



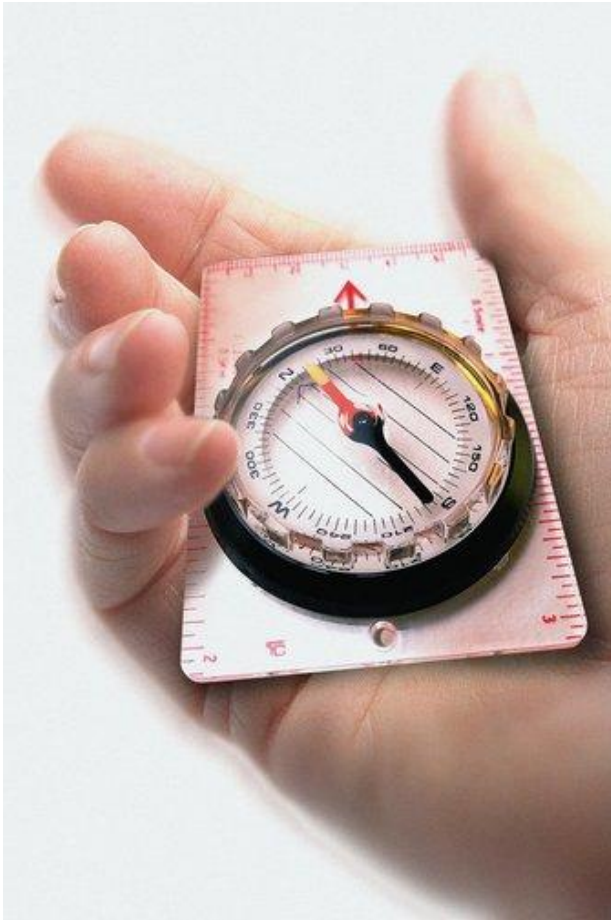
# Administering Users and Managing Schema Objects





# Course objectives

After completing this lesson, you should be able to do the following:



- **Create and manage database user accounts**
- **Create and manage roles**
- **Grant and revoke privileges**
- **Control resource usage by users**
- **Create and modify tables**
- **Define constraints**
- **Create indexes and views**





## Course topics

Course's plan:



- Administering Users
- Managing Schema Objects





# Administering Users



# Preview

- Creating a User
- Profiles and Users
- Authenticating Users
- Privileges
- Assigning Quota to Users
- Roles





# Creating a user

## Database User Accounts

Each database user account has a:

- Unique username
- Authentication method
- Default tablespace
- Temporary tablespace
- User profile





# Creating a user

## Checklist for Creating Users

- Select a profile.
- Select an authentication technique.
- Assign a default tablespace and temporary tablespace.
- Grant privileges and roles to the user.
- Decide on quotas for each tablespace.





# Creating a user

## Creating User with database control

- Select Users from the Administration properties page.
- Click the Create button:

The screenshot shows the 'Create User' dialog box with the following fields and options:

- Title Bar:** Create User
- Buttons:** Show SQL, Cancel, OK
- Tabs:** General (selected), Roles, System Privileges, Object Privileges, Quotas, Consumer Groups, Proxy Users
- Fields:**
  - \* Name: APPSUSER
  - Profile: DEFAULT (dropdown)
  - Authentication: Password (dropdown)
  - \* Enter Password: (password field with dots)
  - \* Confirm Password: (password field with dots)
  - ☐ Expire Password now
  - Default Tablespace: USERS (with a key icon)
  - Temporary Tablespace: TEMP (with a key icon)
  - Status: ☐ Locked ☒ Unlocked







# Creating a user

## Default and Temporary Tablespaces and Locking

- **Default:** Default location of database objects
- **Temporary:** Used for sorting

Default Tablespace

Temporary Tablespace

Status ☐ Locked ☒ Unlocked





# Profiles and users

## Creating Profile with database control

Users are assigned only one profile at any given time.

