Accessing Data in the Oracle Database Server



```
oracle@EDRSR25P1:~/Desktop
File Edit View Search Terminal Help
[oracle@EDRSR25P1 Desktop]$ sqlplus
SQL*Plus: Release 12.1.0.0.2 Beta on Tue Aug 28 02:06:39 2012
Copyright (c) 1982, 2012, Oracle. All rights reserved.
Enter user-name:
SQL*Plus
```



Case Scenario: Need to Extract Data



Faculty

Sean, by now you should understand the need to use SQL to access data in a relational database. Can you think of scenarios where retrieving data from a database table would be necessary?

Sure. Let me think of some use cases.



Student

Use Cases



Hospitals



Retail



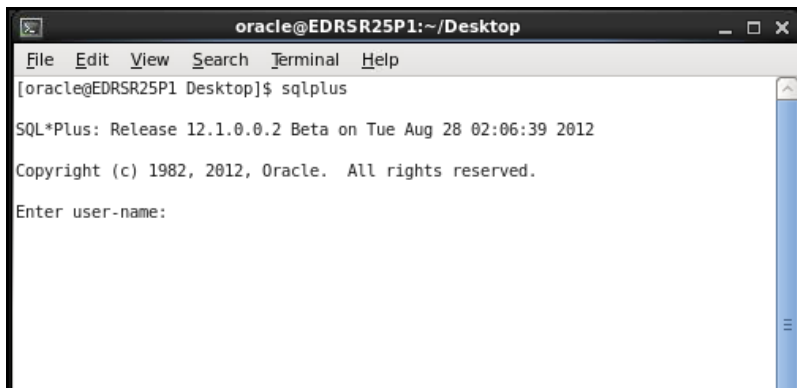
Airports



Schools

Connecting to an Oracle Database

- You can connect to an Oracle database through a client program such as:
 - SQL*Plus
 - Oracle SQL Developer

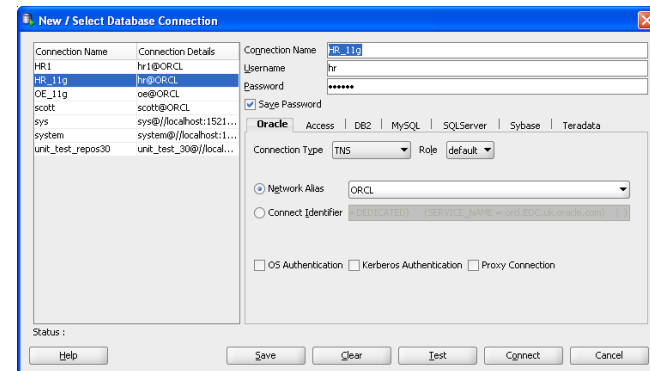


A terminal window titled 'oracle@EDRSR25P1:~/Desktop' showing the execution of 'sqlplus'. The output includes the SQL*Plus version (12.1.0.0.2 Beta) and the prompt 'Enter user-name:'.

