Text data types

DATA TYPES AND FUNCTIONS IN SNOWFLAKE

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Data types and functions in Snowflake

Snowflake is used by more than 10,000 organizations globally

Data Types

Manipulating Data

Advanced Techniques

[1] https://www.snowflake.com/en/company/overview/about-snowflake/

Snowflake text data

Text data is one of the most popular data types in Snowflake

- Categorical values
- Messages
- Phone numbers
- Unstructured text

```
-- Text data might be categorical
'Software Engineer'

-- Messages are also text data
'Hello, World!'

-- As well as phone numbers
'931-663-0164'

-- And even things like this!
'Taylormade,Titleist,Ping'
```

Text data types

```
CREATE TABLE TABLE_NAME (
    message VARCHAR(100),
    phone_number TEXT,
    brands STRING
);
```

Define column with `VARCHAR(...)`

- `TEXT`
- `STRING`

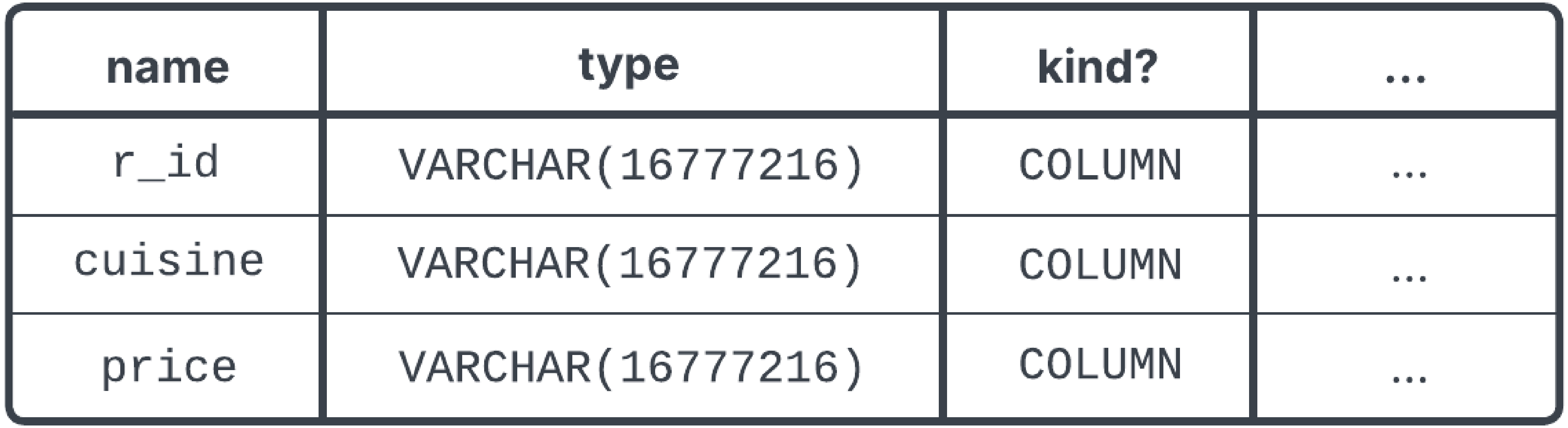
```
    message      |  phone_number  |              brands
---------------- | -------------- | ----------------------------
 Hello, World!   |  931-663-0164  |  Taylormade, Titleist, Ping
 Goodnight!      |  617-256-3086  |  Apple, Windows, Linux
```

Columns that store text data can look quite different!

Describing a Snowflake table

```
DESCRIBE TABLE <SCHEMA>.<table_name>;
```

- Outputs information about each column in the table
- `name` , `type` , `default` , ...



name	type	kind?	...
r_id	VARCHAR(16777216)	COLUMN	...
cuisine	VARCHAR(16777216)	COLUMN	...
price	VARCHAR(16777216)	COLUMN	...

Text data in queries

```
SELECT
    <field>,
    <another-field>,
    -- Can be used in a SELECT
    '<value>'
FROM SCHEMA.TABLE_NAME;
```

```
SELECT
    *
FROM SCHEMA.TABLE_NAME
-- Can be used in a WHERE clause
WHERE FIELD = '<value>';
```

- Text values can be used in different parts of a SQL query
- `SELECT`
- `WHERE`
- `CASE`

`'...'` Single Quotes

- Case-sensitive

Manipulating text data

Function	Description
`LENGTH`	Find the number of characters in a text value.
`TRIM`	Remove a sequence of characters at the beginning or end of a string.
`RTRIM`	Same functionality as `TRIM` , only applied to right-side of the string.
`LTRIM`	Same functionality as `TRIM` , only applied to left-side of the string.
`SPLIT`	Split a string using some delimiter, like a comma.
`SEARCH`	Search a string for a certain value.
`CAST` , `::`	Convert other data types into a `VARCHAR` data type.

Let's practice!

