

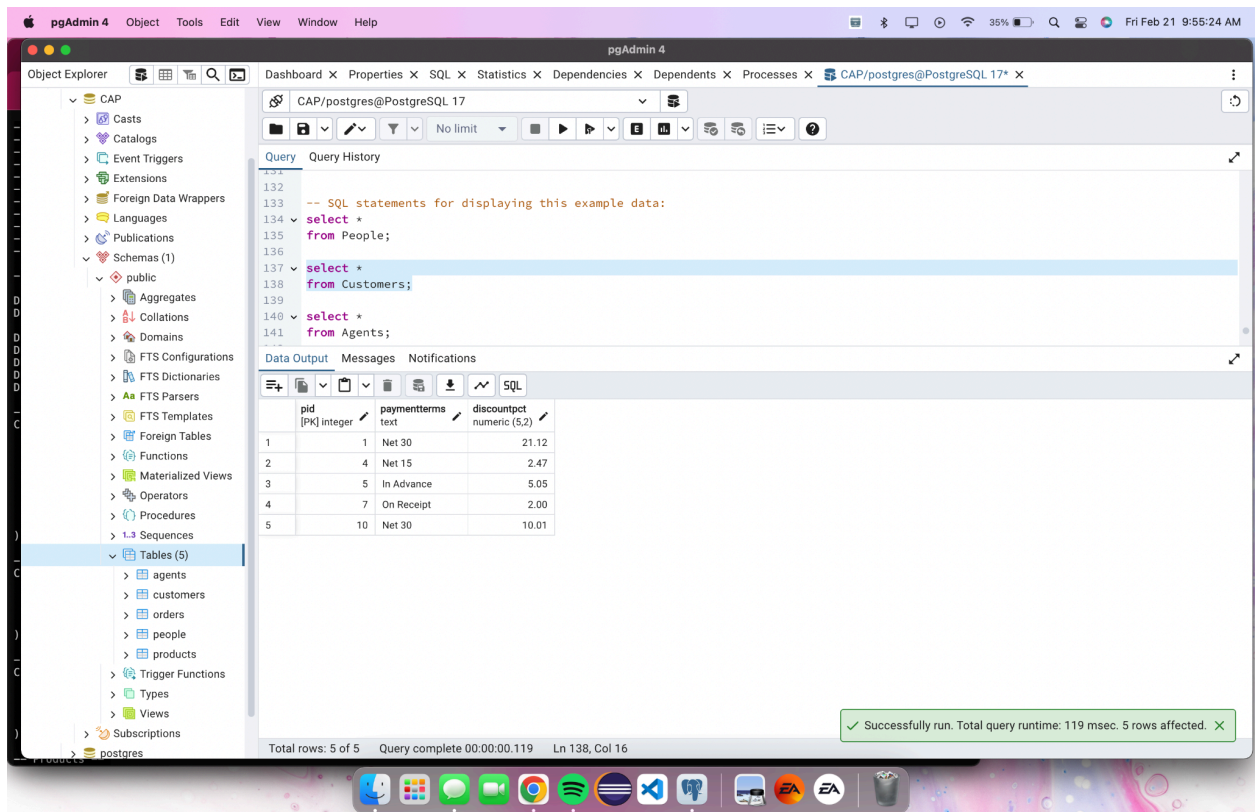
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## 1. Select \* from people

The screenshot shows the pgAdmin 4 interface. On the left, the Object Explorer shows the database structure, with 'Tables (5)' selected under the 'public' schema. The main pane displays a SQL query: `-- SQL statements for displaying this example data: select * from People;` and `select *`. Below the query, the Data Output tab shows the results of the query, which are 9 rows of data from the 'People' table. The status bar at the bottom indicates 'Total rows: 9 of 9' and 'Query complete 00:00:00.129'.

pid [PK] integer	prefix text	firstname text	lastname text	suffix text	homecity text	dob date
1	Mr.	Billy	Joel	Piano Man	Oyster Bay	1949-05-09
2	Ms.	Renee	Rosnes	[null]	Regina	1962-03-24
3	Sir	Elton	John	Esq.	Pinner	1947-03-25
4	Mr.	Reginald	Dwight		Pinner	1947-03-25
5	Mr.	Michael	McDonald	[null]	St. Louis	1952-02-12
6	Mr.	Ray	Charles	MD	in Georgia	1930-09-23
7	Dr.	Stevie	Wonder	Ph.D.	Saginaw	1950-01-12
8	Ms.	Yuja	Wang (王羽佳)		Beijing	1987-02-10
9	Dr. (Hon)	Diana	Krall		Nanaimo	1960-11-16

## 2. Select \* from customers



pgAdmin 4

Object Explorer

- CAP
  - Casts
  - Catalogs
  - Event Triggers
  - Extensions
  - Foreign Data Wrappers
  - Languages
  - Publications
  - Schemas (1)
    - public
      - Aggregates
      - Collations
      - Domains
      - FTS Configurations
      - FTS Dictionaries
      - FTS Parsers
      - FTS Templates
      - Foreign Tables
      - Functions
      - Materialized Views
      - Operators
      - Procedures
      - Sequences
      - Tables (5)**
        - agents
        - customers
        - orders
        - people
        - products
      - Trigger Functions
      - Types
      - Views
    - Subscriptions

