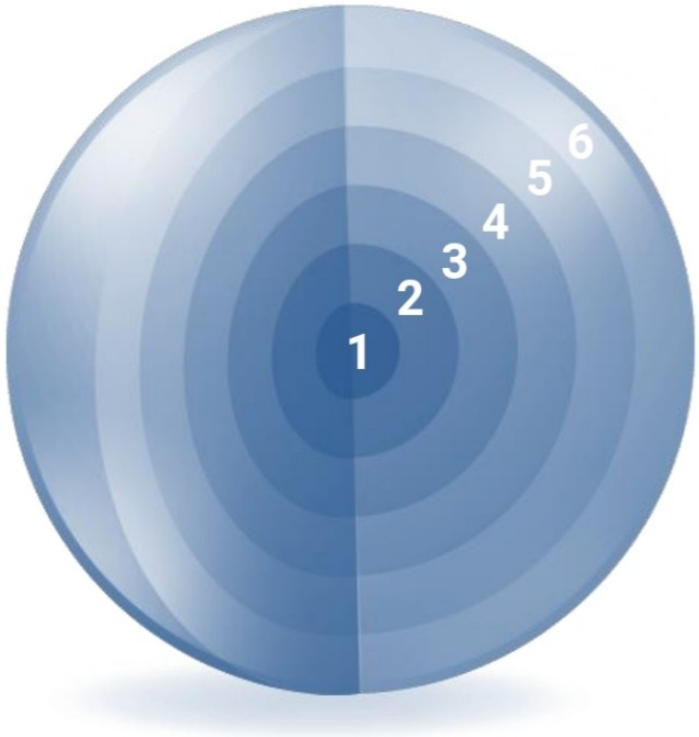
Introduction

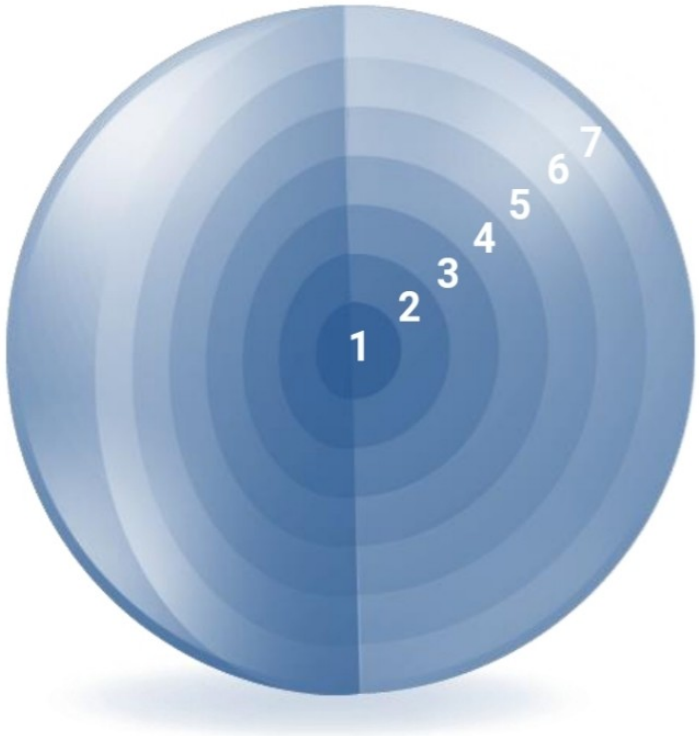
What you will learn at the end of this Session?



1. Define the goals of the course
2. List the features of Oracle Database 11*g*
3. Discuss the theoretical and physical aspects of a relational database
4. Describe Oracle server's implementation of RDBMS and object relational database management system (ORDBMS)
5. Identify the development environments that can be used for this course
6. Describe the database and schema used in this course

ORACLE

What You will learn at the end of this Course?



1. Identify the major components of Oracle Database
2. Retrieve row and column data from tables with the SELECT statement
3. Create reports of sorted and restricted data
4. Employ SQL functions to generate and retrieve customized data
5. Run complex queries to retrieve data from multiple tables
6. Run data manipulation language (DML) statements to update data in Oracle Database
7. Run data definition language (DDL) statements to create and manage schema objects

Oracle Database 11*g*: Focus Areas

Infrastructure Grids	Information Management	Application Development

Oracle Database 11*g*

- Manageability
- High availability
- Performance
- Security
- Information integration

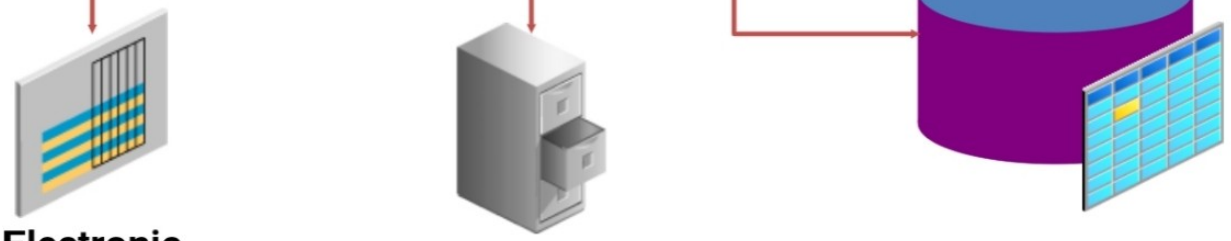
Relational and Object Relational Database Management Systems