### Profiles:

- Control resource consumption
- Manage passwords

**Create Profile**

Show SQL Cancel OK

**General** Password

\* Name

**Details**

CPU/Session (Sec./100)	<input type="text" value="1000"/>	
CPU/Call (Sec./100)	<input type="text" value="UNLIMITED"/>	
Connect Time (Minutes)	<input type="text" value="DEFAULT"/>	
Idle Time (Minutes)	<input type="text" value="60"/>	

**Database Services**

Concurrent Sessions (Per User)	<input type="text" value="DEFAULT"/>	
Reads/Session (Blocks)	<input type="text" value="DEFAULT"/>	
Reads/Call (Blocks)	<input type="text" value="DEFAULT"/>	
Private SGA (KBytes)	<input type="text" value="DEFAULT"/>	
Composite Limit (Service Units)	<input type="text" value="DEFAULT"/>	





# Authenticating users

Three type of authentication

- Password
- External
- Global



\* Name

Profile

Authentication

\* Enter Password

\* Confirm Password

☐ Expire Password now

\* Default Tablespace

Temporary Tablespace

Status ☐ Locked ☒ Unlocked





# Privileges

### The two types of user privileges

- **System:** Enables users to perform particular actions in the database
- **Object:** Enables users to access and manipulate a specific object





# Privileges

## System Privileges

Edit User: HR

Show SQL Revert Apply

General Roles **System Privileges** Object Privileges Quotas Consumer Groups Proxy Users

Modify

System Privilege	Admin Option
UNLIMITED TABLESPACE	<input type="checkbox"/>

Database: orcl > Users > Edit User: HR

Logged in As SYS

Modify System Privileges

Cancel OK

Available System Privileges

- MANAGE SCHEDULER
- MANAGE TABLESPACE
- MERGE\_ANY\_WORKSPACE
- ON COMMIT REFRESH
- QUERY REWRITE
- REMOVE\_ANY\_WORKSPACE
- RESUMABLE
- ROLLBACK\_ANY\_WORKSPACE
- SELECT ANY DICTIONARY
- SELECT ANY SEQUENCE

Selected System Privileges

- SELECT ANY TABLE
- UNLIMITED TABLESPACE
- CREATE TABLE
- RESTRICTED SESSION

Move

Move All

Remove

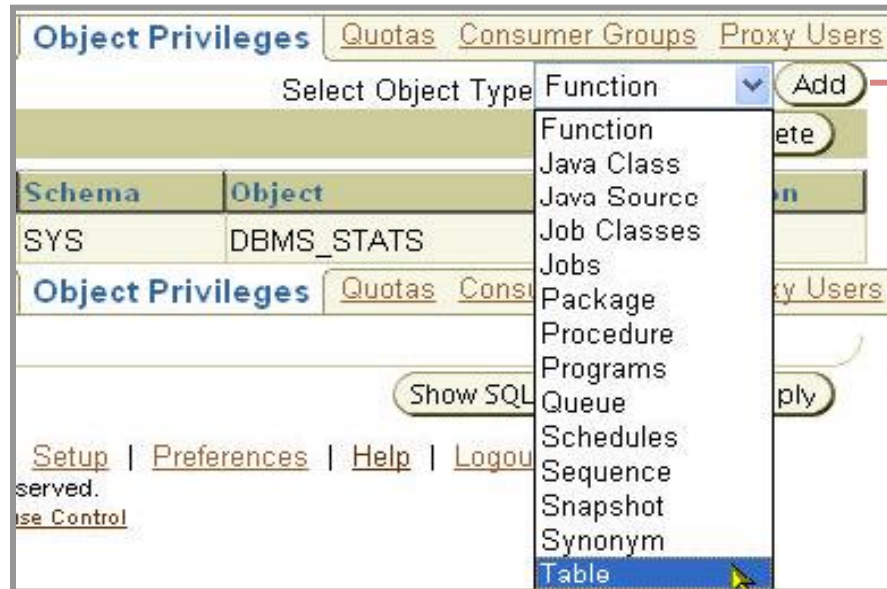
Remove All





# Privileges

## Object Privileges



To grant object privileges:

- Choose the object type
- Select objects
- Select privileges Profiles





# Assigning quota to users

Users who do not have the unlimited tablespace system privilege must be given a quota before they can create objects in a tablespace.

Quotas can be:

- Unlimited
- A specific value in megabytes or kilobytes

**Edit User: HR**

Show SQL Revert Apply

[General](#) [Roles](#) [System Privileges](#) [Object Privileges](#) **Quotas** [Consumer Groups](#) [Proxy Users](#)

Tablespace	Quota	Value	Unit
EXAMPLE	Value <input type="button" value="v"/>	250	MBytes <input type="button" value="v"/>
SYSAUX	None <input type="button" value="v"/>	0	MBytes <input type="button" value="v"/>
SYSTEM	None <input type="button" value="v"/>	0	MBytes <input type="button" value="v"/>
TEMP	None <input type="button" value="v"/>	0	MBytes <input type="button" value="v"/>
UNDOTBS1	None <input type="button" value="v"/>	0	MBytes <input type="button" value="v"/>
USERS (Default)	Unlimited <input type="button" value="v"/>	0	MBytes <input type="button" value="v"/>

