✅ 멘토링 과제 3주차-tibero 3/4장

≡ 태그

> 개인 노트북으로 주로 실습을 하는데 티베로가 깔려있지 않아서 mysql로 실습을 대체했습니다. 사실 이번 주는 포트폴리오를 작성하느라 과제에 집중을 못한 부분이 있어서 부족한 부분이 많은것 같습니다. 4,5주차 부터 티베로로 실습하여 과제 업로드 하겠습니다 !

- sql의 user 확인하기

```
MariaDB [(none)]> select user, host from mysql.user;
+-------------+----------------+
| User        | Host           |
+-------------+----------------+
| root        | %              |
| root        | 127.0.0.1      |
| root        | ::1            |
| root        | desktop-bskeu0a |
| mariadb.sys | localhost      |
| root        | localhost      |
+-------------+----------------+
```


- sql의 테이블 확인하기

```
MariaDB [(none)]> show databases;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| mysql              |
| performance_schema |
| springboot         |
| sys                |
+--------------------+
5 rows in set (0.001 sec)
```

- sql 사용

```
C:\Program Files\MariaDB 10.9\bin>mysql -uroot -p
Enter password: ********
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 8
Server version: 10.9.3-MariaDB mariadb.org binary distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.
```

```
C:\Program Files\MariaDB 10.9\bin>mysql -uroot -p
Enter password: ********
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 8
Server version: 10.9.3-MariaDB mariadb.org binary distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.
```

- 새로운 사용자로 tibero 사용자 생성 후 비밀번호로 1234 입력

```
MariaDB [(none)]> create user 'tibero';
Query OK, 0 rows affected (0.011 sec)
MariaDB [(none)]> create user tibero@localhost identified by '1234';
Query OK, 0 rows affected (0.007 sec)
```

```
MariaDB [(none)]> create user 'tibero';
Query OK, 0 rows affected (0.011 sec)

MariaDB [(none)]> crate user tibero@localhost identified by '1234';
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MariaDB server version for the right syntax to use near 'crate user tibero@localhost id
ified by '1234'' at line 1
MariaDB [(none)]> create user tibero@localhost identified by '1234';
Query OK, 0 rows affected (0.007 sec)
```

- 새로운 사용자로 tibero2 사용자 생성 후 삭제하기

```
MariaDB [(none)]> create user 'tibero2';
Query OK, 0 rows affected (0.006 sec)

MariaDB [(none)]> drop user 'tibero2';
Query OK, 0 rows affected (0.005 sec)
```

