

Hello, World!

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1. Welcome to Oracle SQL Series

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What we are going to look at

- Introduction to SQL.
- Retrieving data from the database.
- Sorting and limiting retrieved data
- Functions i.e. single-row and group functions.
- Joins and sub queries.
- Creating and modifying database tables.
- Data manipulation.

2. Introduction to SQL

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Introduction to SQL

- We use databases everyday to store and access information.
- Almost all modern apps these days use databases.
- There are different types of databases e.g. relational databases, NoSQL databases, etc.
- Relational databases store data in tables.
- Relational databases use SQL programming language.
- SQL is used in so many areas like data analysis, programming, etc.
- SQL statements come in different categories.

Categories of SQL

- Data Definition Language.
- Data Manipulation Language.
- Transaction Control Language.
- Session Control Language.
- System Control.

3. Oracle Installation

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SQL in Oracle Environment

- There are various types of SQL flavors e.g. Oracle, MySQL, etc .
- They share the same syntax with minor adjustments.
- We shall focus on Oracle environment.
- We need to download the Oracle database installer from the Oracle website.
- Oracle comes with a default hr database.
- To connect to it, we use CONNECT keyword followed by the user account and password.

4. Retrieving Data—SELECT

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Retrieving Data

- Data is stored in database tables.
- We use SELECT to read this data.
- We specify the table in which data is stored.
- We specify columns from which data is selected from.
- The syntax is `SELECT column_name FROM table_name;`
- Table and column names must be correct.
- To check for table names, we use the tab view.
- To check for column names, we use DESCRIBE keyword.

Column Alias

- Help in changing the column heading for a specific column in the output.
- The AS keyword is optional.
- Column alias must be wrapped in double quotes if it is more than one word .
- Column alias must be wrapped in double quotes if we need to maintain the letter casing.
- Can be used during sorting.

5. Sorting Data—ORDER BY

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Sorting Retrieved data.

- We can sort the retrieved data either in ascending or descending order.
- We use the ORDER BY keyword followed by the column we need to base on for sorting.
- By default results are sorted in ascending order.
- We can use column alias or column positions during sorting.
- The ORDER BY keyword must always be the last in any SELECT statement.
- We can also sort for NULLS [NULLS FIRST or NULLS LAST]

6. Filtering Data—WHERE

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Limiting Retrieved data.

- We can limit the data retrieved by specifying a condition.
- We use the WHERE clause for this case.
- It comes after the table name followed by a condition.
- Only data matching a specific condition is returned .
- WHERE clause is accompanied by operators i.e. comparison operators [$>$, $<$, $>=$, $<=$, $=$, \neq , ANY, ALL], logical operators [AND, OR, NOT] and other operators [IN, NOT IN, BETWEEN, LIKE, IS NULL, IS NOT NULL, DISTINCT.]

7. Functions—Single Row

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Single-row functions.

- A function is a program called upon whenever needed.
- We use functions to perform different tasks with the data.
- Single-row functions work on a single row of data.
- They are grouped into character functions [UPPER, LOWER, INITCAP, CONCAT, LENGTH, LPAD, RPAD, LTRIM, RTRIM, SUBSTR, REPLACE], number functions [ABS, FLOOR, CEIL, ROUND], null handling functions [NVL, NVL2], date functions [SYSDATE, MONTHS_BETWEEN, ADD_MONTH

8. Functions—Group

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Group functions.

- Sometimes referred to as aggregate functions.
- They work on multiple rows and return a single value.
- They include MAX, MIN, COUNT, AVG, etc.
- We can use group functions to group data using GROUP BY keyword.
- When the group function columns are mixed with non-group function columns, we include all the non-group function columns in the GROUP BY clause.
- To filter the grouped results, we use HAVING keyword.

9. Joins

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Joins

- Sometimes the data we need is in different tables.
- We use joins to get data from multiple tables.
- We use the JOIN keyword to join two tables followed by USING keyword.
- We must have a common column that is indicated in the USING clause.
- Inner joins returns data in matched rows from both tables i.e. table A and table B.
- Left outer join returns all records from table A regardless whether there is a matching record in table B

Joins ...

- Right join returns all records from table B regardless whether there is a matching record in table A.
- Full join returns all records from both tables regardless whether there is a matching row in either tables or not.

10. Sub queries

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Sub queries

- It is a query within a query.
- Sometimes the data we need cannot be got using a single query.
- For example, if we need to know the employees who earn an average salary.
- The inner query is first worked on.
- Then the results of the inner query is used to work on the outer query.