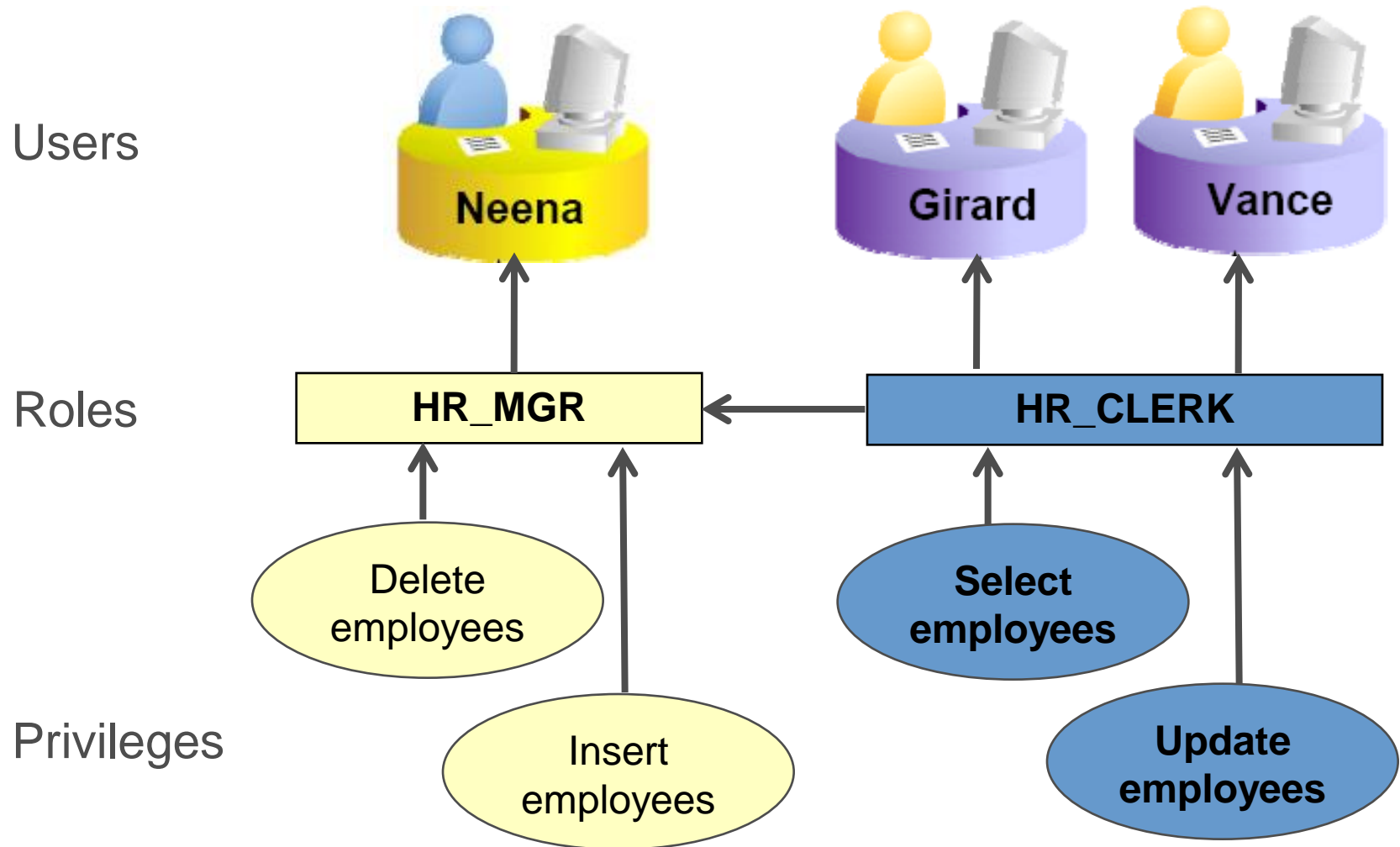






## Roles

### Presentation







# Roles

## Assigning Roles to Users

Database: orcl > Users > Edit User: RIC

### Modify Roles

Available Roles		Selected Roles
AQ_ADMINISTRATOR_ROLE	>	CONNECT
AQ_USER_ROLE	>>	
AUTHENTICATEDUSER	>>>	
CTXAPP	<	
<b>DBA</b>	<<	
DELETE_CATALOG_ROLE	<<<	
DMSYS_ROLE	Remove	
DMUSER_ROLE	Remove All	
DM_CATALOG_ROLE		
EJBCLIENT		





