# Applied Databases Inserting, Updating, Deleting

HIGHER DIPLOMA IN DATA ANALYTICS



CRUD (Create/Insert, Read, Update Delete)



- CRUD (Create/Insert, Read, Update Delete)
  <a href="https://dev.mysql.com/doc/refman/8.0/en/insert.html">https://dev.mysql.com/doc/refman/8.0/en/insert.html</a>
- ► INSERT INTO VALUES (value1, value2, valueN);
- INSERT INTO (column1, column2, column)
  VALUES (value1, value2, valueN);



```
mysql> DESCRIBE person;
                                    Null | Key | Default | Extra
  Field
               | Type
                 int(11)
varchar(20)
int(11)
enum('M','F')
tinyint(1)
  personID
                                     NO
                                              PRI
                                                     NULL
                                                                  auto_increment
                                                     NULL
NULL
                                     NO
  name
                                     YES
  age
                                     YES
  sex
  is$tudent |
                                     YES
5 rows in set (0.00 sec)
```



```
mysql> DESCRIBE person;
 Field
             | Type
                                Null | Key | Default | Extra
 personID
               int(11)
                                        \mathsf{PRI}
                                               NULL
                                                          auto_increment
                                 NO
               varchar(20)
                                 NO
                                               NULL
  name
               int(11)
enum('M','F')
                                 YES
                                               NULL
  age
                                 YES
  sex
  isStudent |
               tinyint(1)
                                 YES
5 rows in set (0.00 sec)
```

```
mysql> INSERT INTO person VALUES(1, "John", 23, "M", 1);
Query OK, 1 row affected (0.00 sec)
```



```
mysql> DESCRIBE person;
 Field
                                Null | Key | Default | Extra
             | Type
 personID | int(11)
                                        \mathsf{PRI}
                                               NULL
                                                          auto_increment
                                NO
               varchar(20)
                                NO
                                               NULL
  name
               int(11)
enum('M','E')
                                YES
                                               NULL
  age
                                 YES
  sex
               tinyint(1)
                                 YES
  is$tudent |
5 rows in set (0.00 sec)
```

```
mysql> INSERT INTO person VALUES<mark>(</mark>1, "John", 23, "M", 1);
Query OK, 1 row affected (0.00 sec)
```



```
mysql> DESCRIBE person;
 Field
                                Null | Key | Default | Extra
             | Type
 personID
               int(11)
                                         \mathsf{PRI}
                                               NULL
                                                           auto_increment
                                 NO
               varchar(20)
                                 NO
                                               NULL
  name 🧸
               int(11)
enum('M','F')
                                 YES
                                               NULL
  age
                                 YES
  sex
               tinyint(1)
                                 YES
  is$tudent |
5 rows in set (0.00 sec)
```

```
mysql> INSERT INTO person VALUES(1, "John", 23, "M", 1);
Query OK, 1 row affected (0.00 sec)
```



```
mysql> DESCRIBE person;
 Field
             | Type
                                Null | Key | Default | Extra
 personID
               int(11)
                                        \mathsf{PRI}
                                               NULL
                                                          auto_increment
                                 NO
               varchar(20)
                                 NO
                                               NULL
  name
              int(11)
epum('M','F')
                                 YES
                                               NULL
  age 🚽
                                 YES
  sex
  isStudent | tinyint(1)
                                 YES
5 rows in set (0.00 sec)
```

```
mysql> INSERT INTO person VALUES(1, "John", 23, "M", 1);
Query OK, 1 row affected (0.00 sec)
```



```
mysql> DESCRIBE person;
 Field
             | Type
                                Null | Key | Default | Extra
 personID
               int(11)
                                        \mathsf{PRI}
                                               NULL
                                                          auto_increment
                                 NO
               varchar(20)
                                 NO
                                               NULL
  name
               int(11)
enum('M','F')
                                 YES
                                               NULL
  age
                                 YES
  sex 👡
  isStudent | tinyint(1)
                                 YES
5 rows in set (0.00 sec)
```

```
mysql> INSERT INTO person VALUES(1, "John", 23, "M") 1);
Query OK, 1 row affected (0.00 sec)
```



```
mysql> DESCRIBE person;
 Field
             | Type
                                Null | Key | Default | Extra
 personID
               int(11)
                                        \mathsf{PRI}
                                               NULL
                                                          auto_increment
                                 NO
               varchar(20)
                                 NO
                                               NULL
  name
               int(11)
enum('M','F')
                                 YES
                                               NULL
  age
                                 YES
  sex
  isStudent | tinyint(1)
                                 YES
5 rows in set (0.00 sec)
```