- Relational model and object relational model
- User-defined data types and objects
- Fully compatible with relational database
- Supports multimedia and large objects
- High-quality database server features

Data Storage on Different Media

	DEPARTMENT_ID	DEPARTMENT_NAME	MANAGER_ID	LOCATION_ID
1	10	Administration	200	1700
2	20	Marketing	201	1800
3	50	Shipping		
4	60	IT		
5	80	Sales		
6	90	Executive		
7	110	Accounting		
8	190	Contracting		

	GRADE_LEVEL	LOWEST_SAL	HIGHEST_SAL
1	A	1000	2999
2	B	3000	5999
3	C	6000	9999
4	D	10000	14999
5	E	15000	24999
6	F	25000	40000



Electronic spreadsheet **Filing cabinet** **Database**

Relational Database Concept

Dr. E. F. Codd proposed the relational model for database systems in 1970.

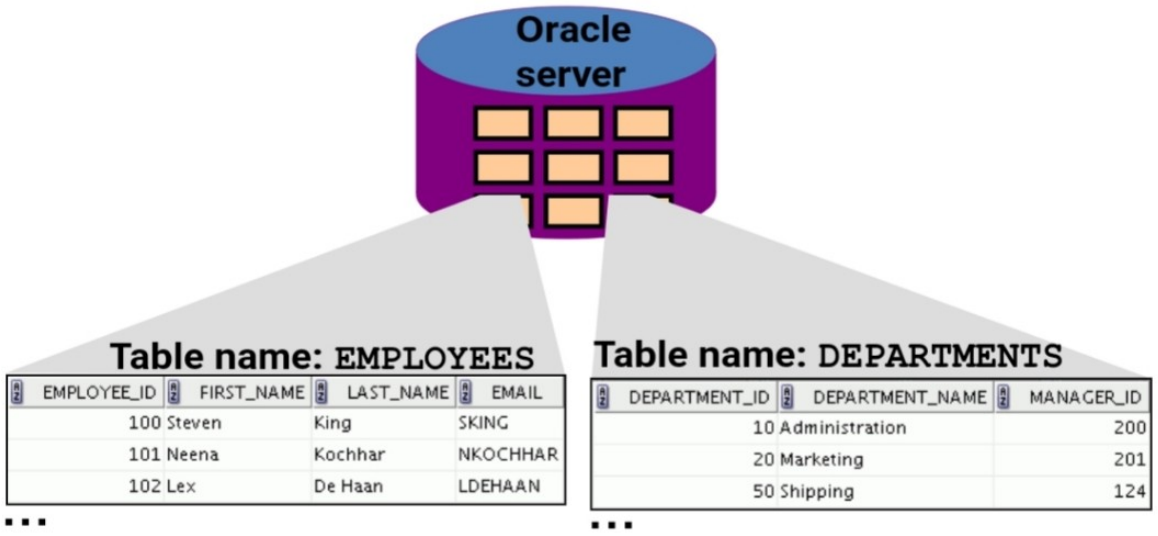
It is the basis for the relational database management system (RDBMS).

The relational model consists of the following:

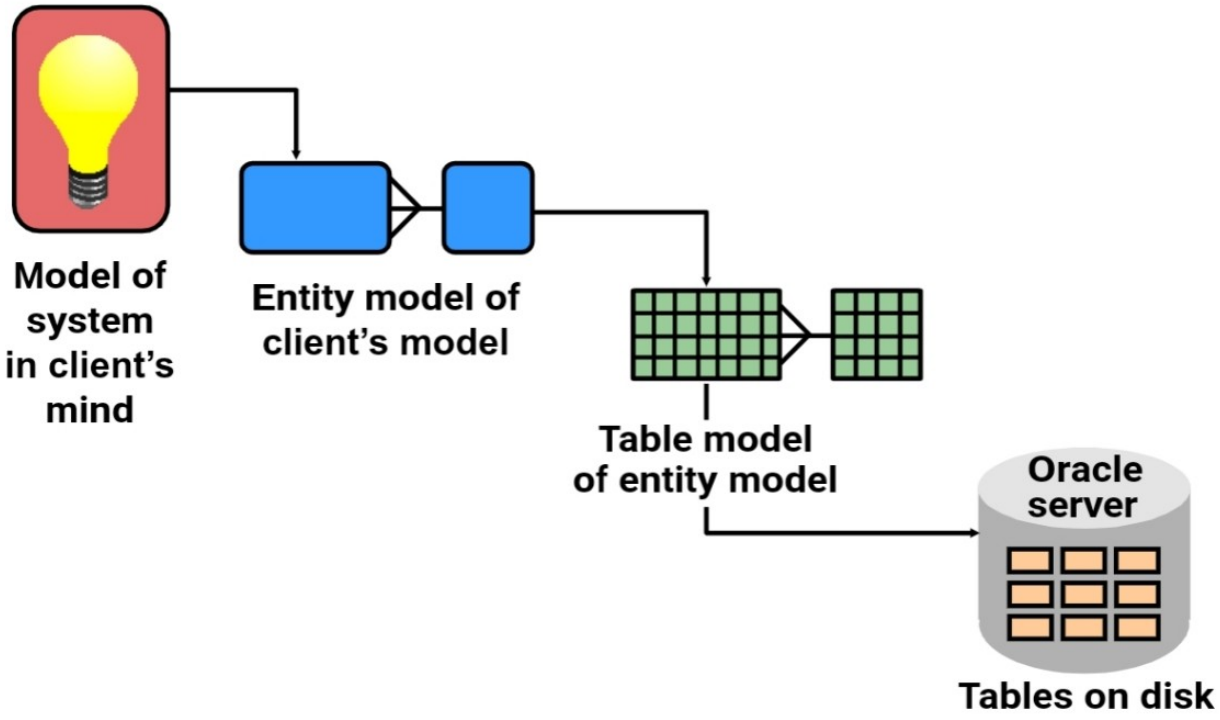
- Collection of objects or relations
- Set of operators to act on the relations
- Data integrity for accuracy and consistency

Definition of a Relational Database

- A relational database is a collection of relations or two-dimensional tables.

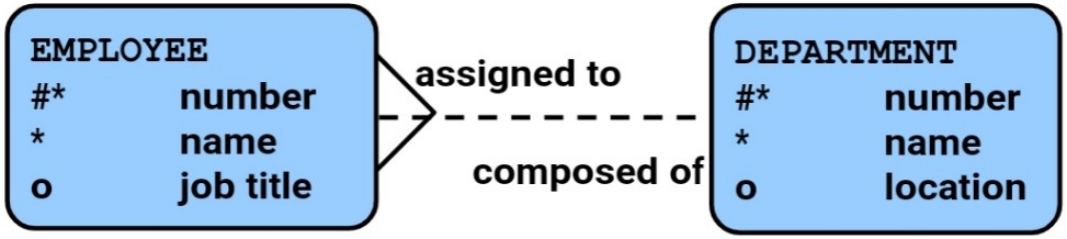


Data Models



Entity Relationship Model

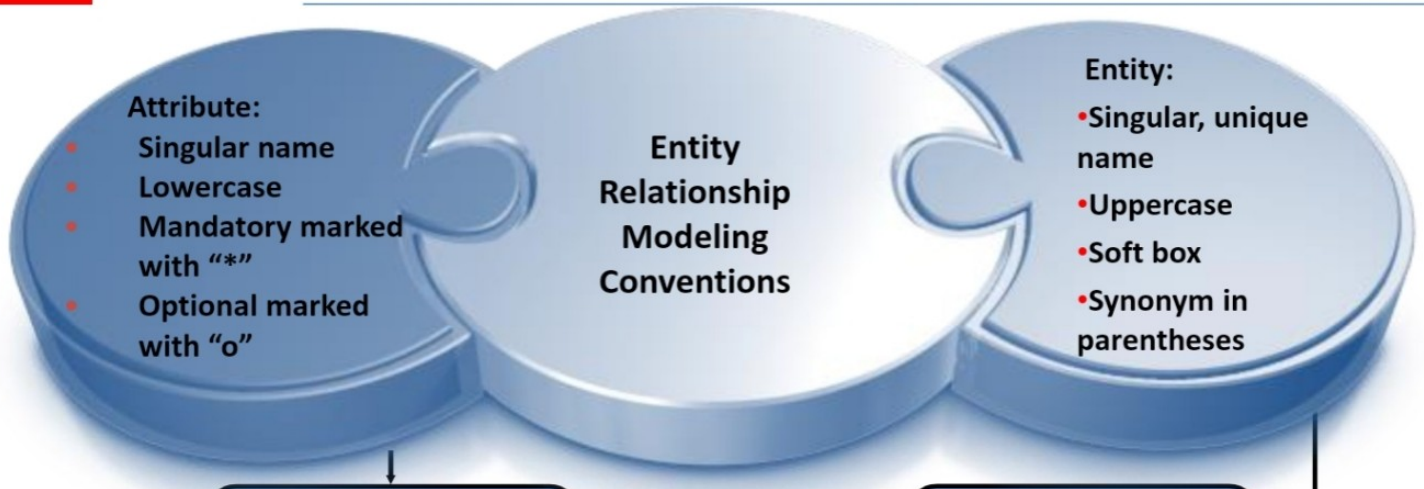
– **Create an entity relationship diagram from business specifications or narratives:**