# Roles

## Benefits of Roles

- Easier privilege management
- Dynamic privilege management
- Selective availability of privileges
- Can be granted through the operating system





# Roles

## Predefined Roles

Roles	Privileges
<b>CONNECT</b>	CREATE SESSION, CREATE TABLE, CREATE VIEW, CREATE SYNONYM, CREATE SEQUENCE, CREATE DATABASE LINK, CREATE CLUSTER, ALTER SESSION
<b>RESOURCE</b>	CREATE TABLE, CREATE PROCEDURE, CREATE SEQUENCE, CREATE TRIGGER, CREATE TYPE, CREATE CLUSTER, CREATE INDEXTYPE, CREATE OPERATOR





# Roles

### Predefined Roles (continued)

Roles	Privileges
<b>SCHEDULER_ADMIN</b>	CREATE ANY JOB, CREATE JOB, EXECUTE ANY CLASS, EXECUTE ANY PROGRAM, MANAGE SCHEDULER
<b>DBA</b>	Most system privileges, several other roles. Do not grant to nonadministrators.
<b>SELECT_CATALOG_ROLE</b>	No system privileges but over 1600 object privileges on the data dictionary





# Roles

## Secure Roles

- Roles may be nondefault :

```
SET ROLE vacationdba;
```

- Roles may be protected through authentication:

Create Role

General Roles System Privileges Object Privileges Consumer Groups

\* Name: NewRole

Authentication: None (selected), Password, External, Global

- Roles may also be secured programmatically:

```
CREATE ROLE secure_application_role  
IDENTIFIED USING <security_procedure_name>;
```





# Part 1 Summary

**Creating a  
User**

**Profiles and  
Users**

**Authenticating  
Users**

**Privileges**

**Assigning  
Quota to Users**

**Roles**





## Part 1 Stop-and-think

Do you have any questions?





# Managing Schema Objects





# Preview

- Schemas
- Guidelines for Objects Management
- Data Types
- Managing Tables
- Indexes
- Views
- Sequences





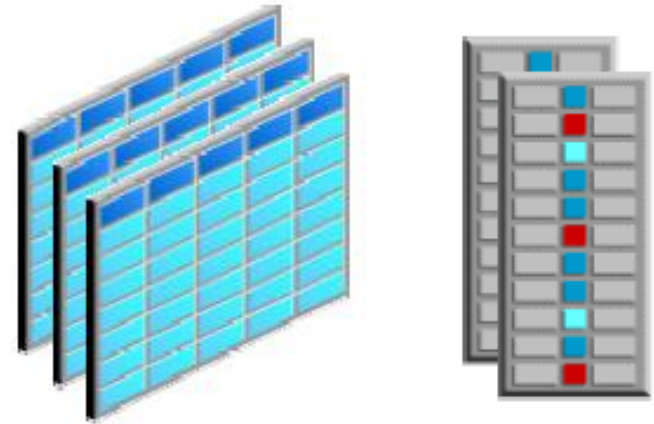
# Schemas

What's a schema?



HR User

Owns



HR Schema





# Schemas

## Database User and schemas

- The collection of objects owned by a user is the schema
- A user can be associated with only one schema
- Username and schema are often used interchangeably

### Schema Objects

Tables  
Triggers  
Indexes  
Views  
Sequences  
Stored program units  
Synonyms  
User-defined data types  
Database links