Numeric data types

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Numeric data types

`NUMBER`

- Control the size of numeric values
- `DECIMAL` , `INTEGER` are synonymous with `NUMBER`

```
126            -- Integers
7.99           -- Dollar amounts
.000191        -- Decimals
-46.88         -- Negative values
563719100      -- ID's


...


1.234E+2       -- Numeric constants
```

Precision and scale

`NUMBER(<precision>, <scale>)`

Precision is the **total number** of digits in the number

Scale is the number of digits **after** the decimal point

```
-- Precision: 4, Scale: 2
NUMBER(4, 2)


1.75    -- Good!
624.99  -- Won't fit
```

Precision and scale

```
-- Precision: 3, Scale: 0
NUMBER(3, 0)


42     -- Good!
1000   -- Won't fit
41.99  -- Won't fit
```

- Default `NUMBER` is `NUMBER(38, 0)`

Defining numeric data types

```
CREATE TABLE sales (
    id NUMBER,                  -- Traditional numeric data
    price NUMBER(5, 2),         -- Dollar values up to $999.99
    quantity NUMBER(4, 0)       -- Integer values less than 10,000
);
```

```
DESCRIBE TABLE schema.table;
```

```
   name    |     type     |   kind   | ...
---------- | ------------ | -------- | ---
    id     | NUMBER(38,0) |  COLUMN  | ...
   price   | NUMBER(5,2)  |  COLUMN  | ...
 quantity  | NUMBER(4,0)  |  COLUMN  | ...
```

FLOAT data type

- Used in Scientific and statistical calculations
- "Approximate" numeric type
- Possibility of rounding errors
- **Fast and can handle extreme scale!**

`0.0000000120056`

```sql
CREATE TABLE metrics (
    id NUMBER,
    accuracy FLOAT
);
```

```sql
DESCRIBE TABLE schema.table;
```

```
   name     |      type      | ...
----------- | -------------- | ---
    id      |  NUMBER(38,0)  | ...
 accuracy   |  FLOAT         | ...
```

Manipulating numeric data

- Numeric data can be manipulated in a number of different ways

- **Comparing values** using tools such as `=` , `!=` , `<` , or `>` .
- Performing **arithmetic operations,** such as `+` , `-` , `/` , or `*` .
- **Aggregating data** with `SUM` , `AVG` , or `COUNT` .
- Calculating **summary statistics** with `MEDIAN` , `STDDEV` , and `CORR` .

- *... and tons more!*

Let's practice!

DATA TYPES AND FUNCTIONS IN SNOWFLAKE

Datetime data types

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DATE data types

- Date values **store the day on which something occurred**

```
2023-04-01
YYYY-MM-DD
```

```sql
CREATE TABLE sales (
    transaction_date DATE  -- Define a column of type `DATE`
);
```

DATE data types

```sql
SELECT
    TO_DATE('2023-04-01') AS the_date, -- Convert a string into a DATE
    '2023-04-01'::DATE AS casted_date  -- Casted using <value>::DATE
;
```

```
  the_date  | casted_date
----------- | ------------
 2023-04-01 | 2023-04-01
```

Time data types

- Captures the **hours, minutes, and seconds that some event occurred**

```
08:24:08
HH:MM:SS
```

```
CREATE TABLE sales (
    transaction_time TIME  -- Create a column with the `TIME` keyword
);
```

- Define a `TIME` column

Time data types

```
SELECT
    TO_TIME('08:24:04') AS the_time,
    '08:24:04'::TIME AS casted_time
;
```

```
|   the_time   | casted_time |
| ----------- | ------------ |
|   08:24:08   |   08:24:08   |
```

- `TO_TIME` function
- Cast using `::`

Timestamp data types

- `TIMESTAMP` captures both date and time

```
2023-04-01 08:24:04
YYYY-MM-DD HH:MM:SS
```

```sql
CREATE TABLE (
    transaction_timestamp TIMESTAMP
);
```

Timestamp data types

```
SELECT
    TO_TIMESTAMP('2023-04-01 08:24:04') AS the_timestamp,
    '2023-04-01 08:24:04'::TIMESTAMP AS casted_timestamp
;
```

- Convert a string to a timestamp using `TO_TIMESTAMP` or `<value>::TIMESTAMP`
- Most common way to store datetime data

```
       the_timestamp      |     casted_timestamp
--------------------------|--------------------------
    2024-04-01 08:24:08   |   2024-04-01 08:24:08
```

Examples

```sql
SELECT
    TO_DATE('2021-05-14') AS the_date,
    TO_TIME('06:13:00') AS the_time,
    TO_TIMESTAMP('2021-05-14T06:13:00') AS the_timestamp,

    -- Extract the DATE from a TIMESTAMP, we could do the same with TIME!
    transaction_timestamp::DATE AS casted_date
;
```

```
  the_date    |   the_time  |     the_timestamp     | casted_date
------------- | ----------- | --------------------- | ------------
 2021-05-14   |   06:13:00  | 2021-05-14T06:13:00   |  2021-05-14
```

Timezones

By default, `DATE` , `TIME` , and `TIMESTAMP` 's are stored without a timezone

`TIMESTAMP_NTZ`

- Default implementation of `TIMESTAMP`
- No timezone is stored

`TIMESTAMP_LTZ`

- Relies on **local** timezone

`TIMESTAMP_TZ`

- User **specifies** timezone

[1] https://docs.snowflake.com/en/sql-reference/data-types-datetime#timestamp-ltz-timestamp-ntz-timestamp-tz

Let's practice!