



Exploring SQL Basics

```
Lookup.KeyValue  
f.constant(['em  
=tf.constant([0  
.lookup.StaticV  
  
buckets=5)
```

Overview

1. Introduction to Database and RDBMS
2. Understanding SQL
3. Types of SQL Commands
4. Basic SQL Query Example
5. Introducing PostgreSQL and Comparison with Other Database
6. Data Types in PostgreSQL



Introduction to Database and RDBMS

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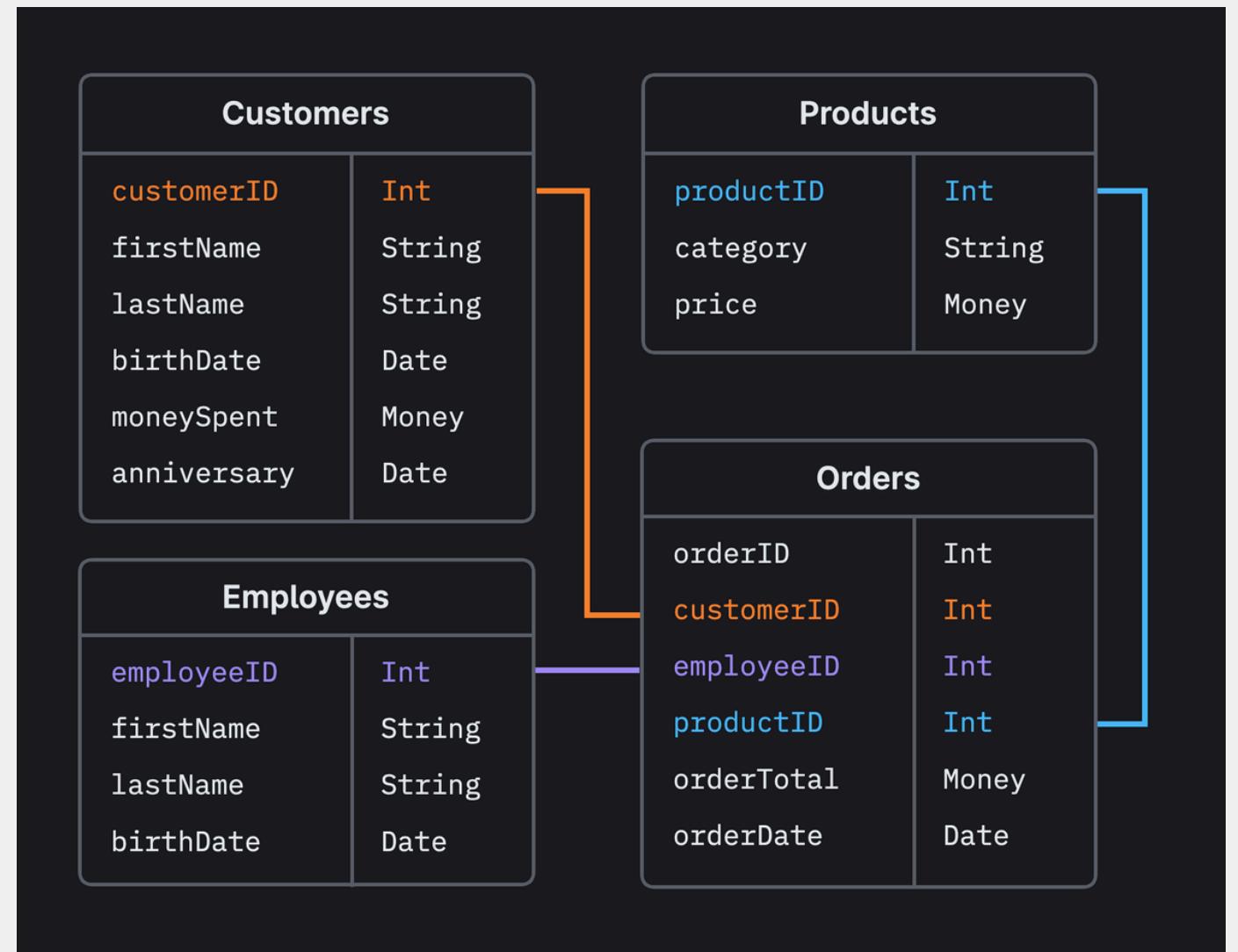
What is a Database?