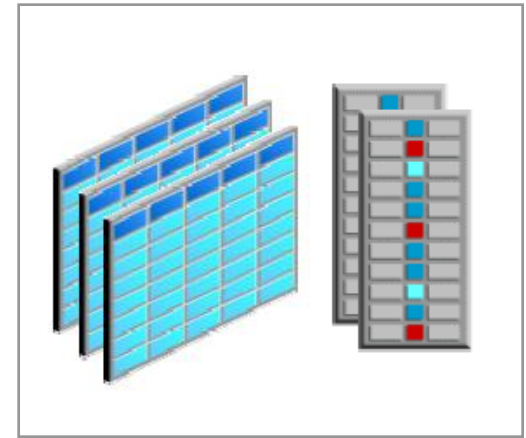
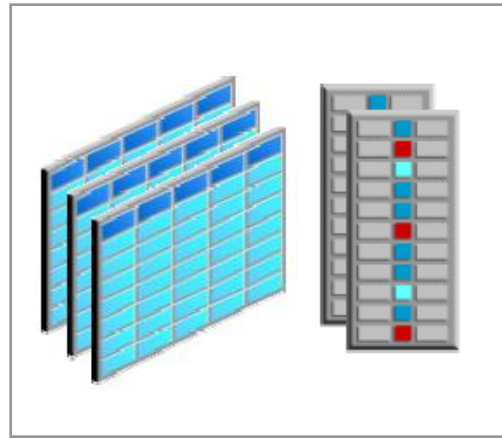
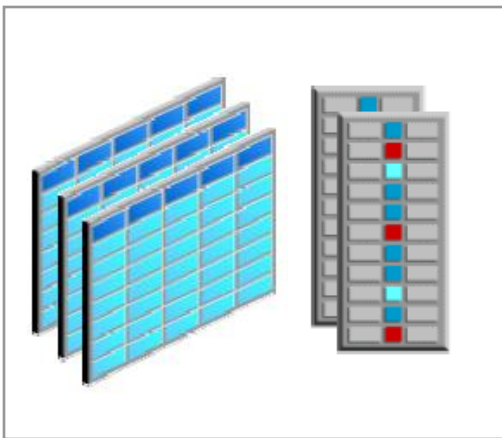




# Schemas

Schemas created as part of the database creation process

- SYS
- SYSTEM
- Sample schemas





# Guidelines for Objects Management

## Global view

Click a link to access the schema objects.

Database: orcl.us.oracle.com

<a href="#">Home</a>	<a href="#">Performance</a>	<a href="#">Administration</a>	<a href="#">Maintenance</a>
----------------------	-----------------------------	--------------------------------	-----------------------------

<b>Instance</b>	<b>Storage</b>
<a href="#">Memory Parameters</a>	<a href="#">Controlfiles</a>
<a href="#">Undo Management</a>	<a href="#">Tablespaces</a>
<a href="#">All Initialization Parameters</a>	<a href="#">Datafiles</a>
	<a href="#">Rollback Segments</a>
	<a href="#">Redo Log Groups</a>
	<a href="#">Archive Logs</a>
	<a href="#">Temporary Tablespace Groups</a>

<b>Schema</b>		
<a href="#">Tables</a>	<a href="#">Packages</a>	<a href="#">Array Types</a>
<a href="#">Indexes</a>	<a href="#">Package Bodies</a>	<a href="#">Object Types</a>
<a href="#">Views</a>	<a href="#">Procedures</a>	<a href="#">Table Types</a>
<a href="#">Synonyms</a>	<a href="#">Functions</a>	
<a href="#">Sequences</a>	<a href="#">Triggers</a>	
<a href="#">Database Links</a>	<a href="#">Java Sources</a>	
	<a href="#">Java Classes</a>	

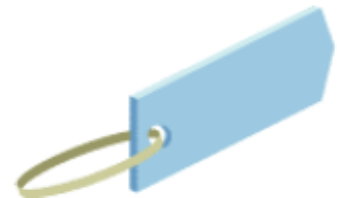




# Guidelines for Objects Management

## Naming database objects

- Names must be from 1 to 30 bytes long with these exceptions:
  - Names of databases are limited to 8 bytes
  - Names of database links can be as long as 128 bytes
- Nonquoted names cannot be Oracle reserved words.
- Nonquoted names must begin with an alphabetic character from your database character set.

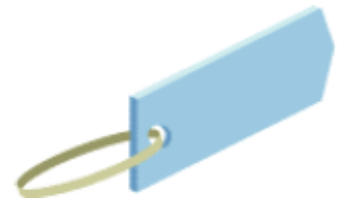




# Guidelines for Objects Management

## Naming database objects (continued)

- Nonquoted names can contain only :
  - Alphanumeric characters from your database character set
  - The underscore ( \_ )
  - Dollar sign ( \$ )
  - Pound sign ( # )
- Two objects can't have the same name within the same namespace





# Guidelines for Objects Management

## Schema Object Namespaces

The following are in the same namespace :

- Tables
- Views
- Sequences
- Private synonyms
- Stand-alone Procedures
- Stand-alone stored Functions
- Packages
- Materialized views
- User-defined types







