UNIVERSITY OF TWENTE.



Basic SQL

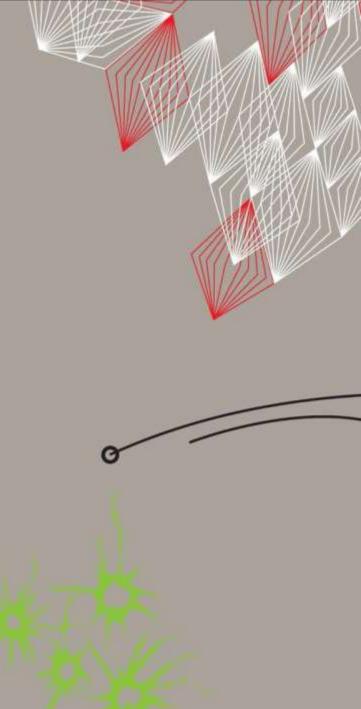
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SQL

- Data types
- Data definition
- Data manipulation
- Data retrieval





SQL Data typesNumeric Types

Name	Storage Size	Description	Range	
smallint	2 bytes	2 bytes small-range integer -32768 to +32767		
integer	4 bytes	typical choice for integer	-2147483648 to +2147483647	
bigint	8 bytes	large-range integer	-9223372036854775808 to 9223372036854775807	
decimal	variable	user-specified precision, exact up to 131072 digits before the decimal point; up to 16383 digits after the decimal point		
numeric	variable	user-specified precision,exact	up to 131072 digits before the decimal point; up to 16383 digits after the decimal point	
real	4 bytes	variable- precision,inexact	6 decimal digits precision	
double precision	8 bytes	variable- precision,inexact	15 decimal digits precision	
smallserial	2 bytes	small autoincrementing integer	1 to 32767	
serial	4 bytes	autoincrementing integer	1 to 2147483647	
bigserial	8 bytes	large autoincrementing integer	1 to 9223372036854775807	



Source: PostgreSQL - Data Type (tutorialspoint.com)



SQL Data types

Monetary Types, Character Types, and Boolean

Name	Storage Size	Description	Range
money	8 bytes	currency amount	-92233720368547758.08 to +92233720368547758.07

S. No.	Name & Description		
1	character varying(n), varchar(n) variable-length with limit		
2	character(n), char(n) fixed-length, blank padded		
3	text variable unlimited length		





Source: PostgreSQL - Data Type (tutorialspoint.com)



SQL Data types

Date/Time Types

Name	Storage Size	Description	Low Value	High Value
timestamp [(p)] [without time zone]	8 bytes	both date and time (no time zone)	4713 BC	294276 AD
TIMESTAMPTZ	8 bytes	both date and time, with time zone	4713 BC	294276 AD
date	4 bytes	date (no time of day)	4713 BC	5874897 AD
time [(p)] [without time zone]	8 bytes	time of day (no date)	00:00:00	24:00:00
time [(p)] with time zone	12 bytes	times of day only, with time zone	00:00:00+1459	24:00:00-1459
interval [fields] [(p)	12 bytes	time interval	-178000000 years	178000000 years



Source: PostgreSQL - Data Type (tutorialspoint.com)



SQL Data types

Other data types in PostgreSQL

- Geometric Types
- Network Address Type
- Bit String Type
- Text Search Type
- UUID Type
- XML Type
- JSON Type
- Array Type





SQL Data Definition

CREATE TABLE

```
CREATE TABLE student (
    student_name CHAR (32),
    student_age integer,
    city CHAR (100),
    PRIMARY KEY (student_name)
);
```





Data Definition

DROP TABLE

DROP TABLE student;

ALTER TABLE

```
ALTER TABLE student ADD student_address CHAR (100);
ALTER TABLE student DROP student_address;
ALTER TABLE student ALERT ID CHAR(10);
```





INSERT – Add rows of data to a table

```
General form:
    INSERT INTO 
        [(<column1> [, <column2>]...)]
    VALUES
        (<constant> [<constant>]...);

Example:
    INSERT INTO student
        (student_name, student_age, city)
    VALUES
        ('Fredrik', 82, 'Enschede');
```





UPDATE – Change/modify existing rows in a table

```
General form:
```





DELETE – Remove rows from a table

```
General form:
```

```
DELETE FROM 
[WHERE <condition>];
```

Example:

```
DELETE FROM student
WHERE student_name = 'Fredrik';
```





Constraints are used to make sure that the integrity of the database is kept.





Data retrieval

```
SELECT - Retrieve rows from one (or more) table(s)
General form:
    SELECT * | <column>[, <column>...]
    FROM 
    [WHERE <condition>]
    [GROUP BY <column> [HAVING <condition>]]
    [ORDER BY <column>];
Example:
    SELECT *
    FROM student
    WHERE student_name = 'Fredrik';
Result:
```





QUESTIONS?