- sql에 각각의 데이터베이스에 있는 테이블 확인하기

```
MariaDB [(none)]> use sys;
Database changed
MariaDB [sys]> show tables;
+---------------------------------------------+
| Tables_in_sys                               |
+---------------------------------------------+
| host_summary                                |
| host_summary_by_file_io                     |
| host_summary_by_file_io_type                |
| host_summary_by_stages                      |
| host_summary_by_statement_latency           |
| host_summary_by_statement_type              |
| innodb_buffer_stats_by_schema               |
| innodb_buffer_stats_by_table                |
| innodb_lock_waits                           |
| io_by_thread_by_latency                     |
| io_global_by_file_by_bytes                  |
| io_global_by_file_by_latency                |
| io_global_by_wait_by_bytes                  |
| io_global_by_wait_by_latency                |
| latest_file_io                              |
| memory_by_host_by_current_bytes             |
| memory_by_thread_by_current_bytes           |
| memory_by_user_by_current_bytes             |
| memory_global_by_current_bytes              |
| memory_global_total                         |
| metrics                                     |
```

```
| processlist                                     |
| ps_check_lost_instrumentation                   |
| schema_auto_increment_columns                   |
| schema_index_statistics                         |
| schema_object_overview                          |
| schema_redundant_indexes                        |
| schema_table_lock_waits                         |
| schema_table_statistics                         |
| schema_table_statistics_with_buffer             |
| schema_tables_with_full_table_scans             |
| schema_unused_indexes                           |
| session                                         |
| session_ssl_status                              |
| statement_analysis                              |
| statements_with_errors_or_warnings              |
| statements_with_full_table_scans                |
| statements_with_runtimes_in_95th_percentile     |
| statements_with_sorting                         |
| statements_with_temp_tables                     |
| sys_config                                      |
| user_summary                                    |
| user_summary_by_file_io                         |
| user_summary_by_file_io_type                    |
| user_summary_by_stages                          |
| user_summary_by_statement_latency               |
| user_summary_by_statement_type                  |
| version                                         |
| wait_classes_global_by_avg_latency              |
| wait_classes_global_by_latency                  |
| waits_by_host_by_latency                        |
| waits_by_user_by_latency                        |
| waits_global_by_latency                         |
| x$host_summary                                  |
| x$host_summary_by_file_io                       |
| x$host_summary_by_file_io_type                  |
| x$host_summary_by_stages                        |
| x$host_summary_by_statement_latency             |
| x$host_summary_by_statement_type                |
| x$innodb_buffer_stats_by_schema                 |
| x$innodb_buffer_stats_by_table                  |
| x$innodb_lock_waits                             |
| x$io_by_thread_by_latency                       |
| x$io_global_by_file_by_bytes                    |
| x$io_global_by_file_by_latency                  |
| x$io_global_by_wait_by_bytes                    |
| x$io_global_by_wait_by_latency                  |
| x$latest_file_io                                |
| x$memory_by_host_by_current_bytes               |
| x$memory_by_thread_by_current_bytes             |
| x$memory_by_user_by_current_bytes               |
| x$memory_global_by_current_bytes                |
| x$memory_global_total                           |
| x$processlist                                   |
| x$ps_digest_95th_percentile_by_avg_us           |
| x$ps_digest_avg_latency_distribution            |
| x$ps_schema_table_statistics_io                 |
| x$schema_flattened_keys                         |
| x$schema_index_statistics                       |
| x$schema_table_lock_waits                       |
| x$schema_table_statistics                       |
| x$schema_table_statistics_with_buffer           |
| x$schema_tables_with_full_table_scans           |
| x$session                                       |
| x$statement_analysis                            |
| x$statements_with_errors_or_warnings            |
| x$statements_with_full_table_scans              |
| x$statements_with_runtimes_in_95th_percentile   |
| x$statements_with_sorting                       |
| x$statements_with_temp_tables                   |
| x$user_summary                                  |
| x$user_summary_by_file_io                       |
| x$user_summary_by_file_io_type                  |
| x$user_summary_by_stages                        |
| x$user_summary_by_statement_latency             |
| x$user_summary_by_statement_type                |
| x$wait_classes_global_by_avg_latency            |
| x$wait_classes_global_by_latency                |
| x$waits_by_host_by_latency                      |
| x$waits_by_user_by_latency                      |
| x$waits_global_by_latency                       |
+-------------------------------------------------+
101 rows in set (0.010 sec)

MariaDB [sys]> use information_schema;
Database changed
MariaDB [information_schema]> show tables;
+---------------------------------------+
```

```
| Tables_in_information_schema            |
+-----------------------------------------+
| ALL_PLUGINS                             |
| APPLICABLE_ROLES                        |
| CHARACTER_SETS                          |
| CHECK_CONSTRAINTS                       |
| COLLATIONS                              |
| COLLATION_CHARACTER_SET_APPLICABILITY   |
| COLUMNS                                 |
| COLUMN_PRIVILEGES                       |
| ENABLED_ROLES                           |
| ENGINES                                 |
| EVENTS                                  |
| FILES                                   |
| GLOBAL_STATUS                           |
| GLOBAL_VARIABLES                        |
| KEYWORDS                                |
| KEY_CACHES                              |
| KEY_COLUMN_USAGE                        |
| OPTIMIZER_TRACE                         |
| PARAMETERS                              |
| PARTITIONS                             |
| PLUGINS                                 |
| PROCESSLIST                             |
| PROFILING                               |
| REFERENTIAL_CONSTRAINTS                 |
| ROUTINES                                |
| SCHEMATA                                |
| SCHEMA_PRIVILEGES                       |
| SESSION_STATUS                          |
| SESSION_VARIABLES                       |
| STATISTICS                              |
| SQL_FUNCTIONS                           |
| SYSTEM_VARIABLES                        |
| TABLES                                  |
| TABLESPACES                             |
| TABLE_CONSTRAINTS                       |
| TABLE_PRIVILEGES                        |
| TRIGGERS                                |
| USER_PRIVILEGES                         |
| VIEWS                                   |
| CLIENT_STATISTICS                       |
| INDEX_STATISTICS                        |
| INNODB_FT_CONFIG                        |
| GEOMETRY_COLUMNS                        |
| INNODB_SYS_TABLESTATS                   |
| SPATIAL_REF_SYS                         |
| USER_STATISTICS                         |
| INNODB_TRX                              |
| INNODB_CMP_PER_INDEX                    |
| INNODB_METRICS                          |
| INNODB_FT_DELETED                       |
| INNODB_CMP                              |
| THREAD_POOL_WAITS                       |
| INNODB_CMP_RESET                        |
| THREAD_POOL_QUEUES                      |
| TABLE_STATISTICS                        |
| INNODB_SYS_FIELDS                       |
| INNODB_BUFFER_PAGE_LRU                  |
| INNODB_LOCKS                            |
| INNODB_FT_INDEX_TABLE                   |
| INNODB_CMPMEM                           |
| THREAD_POOL_GROUPS                      |
| INNODB_CMP_PER_INDEX_RESET              |
| INNODB_SYS_FOREIGN_COLS                 |
| INNODB_FT_INDEX_CACHE                   |
| INNODB_BUFFER_POOL_STATS                |
| INNODB_FT_BEING_DELETED                 |
| INNODB_SYS_FOREIGN                      |
| INNODB_CMPMEM_RESET                     |
| INNODB_FT_DEFAULT_STOPWORD              |
| INNODB_SYS_TABLES                       |
| INNODB_SYS_COLUMNS                      |
| INNODB_SYS_TABLESPACES                  |
| INNODB_SYS_INDEXES                      |
| INNODB_BUFFER_PAGE                      |
| INNODB_SYS_VIRTUAL                      |
| user_variables                         |
| INNODB_TABLESPACES_ENCRYPTION           |
| INNODB_LOCK_WAITS                       |
| THREAD_POOL_STATS                       |
+-----------------------------------------+
79 rows in set (0.001 sec)

MariaDB [information_schema]> use performance_schema;
Database changed
MariaDB [performance_schema]> show tables;
```

```
+----------------------------------------------------+
| Tables_in_performance_schema                       |
+----------------------------------------------------+
| accounts                                           |
| cond_instances                                     |
| events_stages_current                              |
| events_stages_history                              |
| events_stages_history_long                         |
| events_stages_summary_by_account_by_event_name     |
| events_stages_summary_by_host_by_event_name        |
| events_stages_summary_by_thread_by_event_name      |
| events_stages_summary_by_user_by_event_name        |
| events_stages_summary_global_by_event_name         |
| events_statements_current                          |
| events_statements_history                          |
| events_statements_history_long                     |
| events_statements_summary_by_account_by_event_name |
| events_statements_summary_by_digest                |
| events_statements_summary_by_host_by_event_name    |
| events_statements_summary_by_program               |
| events_statements_summary_by_thread_by_event_name  |
| events_statements_summary_by_user_by_event_name    |
| events_statements_summary_global_by_event_name     |
| events_transactions_current                        |
| events_transactions_history                        |
| events_transactions_history_long                   |
| events_transactions_summary_by_account_by_event_name |
| events_transactions_summary_by_host_by_event_name  |
| events_transactions_summary_by_thread_by_event_name |
| events_transactions_summary_by_user_by_event_name  |
| events_transactions_summary_global_by_event_name   |
| events_waits_current                               |
| events_waits_history                               |
| events_waits_history_long                          |
| events_waits_summary_by_account_by_event_name      |
| events_waits_summary_by_host_by_event_name         |
| events_waits_summary_by_instance                   |
| events_waits_summary_by_thread_by_event_name       |
| events_waits_summary_by_user_by_event_name         |
| events_waits_summary_global_by_event_name          |
| file_instances                                     |
| file_summary_by_event_name                         |
| file_summary_by_instance                           |
| global_status                                      |
| host_cache                                         |
| hosts                                              |
| memory_summary_by_account_by_event_name            |
| memory_summary_by_host_by_event_name               |
| memory_summary_by_thread_by_event_name             |
| memory_summary_by_user_by_event_name               |
| memory_summary_global_by_event_name                |
| metadata_locks                                     |
| mutex_instances                                    |
| objects_summary_global_by_type                     |
| performance_timers                                 |
| prepared_statements_instances                      |
| replication_applier_configuration                  |
| replication_applier_status                         |
| replication_applier_status_by_coordinator          |
| replication_applier_status_by_worker               |
| replication_connection_configuration               |
| rwlock_instances                                   |
| session_account_connect_attrs                      |
| session_connect_attrs                              |
| session_status                                     |
| setup_actors                                       |
| setup_consumers                                    |
| setup_instruments                                  |
| setup_objects                                      |
| setup_timers                                       |
| socket_instances                                   |
| socket_summary_by_event_name                       |
| socket_summary_by_instance                         |
| status_by_account                                  |
| status_by_host                                     |
| status_by_thread                                   |
| status_by_user                                     |
| table_handles                                      |
| table_io_waits_summary_by_index_usage              |
| table_io_waits_summary_by_table                    |
| table_lock_waits_summary_by_table                  |
| threads                                            |
| user_variables_by_thread                           |
| users                                              |
+----------------------------------------------------+
81 rows in set (0.010 sec)
```

```
MariaDB [performance_schema]> use springboot;
Database changed
MariaDB [springboot]> show tables;
+---------------------+
| Tables_in_springboot |
+---------------------+
| mina                |
```

```
MariaDB [(none)]> use sys;
Database changed
MariaDB [sys]> show tables;
+-------------------------------------------------+
| Tables_in_sys                                   |
+-------------------------------------------------+
| host_summary                                    |
| host_summary_by_file_io                         |
| host_summary_by_file_io_type                    |
| host_summary_by_stages                          |
| host_summary_by_statement_latency               |
| host_summary_by_statement_type                  |
| innodb_buffer_stats_by_schema                   |
| innodb_buffer_stats_by_table                    |
| innodb_lock_waits                               |
| io_by_thread_by_latency                         |
| io_global_by_file_by_bytes                      |
| io_global_by_file_by_latency                    |
| io_global_by_wait_by_bytes                      |
| io_global_by_wait_by_latency                    |
| latest_file_io                                  |
| memory_by_host_by_current_bytes                 |
| memory_by_thread_by_current_bytes               |
| memory_by_user_by_current_bytes                 |
| memory_global_by_current_bytes                  |
| memory_global_total                             |
| metrics                                         |
| processlist                                     |
| ps_check_lost_instrumentation                   |
| schema_auto_increment_columns                   |
| schema_index_statistics                         |
| schema_object_overview                          |
| schema_redundant_indexes                        |
| schema_table_lock_waits                         |
| schema_table_statistics                         |
| schema_table_statistics_with_buffer             |
| schema_tables_with_full_table_scans             |
| schema_unused_indexes                           |
| session                                         |
| session_ssl_status                              |
| statement_analysis                              |
| statements_with_errors_or_warnings              |
| statements_with_full_table_scans                |
| statements_with_runtimes_in_95th_percentile     |
| statements_with_sorting                         |
```

```
| statements_with_runtimes_in_95th_percentile |
| statements_with_sorting                     |
| statements_with_temp_tables                 |
| sys_config                                  |
| user_summary                                |
| user_summary_by_file_io                     |
| user_summary_by_file_io_type                |
| user_summary_by_stages                      |
| user_summary_by_statement_latency           |
| user_summary_by_statement_type              |
| version                                     |
| wait_classes_global_by_avg_latency          |
| wait_classes_global_by_latency              |
| waits_by_host_by_latency                    |
| waits_by_user_by_latency                    |
| waits_global_by_latency                     |
| x$host_summary                              |
| x$host_summary_by_file_io                   |
| x$host_summary_by_file_io_type              |
| x$host_summary_by_stages                    |
| x$host_summary_by_statement_latency         |
| x$host_summary_by_statement_type            |
| x$innodb_buffer_stats_by_schema             |
| x$innodb_buffer_stats_by_table              |
| x$innodb_lock_waits                         |
| x$io_by_thread_by_latency                   |
| x$io_global_by_file_by_bytes                |
| x$io_global_by_file_by_latency              |
| x$io_global_by_wait_by_bytes                |
| x$io_global_by_wait_by_latency              |
| x$latest_file_io                            |
| x$memory_by_host_by_current_bytes           |
| x$memory_by_thread_by_current_bytes         |
| x$memory_by_user_by_current_bytes           |
| x$memory_global_by_current_bytes            |
| x$memory_global_total                       |
| x$processlist                               |
| x$ps_digest_95th_percentile_by_avg_us       |
| x$ps_digest_avg_latency_distribution        |
| x$ps_schema_table_statistics_io             |
| x$schema_flattened_keys                     |
| x$schema_index_statistics                   |
| x$schema_table_lock_waits                   |
| x$schema_table_statistics                   |
| x$schema_table_statistics_with_buffer       |
| x$schema_tables_with_full_table_scans       |
| x$session                                   |
```

```
|  x$user_summary_by_statement_type            |
|  x$wait_classes_global_by_avg_latency        |
|  x$wait_classes_global_by_latency            |
|  x$waits_by_host_by_latency                  |
|  x$waits_by_user_by_latency                  |
|  x$waits_global_by_latency                   |
+----------------------------------------------+
101 rows in set (0.010 sec)

MariaDB [sys]> use information_schema;
Database changed
MariaDB [information_schema]> show tables;
+-----------------------------------------+
| Tables_in_information_schema            |
+-----------------------------------------+
| ALL_PLUGINS                             |
| APPLICABLE_ROLES                        |
| CHARACTER_SETS                          |
| CHECK_CONSTRAINTS                       |
| COLLATIONS                              |
| COLLATION_CHARACTER_SET_APPLICABILITY   |
| COLUMNS                                 |
| COLUMN_PRIVILEGES                       |
| ENABLED_ROLES                           |
| ENGINES                                 |
| EVENTS                                  |
| FILES                                   |
| GLOBAL_STATUS                           |
| GLOBAL_VARIABLES                        |
| KEYWORDS                                |
| KEY_CACHES                              |
| KEY_COLUMN_USAGE                        |
| OPTIMIZER_TRACE                         |
| PARAMETERS                              |
| PARTITIONS                              |
| PLUGINS                                 |
| PROCESSLIST                             |
| PROFILING                               |
| REFERENTIAL_CONSTRAINTS                 |
| ROUTINES                                |
| SCHEMATA                                |
| SCHEMA_PRIVILEGES                       |
| SESSION_STATUS                          |
| SESSION_VARIABLES                       |
| STATISTICS                              |
| SQL_FUNCTIONS                           |
```

```
MariaDB [information_schema]> use performance_schema;
Database changed
MariaDB [performance_schema]> show tables;
+-------------------------------------------------------+
| Tables_in_performance_schema                          |
+-------------------------------------------------------+
| accounts                                              |
| cond_instances                                        |
| events_stages_current                                 |
| events_stages_history                                 |
| events_stages_history_long                            |
| events_stages_summary_by_account_by_event_name        |
| events_stages_summary_by_host_by_event_name           |
| events_stages_summary_by_thread_by_event_name         |
| events_stages_summary_by_user_by_event_name           |
| events_stages_summary_global_by_event_name            |
| events_statements_current                             |
| events_statements_history                             |
| events_statements_history_long                        |
| events_statements_summary_by_account_by_event_name    |
| events_statements_summary_by_digest                   |
| events_statements_summary_by_host_by_event_name       |
| events_statements_summary_by_program                  |
| events_statements_summary_by_thread_by_event_name     |
| events_statements_summary_by_user_by_event_name       |
| events_statements_summary_global_by_event_name        |
| events_transactions_current                           |
| events_transactions_history                           |
| events_transactions_history_long                      |
| events_transactions_summary_by_account_by_event_name  |
| events_transactions_summary_by_host_by_event_name     |
| events_transactions_summary_by_thread_by_event_name   |
| events_transactions_summary_by_user_by_event_name     |
| events_transactions_summary_global_by_event_name      |
| events_waits_current                                  |
| events_waits_history                                  |
```

```
MariaDB [performance_schema]> use springboot;
Database changed
MariaDB [springboot]> show tables;
+-----------------------+
| Tables_in_springboot  |
+-----------------------+
| mina                  |
+-----------------------+
1 row in set (0.001 sec)
```