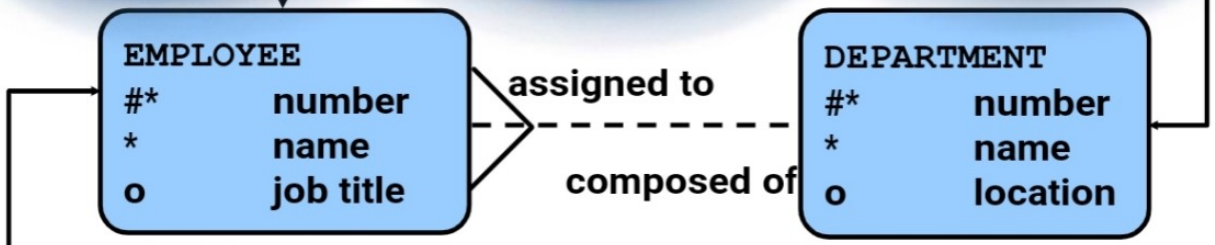


– **Scenario:**

- **". . . Assign one or more employees to a department . . ."**
- **". . . Some departments do not yet have assigned employees . . ."**

Entity Relationship Modeling Conventions





Unique Identifier (UID)
Primary marked with "#"
Secondary marked with "(#)"

Relating Multiple Tables

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

Table name: DEPARTMENTS

DEPARTMENT_ID	DEPARTMENT_NAME	MANAGER_ID	LOCATION_ID
10	Administration	200	1700
20	Marketing	201	1800
50	Shipping	124	1500
60	IT	103	1400
80	Sales	149	2500
90	Executive	100	1700
110	Accounting	205	1700
190	Contracting	(null)	1700

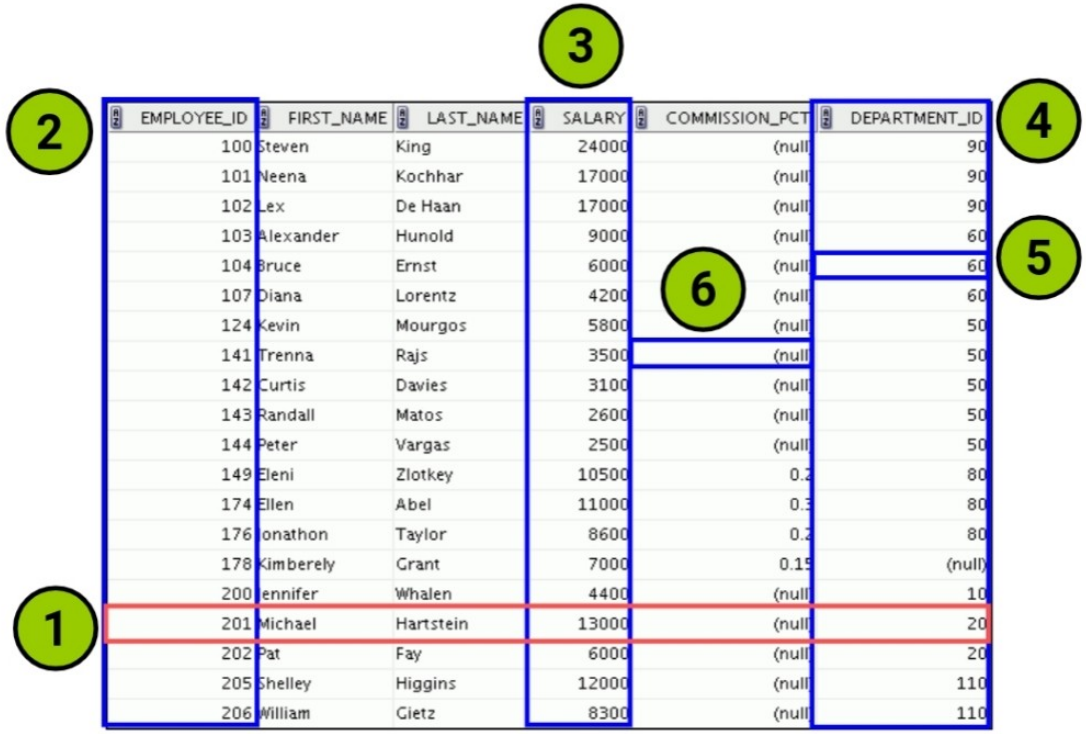
Primary key

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
107	Diana	Lorentz	60
124	Kevin	Mourgos	50
141	Trenna	Rajs	50
142	Curtis	Davies	50

