

2023-1 데이터베이스 중간고사 Cheat Sheet

SELECT: $\sigma_{predicate}(relation)$

PROJECT: $\pi_{attr1, attr2...}(relation)$

UNION: $relation_1 \cup relation_2$

INTERSECTION: $relation_1 \cap relation_2$

DIFFERENCE: $relation_1 - relation_2$

CARTESIAN PRODUCT: $relation_1 \times relation_2$

RENAME: $\rho_{renamed_relation}(original_relation)$

JOIN: $relation_1 \bowtie relation_2$

THETA JOIN: $relation_1 \bowtie_{\theta} relation_2$

DIVISION: $relation_1 \div relation_2$

ASSIGNMENT: $r_2 \leftarrow r_1$

AGGREGATION: $G_{G_1, G_2, ..., G_m} G_{F_1(A_1), F_2(A_2), ..., F_n(A_n)}(r)$

LEFT OUTER JOIN: $r \bowtie_s s$

RIGHT OUTER JOIN: $r \bowtie_s s$

FULL OUTER JOIN: $r \bowtie_s s$

OUTER UNION: $r \cup^+ s$

CREATE DATABASE

```
CREATE [OR REPLACE] {DATABASE | SCHEMA} [IF NOT EXISTS] db_name
[create_specification] ...

create_specification:
    [DEFAULT] CHARACTER SET [=] charset_name
    | [DEFAULT] COLLATE [=] collation_name
    | COMMENT [=] 'comment'
```

DROP DATABASE

```
DROP {DATABASE | SCHEMA} [IF EXISTS] db_name
```

USE

```
USE db_name
```

CREATE TABLE

```
CREATE [OR REPLACE] [TEMPORARY] TABLE [IF NOT EXISTS] tbl_name
    (create_definition,...) [table_options] ... [partition_options]
CREATE [OR REPLACE] [TEMPORARY] TABLE [IF NOT EXISTS] tbl_name
    [(create_definition,...)] [table_options] ... [partition_options]
select_statement
CREATE [OR REPLACE] [TEMPORARY] TABLE [IF NOT EXISTS] tbl_name
    { LIKE old_table_name | (LIKE old_table_name) }

select_statement:
    [IGNORE | REPLACE] [AS] SELECT ...    (Some legal select statement)
```

```
create_definition:
    { col_name column_definition | index_definition | period_definition | CHECK (expr) }

column_definition:
    data_type
    [NOT NULL | NULL] [DEFAULT default_value | (expression)]
    [ON UPDATE [NOW | CURRENT_TIMESTAMP] [(precision)]]
    [AUTO_INCREMENT] [ZEROFILL] [UNIQUE [KEY] | [PRIMARY] KEY]
    [INVISIBLE] [{WITH|WITHOUT} SYSTEM VERSIONING]
    [COMMENT 'string'] [REF_SYSTEM_ID = value]
    [reference_definition]
    | data_type [GENERATED ALWAYS]
    AS { { ROW {START|END} } | { (expression) [VIRTUAL | PERSISTENT | STORED] } }
    [UNIQUE [KEY]] [COMMENT 'string']

constraint_definition:
    CONSTRAINT [constraint_name] CHECK (expression)
```

DROP TABLE

```
DROP [TEMPORARY] TABLE [IF EXISTS] [/*COMMENT TO SAVE*/]
    tbl_name [, tbl_name] ...
    [WAIT n|NOWAIT]
    [RESTRICT | CASCADE]
```

DELETE FROM

```
DELETE [LOW_PRIORITY] [QUICK] [IGNORE]
    FROM tbl_name [PARTITION (partition_list)]
    [WHERE where_condition]
    [ORDER BY ...]
    [LIMIT row_count]
    [RETURNING select_expr
    [, select_expr ...]]
```