- 사용자 권한 생성, 권한 적용하기 , 권한 확인하기

```
MariaDB [springboot]> grant all privileges on springboot.mina to 'tibero';
Query OK, 0 rows affected (0.008 sec)

MariaDB [springboot]> flush privileges;
Query OK, 0 rows affected (0.009 sec)

MariaDB [springboot]> show grants for 'tibero';
+--------------------------------------------------------+
| Grants for tibero@%                                    |
+--------------------------------------------------------+
| GRANT USAGE ON *.* TO `tibero`@`%`                     |
| GRANT ALL PRIVILEGES ON `springboot`.`mina` TO `tibero`@`%` |
+-----------------------------*--------------------------+
2 rows in set (0.003 sec)
```

```
MariaDB [springboot]> grant all privileges on springboot.mina to 'tibero';
Query OK, 0 rows affected (0.008 sec)

MariaDB [springboot]> flush privileges;
Query OK, 0 rows affected (0.009 sec)

MariaDB [springboot]> show grants for 'tibero';
+---------------------------------------------------------+
| Grants for tibero@%                                     |
+---------------------------------------------------------+
| GRANT USAGE ON *.* TO `tibero`@`%`                      |
| GRANT ALL PRIVILEGES ON `springboot`.`mina` TO `tibero`@`%` |
+---------------------------------------------------------+
2 rows in set (0.003 sec)
```

- mina 테이블 정보 확인하기

```
MariaDB [springboot]> show TABLES from springboot;
+----------------------+
| Tables_in_springboot |
+----------------------+
| mina                 |
+----------------------+
1 row in set (0.001 sec)

MariaDB [springboot]> desc mina;
+-------+---------+------+-----+---------+-------+
| Field | Type    | Null | Key | Default | Extra |
+-------+---------+------+-----+---------+-------+
| 열 1  | int(11) | YES  |     | NULL    |       |
+-------+---------+------+-----+---------+-------+
1 row in set (0.060 sec)

MariaDB [springboot]> select * from mina;
Empty set (0.004 sec)
```

- 테이블 생성하기

```
CREATE TABLE USERINFO (
    -> USERNO INT PRIMARY KEY AUTO_INCREMENT,
    -> ID VARCHAR(13),
    -> name VARCHAR(15),
    -> testID DECIMAL(2)
    -> );

MariaDB [testuser]> create table userTbl
    -> (
    -> userID char(8) primary key,
    -> name varchar(10) not null unique,
    -> birthYear int not null,
    -> addr char(2) not null,
    -> mobile char(3),
    -> mdate date
    -> );
Query OK, 0 rows affected (0.040 sec)
MariaDB [testuser]> CREATE TABLE EMP (
    -> EMPNO DECIMAL(4),
    -> ENAME VARCHAR(10),
    -> JOB VARCHAR(9),
    -> MGR DECIMAR(4),
    -> HIREDATE DATE,
    -> SAL DECIMAL(7,2),
    -> COMM DECIMAL(2),
    -> CONSTRAINT PK_EMP PRIMAR KEY(EMPNO),
    -> CONSTRAINT PK_DEPTNO FOREIGN KEY (DEPTNO) REFFERENCES DEPT(DEPTNO)
    -> );


MariaDB [testuser]> CREATE TABLE EMP (
    ->      EMPNO DECIMAL(4),
    ->      ENAME VARCHAR(10),
    ->      JOB VARCHAR(9),
    ->      MGR DECIMAL(4),
    ->      HIREDATE DATE,
    ->      SAL DECIMAL(7,2),
    ->      COMM DECIMAL(7,2),
```

```
    ->      DEPTNO DECIMAL(2),
    ->      CONSTRAINT PK_EMP PRIMARY KEY (EMPNO),
    ->      CONSTRAINT FK_DEPTNO FOREIGN KEY (DEPTNO) REFERENCES DEPT(DEPTNO)
    -> );
Query OK, 0 rows affected, 1 warning (0.031 sec)

MariaDB [testuser]> CREATE TABLE SALGRADE (
    -> GRADE TINYINT,
    -> LOSAL SMALLINT,
    -> HISAL SMALLINT
    -> );
Query OK, 0 rows affected (0.031 sec)
```

```
MariaDB [testuser]> create table userTbl
    -> (
    -> userID char(8) primary key,
    -> name varchar(10) not null unique,
    -> birthYear int not null,
    -> addr char(2) not null,
    -> mobile char(3),
    -> mdate date
    -> );
Query OK, 0 rows affected (0.040 sec)
```

```
MariaDB [testuser]>  CREATE TABLE USERINFO (
    -> USERNO  INT PRIMARY KEY AUTO_INCREMENT,
    -> ID VARCHAR(13),
    -> name VARCHAR(15),
    -> testID DECIMAL(2)
    -> );
Query OK, 0 rows affected (0.044 sec)
```

```
MariaDB [testuser]> CREATE TABLE DEPT (
    -> DEPTNO DECIMAL(2),
    -> DNAME VARCHAR(14),
    -> LOC VARCHAR(13),
    -> CONSTRAINT PK_DEPT PRIMARY KEY (DEPTNO)
    -> );
Query OK, 0 rows affected, 1 warning (0.030 sec)
```

