

Assignment Project Exam Help

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What is SQL?

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 SQL was initially developed at IBM (SEQUEL → SQL), as one of the first commercial languages for the relational data model.

1986 – SQL was standardised by ANSI and ISO (~ SQL-86).

1989 – SQL was standardised by ANSI and ISO (~ SQL-86).

1992 – SQL was strengthened and much expanded (→ SQL-92).

optional specialised packages (SQL:1999).

- 2003 SQL was further expanded, e.g., XML support (→ SQL:2003).
- 2011 SQL was further expanded, e.g., improved support for temporal databases (→ SQL:2011).



What is SQL?

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SQL provides an interface to relational database systems, including:

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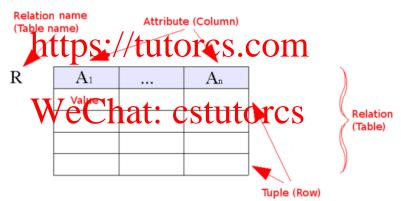
Data Manipulation Language (DML);

Transaction Control Language (TCL).



Relational Data Model and SQL

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Data Definition Language

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Data Definition Language – Create Table

Assignment Project Exam Help specifying its name, its attributes and, optionally, its constraints.

CREATE TABLE table_name

https://www.large.constraints],

attribute_name data_type [attribute constraints],

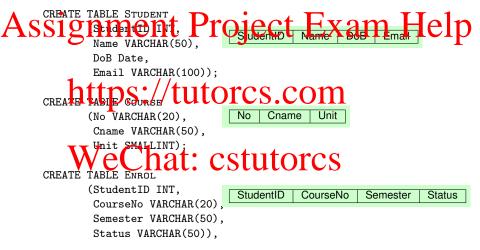
[table constraints]);

• For each attribute in a relation, we specify its name, its type and, optionally, a constraint specific to the attribute (i.e., attribute constraint).

attribute_name data_type [attribute_constraint]



Create Table – Example





Attribute Data Types

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 FLOAT or REAL, and DOUBLE PRECISION provide floating point numbers of various precisjon.

nureración of periodición parameters precision i and scare :

- precision for the total number of digits;
- scale for the number of digits following the decimal point.
- String types

 And the last of the dangth Sylver n is the number
 - CHARMA CHARACTER STRINGS WITH KECKENGTH Where n is the number of characters.
 - VARCHAR(n) allows character strings of varying length, where n is the maximum number of characters.
 - BIT(n) allows bit strings of fixed length, where n is the number of bits.
 - BIT VARYING(n) allows bit strings of varying length, where n is the maximum number of bits.



Attribute Data Types

Assignation the provides date values (year, month, day).

- TIME provides time values (hour, minute, second).
- TIMESTAMP includes the DATE and TIME fields, plus a minimum of six positions for seconds and an optional WITH TIME ZONE qualifier.

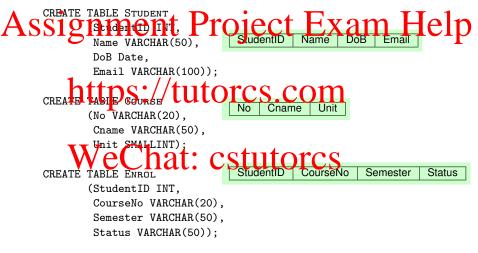
 THE WAL specifies a relative value that can be used to increment or decrement a value of a date, time or timestamp.
- Boolean type: has the values of TRUE or FALSE.
- The MATA TO LONA IN Statemen is State to treat a comain that is essentially a specific data type.

```
CREATE DOMAIN domain_name AS data_type
    [default expression][constraint,...,constraint];
```

Example: CREATE DOMAIN ssn_type AS CHAR(9);



Attribute Data Types – Example





Attribute Constraints

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NOT NULL: specify that NULL is not allowed for an attribute.

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UNIQUE: ensure that uniqueness of the values for an attribute or a set ____of_attribute in a table.

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FOREIGN KEY: enforce referential integrity between two tables.

INDEX: provides accelerated access to the rows of table.