- Kumpulan data terstruktur yang memungkinkan pengambilan, penyisipan, dan penghapusan informasi secara efisien
- Dianggap sebagai sistem pengarsipan digital untuk mengorganisir data agar mudah diakses dan dikelola
- Database biasanya dikelola oleh software yang dikenal sebagai Database Management System (DBMS) untuk membuat, memodifikasi, dan mengkueri basis data sambil mengelola keamanan dan kontrol akses



What is a RDBMS?

- Relational Database Management System (RDBMS) mengorganisir data ke dalam tabel (relasi) yang terdiri dari baris dan kolom
- Setiap tabel mewakili entitas tertentu
- Relasi antara tabel ditetapkan melalui key (primary key dan foreign key)



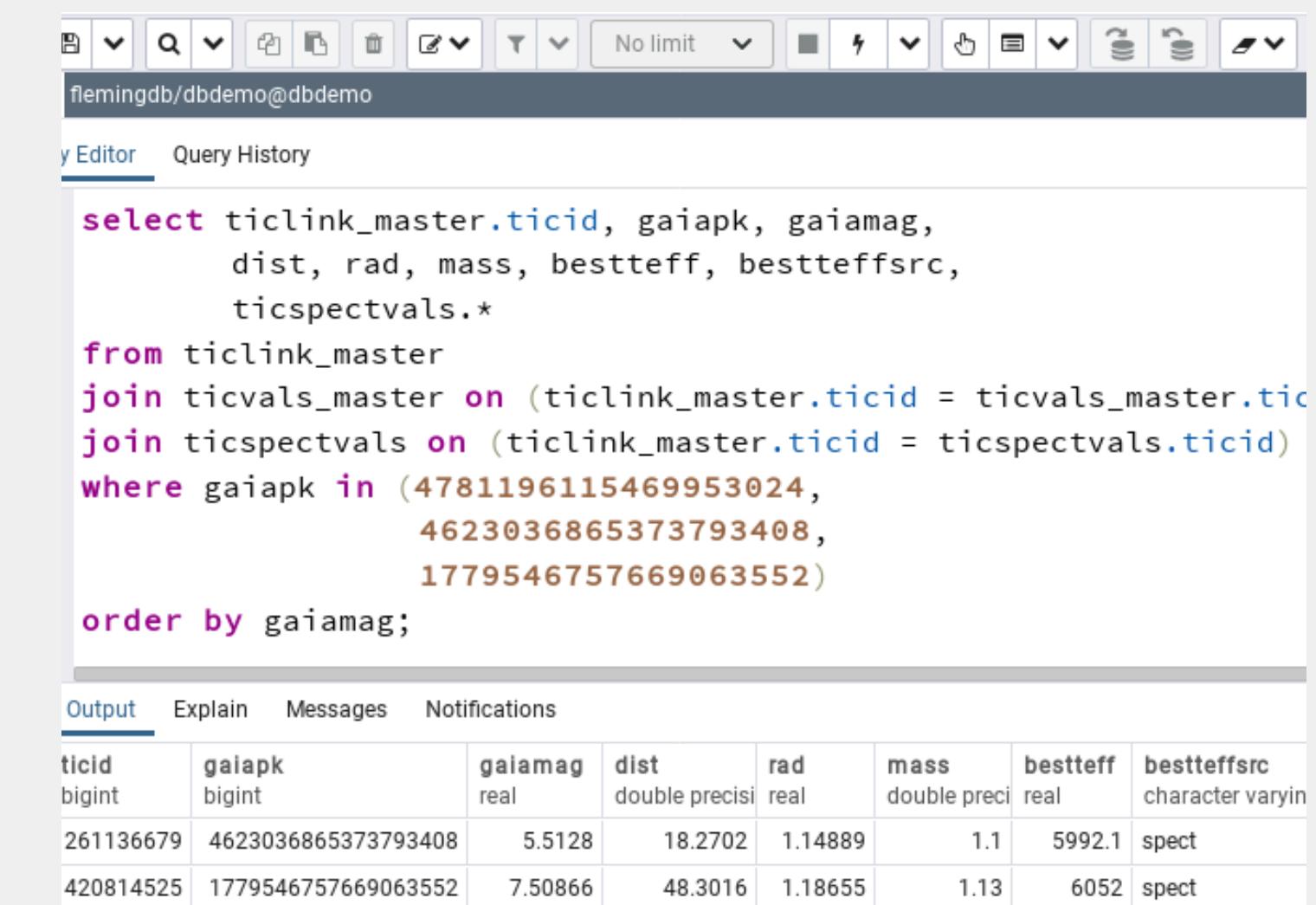


Understanding SQL

```
Lookup.KeyValue  
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```

Understanding SQL

- Structured Query Language (SQL)
- SQL dapat digunakan untuk berbagai tugas seperti membangun database atau tabel, memasukkan data, memperbarui data, menghapus data, mengambil data, serta mengelola hak akses dalam database
- Membuat basis data dan tabel
- Bahasa standar yang digunakan di berbagai RDBMS seperti MySQL, Oracle, PostgreSQL, dan Microsoft SQL Server
- Sintaks yang sederhana dan mudah dibaca manusia



The screenshot shows a SQL query editor interface. At the top, there's a toolbar with various icons. Below it is a connection bar showing 'flemingdb/dbdemo@dbdemo'. The main area has tabs for 'Query Editor' (which is selected) and 'Query History'. A pink-colored SQL query is pasted into the editor:

```
select ticlink_master.ticid, gaiapk, gaiamag,
       dist, rad, mass, bestteff, bestteffsrc,
       ticspectvals.*
  from ticlink_master
 join ticvals_master on (ticlink_master.ticid = ticvals_master.ticid)
 join ticspectvals on (ticlink_master.ticid = ticspectvals.ticid)
 where gaiapk in (4781196115469953024,
                  4623036865373793408,
                  1779546757669063552)
   order by gaiamag;
```

Below the query, there are tabs for 'Output', 'Explain', 'Messages', and 'Notifications'. The 'Output' tab is selected and displays a table with the results of the query:

ticid	gaiapk	gaiamag	dist	rad	mass	bestteff	bestteffsrc
bigint	bigint	real	double precision	real	double precision	real	character varying
261136679	4623036865373793408	5.5128	18.2702	1.14889	1.1	5992.1	spect
420814525	1779546757669063552	7.50866	48.3016	1.18655	1.13	6052	spect

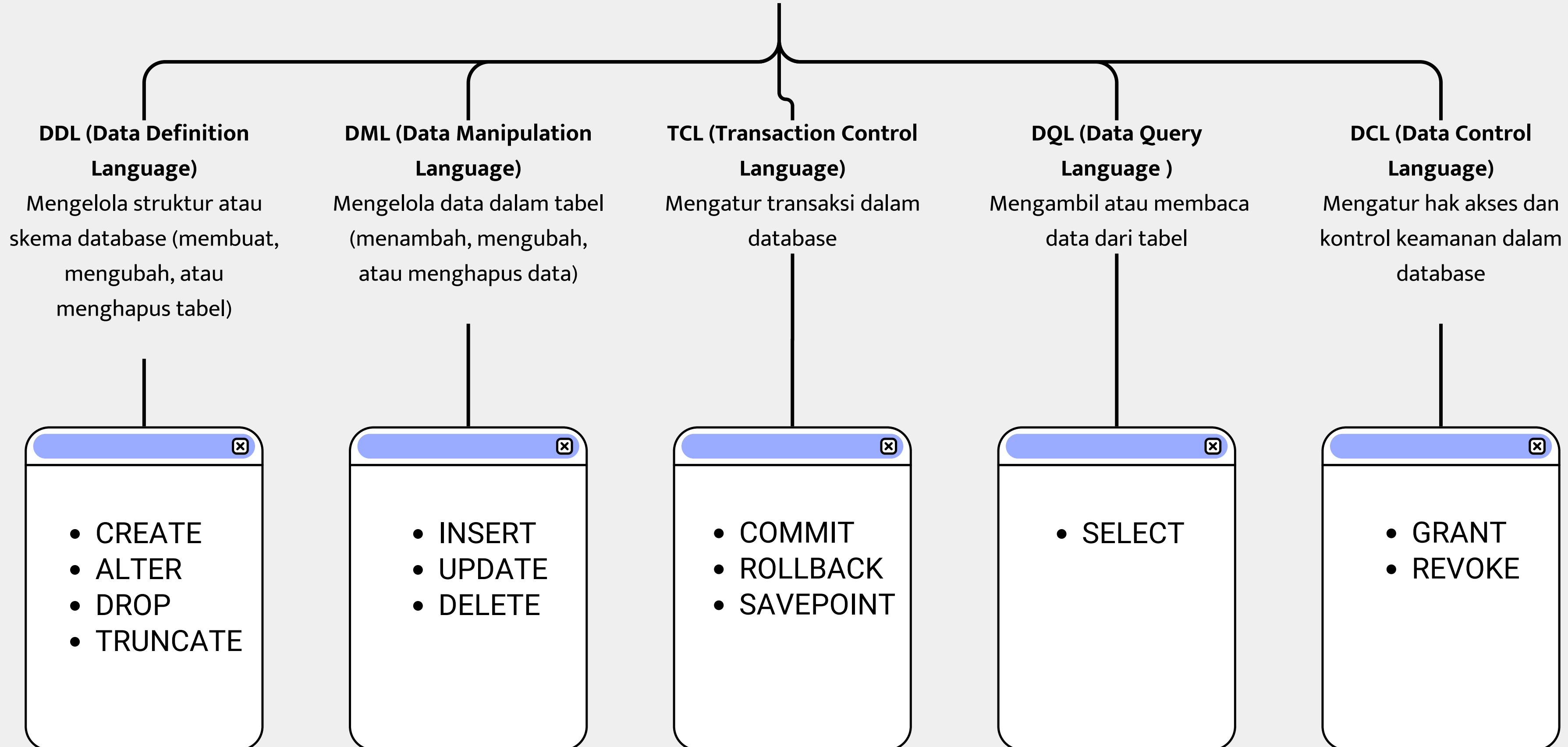


Types of SQL Commands

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```
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```

Types of SQL Commands



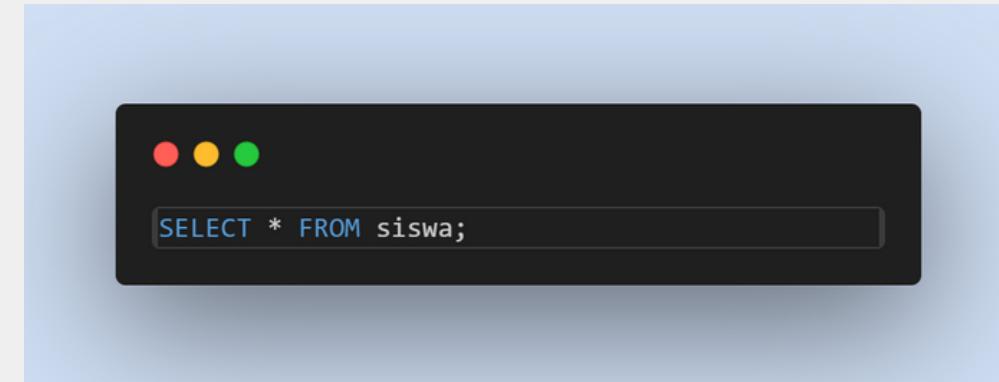


Basic SQL Query Example

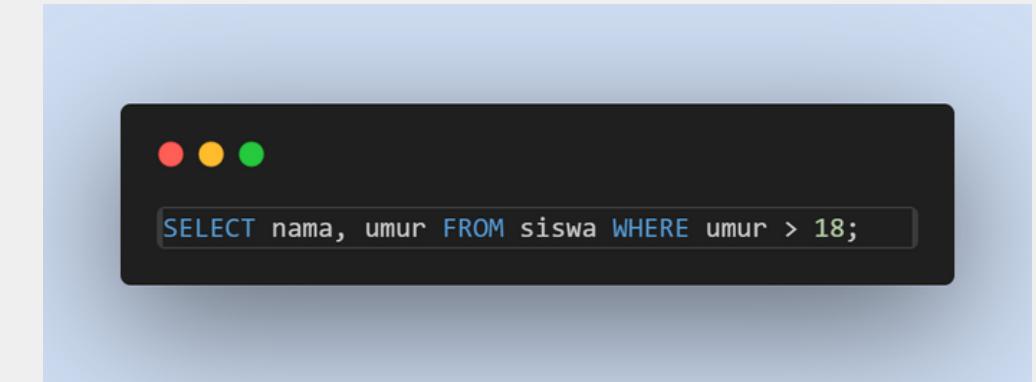
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```

Basic SQL Query Example

- **Select Data:** Perintah ini mengambil semua catatan dari tabel “siswa”

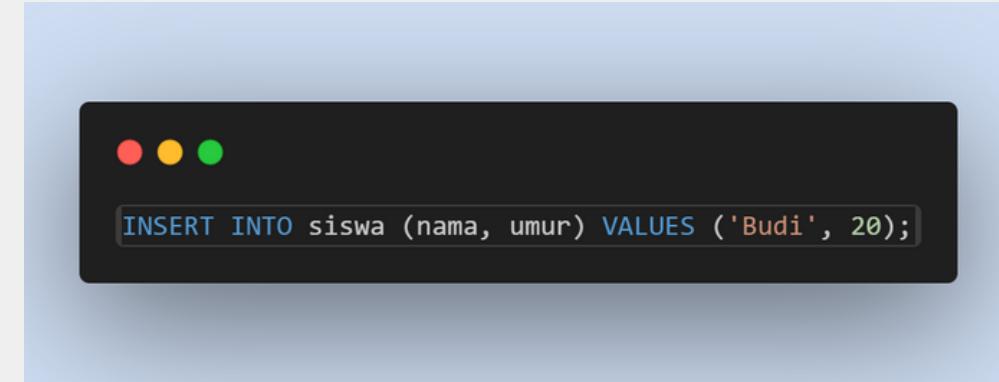