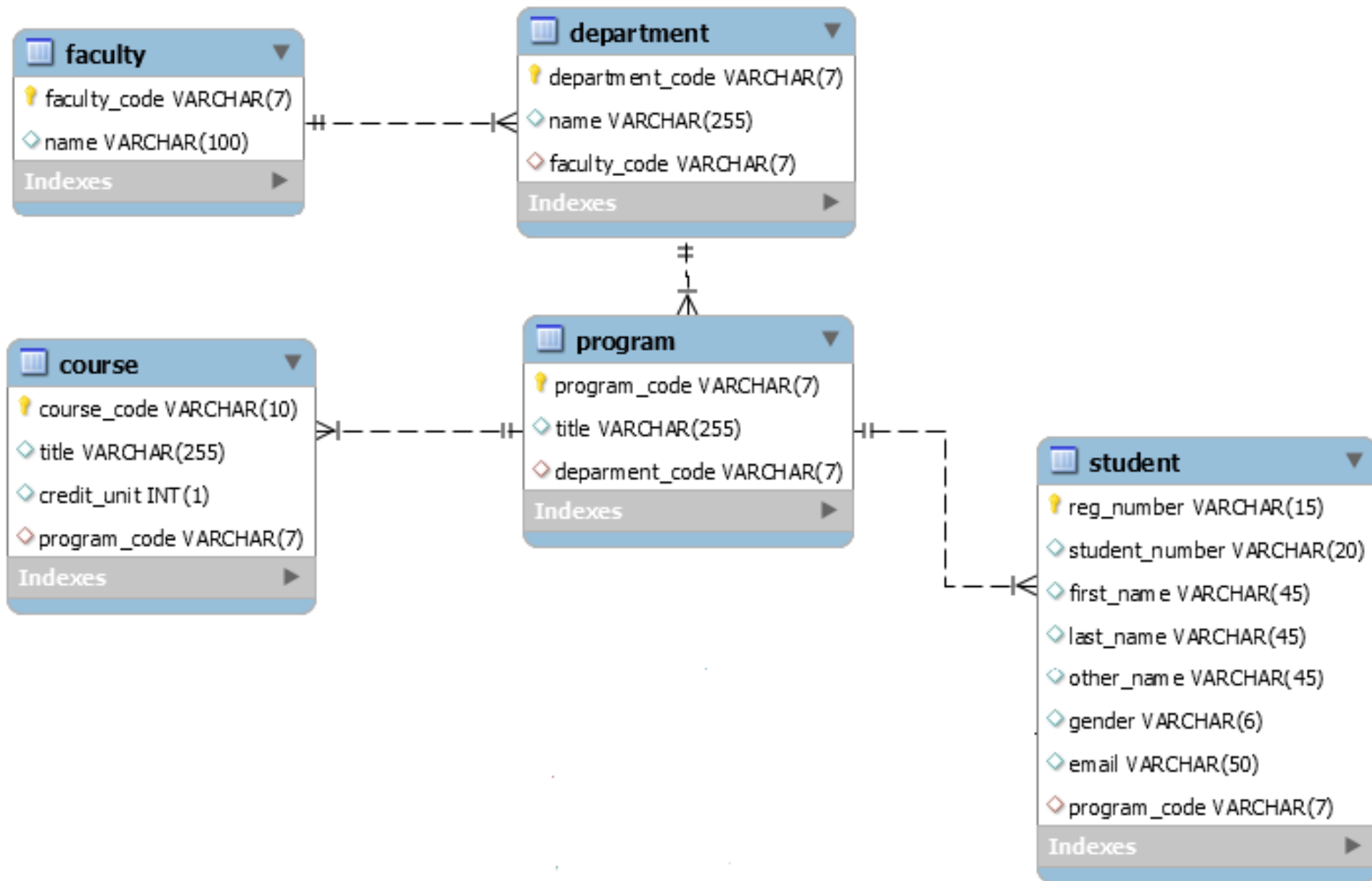
11. Creating Tables

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Creating Tables.

- We can create our own tables.
- We use the CREATE TABLE keyword.
- `CREATE TABLE table_name (column_name datatype (no. of characters) {constraint});`
- Common data types include VARCHAR2, NUMBER, DATE, TIMESTAMP
- Constraints include PRIMARY KEY, NOT NULL, NULL, FOREIGN KEY, UNIQUE.
- We can create tables from existing tables.



12. Modifying Tables

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Modifying Tables.

- Sometimes we need to make changes to created tables.
- When modifying the table attributes, we use ALTER TABLE keyword e.g. adding columns, changing column data type and length, renaming columns, dropping columns, etc. .
- To add column column, we use ALTER TABLE tablename ADD column_attributes;
- To rename column, we use ALTER TABLE tablename RENAME COLUMN oldcolumn TO newcolumn;
- To rename tables, we use RENAME keyword i.e. RENAME oldtablename TO newtablename.
- To delete a table, we use DROP keyword i.e. DROP table_name;

12. Data Manipulation

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Data Manipulation.

- After creating tables, we can begin using them.
- To enter data, we use the INSERT keyword.
- To update records, we use UPDATE keyword.
- To delete records, we use DELETE keyword or TRUNCATE keyword..
- To save changes, we use COMMIT.
- To discard the changes, we use ROLLBACK.

Thank you!

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