SQL Editor

```
-- SQL statements for displaying this example data:
select *
from People;
select *
from Customers;
select *
from Agents;
```

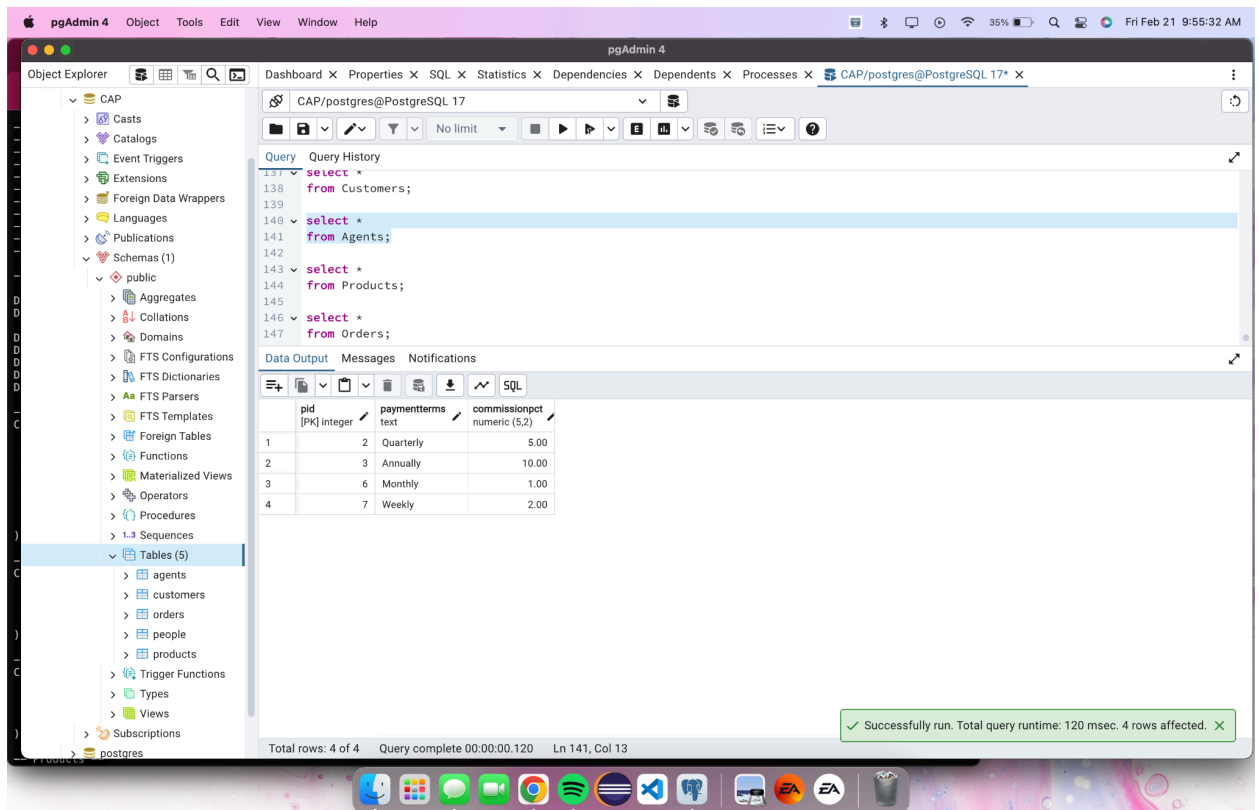
Data Output

pid [PK] integer	paymentterms text	discountpct numeric (5,2)
1	1 Net 30	21.12
2	4 Net 15	2.47
3	5 In Advance	5.05
4	7 On Receipt	2.00
5	10 Net 30	10.01

Successfully run. Total query runtime: 119 msec. 5 rows affected.

Total rows: 5 of 5 Query complete 00:00:00.119 Ln 138, Col 16

## 3. Select \* from agents



pgAdmin 4

Object Explorer

- CAP
  - Casts
  - Catalogs
  - Event Triggers
  - Extensions
  - Foreign Data Wrappers
  - Languages
  - Publications
  - Schemas (1)
    - public
      - Aggregates
      - Collations
      - Domains
      - FTS Configurations
      - FTS Dictionaries
      - FTS Parsers
      - FTS Templates
      - Foreign Tables
      - Functions
      - Materialized Views
      - Operators
      - Procedures
      - Sequences
      - Tables (5)**
        - agents
        - customers
        - orders
        - people
        - products
      - Trigger Functions
      - Types
      - Views
    - Subscriptions

SQL Editor

```
select *
from Customers;
select *
from Agents;
select *
from Products;
select *
from Orders;
```

Data Output

pid [PK] integer	paymentterms text	commissionpct numeric (5,2)
1	2 Quarterly	5.00
2	3 Annually	10.00
3	6 Monthly	1.00
4	7 Weekly	2.00

Successfully run. Total query runtime: 120 msec. 4 rows affected.