Primary key Foreign key

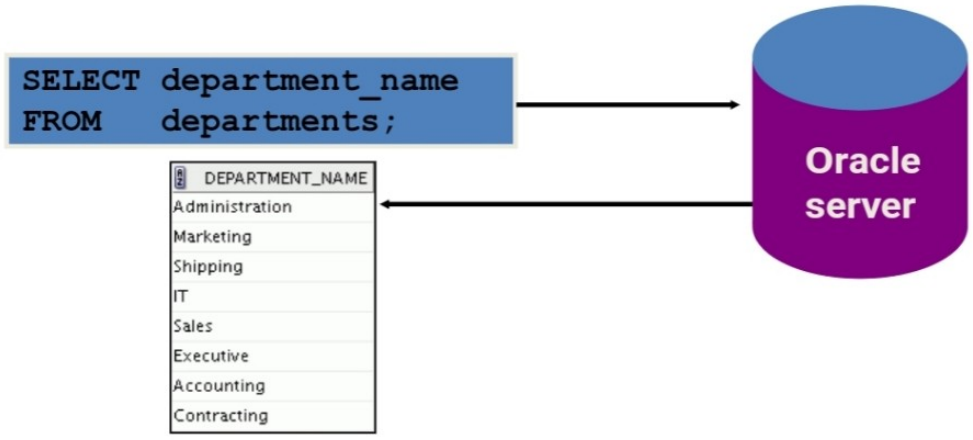
Relational Database Terminology



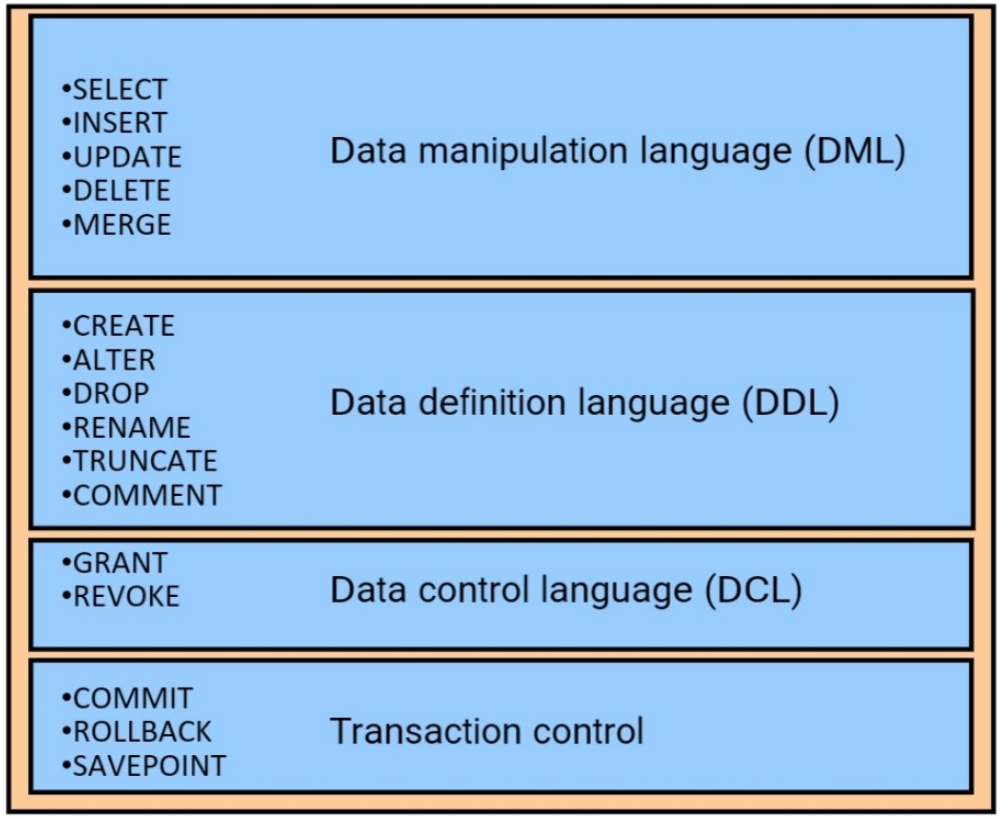
EMPLOYEE_ID	FIRST_NAME	LAST_NAME	SALARY	COMMISSION_PCT	DEPARTMENT_ID
100	Steven	King	24000	(null	90
101	Neena	Kochhar	17000	(null	90
102	Lex	De Haan	17000	(null	90
103	Alexander	Hunold	9000	(null	60
104	Bruce	Ernst	6000	(null	60
107	Diana	Lorentz	4200	(null	60
124	Kevin	Mourgos	5800	(null	50
141	Trenna	Rajs	3500	(null	50
142	Curtis	Davies	3100	(null	50
143	Randall	Matos	2600	(null	50
144	Peter	Vargas	2500	(null	50
149	Eleni	Zlotkey	10500	0.2	80
174	Ellen	Abel	11000	0.3	80
176	Jonathon	Taylor	8600	0.2	80
178	Kimberely	Grant	7000	0.15	(null)
200	Jennifer	Whalen	4400	(null	10
201	Michael	Hartstein	13000	(null	20
202	Pat	Fay	6000	(null	20
205	Shelley	Higgins	12000	(null	110
206	William	Gietz	8300	(null	110

Using SQL to Query Your Database

- Structured query language (SQL) is:
  - The ANSI standard language for operating relational databases
  - Efficient, easy to learn, and use
  - Functionally complete (With SQL, you can define, retrieve, and manipulate data in the tables.)

