**Altering Tables in SQL**

The **ALTER TABLE** statement in SQL is used to **modify an existing table** by adding, deleting, or changing columns, constraints, or indexes.

**Adding a Column**

To add a new column to an existing table, use the following syntax:

*ALTER TABLE table\_name*

*ADD column\_name datatype;*

**For example:** Add a DateOfBirth column to the student’s table

*ALTER TABLE Students*

*ADD DateOfBirth DATE;*

**Modifying a Column**

To change the data type or constraints of an existing column:

*ALTER TABLE table\_name*

*MODIFY column\_name new\_datatype;*

**For example:** Change the PhoneNumber column to VARCHAR (15)

*ALTER TABLE Students*

*MODIFY PhoneNumber VARCHAR (15);*

**Nb**: **For SQL Server and PostgreSQL use *ALTER COLUMN* instead of *MODIFY***

*ALTER TABLE Students*

*ALTER COLUMN PhoneNumber VARCHAR (15);*

**Renaming a Column**

To rename a column in a table:

*ALTER TABLE table\_name*

*RENAME COLUMN old\_name TO new\_name;*

**For example:** Rename PhoneNumber to ContactNumber

*ALTER TABLE Students*

*RENAME COLUMN PhoneNumber TO ContactNumber;*

**Nb: For SQL Server use: EXEC sp\_rename 'Students.PhoneNumber', 'ContactNumber', 'COLUMN'.**

**Deleting (Dropping) a Column**

To remove a column from a table:

*ALTER TABLE table\_name*

*DROP COLUMN column\_name;*

**For example:** Remove the DateOfBirth column from Students

*ALTER TABLE Students*

*DROP COLUMN DateOfBirth;*

**Adding a Primary Key**

If a table doesn’t have a primary key, you can add one:

*ALTER TABLE table\_name*

*ADD CONSTRAINT constraint\_name PRIMARY KEY (column\_name);*

**For example:** Set StudentID as the primary key

*ALTER TABLE Students*

*ADD CONSTRAINT pk\_student PRIMARY KEY (StudentID);*

**Adding a Foreign Key**

To create a relationship between two tables:

*ALTER TABLE table\_name*

*ADD CONSTRAINT constraint\_name*

*FOREIGN KEY (column\_name) REFERENCES parent\_table(column\_name);*

**For example:** Link CourseID in Enrollments to Courses table

*ALTER TABLE Enrollments*

*ADD CONSTRAINT fk\_course FOREIGN KEY (CourseID) REFERENCES Courses(CourseID);*

**Dropping Constraints**

To remove a constraint from a table:

*ALTER TABLE table\_name*

*DROP CONSTRAINT constraint\_name;*

**Example:** Remove the primary key constraint from Students

*ALTER TABLE Students*

*DROP CONSTRAINT pk\_student;*

**Renaming a Table**

To change the table name:

*ALTER TABLE old\_table\_name*

*RENAME TO new\_table\_name;*

**Example:** Rename table Students to Learners.

*ALTER TABLE Students*

*RENAME TO Learners;*

**Nb: For SQL Server, use: EXEC sp\_rename 'Students', 'Learners';**

**SQL Rules and Conventions**

* Certain ‘**keywords’** are ‘**reserved’** and have special meaning in SQL e.g.: SELECT, FROM, DATE.
* Names can be made from:

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* SQL statement all end with semicolon “**;**”.

**SELECT Statement**

The **SELECT** statement is used to **retrieve data** from a database.

To Retrieves all records from a table:

*SELECT \* FROM table\_name;*

**Example:** Get all records from the Courses table:

*SELECT \* FROM Courses;*

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**Retrieves specific columns:**

*SELECT column1, column2 FROM table\_name;*

**Example**

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**WHERE Clause (Filtering Data)**

The **WHERE** clause is used to **filter** records based on conditions.

*SELECT column1, column2*

*FROM table\_name*

*WHERE condition;*

**Example:** Get courses that have coursecode of C004:

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**Operators in SQL**

WHERE clauses use some simple form of mathematical operators.

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**Logical Operator in SQL**

In addition to the mathematical operators, you can use the logical operators to create compound statements:

* **AND:** Both conditions must be true
* **OR**: At least one condition must be true
* **NOT**: Negates a condition

**Example of AND operator in SQL**

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**Example of OR operator in SQL**

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**Example of NOT operator in SQL**

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