]

```
MariaDB [testuser]> CREATE TABLE EMP (
    ->      EMPNO DECIMAL(4),
    ->      ENAME VARCHAR(10),
    ->      JOB VARCHAR(9),
    ->      MGR DECIMAL(4),
    ->      HIREDATE DATE,
    ->      SAL DECIMAL(7,2),
    ->      COMM DECIMAL(7,2),
    ->      DEPTNO DECIMAL(2),
    ->      CONSTRAINT PK_EMP PRIMARY KEY (EMPNO),
    ->      CONSTRAINT FK_DEPTNO FOREIGN KEY (DEPTNO) REFERENCES DEPT(DEPTNO)
    -> );
Query OK, 0 rows affected, 1 warning (0.031 sec)
```

```
MariaDB [testuser]> CREATE TABLE SALGRADE (
    -> GRADE TINYINT,
    -> LOSAL SMALLINT,
    -> HISAL SMALLINT
    -> );
Query OK, 0 rows affected (0.031 sec)
```

- userinfo, usertbl 테이블 정보 확인하기

```
MariaDB [(none)]> use testuser;
Database changed
MariaDB [testuser]> desc userinfo;
+--------+-------------+------+-----+---------+----------------+
| Field  | Type        | Null | Key | Default | Extra          |
+--------+-------------+------+-----+---------+----------------+
| USERNO | int(11)     | NO   | PRI | NULL    | auto_increment |
| ID     | varchar(13) | YES  |     | NULL    |                |
| name   | varchar(15) | YES  |     | NULL    |                |
| testID | decimal(2,0)| YES  |     | NULL    |                |
+--------+-------------+------+-----+---------+----------------+
4 rows in set (0.020 sec)

MariaDB [testuser]> desc usertbl;
+-----------+-------------+------+-----+---------+-------+
| Field     | Type        | Null | Key | Default | Extra |
+-----------+-------------+------+-----+---------+-------+
| userID    | char(8)     | NO   | PRI | NULL    |       |
| name      | varchar(10) | NO   | UNI | NULL    |       |
| birthYear | int(11)     | NO   |     | NULL    |       |
| addr      | char(2)     | NO   |     | NULL    |       |
| mobile    | char(3)     | YES  |     | NULL    |       |
| mdate     | date        | YES  |     | NULL    |       |
+-----------+-------------+------+-----+---------+-------+
6 rows in set (0.138 sec)

MariaDB [testuser]> DESC SALGRADE;
+-------+-------------+------+-----+---------+-------+
| Field | Type        | Null | Key | Default | Extra |
+-------+-------------+------+-----+---------+-------+
| GRADE | tinyint(4)  | YES  |     | NULL    |       |
| LOSAL | smallint(6) | YES  |     | NULL    |       |
| HISAL | smallint(6) | YES  |     | NULL    |       |
+-------+-------------+------+-----+---------+-------+
3 rows in set (0.125 sec)

MariaDB [testuser]> DESC EMP;
+----------+-------------+------+-----+---------+-------+
| Field    | Type        | Null | Key | Default | Extra |
+----------+-------------+------+-----+---------+-------+
| EMPNO    | decimal(4,0)| NO   | PRI | NULL    |       |
| ENAME    | varchar(10) | YES  |     | NULL    |       |
| JOB      | varchar(9)  | YES  |     | NULL    |       |
| MGR      | decimal(4,0)| YES  |     | NULL    |       |
| HIREDATE | date        | YES  |     | NULL    |       |
| SAL      | decimal(7,2)| YES  |     | NULL    |       |
| COMM     | decimal(7,2)| YES  |     | NULL    |       |
| DEPTNO   | decimal(2,0)| YES  | MUL | NULL    |       |
+----------+-------------+------+-----+---------+-------+
8 rows in set (0.070 sec)

MariaDB [testuser]> DESC DEPT;
+--------+-------------+------+-----+---------+-------+
| Field  | Type        | Null | Key | Default | Extra |
+--------+-------------+------+-----+---------+-------+
| DEPTNO | decimal(2,0)| NO   | PRI | NULL    |       |
| DNAME  | varchar(14) | YES  |     | NULL    |       |
| LOC    | varchar(13) | YES  |     | NULL    |       |
+--------+-------------+------+-----+---------+-------+
3 rows in set (0.014 sec)
```

```
MariaDB [testuser]> DESC SALGRADE;
+--------+-------------+------+-----+---------+-------+
| Field  | Type        | Null | Key | Default | Extra |
+--------+-------------+------+-----+---------+-------+
| GRADE  | tinyint(4)  | YES  |     | NULL    |       |
| LOSAL  | smallint(6) | YES  |     | NULL    |       |
| HISAL  | smallint(6) | YES  |     | NULL    |       |
+--------+-------------+------+-----+---------+-------+
3 rows in set (0.125 sec)

MariaDB [testuser]> DESC EMP;
+----------+--------------+------+-----+---------+-------+
| Field    | Type         | Null | Key | Default | Extra |
+----------+--------------+------+-----+---------+-------+
| EMPNO    | decimal(4,0) | NO   | PRI | NULL    |       |
| ENAME    | varchar(10)  | YES  |     | NULL    |       |
| JOB      | varchar(9)   | YES  |     | NULL    |       |
| MGR      | decimal(4,0) | YES  |     | NULL    |       |
| HIREDATE | date         | YES  |     | NULL    |       |
| SAL      | decimal(7,2) | YES  |     | NULL    |       |
| COMM     | decimal(7,2) | YES  |     | NULL    |       |
| DEPTNO   | decimal(2,0) | YES  | MUL | NULL    |       |
+----------+--------------+------+-----+---------+-------+
8 rows in set (0.070 sec)

MariaDB [testuser]> DESC DEPT;
+--------+--------------+------+-----+---------+-------+
| Field  | Type         | Null | Key | Default | Extra |
+--------+--------------+------+-----+---------+-------+
| DEPTNO | decimal(2,0) | NO   | PRI | NULL    |       |
| DNAME  | varchar(14)  | YES  |     | NULL    |       |
| LOC    | varchar(13)  | YES  |     | NULL    |       |
+--------+--------------+------+-----+---------+-------+
3 rows in set (0.014 sec)
```