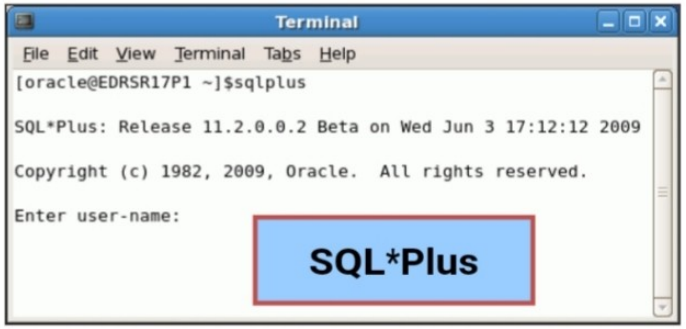


SQL Statements

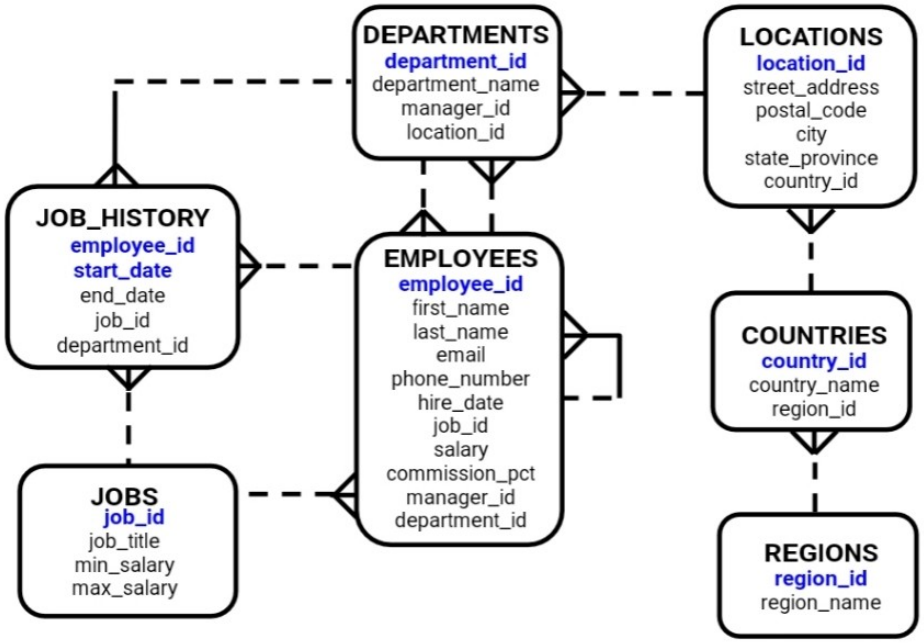


Development Environments for SQL

- There are two development environments for this course:
  - The primary tool is Oracle SQL Developer.
  - SQL*Plus command-line interface can also be used.



Human Resources (HR) Schema



Tables Used in the Course

EMPLOYEES

EMPLOYEE_ID	FIRST_NAME	LAST_NAME	SALARY	COMMISSION_PCT	DEPARTMENT_ID	EMAIL	PHONE_NUMBER	HIRE_DATE
100	Steven	King	24000	(null)	90	SKING	515.123.4567	17-JUN-87
101	Neena	Kochhar	17000	(null)	90	NKOCHHAR	515.123.4568	21-SEP-89
102	Lex	De Haan	17000	(null)	90	LDEHAAN	515.123.4569	13-JAN-93
103	Alexander	Hunold	9000	(null)	60	AHUNOLD	590.423.4567	03-JAN-90
104	Bruce	Ernst	6000	(null)	60	BERNST	590.423.4568	21-MAY-91
107	Diana	Lorentz	4200	(null)	60	DLORENTZ	590.423.5567	07-FEB-99
124	Kevin	Mourgos	5800	(null)	50	KMOURGOS	650.123.5234	16-NOV-99
141	Trenna	Rajs	3500	(null)	50	TRAJS	650.121.8009	17-OCT-95
142	Curtis	Davies	3100	(null)	50	CDAVIES	650.121.2994	29-JAN-97
143	Randall	Matos	2600	(null)	50	RMATOS	650.121.2874	15-MAR-98
144	Peter	Vargas	2500	(null)	50	PVARGAS	650.121.2004	09-JUL-98
149	Eleni	Zlotkey	10500	0.2	80	EZLOTKEY	011.44.1344.429018	29-JAN-00
174	Ellen	Abel	11000	0.3	80	EABEL	011.44.1644.429267	11-MAY-96
176	Jonathon	Taylor	8600	0.2	80	JTAYLOR	011.44.1644.429265	24-MAR-98
178	Kimberely	Grant	7000	0.15	(null)	KGRANT	011.44.1644.429263	24-MAY-99
200	Jennifer	Whalen	4400	(null)	10	JWHALEN	515.123.4444	17-SEP-87
201	Michael	Hartstein	13000	(null)	20	MHARTSTE	515.123.5555	17-FEB-96
202	Pat	Fay	6000	(null)	20	PFAY	603.123.6666	17-AUG-97
205	Shelley	Higgins	12000	(null)	110	SHIGGINS	515.123.8080	07-JUN-94
206	William	Gietz	8300	(null)	110	WGIETZ	515.123.8181	07-JUN-94