# Guidelines for Objects Management

## Schema Object Namespaces (continued)

The following have their own namespace :

- Indexes
- Constraints
- Clusters
- Database triggers
- Private database links
- Dimensions





# Data Types

### Common data types

- **CHAR(size)**: Fixed-length character data of length **size** bytes
- **VARCHAR2(size)**: Variable-length character string having maximum length **size** bytes
- **DATE**: Valid date range from January 1, 4712 BC to December 31, 9999 AD
- **NUMBER(p, s)**: Number having precision **p** and scale **s**

ABC



42





# Data Types

### Other data types

- FLOAT
- INTEGER
- NCHAR
- NVARCHAR2
- LONG
- LONG RAW
- RAW
- ROWID
- UROWID
- BLOB
- CLOB
- NCLOB
- BFILE
- TIMESTAMP





# Managing Tables


## Creating and modifying tables


Database: [orcl.us.oracle.com](http://orcl.us.oracle.com) > [Tables](#) > Create Table

### Create Table

**General** [Constraints](#) [Storage](#) [Options](#) [Partitions](#)






\* Name

Schema  

Tablespace   [Estimate](#)

Organization **Standard, Heap Organized**

### Columns

Select	Name	Data Type	Size
<input checked="" type="radio"/>	<input type="text" value="job_id"/>	NUMBER 	<input type="text" value="5"/>
<input type="radio"/>	<input type="text" value="job_title"/>	VARCHAR2 	<input type="text" value="30"/>
<input type="radio"/>	<input type="text" value="min_salary"/>	NUMBER 	<input type="text" value="6"/>
<input type="radio"/>	<input type="text" value="max_salary"/>	NUMBER 	<input type="text" value="6"/>
<input type="radio"/>	<input type="text" value=""/>	VARCHAR2 	<input type="text" value=""/>

[Add 5 Table Columns](#)

Specify the table name and schema.

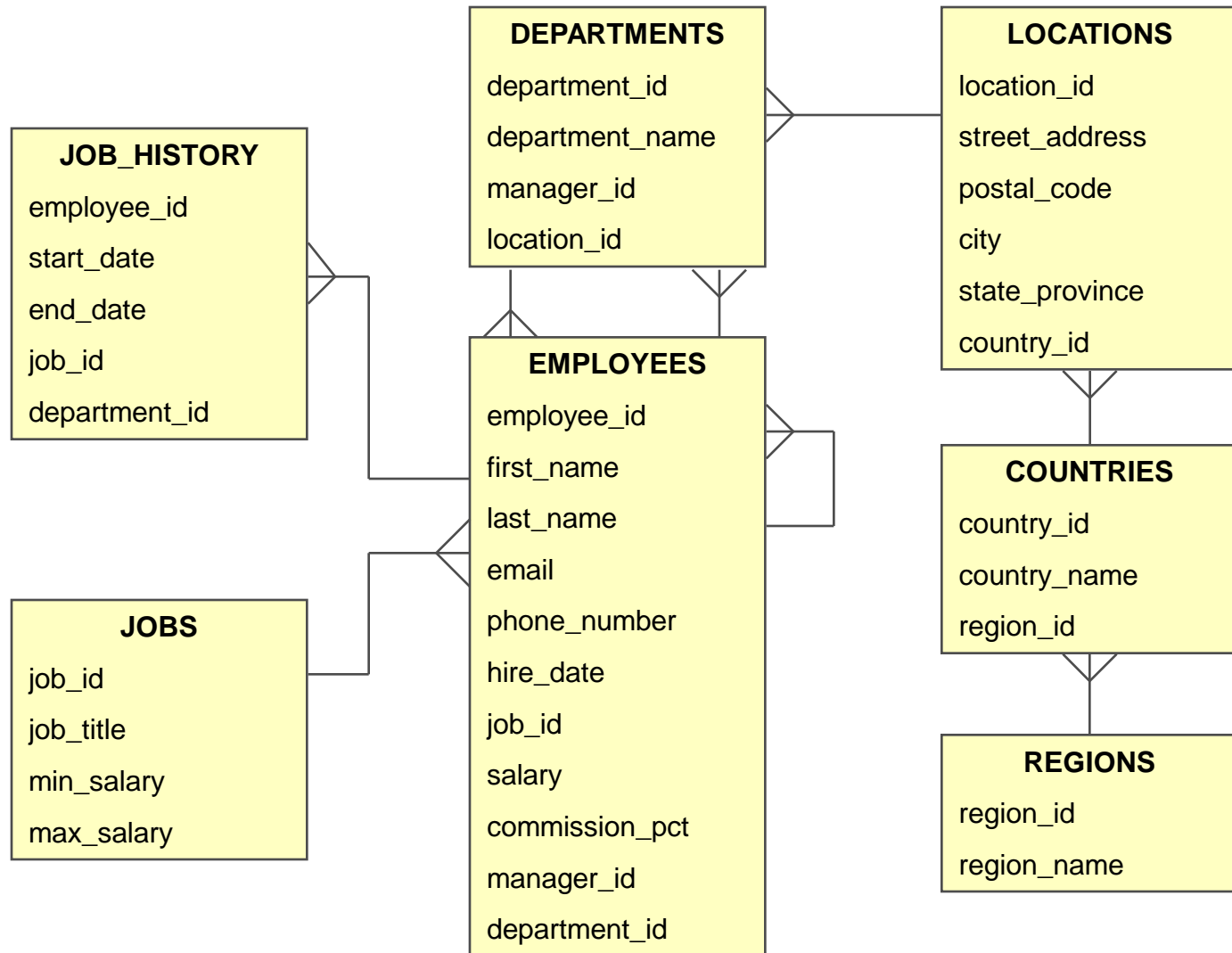
Specify the column names, data types, and lengths.