- 테이블 데이터 생성하기

```
MariaDB [testuser]> INSERT INTO DEPT VALUES (10,'ACCOUNTING','NEW YORK');
Query OK, 1 row affected (0.007 sec)

MariaDB [testuser]> INSERT INTO DEPT VALUES (20,'RESEARCH','DALLAS');
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO DEPT VALUES (30,'SALES','CHICAGO');
Query OK, 1 row affected (0.002 sec)

MariaDB [testuser]> INSERT INTO DEPT VALUES (40,'OPERATIONS','BOSTON');
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO EMP VALUES (7369,'SMITH','CLERK',7902,STR_TO_DATE('17-12-1980','%d-%m-%Y'),800,NULL,20);
Query OK, 1 row affected (0.004 sec)

MariaDB [testuser]> INSERT INTO EMP VALUES (7499,'ALLEN','SALESMAN',7698,STR_TO_DATE('20-2-1981','%d-%m-%Y'),1600,300,30);
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO EMP VALUES (7521,'WARD','SALESMAN',7698,STR_TO_DATE('22-2-1981','%d-%m-%Y'),1250,500,30);
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO EMP VALUES (7566,'JONES','MANAGER',7839,STR_TO_DATE('2-4-1981','%d-%m-%Y'),2975,NULL,20);
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO EMP VALUES (7654,'MARTIN','SALESMAN',7698,STR_TO_DATE('28-9-1981','%d-%m-%Y'),1250,1400,30);
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO EMP VALUES (7698,'BLAKE','MANAGER',7839,STR_TO_DATE('1-5-1981','%d-%m-%Y'),2850,NULL,30);
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO EMP VALUES (7782,'CLARK','MANAGER',7839,STR_TO_DATE('9-6-1981','%d-%m-%Y'),2450,NULL,10);
Query OK, 1 row affected (0.002 sec)

MariaDB [testuser]> INSERT INTO EMP VALUES (7788,'SCOTT','ANALYST',7566,STR_TO_DATE('13-7-1987','%d-%m-%Y')-85,3000,NULL,20);
Query OK, 1 row affected (0.002 sec)

MariaDB [testuser]> INSERT INTO EMP VALUES (7839,'KING','PRESIDENT',NULL,STR_TO_DATE('17-11-1981','%d-%m-%Y'),5000,NULL,10);
```

```
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO EMP VALUES (7844,'TURNER','SALESMAN',7698,STR_TO_DATE('8-9-1981','%d-%m-%Y'),1500,0,30);
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO EMP VALUES (7876,'ADAMS','CLERK',7788,STR_TO_DATE('13-7-1987', '%d-%m-%Y'),1100,NULL,20);
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO EMP VALUES (7900,'JAMES','CLERK',7698,STR_TO_DATE('3-12-1981','%d-%m-%Y'),950,NULL,30);
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO EMP VALUES (7902,'FORD','ANALYST',7566,STR_TO_DATE('3-12-1981','%d-%m-%Y'),3000,NULL,20);
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO EMP VALUES (7934,'MILLER','CLERK',7782,STR_TO_DATE('23-1-1982','%d-%m-%Y'),1300,NULL,10);
Query OK, 1 row affected (0.004 sec)

MariaDB [testuser]> INSERT INTO SALGRADE VALUES (1,700,1200);
Query OK, 1 row affected (0.002 sec)

MariaDB [testuser]> INSERT INTO SALGRADE VALUES (2,1201,1400);
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO SALGRADE VALUES (3,1401,2000);
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO SALGRADE VALUES (4,2001,3000);
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO SALGRADE VALUES (5,3001,9999);
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> COMMIT;
```

```
MariaDB [testuser]> INSERT INTO DEPT VALUES (10,'ACCOUNTING','NEW YORK');
Query OK, 1 row affected (0.007 sec)

MariaDB [testuser]> INSERT INTO DEPT VALUES (20,'RESEARCH','DALLAS');
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO DEPT VALUES (30,'SALES','CHICAGO');
Query OK, 1 row affected (0.002 sec)

MariaDB [testuser]> INSERT INTO DEPT VALUES (40,'OPERATIONS','BOSTON');
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO EMP VALUES (7369,'SMITH','CLERK',7902,STR_TO_DATE('17-12-1980','%d-%m-%Y'),800,NULL,20);
Query OK, 1 row affected (0.004 sec)

MariaDB [testuser]> INSERT INTO EMP VALUES (7499,'ALLEN','SALESMAN',7698,STR_TO_DATE('20-2-1981','%d-%m-%Y'),1600,300,30);
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO EMP VALUES (7521,'WARD','SALESMAN',7698,STR_TO_DATE('22-2-1981','%d-%m-%Y'),1250,500,30);
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO EMP VALUES (7566,'JONES','MANAGER',7839,STR_TO_DATE('2-4-1981','%d-%m-%Y'),2975,NULL,20);
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO EMP VALUES (7654,'MARTIN','SALESMAN',7698,STR_TO_DATE('28-9-1981','%d-%m-%Y'),1250,1400,30);
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO EMP VALUES (7698,'BLAKE','MANAGER',7839,STR_TO_DATE('1-5-1981','%d-%m-%Y'),2850,NULL,30);
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO EMP VALUES (7782,'CLARK','MANAGER',7839,STR_TO_DATE('9-6-1981','%d-%m-%Y'),2450,NULL,10);
Query OK, 1 row affected (0.002 sec)

MariaDB [testuser]> INSERT INTO EMP VALUES (7788,'SCOTT','ANALYST',7566,STR_TO_DATE('13-7-1987','%d-%m-%Y')-85,3000,NULL,20);
Query OK, 1 row affected (0.002 sec)

MariaDB [testuser]> INSERT INTO EMP VALUES (7839,'KING','PRESIDENT',NULL,STR_TO_DATE('17-11-1981','%d-%m-%Y'),5000,NULL,10);
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO EMP VALUES (7844,'TURNER','SALESMAN',7698,STR_TO_DATE('8-9-1981','%d-%m-%Y'),1500,0,30);
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO EMP VALUES (7876,'ADAMS','CLERK',7788,STR_TO_DATE('13-7-1987', '%d-%m-%Y'),1100,NULL,20);
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO EMP VALUES (7900,'JAMES','CLERK',7698,STR_TO_DATE('3-12-1981','%d-%m-%Y'),950,NULL,30);
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO EMP VALUES (7902,'FORD','ANALYST',7566,STR_TO_DATE('3-12-1981','%d-%m-%Y'),3000,NULL,20);
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO EMP VALUES (7934,'MILLER','CLERK',7782,STR_TO_DATE('23-1-1982','%d-%m-%Y'),1300,NULL,10);
Query OK, 1 row affected (0.004 sec)

MariaDB [testuser]> INSERT INTO SALGRADE VALUES (1,700,1200);
Query OK, 1 row affected (0.002 sec)

MariaDB [testuser]> INSERT INTO SALGRADE VALUES (2,1201,1400);
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO SALGRADE VALUES (3,1401,2000);
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO SALGRADE VALUES (4,2001,3000);
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> INSERT INTO SALGRADE VALUES (5,3001,9999);
Query OK, 1 row affected (0.001 sec)

MariaDB [testuser]> COMMIT;
```

- EMP 테이블, DEPT 테이블, SALGRADE 테이블 정보보기

```
MariaDB [testuser]> SELECT * FROM EMP;
+-------+--------+-----------+------+------------+---------+---------+--------+
| EMPNO | ENAME  | JOB       | MGR  | HIREDATE   | SAL     | COMM    | DEPTNO |
+-------+--------+-----------+------+------------+---------+---------+--------+
|  7369 | SMITH  | CLERK     | 7902 | 1980-12-17 |  800.00 |    NULL |     20 |
|  7499 | ALLEN  | SALESMAN  | 7698 | 1981-02-20 | 1600.00 |  300.00 |     30 |
|  7521 | WARD   | SALESMAN  | 7698 | 1981-02-22 | 1250.00 |  500.00 |     30 |
|  7566 | JONES  | MANAGER   | 7839 | 1981-04-02 | 2975.00 |    NULL |     20 |
|  7654 | MARTIN | SALESMAN  | 7698 | 1981-09-28 | 1250.00 | 1400.00 |     30 |
|  7698 | BLAKE  | MANAGER   | 7839 | 1981-05-01 | 2850.00 |    NULL |     30 |
|  7782 | CLARK  | MANAGER   | 7839 | 1981-06-09 | 2450.00 |    NULL |     10 |
|  7788 | SCOTT  | ANALYST   | 7566 | 1987-06-28 | 3000.00 |    NULL |     20 |
|  7839 | KING   | PRESIDENT | NULL | 1981-11-17 | 5000.00 |    NULL |     10 |
|  7844 | TURNER | SALESMAN  | 7698 | 1981-09-08 | 1500.00 |    0.00 |     30 |
|  7876 | ADAMS  | CLERK     | 7788 | 1987-07-13 | 1100.00 |    NULL |     20 |
|  7900 | JAMES  | CLERK     | 7698 | 1981-12-03 |  950.00 |    NULL |     30 |
|  7902 | FORD   | ANALYST   | 7566 | 1981-12-03 | 3000.00 |    NULL |     20 |
|  7934 | MILLER | CLERK     | 7782 | 1982-01-23 | 1300.00 |    NULL |     10 |
+-------+--------+-----------+------+------------+---------+---------+--------+
14 rows in set (0.002 sec)

MariaDB [testuser]> SELECT * FROM SALGRADE;
+-------+-------+-------+
| GRADE | LOSAL | HISAL |
+-------+-------+-------+
|     1 |   700 |  1200 |
|     2 |  1201 |  1400 |
|     3 |  1401 |  2000 |
|     4 |  2001 |  3000 |
|     5 |  3001 |  9999 |
+-------+-------+-------+
5 rows in set (0.000 sec)

MariaDB [testuser]> SELECT * DEPT;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MariaDB server version for the rig
MariaDB [testuser]> SELECT * FROM DEPT;
+--------+------------+----------+
| DEPTNO | DNAME      | LOC      |
+--------+------------+----------+
|     10 | ACCOUNTING | NEW YORK |
|     20 | RESEARCH   | DALLAS   |
|     30 | SALES      | CHICAGO  |
|     40 | OPERATIONS | BOSTON   |
+--------+------------+----------+
4 rows in set (0.000 sec)

MariaDB [testuser]> SELECT COUNT(EMPNO) FROM EMP;
+--------------+
| COUNT(EMPNO) |
+--------------+
|           14 |
+--------------+
1 row in set (0.004 sec)
```

```
MariaDB [testuser]> SELECT * FROM EMP;
+-------+--------+-----------+------+------------+---------+---------+--------+
| EMPNO | ENAME  | JOB       | MGR  | HIREDATE   | SAL     | COMM    | DEPTNO |
+-------+--------+-----------+------+------------+---------+---------+--------+
|  7369 | SMITH  | CLERK     | 7902 | 1980-12-17 |  800.00 |    NULL |     20 |
|  7499 | ALLEN  | SALESMAN  | 7698 | 1981-02-20 | 1600.00 |  300.00 |     30 |
|  7521 | WARD   | SALESMAN  | 7698 | 1981-02-22 | 1250.00 |  500.00 |     30 |
|  7566 | JONES  | MANAGER   | 7839 | 1981-04-02 | 2975.00 |    NULL |     20 |
|  7654 | MARTIN | SALESMAN  | 7698 | 1981-09-28 | 1250.00 | 1400.00 |     30 |
|  7698 | BLAKE  | MANAGER   | 7839 | 1981-05-01 | 2850.00 |    NULL |     30 |
|  7782 | CLARK  | MANAGER   | 7839 | 1981-06-09 | 2450.00 |    NULL |     10 |
|  7788 | SCOTT  | ANALYST   | 7566 | 1987-06-28 | 3000.00 |    NULL |     20 |
|  7839 | KING   | PRESIDENT | NULL | 1981-11-17 | 5000.00 |    NULL |     10 |
|  7844 | TURNER | SALESMAN  | 7698 | 1981-09-08 | 1500.00 |    0.00 |     30 |
|  7876 | ADAMS  | CLERK     | 7788 | 1987-07-13 | 1100.00 |    NULL |     20 |
|  7900 | JAMES  | CLERK     | 7698 | 1981-12-03 |  950.00 |    NULL |     30 |
|  7902 | FORD   | ANALYST   | 7566 | 1981-12-03 | 3000.00 |    NULL |     20 |
|  7934 | MILLER | CLERK     | 7782 | 1982-01-23 | 1300.00 |    NULL |     10 |
+-------+--------+-----------+------+------------+---------+---------+--------+
14 rows in set (0.002 sec)

MariaDB [testuser]> SELECT * FROM SALGRADE;
+-------+-------+-------+
| GRADE | LOSAL | HISAL |
+-------+-------+-------+
|     1 |   700 |  1200 |
|     2 |  1201 |  1400 |
|     3 |  1401 |  2000 |
|     4 |  2001 |  3000 |
|     5 |  3001 |  9999 |
+-------+-------+-------+
5 rows in set (0.000 sec)

MariaDB [testuser]> SELECT * DEPT;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MariaDB server version
for the right syntax to use near 'DEPT' at line 1
MariaDB [testuser]> SELECT * FROM DEPT;
+--------+------------+----------+
| DEPTNO | DNAME      | LOC      |
+--------+------------+----------+
|     10 | ACCOUNTING | NEW YORK |
|     20 | RESEARCH   | DALLAS   |
|     30 | SALES      | CHICAGO  |
|     40 | OPERATIONS | BOSTON   |
+--------+------------+----------+
4 rows in set (0.000 sec)

MariaDB [testuser]> SELECT COUNT(EMPNO) FROM EMP;
+--------------+
| COUNT(EMPNO) |
+--------------+
|           14 |
+--------------+
1 row in set (0.004 sec)
```