```
SELECT * FROM siswa;
```



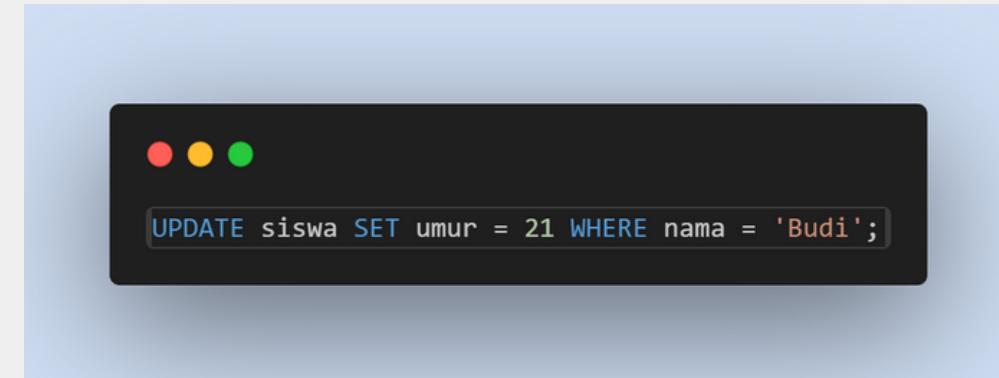
```
SELECT nama, umur FROM siswa WHERE umur > 18;
```

- **Insert Data:** Perintah ini menambahkan catatan karyawan baru



```
INSERT INTO siswa (nama, umur) VALUES ('Budi', 20);
```

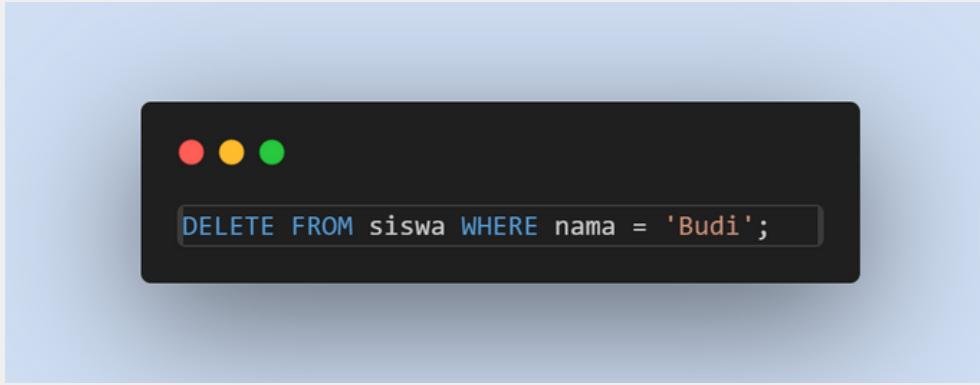
- **Update Data:** Perintah ini memodifikasi posisi karyawan yang sudah ada



```
UPDATE siswa SET umur = 21 WHERE nama = 'Budi';
```

Basic SQL Query Example

- **Delete Data:** Menghapus semua baris dari tabel "siswa" dimana nilai kolom "nama" adalah 'Budi'



A screenshot of a terminal window with a dark theme. At the top, there are three small colored dots (red, yellow, green) followed by a black rectangular input field. Inside the input field, the SQL command `DELETE FROM siswa WHERE nama = 'Budi';` is written in white text.



Introducing PostgreSQL and Comparison with Other Database