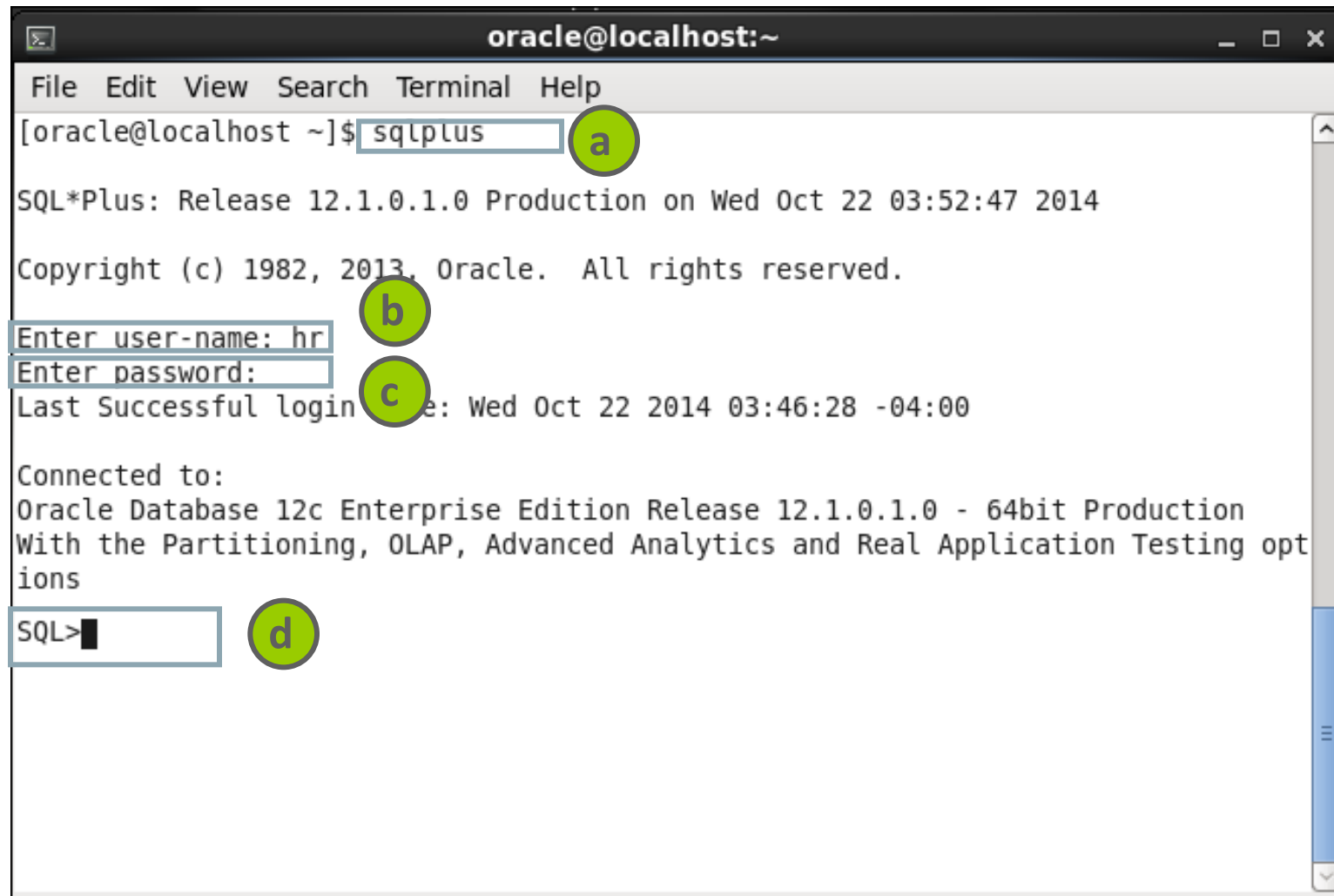
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oracle@EDRSR25P1:~/Desktop
File Edit View Search Terminal Help
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```

