Cognizant | Academy

Business Focused. Learner Centric.

Introduction to Relational Databases

Creating Tables

Enabling Objectives

After completing this chapter, in the next 45 minutes you will be able to :

- Create at least 1 table using Data Definition Language(DDL) statement on oracle database platform

Key Topics

- Using DDL statements
- Using CRATE TABLE command.
- Using Oracle Datatypes

DDL Statements

Data Definition Language

- DDL refers to "Data Definition Language",
- Creates or modifies the structure of the table

CREATE table object

ALTER table object

DROP table object

Guidelines for creating table

- Table structure once defined can be modified
- Table names must be unique within a database schema
- Column names must be unique within a table
- Tables can be created at any time, even while users are using the database

Guidelines for creating table

- Use descriptive names
- Case sensitivity varies by dbms.
  - Assume case *insensitivity* when making names
  - Assume case *sensitivity* when accessing names

Data Types

- Specifies storage format
- Specifies constraints, and a valid range of values.
- Must to specify a datatype for each columns

```
CREATE TABLE Employee (
      employee_code        char(4),
      employee_name        varchar(50),
      hire_date            date,
      employee_salary      decimal(8,2),
      dept_id              char(2),
     );
```

Common Data Types (MySQL versions)

Data Type	Description
varchar(size)	Variable-length character
char (size)	Fixed-length character data
integer(size) int(size)	32-bit signed int. *size* specifies display size.
decimal(size, d)	Exact fixed-point number. *size* is total digits, *d* is digits after decimal
boolean/bool	numeric boolean (0 is false)
date/datetime	Date and time values
text	String up to 65535 characters
longtext	String up to 4.3B characters

Lend a hand

Create a table Employee on Oracle Database

```
CREATE TABLE Employee (
      employee_code        number(4),
      employee_name        varchar2(20),
      hire_date            date,
      employee_salary      number(7,2),
      dept_id              number(2),
     );
```

Constraints

Constraints

- Constraints are rules enforced
  - At the table and column level
- Enforce rules on the data in a table
  - Whenever a row is inserted, updated or deleted from table
- Prevents deletion of a table
  - If there are dependencies from other tables

Constraints Types

Constraints	Description
Primary Key	Uniquely identifies each row of the table
Foreign Key	Establishes and enforces a referential integrity constraint between the column and a column of referenced table
Check	Specifies a condition that must be true
Unique	Specifies a column whose values must be unique
Not null	Specifies that the column cannot contain a null value

Not Null constraint

Ensures null values are not permitted in a column

```
CREATE TABLE Employee (
e_name          varchar(50) not null,
Salary          decimal(8,2),
hire_date       date  constraint nn_jdate not null
);
```

System Generated name

User defined name

Unique Constraint

- Ensures every value entered is unique at table level
- Allows single null value at table level

```
CREATE TABLE Employee (
e_name          varchar(50) not null,
salary          number(8,2),
e_mail          varchar(50),
hire_date       date constraint nn_jdate not null,
                constraint uq_email unique(e_mail)
);
```

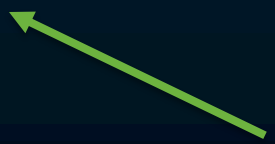


Table level constraint

Primary Key Constraint

- Uniquely identifies each row in the table (ENTITY INTEGRITY)
- One per table
- Can be a single column or a combination of columns
- Enforces uniqueness and not null