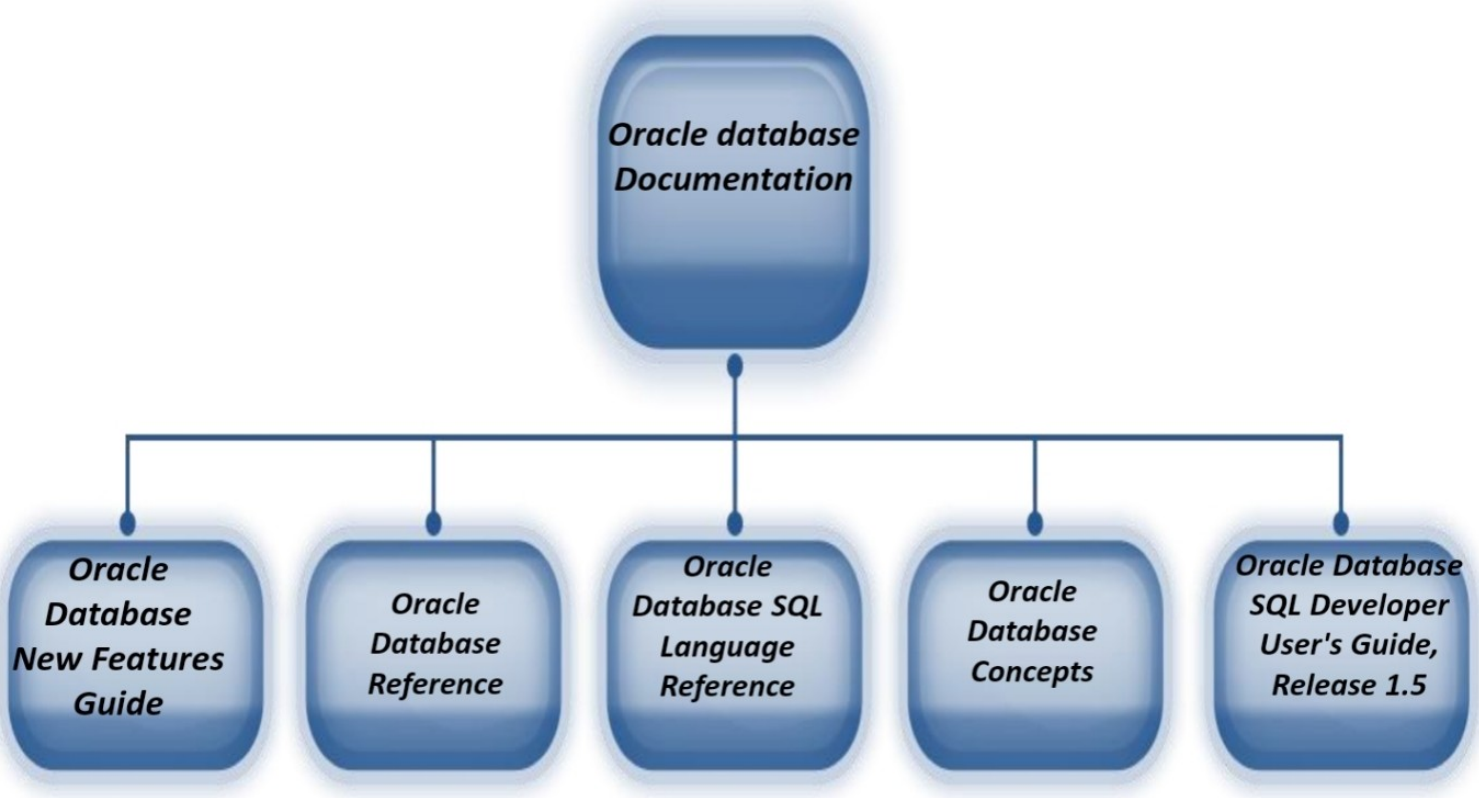
GRADE_LEVEL	LOWEST_SAL	HIGHEST_SAL
A	1000	2999
B	3000	5999
C	6000	9999
D	10000	14999
E	15000	24999
F	25000	40000

JOB_GRADES

DEPARTMENT_ID	DEPARTMENT_NAME	MANAGER_ID	LOCATION_ID
10	Administration	200	1700
20	Marketing	201	1800
50	Shipping	124	1500
60	IT	103	1400
80	Sales	149	2500
90	Executive	100	1700
110	Accounting	205	1700
190	Contracting	(null)	1700