- 월급여가 3000이상 되는 사원 조회하기 - 부질의 등식 사용

```
MariaDB [testuser]> SELECT * FROM EMP
    -> WHERE SAL >= 3000;
+-------+-------+-----------+--
```

```
MariaDB [testuser]> SELECT * FROM EMP
    -> WHERE SAL >= 3000;
+-------+-------+-----------+------+------------+---------+------+--------+
| EMPNO | ENAME | JOB       | MGR  | HIREDATE   | SAL     | COMM | DEPTNO |
+-------+-------+-----------+------+------------+---------+------+--------+
|  7788 | SCOTT | ANALYST   | 7566 | 1987-06-28 | 3000.00 | NULL |     20 |
|  7839 | KING  | PRESIDENT | NULL | 1981-11-17 | 5000.00 | NULL |     10 |
|  7902 | FORD  | ANALYST   | 7566 | 1981-12-03 | 3000.00 | NULL |     20 |
+-------+-------+-----------+------+------------+---------+------+--------+
3 rows in set (0.009 sec)
```

- 이름이 S로 시작하는 사원 과 이름 안에 S가 포함된 사원 조회하기 - LIKE 구분에서 '_%' 와 '%_%'의 차이

```
MariaDB [testuser]> SELECT EMPNO, ENAME
    -> FROM EMP
    -> WHERE ENAME LIKE 'S%';
+-------+-------+
| EMPNO | ENAME |
```

```
+-------+-------+
| 7369 | SMITH |
| 7788 | SCOTT |
+-------+-------+
2 rows in set (0.003 sec)

MariaDB [testuser]> SELECT EMPNO, ENAME
    -> FROM EMP
    -> WHERE ENAME LIKE '%S%';
+-------+-------+
| EMPNO | ENAME |
+-------+-------+
| 7369 | SMITH |
| 7566 | JONES |
| 7788 | SCOTT |
| 7876 | ADAMS |
| 7900 | JAMES |
+-------+-------+
5 rows in set (0.001 sec)
아스키코드가 달라서 대소문자가 구분
기본적인 객체는 소문자로 만들어도 db내부적으로 대문자가 들어간다.
create table 감싸서 대소문자 구분 가능
```


- 커미션이 300,500,1400 인 사원의 사번, 이름, 커미션 조회하기

```
1. OR 방식
MariaDB [testuser]> SELECT EMPNO, ENAME, COMM
    -> FROM EMP
    -> WHERE COMM = 300 OR COMM = 500 OR COMM = 1400;
+-------+--------+---------+
| EMPNO | ENAME  | COMM    |
+-------+--------+---------+
| 7499 | ALLEN  |  300.00 |
| 7521 | WARD   |  500.00 |
| 7654 | MARTIN | 1400.00 |
+-------+--------+---------+
3 rows in set (0.001 sec)

2. IN 방식
MariaDB [testuser]> SELECT EMPNO, ENAME, COMM
    -> FROM EMP
    -> WHERE COMM IN (300,500,1400);
+-------+--------+---------+
| EMPNO | ENAME  | COMM    |
+-------+--------+---------+
| 7499 | ALLEN  |  300.00 |
| 7521 | WARD   |  500.00 |
| 7654 | MARTIN | 1400.00 |
```

```
+-------+--------+---------+
3 rows in set (0.000 sec)
```

- 직속상사가 NULL인 사원의 이름과 직급 조회 - IS NULL 과 IS NOT NULL

```
MariaDB [testuser]> SELECT ENAME, JOB
    -> FROM EMP
    -> WHERE MGR IS NULL;
+-------+-----------+
| ENAME | JOB       |
+-------+-----------+
| KING  | PRESIDENT |
+-------+-----------+
1 row in set (0.001 sec)

MariaDB [testuser]> SELECT ENAME, JOB
    -> FROM EMP
    -> WHERE MGR IS NOT NULL;
+--------+----------+
| ENAME  | JOB      |
+--------+----------+
| SMITH  | CLERK    |
| ALLEN  | SALESMAN |
| WARD   | SALESMAN |
| JONES  | MANAGER  |
| MARTIN | SALESMAN |
| BLAKE  | MANAGER  |
| CLARK  | MANAGER  |
| SCOTT  | ANALYST  |
| TURNER | SALESMAN |
| ADAMS  | CLERK    |
| JAMES  | CLERK    |
| FORD   | ANALYST  |
| MILLER | CLERK    |
+--------+----------+
13 rows in set (0.001 sec)
```

```
MariaDB [testuser]> SELECT ENAME, JOB
    -> FROM EMP
    -> WHERE MGR IS NULL;
+-------+-----------+
| ENAME | JOB       |
+-------+-----------+
| KING  | PRESIDENT |
+-------+-----------+
1 row in set (0.001 sec)

MariaDB [testuser]> SELECT ENAME, JOB
    -> FROM EMP
    -> WHERE MGR IS NOT NULL;
+--------+----------+
| ENAME  | JOB      |
+--------+----------+
| SMITH  | CLERK    |
| ALLEN  | SALESMAN |
| WARD   | SALESMAN |
| JONES  | MANAGER  |
| MARTIN | SALESMAN |
| BLAKE  | MANAGER  |
| CLARK  | MANAGER  |
| SCOTT  | ANALYST  |
| TURNER | SALESMAN |
| ADAMS  | CLERK    |
| JAMES  | CLERK    |
| FORD   | ANALYST  |
| MILLER | CLERK    |
+--------+----------+
13 rows in set (0.001 sec)
```