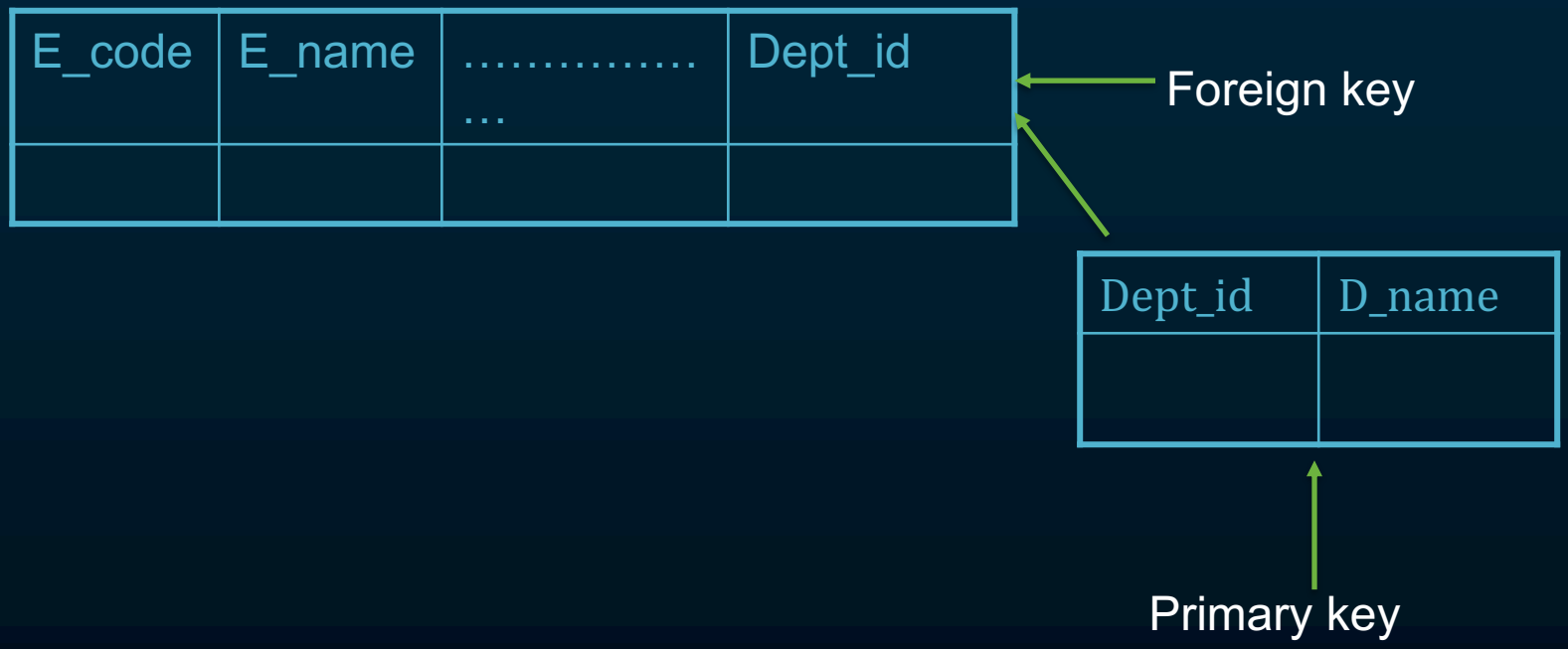
Primary Key Constraint

A unique index is automatically created on primary key column

```
CREATE TABLE Employee(
e_code          char(7) constraint pk_ecode primary key,
e_name          varchar(50) not null,
e_mail          varchar(50),
hire_date       date constraint nn_jdate not null,
                constraint uq_email unique(e_mail)
);
```

Foreign Key Constraint

- Designates a column as foreign key
- Establishes a relationship between a primary key in the same table or a different table .



Foreign Key Constraint

```
CREATE TABLE Department(
dept_id          char(4),
dept_name        varchar(20),
                 constraint pk_dcode primary key
);
```

```
CREATE TABLE Employee(
…….. ,
dept_id           number(4) constraint fk_code
references   department (dept_id));
```

Foreign Key Constraint

- Foreign Key columns reference a Primary Key or Unique
  - column from the same or different table

- By default the referenced column in the parent table cannot be updated or deleted
- ON DELETE options
  - RESTRICT – default. Prevents deletion or updating of PK field if referenced by FK
  - CASCADE – Delete record with FK as well
  - SET NULL – set all referencing FK fields to null
- ON UPDATE Options
  - RESTRICT
  - CASCADE – sets referencing FK values to new PK value
  - SET NULL

Check Constraint

- Checked when ever data is inserted or updated
- Multiple check constraints can be defined on a single column

```
CREATE TABLE Employee(
e_code          char(6) constraint pk_ecode primary key,
e_name          varchar(50) not null,
e_mail          varchar(50),
e_salary        number(8,2),
hire_date       date constraint nn_jdate not null,
                constraint uq_email unique(e_mail) ,
                constraint chk_sal check (e_salary > 0)
);
```

Table Modification

Alter Table

- ALTER TABLE statement is used alter table structure
  - Add new columns
  - Modify existing columns
  - Define default values for new columns
  - Drop a column

```
ALTER TABLE t_name
        ADD | MODIFY (column datatype [DEFAULT EXPR])

ALTER TABLE t_name
DROP (column)
```

Guidelines to ALTER TABLE

- Only one column can be dropped at a time
- The table must have at least one column remaining, after it is altered

```
ALTER TABLE Employee modify (e_code char(7));
```

- Allow to decrease column width only if the column has no values

Alter constraints

- ALTER TABLE statement used to add or drop a constraint
- Not null constraints can only be added using ALTER TABLE MODIFY clause
- Constraint can be enabled or disabled

Lend a hand

- Alter the Employee table created adding following constraints

```
ALTER TABLE Employee add constraint chk_sal
                        check (e_salary > 0);

ALTER TABLE Employee add constraint uq_mail unique( e_mail );

ALTER TABLE Employee add constraint pk_ecode
                    primary key(e_code);
```

Dropping a Table

- DROP table command is used to drop the table structure from the database
- All data and the structure in the table gets deleted

Drop table structure

- Only the creator of the table or a user with DROP ANY TABLE privilege can remove a table

```
Drop table Employee;
```