Total rows: 4 of 4 Query complete 00:00:00.120 Ln 141, Col 13

#### 4. Select \* from products

The screenshot shows the pgAdmin 4 interface. The left sidebar displays the database structure, with the 'public' schema selected. The main pane shows a SQL query editor with the following query:

```
select *  
from Customers;  
  
select *  
from Agents;  
  
select *  
from Products;  
  
select *  
from Orders;
```

The 'Data Output' tab is active, displaying the results of the query in a table. The table has 9 rows and 6 columns: prodid [PK] text, name text, city text, qtyonhand integer, priceusd numeric (10,2). The status bar at the bottom indicates 'Total rows: 9 of 9' and 'Query complete 00:00:00.131 Ln 144, Col 15'. A green notification box at the bottom right says 'Successfully run. Total query runtime: 131 msec'.

prodid [PK] text	name text	city text	qtyonhand integer	priceusd numeric (10,2)	
1	p01	Kurzweil PC2R	Dallas	47	67.76
2	p02	Yamaha CP-80	Newark	2399	51.50
3	p03	Apple //+	Duluth	1979	65.02
4	p04	LCARS module	Duluth	3	17.01
5	p05	Roland 808	Dallas	8675309	16.61
6	p06	PDP-11 operator panel	Beijing	88	88.00
7	p07	Flux Capacitor	Newark	1007	1.00
8	p08	HAL 9000 memory ch...	Newark	200	1.25
9	p09	Oberheim OB-Xa	Regina	1	37900.42

#### 5. Select \* from orders

The screenshot shows the pgAdmin 4 interface. The left sidebar displays the database structure, with the 'public' schema selected. The main pane shows a SQL query editor with the following query:

```
from Customers;  
  
select *  
from Agents;  
  
select *  
from Products;  
  
select *  
from Orders;
```

The 'Data Output' tab is active, displaying the results of the query in a table. The table has 14 rows and 7 columns: ordernum [PK] integer, dateordered date, custid integer, agentid integer, prodid character (3), quantityordered integer, totalusd numeric (12,2). The status bar at the bottom indicates 'Total rows: 14 of 14' and 'Query complete 00:00:00.111 Ln 147, Col 13'. A green notification box at the bottom right says 'Successfully run. Total query runtime: 111 msec'.

ordernum [PK] integer	dateordered date	custid integer	agentid integer	prodid character (3)	quantityordered integer	totalusd numeric (12,2)	
1	1011	2024-01-22	1	2	p01	1100	58794.00
2	1012	2023-01-23	4	3	p03	1200	76096.81
3	1015	2022-01-23	5	3	p05	1000	15771.20
4	1016	2021-01-23	7	3	p01	1000	66404.80
5	1017	2023-02-14	1	3	p03	500	25643.98
6	1018	2023-02-14	1	3	p04	600	8050.49
7	1019	2023-02-14	1	2	p02	400	16249.28
8	1020	2023-02-14	4	6	p07	600	585.18
9	1021	2023-02-14	4	6	p01	1000	66086.33
10	1022	2023-03-15	1	3	p06	450	31236.48
11	1023	2023-03-15	1	2	p05	500	6550.98
12	1024	2023-03-15	5	2	p01	880	56671.55
13	1025	2022-04-01	7	3	p07	888	870.24
14	1026	2022-05-04	7	6	p03	808	47233.00

6. Explain the distinctions among the terms primary key, candidate key, and superkey.
  - a. The Super key is any field or set of fields that uniquely identify every row in a table. A candidate key is a minimal super key, so it shares some fields like pid, an orderNum, or even a DOB, but it doesn't share every unique identifier. Lastly, a primary key is the "chosen candidate key", so it is more so one distinct column that identifies each table.
7. Write a short essay on data types. Select a topic for which you might create a table. Name the table and list its fields (columns). For each field, give its data type and whether or not it is nullable.
  - a. My topic is clothing inventory. The name of the table would be New Inventory. The fields would consist of pid (product ID), quantityOrdered, indCost (individual cost), and totalUSD.

pid	QuantityOrdered	indCost	totalUSD
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- b.
8. Explain the following rational "rules" with examples and reasons why they are important.
  - a. The "first normal form" rule - The first normal form rule is most basically described as not being allowed to have more than one value at any intersection of a row and column in a table. For example, if we had a table that described people, in which a column were called "skills" to describe a person, there cannot be more than one descriptor per row within the column. So, you cannot have "stealth, humor" in the same row/column intersection. You can only have either "stealth" or "humor" in the intersection.
  - b. The "access rows by content" rule - The access rows by content rule is best summarized by saying we can ask for query data by asking for what is there and not based on where it is. For example, we can ask for corresponding data within the same row by asking for key identifiers such as "what is the name of pid 007". But, we cannot ask "what is the name of the first row" because that information is susceptible to change, but the name for pid 007 will stay constant.
  - c. The "all rows must be unique" rule - The all rows must be unique rule is best described as making sure every row within a table is unique and not repeated. For example, we cannot repeat the information for pid 007 in another row and repeat the information again. This is because then it would make those two rows indistinguishable.