- 부서별 평균 월 급여 구하기 / 전체 사원수와 커미션을 받는 사원들의 수 구하기 / 부서별 최대 급여와 최소 급여 구하기

-그룹함수와 그룹화의 기준이 되는 칼럼이 함께 쓰일때는 묶는 칼럼을 GROUP BY로 명시해야만 에러를 피할 수 있다.

```
MariaDB [testuser]> SELECT DEPTNO, AVG(SAL)
    -> FROM EMP
    -> GROUP BY DEPTNO;
+--------+------------+
| DEPTNO | AVG(SAL)   |
+--------+------------+
|     10 | 2916.666667 |
|     20 | 2175.000000 |
|     30 | 1566.666667 |
+--------+------------+
3 rows in set (0.003 sec)

MariaDB [testuser]> SELECT DEPTNO, COUNT(*), COUNT(COMM)
    -> FROM EMP
    -> GROUP BY DEPTNO;
+--------+----------+------------+
| DEPTNO | COUNT(*) | COUNT(COMM) |
+--------+----------+------------+
|     10 |        3 |          0 |
|     20 |        5 |          0 |
|     30 |        6 |          4 |
+--------+----------+------------+
3 rows in set (0.001 sec)

MariaDB [testuser]> SELECT DEPTNO,MAX(SAL),MIN(SAL)
    -> FROM EMP
    -> GROUP BY DEPTNO;
+--------+----------+----------+
| DEPTNO | MAX(SAL) | MIN(SAL) |
+--------+----------+----------+
|     10 |  5000.00 |  1300.00 |
|     20 |  3000.00 |   800.00 |
|     30 |  2850.00 |   950.00 |
+--------+----------+----------+
3 rows in set (0.002 sec)
```

- 부서별 급여 평균이 2000이상인 경우로 부서별로 급여 평균 구하기

-GROUP BY 구문을 사용하면 결과에 조건을 줄때 WHERE조건문을 사용할 수 없다. GROUP BY구문을 사용하면서 조건을 주기 위해서는 HAVING 구문을 사용한다.

-HAVING 구문에서는 그룹화의 기준이 되는 칼럼과 그룹함수만이 사용 할 수 있다. DEPTNO는 HAVING 구문에서 사용 할 수 없다.(그룹화의 기준이 되는 칼럼이 DEPTNO이므로,)

```
MariaDB [testuser]> SELECT DEPTNO, AVG(SAL)
    -> FROM EMP
    -> WHERE AVG(SAL) >= 2000
    -> GROUP BY DEPTNO;
ERROR 1111 (HY000): Invalid use of group function
MariaDB [testuser]> SELECT DEPTNO, AVG(SAL)
    -> FROM EMP
    -> GROUP BY DEPTNO
    -> HAVING AVG(SAL) >= 2000;
+--------+------------+
| DEPTNO | AVG(SAL)   |
+--------+------------+
|     10 | 2916.666667 |
|     20 | 2175.000000 |
+--------+------------+
2 rows in set (0.001 sec)
```

- 월급여가 1000 이상인 사원을 대상으로 부서별로 월 급여 평균을 구하라 (월급여 평균이 2000이상인 레코드 한정)

-WHERE 절은 테이블에서 데이터를 가져올때 그 테이블에서 특정 조건에 부합하는 레코드만을 가져올때 사용한다. HAVING 절은 GROUP BY 구문을 사용하여 구한 레코드 중에서 원하는 조건에 맞는 레코드만을 가져올때 사용한다.

```
MariaDB [testuser]> SELECT DEPTNO,AVG(SAL)
    -> FROM EMP
    -> WHERE SAL >= 1000
    -> GROUP BY DEPTNO
    -> HAVING AVG(SAL) >= 2000;\
+-------+------------+
| DEPTNO | AVG(SAL)   |
+-------+------------+
|     10 | 2916.666667 |
|     20 | 2518.750000 |
+-------+------------+
2 rows in set (0.001 sec)

MariaDB [testuser]> SELECT DEPTNO, AVG(SAL)
    -> FROM EMP
    -> GROUP BY DEPTNO
    -> HAVING AVG(SAL) >= 2000;
+-------+------------+
| DEPTNO | AVG(SAL)   |
+-------+------------+
|     10 | 2916.666667 |
|     20 | 2175.000000 |
+-------+------------+
2 rows in set (0.001 sec)
```

- 급여가 높은 순으로 조회하되, 급여가 같을 경우 이름의 철자가 빠른 사원순으로 사번, 이름, 월급여를 조회하기

```
MariaDB [testuser]> SELECT EMPNO, ENAME, SAL
    -> FROM EMP
    -> ORDER BY SAL DESC, ENAME ASC;
+-------+--------+---------+
| EMPNO | ENAME  | SAL     |
+-------+--------+---------+
|  7839 | KING   | 5000.00 |
|  7902 | FORD   | 3000.00 |
|  7788 | SCOTT  | 3000.00 |
|  7566 | JONES  | 2975.00 |
|  7698 | BLAKE  | 2850.00 |
|  7782 | CLARK  | 2450.00 |
|  7499 | ALLEN  | 1600.00 |
|  7844 | TURNER | 1500.00 |
|  7934 | MILLER | 1300.00 |
|  7654 | MARTIN | 1250.00 |
|  7521 | WARD   | 1250.00 |
|  7876 | ADAMS  | 1100.00 |
|  7900 | JAMES  |  950.00 |
|  7369 | SMITH  |  800.00 |
+-------+--------+---------+
14 rows in set (0.003 sec)
```

```
MariaDB [testuser]> SELECT EMPNO, ENAME, SAL
    -> FROM EMP
    -> ORDER BY SAL DESC, ENAME ASC;
+-------+--------+---------+
| EMPNO | ENAME  | SAL     |
+-------+--------+---------+
|  7839 | KING   | 5000.00 |
|  7902 | FORD   | 3000.00 |
|  7788 | SCOTT  | 3000.00 |
|  7566 | JONES  | 2975.00 |
|  7698 | BLAKE  | 2850.00 |
|  7782 | CLARK  | 2450.00 |
|  7499 | ALLEN  | 1600.00 |
|  7844 | TURNER | 1500.00 |
|  7934 | MILLER | 1300.00 |
|  7654 | MARTIN | 1250.00 |
|  7521 | WARD   | 1250.00 |
|  7876 | ADAMS  | 1100.00 |
|  7900 | JAMES  |  950.00 |
|  7369 | SMITH  |  800.00 |
+-------+--------+---------+
14 rows in set (0.003 sec)
```

- 사원명과 부서명을 조회하기 - 테이블에 별명을 붙여서 간단하게 쿼리를 작성할 수 있다.

```
MariaDB [testuser]> SELECT ENAME, DNAME
    -> FROM EMP, DEPT
    -> WHERE EMP.DEPTNO = DEPT.DEPTNO;
+--------+------------+
| ENAME  | DNAME      |
+--------+------------+
| CLARK  | ACCOUNTING |
| KING   | ACCOUNTING |
| MILLER | ACCOUNTING |
| SMITH  | RESEARCH   |
| JONES  | RESEARCH   |
| SCOTT  | RESEARCH   |
| ADAMS  | RESEARCH   |
| FORD   | RESEARCH   |
| ALLEN  | SALES      |
| WARD   | SALES      |
| MARTIN | SALES      |
| BLAKE  | SALES      |
| TURNER | SALES      |
| JAMES  | SALES      |
+--------+------------+
14 rows in set (0.003 sec)

MariaDB [testuser]> SELECT E.ENAME, D.DNAME
    -> FROM EMP E, DEPT D
    -> WHERE E.DEPTNO = D.DEPTNO;
+--------+------------+
| ENAME  | DNAME      |
+--------+------------+
| CLARK  | ACCOUNTING |
| KING   | ACCOUNTING |
| MILLER | ACCOUNTING |
| SMITH  | RESEARCH   |
| JONES  | RESEARCH   |
| SCOTT  | RESEARCH   |
| ADAMS  | RESEARCH   |
| FORD   | RESEARCH   |
| ALLEN  | SALES      |
| WARD   | SALES      |
| MARTIN | SALES      |
| BLAKE  | SALES      |
| TURNER | SALES      |
| JAMES  | SALES      |
+--------+------------+
14 rows in set (0.001 sec)
```