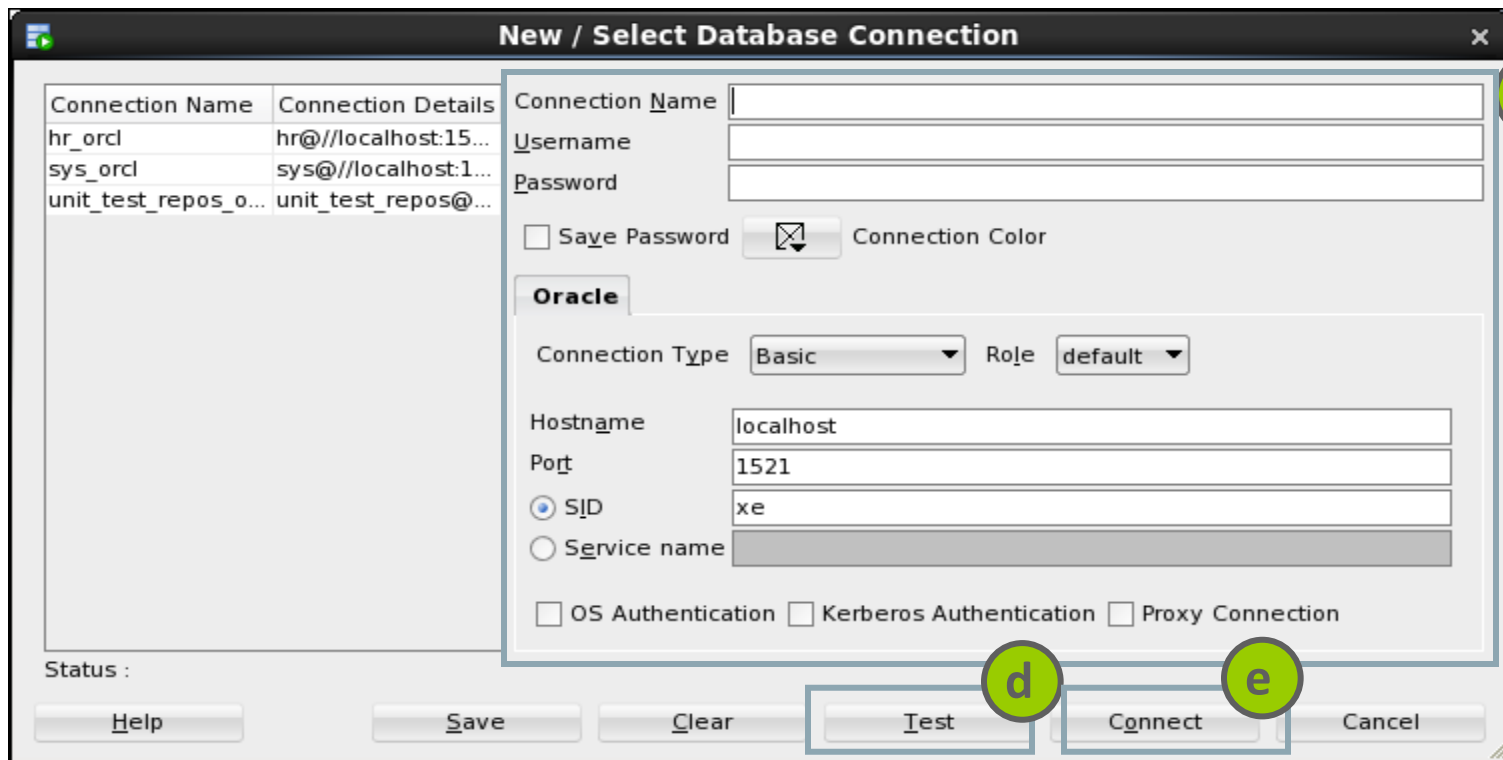
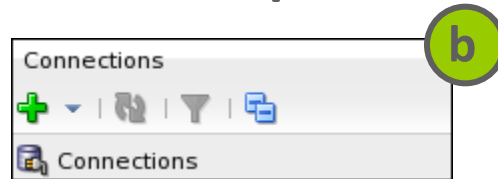
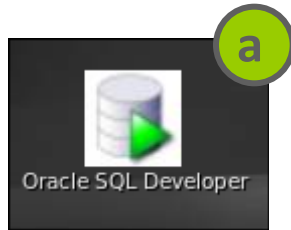


Connecting to an Oracle Database Using SQL*Plus



```
oracle@localhost:~  
File Edit View Search Terminal Help  
[oracle@localhost ~]$ sqlplus a  
SQL*Plus: Release 12.1.0.1.0 Production on Wed Oct 22 03:52:47 2014  
Copyright (c) 1982, 2013, Oracle. All rights reserved.  
Enter user-name: hr b  
Enter password: c  
Last Successful login time: Wed Oct 22 2014 03:46:28 -04:00  
Connected to:  
Oracle Database 12c Enterprise Edition Release 12.1.0.1.0 - 64bit Production  
With the Partitioning, OLAP, Advanced Analytics and Real Application Testing opt  
ions  
SQL> d
```

Connecting to an Oracle Database Using Oracle SQL Developer



Summary

In this lesson, you should have learned how to:

- Describe how data is organized in a relational database
- Explain the various relational database terminologies
- Define the structured query language and its functions
- Describe how SQL processing takes place
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