mysql> INSERT INTO person VALUES(1, "John", 23, "M"(1)) Query OK, 1 row affected (0.00 sec)



```
mysql> DESCRIBE person;
 Field
                               Null |
                                       Key | Default | Extra
             | Type
 personID
              int(11)
                                       PRI
                                              NULL
                                NO
                                                         auto_increment
                                NO
                                              NULL
              varchar(20)
  name
              int(11)
enum('M','F')
                                YES
                                              NULL
  age
                                YES
  sex
  is$tudent |
              tinyint(1)
                                YES
5 rows in set (0.00 sec)
```

mysql> INSERT INTO person VALUES(1, "John", 23, "M", 1); Query OK, 1 row affected (0.00 sec)

```
mysql> SELECT * FROM person;
| personID | name | age | sex | isStudent |
| 1 | John | 23 | M | 1 |
1 row in set (0.00 sec)
```



```
mysql> DESCRIBE person;
 Field
                               Null |
                                       Key | Default | Extra
             | Type
                                       PRI
  personID
              int(11)
                                             NULL
                                                       auto_increment
                               NO
                               NO
                                             NULL
              varchar(20)
  name
              int(11)
enum('M','F')
                               YES
                                             NULL
  age
                               YES
  sex
              tinyint(1)
  is$tudent |
                                YES
5 rows in set (0.00 sec)
```

mysql> INSERT INTO person VALUES(1, "John", 23, "M", 1); Query OK, 1 row affected (0.00 sec)

```
mysql> SELECT * FROM person;
| personID | name | age | sex | isStudent |
| 1 | John | 23 | M | 1 |
1 row in set (0.00 sec)
```





```
mysql> DESCRIBE person;
                                 | Null | Key | Default | Extra
  Field
               Type
                int(11)
                                   N0
N0
                                           PRI | NULL
                                                              auto_increment
  personID
                varchar(20)
                                                  NULL
  name
 age | int(11)
sex | enum('M','F')
isStudent | tinyint(1)
                                   YES
                                                  NULL
                                   YES
5 rows in set (0.00 sec)
```

mysql> INSERT INTO person

```
-> VALUES ("Mary", "F", 30);
Query OK, 1 row affected (0.00 sec)
```



```
mysql> DESCRIBE person;
                                Null | Key | Default | Extra
 Field
              Type
               int(11)
                                NО
NO
                                        PRI | NULL
                                                          auto_increment
 personID
              varchar(20)
                                               NULL
 name
                                               NULL
                                YES
               int(11)
  age
              enum('M','F')
tinyint(1)
                                YES
 sex
  is$tudent |
5 rows in set (0.00 sec)
```

#### mysql> INSERT INTO person

```
-> VALUES ("Mary", "F", 30);
Query OK, 1 row affected (0.00 sec)

mysql> SELECT * FROM person;
| personID | name | age | sex | isStudent |
| 1 | John | 23 | M | 1 |
| 2 | Mary | 30 | F | 0 |
2 rows in set (0.00 sec)
```



```
mysql> DESCRIBE person;
                               Null | Key | Default | Extra
 Field
              Type
               int(11)
                                NО
NO
                                        PRI | NULL
                                                          auto_increment
 personID
              varchar(20)
                                              NULL
 name
                                              NULL
                                YES
               int(11)
  age
              enum('M','F')
tinyint(1)
                                YES
 sex
  is$tudent |
5 rows in set (0.00 sec)
```