# Managing Tables

## Understanding Data Integrity





# Managing Tables

## Defining Constraints

Database: [orcl.us.oracle.com](#) > [Tables](#) > Edit Table: HR.COUNTRIES





### Add UNIQUE Constraint

Up to 32 columns can make up a UNIQUE key constraint. The unique key columns constitute a unique key.

**Definition**

Name:

**Table Columns**

Available Columns		Selected Columns
COUNTRY_ID REGION_ID	 Move	COUNTRY_NAME
	 Move All	
	 Remove	
	 Remove All	





# Managing Tables

## Viewing the Attributes of a Table

Database: [orcl.us.oracle.com](http://orcl.us.oracle.com) > [Tables](#) > Edit Table: HR.DEPARTMENTS

### Edit Table: HR.DEPARTMENTS

**General** [Constraints](#) [Segments](#) [Storage](#) [Options](#)

\* Name

Schema

Tablespace

Organization **Standard, Heap Organized**

### Columns

Select	Name	Data Type	Size
<input checked="" type="radio"/>	<input type="text" value="DEPARTMENT_ID"/>	NUMBER <input type="text" value="4"/>	4
<input type="radio"/>	<input type="text" value="DEPARTMENT_NAME"/>	VARCHAR2 <input type="text" value="30"/>	30
<input type="radio"/>	<input type="text" value="MANAGER_ID"/>	NUMBER <input type="text" value="6"/>	6
<input type="radio"/>	<input type="text" value="LOCATION_ID"/>	NUMBER <input type="text" value="4"/>	4
<a href="#">Add 5 Table Columns</a>			





# Managing Tables

## Viewing the Contents of a Table

Database: orcl.oracle.com > Tables > View Data for Table: HR.REGIONS Logged in As SYS

### View Data for Table: HR.REGIONS

Refine Query

OK

Query `SELECT "REGION_ID", "REGION_NAME" FROM "HR"."REGIONS"`

Result

REGION_ID	REGION_NAME
1	Europe
2	Americas
3	Asia
4	Middle East and Africa

Refine Query

OK







# Managing Tables

## Actions with Tables

**Create Index**

**General** | **Storage** | **Options** | **Partitions**

\* Name:

Schema:

Tablespace:  **Estimate Index Size**

Index Type: ☒ Standard - B-tree ☐ Bitmap

**Indexed Table Object**

\* Table Name:  **Populate Columns**

☒ **TIP** The indexed columns and their orders are indicated by the Order field

**Table Columns**

Column Name	Data Type	Sorting Order	Order
EMPLOYEE_ID	NUMBER	ASC	<input type="text"/>
FIRST_NAME	VARCHAR2	ASC	<input type="text"/>
LAST_NAME	VARCHAR2	ASC	<input type="text"/>





# Indexes

## Creating indexes

### Create Index

Show SQLCancelOK

GeneralStorageOptionsPartitions

\* Name

SchemaHR

Tablespace<Default>

Index Type☒ Standard - B-tree☐ Bitmap

Estimate Index Size

#### Indexed Table Object

\* Table NameHR.EMPLOYEES

Populate Columns

☒ TIP The indexed columns and their orders are indicated by the Order field

#### Table Columns

Column Name	Data Type	Sorting Order	Order
EMPLOYEE_ID	NUMBER	ASC	
FIRST_NAME	VARCHAR2	ASC	
LAST_NAME	VARCHAR2	ASC	