ALTER TABLE

```
ALTER [ONLINE] [IGNORE] TABLE [IF EXISTS] tbl_name
    [WAIT n | NOWAIT]
    alter_specification [, alter_specification] ...

alter_specification:
    table_option ...
| ADD [COLUMN] [IF NOT EXISTS] col_name column_definition
    [FIRST | AFTER col_name ]
|
ADD [COLUMN] [IF NOT EXISTS] (col_name column_definition,...
| ADD {INDEX|KEY} [IF NOT EXISTS] [index_name]
    [index_type] (index_col_name,...) [index_option] ...
| ADD [CONSTRAINT [symbol]] PRIMARY KEY
    [index_type] (index_col_name,...) [index_option] ...
| ADD [CONSTRAINT [symbol]]
    UNIQUE [INDEX|KEY] [index_name]
    [index_type] (index_col_name,...) [index_option] ...
| ADD FULLTEXT [INDEX|KEY] [index_name]
    (index_col_name,...) [index_option] ...
| ADD SPATIAL [INDEX|KEY] [index_name]
    (index_col_name,...) [index_option] ...
| ADD [CONSTRAINT [symbol]]
    FOREIGN KEY [IF NOT EXISTS] [index_name] (index_col_name,...)
    reference_definition
|
ADD PERIOD FOR SYSTEM_TIME (start_column_name, end_column_name)
|
ALTER [COLUMN] col_name SET DEFAULT literal | (expression)
| ALTER [COLUMN] col_name DROP DEFAULT
|
CHANGE [COLUMN] [IF EXISTS] old_col_name new_col_name column_definition
    [FIRST|AFTER col_name]
| MODIFY [COLUMN] [IF EXISTS] col_name column_definition
    [FIRST | AFTER col_name]
| DROP [COLUMN] [IF EXISTS] col_name [RESTRICT|CASCADE]
| DROP PRIMARY KEY
```

```
| DROP {INDEX|KEY} [IF EXISTS] index_name
| DROP FOREIGN KEY [IF EXISTS] fk_symbol
| DROP CONSTRAINT [IF EXISTS] constraint_name
| DISABLE KEYS
| ENABLE KEYS
| RENAME [TO] new_tbl_name
| ORDER BY col_name [, col_name] ...
| RENAME COLUMN old_col_name TO new_col_name
| RENAME {INDEX|KEY} old_index_name TO new_index_name
|
CONVERT TO CHARACTER SET charset_name [COLLATE collation_name]
| [DEFAULT] CHARACTER SET [=] charset_name
| [DEFAULT] COLLATE [=] collation_name
| DISCARD TABLESPACE
| IMPORT TABLESPACE
| ALGORITHM [=] {DEFAULT|INPLACE|COPY|NOCOPY|INSTANT}
| LOCK [=] {DEFAULT|NONE|SHARED|EXCLUSIVE}
| FORCE
| partition_options
| ADD PARTITION (partition_definition)
| DROP PARTITION partition_names
| COALESCE PARTITION number
|
REORGANIZE PARTITION [partition_names INTO (partition_definition)]
| ANALYZE PARTITION partition_names
| CHECK PARTITION partition_names
| OPTIMIZE PARTITION partition_names
| REBUILD PARTITION partition_names
| REPAIR PARTITION partition_names
| EXCHANGE PARTITION partition_name WITH TABLE tbl_name
| REMOVE PARTITIONING
| ADD SYSTEM VERSIONING
| DROP SYSTEM VERSIONING
```

INSERT INTO

```
INSERT [LOW_PRIORITY | DELAYED | HIGH_PRIORITY] [IGNORE]
[INTO] tbl_name [PARTITION (partition_list)] [(col,...)]
{VALUES | VALUE} ({expr | DEFAULT},...),(...),...
[ ON DUPLICATE KEY UPDATE
    col=expr
    [, col=expr] ... ] [RETURNING select_expr
    [, select_expr ...]]
```

Or:

```
INSERT [LOW_PRIORITY | DELAYED | HIGH_PRIORITY] [IGNORE]
[INTO] tbl_name [PARTITION (partition_list)]
SET col={expr | DEFAULT}, ...
[ ON DUPLICATE KEY UPDATE
    col=expr
    [, col=expr] ... ] [RETURNING select_expr
    [, select_expr ...]]
```