- 이름, 월급여, 월급여 등급을 조회하기 - 비교연산자와 BETWEN ~ AND 문 비교

```
MariaDB [testuser]> SELECT E.ENAME,E.SAL,S.GRADE
    -> FROM EMP E,SALGRADE S
    -> WHERE E.SAL >= S.LOSAL AND E.SAL <= S.HISAL;
+--------+----------+-------+
| ENAME  | SAL      | GRADE |
+--------+----------+-------+
| SMITH  |  800.00  |     1 |
| ALLEN  | 1600.00  |     3 |
| WARD   | 1250.00  |     2 |
| JONES  | 2975.00  |     4 |
| MARTIN | 1250.00  |     2 |
| BLAKE  | 2850.00  |     4 |
| CLARK  | 2450.00  |     4 |
| SCOTT  | 3000.00  |     4 |
| KING   | 5000.00  |     5 |
| TURNER | 1500.00  |     3 |
| ADAMS  | 1100.00  |     1 |
| JAMES  |  950.00  |     1 |
| FORD   | 3000.00  |     4 |
| MILLER | 1300.00  |     2 |
+--------+----------+-------+
14 rows in set (0.002 sec)

MariaDB [testuser]> SELECT E.ENAME,E.SAL,S.GRADE
    -> FROM EMP E,SALGRADE S
    -> WHERE E.SAL BETWEEN S.LOSAL AND S.HISAL;
+--------+----------+-------+
| ENAME  | SAL      | GRADE |
+--------+----------+-------+
| SMITH  |  800.00  |     1 |
| ALLEN  | 1600.00  |     3 |
| WARD   | 1250.00  |     2 |
| JONES  | 2975.00  |     4 |
| MARTIN | 1250.00  |     2 |
| BLAKE  | 2850.00  |     4 |
| CLARK  | 2450.00  |     4 |
| SCOTT  | 3000.00  |     4 |
| KING   | 5000.00  |     5 |
| TURNER | 1500.00  |     3 |
| ADAMS  | 1100.00  |     1 |
| JAMES  |  950.00  |     1 |
| FORD   | 3000.00  |     4 |
| MILLER | 1300.00  |     2 |
+--------+----------+-------+
14 rows in set (0.002 sec)
```

- 이름, 직속상사 이름을 조회하기

-JOIN을 할때 일반 조인을 하면 NULL값인 경우 조인 조건에 만족하지 않기 때문에 레코드가 배제된다. 이때 NULL값을 포함시키려면 외부조인을 사용해야 한다. A LEFT JOIN B 는 조인 조건에 만족하지 못하더라도 왼쪽 테이블 A의 행을 나타내고 싶을 때 사용한다.

```
MariaDB [testuser]> SELECT E.ENAME,M.ENAME
    -> FROM EMP E,EMP M
    -> WHERE E.MGR = M.EMPNO;
+--------+-------+
| ENAME  | ENAME |
+--------+-------+
| SMITH  | FORD  |
| ALLEN  | BLAKE |
| WARD   | BLAKE |
| JONES  | KING  |
| MARTIN | BLAKE |
| BLAKE  | KING  |
| CLARK  | KING  |
| SCOTT  | JONES |
| TURNER | BLAKE |
| ADAMS  | SCOTT |
| JAMES  | BLAKE |
| FORD   | JONES |
| MILLER | CLARK |
+--------+-------+
13 rows in set (0.001 sec)

MariaDB [testuser]> SELECT E.ENAME,M.ENAME
    -> FROM EMP E LEFT JOIN EMP M ON E.MGR = M.EMPNO;
+--------+-------+
| ENAME  | ENAME |
+--------+-------+
| SMITH  | FORD  |
| ALLEN  | BLAKE |
| WARD   | BLAKE |
| JONES  | KING  |
| MARTIN | BLAKE |
| BLAKE  | KING  |
```

```
| CLARK  | KING  |
| SCOTT  | JONES |
| KING   | NULL  |
| TURNER | BLAKE |
| ADAMS  | SCOTT |
| JAMES  | BLAKE |
| FORD   | JONES |
| MILLER | CLARK |
+--------+-------+
14 rows in set (0.003 sec)
```

```
MariaDB [testuser]> SELECT E.ENAME,M.ENAME
    -> FROM EMP E,EMP M
    -> WHERE E.MGR = M.EMPNO;
+--------+-------+
| ENAME  | ENAME |
+--------+-------+
| SMITH  | FORD  |
| ALLEN  | BLAKE |
| WARD   | BLAKE |
| JONES  | KING  |
| MARTIN | BLAKE |
| BLAKE  | KING  |
| CLARK  | KING  |
| SCOTT  | JONES |
| TURNER | BLAKE |
| ADAMS  | SCOTT |
| JAMES  | BLAKE |
| FORD   | JONES |
| MILLER | CLARK |
+--------+-------+
13 rows in set (0.001 sec)

MariaDB [testuser]> SELECT E.ENAME,M.ENAME
    -> FROM EMP E LEFT JOIN EMP M ON E.MGR = M.EMPNO;
+--------+-------+
| ENAME  | ENAME |
+--------+-------+
| SMITH  | FORD  |
| ALLEN  | BLAKE |
| WARD   | BLAKE |
| JONES  | KING  |
| MARTIN | BLAKE |
| BLAKE  | KING  |
| CLARK  | KING  |
| SCOTT  | JONES |
| KING   | NULL  |
| TURNER | BLAKE |
| ADAMS  | SCOTT |
| JAMES  | BLAKE |
| FORD   | JONES |
| MILLER | CLARK |
+--------+-------+
14 rows in set (0.003 sec)
```

- **부서번호가 30번인 사원들의 이름, 직급, 부서번호, 부서위치를 조회하시오.**

```
MariaDB [testuser]> SELECT ENAME,JOB,E.DEPTNO,LOC
    -> FROM EMP E,DEPT D
    -> WHERE E.DEPTNO = D.DEPTNO AND D.DEPTNO = 30;
+--------+----------+--------+---------+
| ENAME  | JOB      | DEPTNO | LOC     |
+--------+----------+--------+---------+
| ALLEN  | SALESMAN |     30 | CHICAGO |
| WARD   | SALESMAN |     30 | CHICAGO |
| MARTIN | SALESMAN |     30 | CHICAGO |
| BLAKE  | MANAGER  |     30 | CHICAGO |
| TURNER | SALESMAN |     30 | CHICAGO |
| JAMES  | CLERK    |     30 | CHICAGO |
+--------+----------+--------+---------+
6 rows in set (0.003 sec)

MariaDB [testuser]> SELECT ENAME,JOB,E.DEPTNO,LOC
    -> FROM EMP E INNER JOIN DEPT D ON E.DEPTNO = D.DEPTNO
```

```
    -> WHERE D.DEPTNO = 30;
+--------+----------+--------+---------+
| ENAME  | JOB      | DEPTNO | LOC     |
+--------+----------+--------+---------+
| ALLEN  | SALESMAN |     30 | CHICAGO |
| WARD   | SALESMAN |     30 | CHICAGO |
| MARTIN | SALESMAN |     30 | CHICAGO |
| BLAKE  | MANAGER  |     30 | CHICAGO |
| TURNER | SALESMAN |     30 | CHICAGO |
| JAMES  | CLERK    |     30 | CHICAGO |
+--------+----------+--------+---------+
6 rows in set (0.001 sec)
```

```
MariaDB [testuser]> SELECT ENAME,JOB,E.DEPTNO,LOC
    -> FROM EMP E,DEPT D
    -> WHERE E.DEPTNO = D.DEPTNO AND D.DEPTNO = 30;
+--------+----------+--------+---------+
| ENAME  | JOB      | DEPTNO | LOC     |
+--------+----------+--------+---------+
| ALLEN  | SALESMAN |     30 | CHICAGO |
| WARD   | SALESMAN |     30 | CHICAGO |
| MARTIN | SALESMAN |     30 | CHICAGO |
| BLAKE  | MANAGER  |     30 | CHICAGO |
| TURNER | SALESMAN |     30 | CHICAGO |
| JAMES  | CLERK    |     30 | CHICAGO |
+--------+----------+--------+---------+
6 rows in set (0.003 sec)

MariaDB [testuser]> SELECT ENAME,JOB,E.DEPTNO,LOC
    -> FROM EMP E INNER JOIN DEPT D ON E.DEPTNO = D.DEPTNO
    -> WHERE D.DEPTNO = 30;
+--------+----------+--------+---------+
| ENAME  | JOB      | DEPTNO | LOC     |
+--------+----------+--------+---------+
| ALLEN  | SALESMAN |     30 | CHICAGO |
| WARD   | SALESMAN |     30 | CHICAGO |
| MARTIN | SALESMAN |     30 | CHICAGO |
| BLAKE  | MANAGER  |     30 | CHICAGO |
| TURNER | SALESMAN |     30 | CHICAGO |
| JAMES  | CLERK    |     30 | CHICAGO |
+--------+----------+--------+---------+
6 rows in set (0.001 sec)
```