# Views

### What's a view?

- Tailored representation of data in a table or view
- Views do not contain data

Base Table:  
employees

EMPLOYEE_ID	LAST_NAME	JOB_ID	MANAGER_ID	HIRE_DATE	SALARY	DEPARTMENT_ID
203	Mavris	HR_REP	101	07-JUN-94	6500	40
204	Baer	PR_REP	101	07-JUN-94	10000	70
205	Higgins	AC_MGR	101	07-JUN-94	12000	110
206	Gietz	AC_ACCOUNT	205	07-JUN-94	8300	110

EMPLOYEE_ID	LAST_NAME	JOB_ID	MANAGER_ID	DEPARTMENT_ID
203	Mavris	HR_REP	101	40
204	Baer	PR_REP	101	70
205	Higgins	AC_MGR	101	110
206	Gietz	AC_ACCOUNT	205	110

View :  
Staff





# Views

## Creating a view


Database: [orcl.us.oracle.com](http://orcl.us.oracle.com) > [Views](#) > Create View Logged in As SYS

### Create View

[Show SQL](#) [Cancel](#) [OK](#)

**General** [Options](#) [Object](#)

\* Name

\* Schema  

Aliases

☒ Replace the view if exists

\* Query Text 

```
SELECT  
EMPLOYEE_ID, LAST_NAME, JOB_ID, MANAGER_ID,DEPARTMENT_ID  
FROM  
EMPLOYEES
```





# Sequences

## What's a sequence?

### Create Sequence

Show SQLCancelOK

#### General

\* Namelocal\_temp\_ID

\* SchemaRIC

Type☒ Ascending☐ Descending

#### Values

\* Maximum Value☐ Value☒ Unlimited

\* Minimum Value☒ Value☐ Unlimited

\* Interval

\* Initial

#### Options

☐ Cycle Values - Sequence will wrap around on reaching limit

☐ Order Values - Sequence numbers will be generated in order

#### Cache Options

☒ Use Cache

Cache Size





# Sequences

## Using a sequence

**Workspace**

Enter SQL, PL/SQL and SQL\*Plus statements.

Clear

```
INSERT INTO local_temp VALUES  
(local_temp_id.nextval, sysdate, 8, 20);
```

Execute Load Script Save Script Cancel

1 row created.





# Part 2 Summary

**Schema**

**Guidelines  
for Objects  
Management**

**Data  
Types**

**Managing  
Tables**

**Indexes**

**Views**

**Sequences**





## Part 2 Stop-and-think

Do you have any questions?



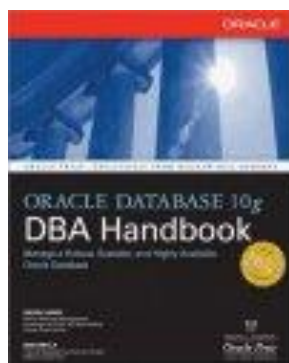
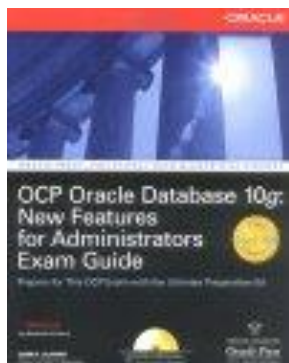




## For more

If you want to go into these subjects more deeply, ...

### Publications



<http://www.oracle.../bookstore/>

### Web sites

<http://www.labo-oracle.com>

<http://www.oracle.com>

<http://otn.oracle.com>

### Courses

Cursus: Merise & SQL

Cursus: PL/SQL

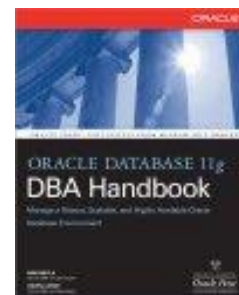
Cursus: DBA1 & DBA2

Cursus: DWH, OAS & BIS

### Certifications

1Z0-042

1Z0-043





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INFORMATION TECHNOLOGY

# **Congratulations**

You have successfully completed  
the SUPINFO course module n°8

**Oracle Technologies  
Administering Users and  
Managing Schema Objects**

# The end