Or:

```
INSERT [LOW_PRIORITY | HIGH_PRIORITY] [IGNORE]
[INTO] tbl_name [PARTITION (partition_list)] [(col,...)]
SELECT ...
[ ON DUPLICATE KEY UPDATE
    col=expr
    [, col=expr] ... ] [RETURNING select_expr
    [, select_expr ...]]
```

UPDATE TABLE

Single-table syntax:

```
UPDATE [LOW_PRIORITY] [IGNORE] table_reference
[PARTITION (partition_list)]
SET col1={expr1|DEFAULT} [,col2={expr2|DEFAULT}] ...
[WHERE where_condition]
[ORDER BY ...]
[LIMIT row_count]
```

Multiple-table syntax:

```
UPDATE [LOW_PRIORITY] [IGNORE] table_references
SET col1={expr1|DEFAULT} [, col2={expr2|DEFAULT}] ...
[WHERE where_condition]
```

Built-in Functions

CHARACTER_LENGTH(str) or CHAR_LENGTH() CONCAT(str1, str2, ...)

CONCAT_WS(separator, str1, str2, ...)

```
SUBSTRING(str,pos),
SUBSTRING(str FROM pos),
SUBSTRING(str,pos,len),
SUBSTRING(str FROM pos FOR len)
```

REPLACE(str, from_str, to_str) STRCMP(expr1, expr2) CAST(expr AS type)

POSITION(substr IN str)

CURDATE & CURTIME UNIX_TIMESTAMP FROM_UNIXTIME(unix_timestamp)

YEAR MONTH DAYOFMONTH DAYOFWEEK HOUR MINUTE SECOND

STR_TO_DATE(str,format) DATE_FORMAT(date, format[, locale])

AVG MAX MIN STD SUM VARIANCE

COUNT COUNT_DISTINCT

+, -, /, *, % () POW SQRT FLOOR CEILING RAND

```
CASE value WHEN [compare_value] THEN result [WHEN [compare_value] THEN
result ...] [ELSE result] END
```

```
CASE WHEN [condition] THEN result [WHEN [condition] THEN result ...]
[ELSE result] END
```

IF(expr1, expr2, expr3)

PASSWORD(str) COMPRESS UNCOMPRESS

PointFromText('POINT(n n)') ST_DISTANCE(g1,g2) AsText(geoValue)

X(point) Y(point)

JSON_VALUE(col_name, path) JSON_TYPE(json_value) JSON_VALID(json_doc or value)

JSON_EXISTS(*json_doc*, *path*) JSON_DETAILED(*json_doc*)

JSON_KEYS(*json_doc*)

JSON_LENGTH(*json_doc*[, *path*])

SELECT

```
SELECT
  [ALL | DISTINCT | DISTINCTROW]
  [HIGH_PRIORITY]
  [STRAIGHT_JOIN]
  [SQL_SMALL_RESULT] [SQL_BIG_RESULT] [SQL_BUFFER_RESULT]
  [SQL_CACHE | SQL_NO_CACHE] [SQL_CALC_FOUND_ROWS]
  select_expr [, select_expr ...]
  [ FROM table_references
  [WHERE where_condition]
  [GROUP BY {col_name | expr | position} [ASC | DESC], ... [WITH ROLLUP]]
  [HAVING where_condition]
  [ORDER BY {col_name | expr | position} [ASC | DESC], ...]
  [LIMIT {[offset,] row_count | row_count OFFSET offset}]
  procedure|[PROCEDURE procedure_name(argument_list)]
  [INTO OUTFILE 'file_name' [CHARACTER SET charset_name] [export_options]

  INTO DUMPFILE 'file_name' INTO var_name [, var_name] ]

  [[FOR UPDATE | LOCK IN SHARE MODE] [WAIT n | NOWAIT] ] ]

export_options:
  [{FIELDS | COLUMNS}
   [TERMINATED BY 'string']
   [[OPTIONALLY] ENCLOSED BY 'char']
   [ESCAPED BY 'char']
  ]
  [LINES
   [STARTING BY 'string']
   [TERMINATED BY 'string']
  ]
```