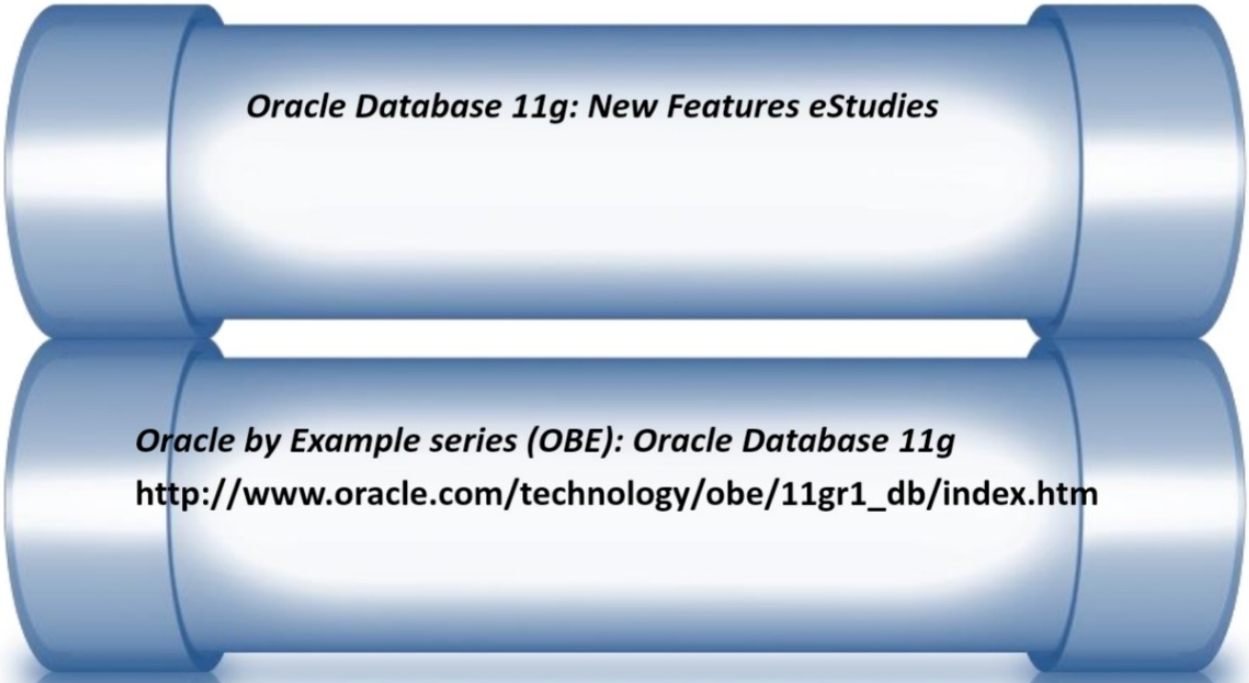
DEPARTMENTS

Oracle Database Documentation

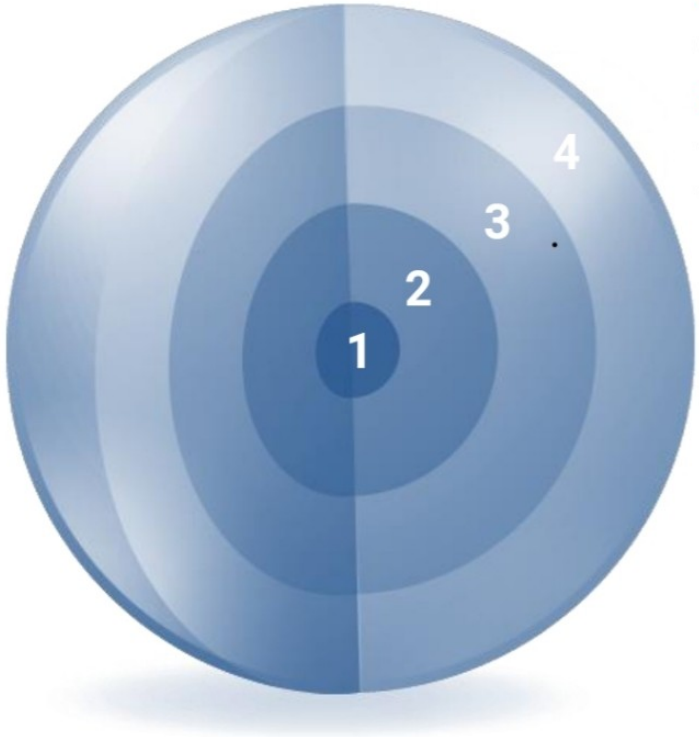


Additional Resources

- For additional information about Oracle Database 11*g*, refer to the following:



Session Summary



Oracle Database 11*g* extends:

- **The benefits of infrastructure grids**
- **The existing information management capabilities**
- **The capabilities to use the major application development environments such as PL/SQL, Java/JDBC, .NET, XML, and so on**

The database is based on ORDBMS

Relational databases are composed of relations, managed by relational operations, and governed by data integrity constraints

With the Oracle server, you can store and manage information by using SQL

Practice I: Overview