Attribute Constraints – Not Null, Default and Check

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Cname VARCHAR(50) NOT NULL,
Unit SMALLINT NOT NULL Default 6);

CREATH TABLES S. COM

(StudentID INT NOT NULL CHECK (StudentID>0),

CourseNo VARCHAR(20) NOT NULL, Semester VARCHAR(50) NOT NULL,

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- If we don't want to have missing and unknown data, we can specify NOT NULL for attributes to forbid NULL values.
- Unit of any new tuple in Course is set to 6 if no explicit value is provided.
- CHECK() for StudentID excludes the student IDs such as 0 and -37.



Attribute Constraints – Unique and Primary Key

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Cname VARCHAR(50) UNIQUE,
Unit SMALLINT NOT NULL Default 6);

CREATE TABLE ENROW / TUTOTCS.COM

(StudentID INT NOT NULL CHECK (StudentID>0),

CourseNo VARCHAR(20) NOT NULL,

Semester VARCHAR(50) NOT NULL,

Vertical Varchar (50), C. Sture (10 Telester),

...);

- If a primary key contains only one attribute, PRIMARY KEY can be defined as an attribute constraint (e.g., in COURSE); otherwise it is defined as a table constraint (e.g., in ENROL).
- PRIMARY KEY specifies a key while UNIQUE specifies additional keys.



Attribute Constraints – Foreign Key

CREATE TABLE STUDENT Project Exam Help DoB Date. Email VARCHAR(100)); appearing in ENROL must exist in STUDENT. Cname VARCHAR(50), Unit SMALLINT); Every CourseNo at: CStuto appearing in ENROL must exist in Course. StudentID INT, CourseNo VARCHAR(20), Semester VARCHAR(50), Status VARCHAR(50));



Attribute Constraints – Foreign Key

CREATE TABLE STUDENT Project Exam Help DoB Date, Email VARCHAR(100)); torcs count in Enrol references Cname VARCHAR(50), StudentID in STUDENT. Unit SMALLINT): CourseNo in ENROL at: cstutogerses StudentID INT. CourseNo VARCHAR(20), Semester VARCHAR(50), Status VARCHAR(50). FOREIGN KEY(StudentID) REFERENCES STUDENT(StudentID), FOREIGN KEY(CourseNo) REFERENCES COURSE(No));



Attribute Constraints – Foreign Key

SSigi Course No Varchar (20) ject Exam Help

Semester VARCHAR(50), Status VARCHAR(50),

FOREIGN KEY (StudentID) REFERENCES STUDENT (StudentID),
FOREIGN KEY (StudentID) REFERENCES (STUDENT (StudentID));

CREATE TABLE STUDENT

StudentID INT PRIMARY KEY,

Wigner (VARCHARGED), CStut

Email VARCHAR(100));

CREATE TABLE COURSE

(No VARCHAR(20) PRIMARY KEY, Cname VARCHAR(50), Unit SMALLINT); Can we define ENROL before STUDENT and COURSE?

COURSE?

COURSE?

No. ENROL has the foreign keys that reference STUDENT and

COURSE.



Attribute Constraints – Index

Assignment Project Exam Help key.

CREATE INDEX index1 ON CUSTOMER (Name, DOB);

CREATE UNIQUE INDEX index2 ON CUSTOMER (Phone);



Data Definition Language – Alter and Drop Table

Assignment Project Exam Help The TLTER TABLE statement is used to modify an existing relation schema,

■ The—XLTER TABLE statement is used to modify an existing relation schema, including:

changing the name of a table;

nation Scioop in the trinkers. Com

- changing the definition of an attribute;
- adding or dropping table constraints.

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 The DROP TABLE statement is used to remove an existing relation schema from a database schema.



Data Definition Language – Alter and Drop Table

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ALTER TABLE CUSTOMER ALTER COLUMN Address SET NOT NULL;

- Add a UNIQUE constraint:

 ALTER LAPLE COSTOMER ADD UNIQUE (Phone), OM
- Add a check() constraint:

```
ADTER TABLE CUSTOMER ADD CONTRAINT CST Live_d Strok to StmC15 > 0);
```

Add a Foreign Key constraint:

```
ALTER TABLE ENROL
ADD FOREIGN KEY(StudentID) REFERENCES Student(StudentID);
```



Data Definition Language – Alter and Drop Table

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Add an attribute EMAIL into the table CUSTOMER:

ALTER TABLE CUSTOMER ADD Email VARCHAR(100);

- ALTER TABLE CUSTOMER DROP COLUMN Email:
- Drop the table ENROL:

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Drop the table Customer (if exists):

DROP TABLE IF EXISTS CUSTOMER;