```
Lookup.KeyValue  
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```

Introducing PostgreSQL

- Gratis & open source
- Memiliki dokumentasi yang lengkap dan komunitas yang besar
- Lintas platform seperti Microsoft Windows, Mac OS, LINUX, dan sebagainya
- Ideal untuk aplikasi yang memerlukan kemampuan skalabilitas tinggi
- Perusahaan besar yang menggunakan PostgreSQL seperti Yahoo, Instagram, Skype, Reddit, dan Twitch

[documentation](#)

The pgAdmin 4 welcome screen features a header with 'Tools' and 'Help'. Below is a 'Welcome' section with the pgAdmin logo and text: 'Management Tools for PostgreSQL', 'Feature rich | Maximises PostgreSQL | Open Source', and a brief description: 'pgAdmin is an Open Source administration and management tool for the PostgreSQL database. It includes a graphical administration interface, an SQL query tool, a procedural code debugger and much more. The tool is designed to answer the needs of developers, DBAs and system administrators alike.' A 'Quick Links' section contains icons for 'Add New Server' (server icon) and 'Configure pgAdmin' (gear icon). Under 'Getting Started', there are four links: 'PostgreSQL Documentation' (pgAdmin icon), 'pgAdmin Website' (globe icon), 'Planet PostgreSQL' (book icon), and 'Community Support' (people icon).

The pgAdmin 4 interface shows the 'Object Explorer' on the left with a tree view of database objects under 'pagila'. The 'Query' tab in the center contains a SQL script for creating a 'film' table and several indexes. The 'Tables (15)' node in the Object Explorer is highlighted.

```
106 CREATE TABLE public.film(
107   film_id serial NOT NULL,
108   title text NOT NULL,
109   description text,
110   release_year "year",
111   language_id integer NOT NULL,
112   original_language_id integer,
113   rental_duration smallint NOT NULL DEFAULT 3,
114   rental_rate numeric(4,2) NOT NULL DEFAULT 4.99,
115   length smallint,
116   replacement_cost numeric(5,2) NOT NULL DEFAULT 19.99,
117   rating mpaa_rating DEFAULT 'G'::mpaa_rating,
118   last_update timestamp with time zone NOT NULL DEFAULT now(),
119   special_features text[],
120   fulltext tsvector NOT NULL,
121   CONSTRAINT film_pkey PRIMARY KEY(film_id)
122 );
123
124
125 CREATE INDEX film_fulltext_idx ON public.film USING gist(fulltext);
126
127 CREATE INDEX idx_fk_language_id ON public.film USING btree
128   (language_id NULLS LAST);
129
130 CREATE INDEX idx_fk_original_language_id ON public.film USING btree
131   (original_language_id NULLS LAST);
132
133 CREATE INDEX idx_title ON public.film USING btree(title NULLS LAST);
134
```

Total rows: 0 of 0 Query complete 00:00:00.051

Comparison with Other Database

Feature	PostgreSQL	MySQL	SQL Server	Oracle Database	MongoDB
Type	Relational (SQL)	Relational (SQL)	Relational (SQL)	Relational (SQL)	NoSQL (Document)
Cost	Free	Free	Paid	Paid	Free
Performance	Baik untuk query kompleks	Cepat untuk query sederhana	Dioptimalkan untuk OLTP	Performa tinggi untuk data besar	Cepat untuk data tidak terstruktur
Query Language	SQL	SQL	T-SQL	PL/SQL	NoSQL
Use Case	Aplikasi kompleks, analisis data	Aplikasi web	Aplikasi perusahaan	Perusahaan besar, sistem keuangan	Big data, penyimpanan dokumen



Data Types in PostgreSQL

```
Lookup.KeyValue  
f.constant(['en-US'])  
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```

Data Types in PostgreSQL

[data types](#)

Tipe Data	Deskripsi
BOOLEAN	TRUE/FALSE
CHAR (n)	String karakter dengan panjang tetap
VARCHAR (n)	String karakter dengan panjang variabel
TEXT	String panjang variabel
INTEGER	Bilangan bulat
REAL	Bilangan floating-point presisi tunggal
DOUBLE PRECISION	Bilangan floating presisi ganda
DATE	Tanggal
TIME	Waktu
TIMESTAMP	Tanggal dan waktu