#### mysql> INSERT INTO person

```
-> VALUES ("Mary", "F", 30);
Query OK, 1 row affected (0.00 sec)

mysql> SELECT * FROM person;
| personID | name | age | sex | isStudent |
| 1 | John | 23 | M | 1 |
| 2 | Mary | 30 | F | 0 |
2 rows in set (0.00 sec)
```



```
mysql> DESCRIBE person;
                                Null | Key | Default | Extra
 Field
              Type
               int(11)
                                NО
NO
                                        PRI | NULL
                                                          auto_increment
 personID
               varchar(20)
                                               NULL
 name
                                               NULL
                                YES
               int(11)
  age
              enum('M','F')
tinyint(1)
                                YES
 sex
  is$tudent |
5 rows in set (0.00 sec)
```

```
-> VALUES ("Mary", "F", 30);
Query OK, 1 row affected (0.00 sec)

mysql> SELECT * FROM person;
| personID | name | age | sex | isStudent |
| 1 | John | 23 | M | 1 |
| 2 | Mary | 30 | F | 0 |
2 rows in set (0.00 sec)
```



```
mysql> DESCRIBE person;
                                Null | Key | Default | Extra
 Field
              Type
               int(11)
                                NО
NO
                                        PRI | NULL
                                                          auto_increment
 personID
               varchar(20)
                                               NULL
 name
                                               NULL
                                YES
               int(11)
  age
              enum('M','F')
tinyint(1)
                                YES
 sex
  is$tudent |
5 rows in set (0.00 sec)
```

```
-> VALUES ("Mary", "F", 30);
Query OK, 1 row affected (0.00 sec)

mysql> SELECT * FROM person;
| personID | name | age | sex | isStudent |
| 1 | John | 23 | M | 1 |
| 2 | Mary | 30 | F | 0 |
2 rows in set (0.00 sec)
```



```
mysql> DESCRIBE person;
                                Null | Key | Default | Extra
 Field
              Type
               int(11)
                                NО
NO
                                        PRI |
                                                          auto_increment
 personID
                                               NULL
               varchar(20)
                                               NULL
 name
                                               NULL
                                YES
               int(11)
  age
              enum('M','F')
tinyint(1)
                                YES
 sex
  is$tudent |
5 rows in set (0.00 sec)
```

```
-> VALUES ("Mary", "F", 30);
Query OK, 1 row affected (0.00 sec)

mysql> SELECT * FROM person;
| personID | name | age | sex | isStudent |
| 1 | John | 23 | M | 1 |
| 2 | Mary | 30 | F | 0 |
2 rows in set (0.00 sec)
```



```
mysql> DESCRIBE person;
                              Null | Key | Default | Extra
 Field
             Type
              int(11)
                               NО
NO
                                       PRI |
                                                        auto_increment
 personID
                                             NULL
              varchar(20)
                                             NULL
 name
                               YES
                                             NULL
              int(11)
  age
              enum('M', 'F')
                               YES
 sex
  is$tudent |
              tinyint(1)
                                            (0)
5 rows in set (0.00 sec)
```

```
-> VALUES ("Mary", "F", 30);
Query OK, 1 row affected (0.00 sec)

mysql> SELECT * FROM person;
| personID | name | age | sex | isStudent |
| 1 | John | 23 | M | 1 |
| 2 | Mary | 30 | F | 0 |
2 rows in set (0.00 sec)
```



```
mysql> DESCRIBE person;
                              Null | Key | Default | Extra
 Field
              Type
              int(11)
                               NО
NO
                                       PRI |
                                                        auto_increment
 personID
                                             NULL
              varchar(20)
                                             NULL
 name
                               YES
                                             NULL
              int(11)
  age
              enum('M', 'F')
                               YES
 sex
  is$tudent |
              tinyint(1)
                                            (0)
5 rows in set (0.00 sec)
```

```
-> VALUES ("Mary", "F", 30);
Query OK, 1 row affected (0.00 sec)

mysql> SELECT * FROM person;
| personID | name | age | sex | isStudent |
| 1 | John | 23 | M | 1 |
| 2 | Mary | 30 | F | 0 |
2 rows in set (0.00 sec)
```



```
mysql> DESCRIBE person;
 Field
             Type
                               Null | Key | Default | Extra
              int(11)
                                       PRI
                                             NULL
 personID
                               NO
                                                        auto_increment
              varchar(20)
                                NO
                                             NULL
 name
              int(11)
enum('M','F')
                               YES
                                             NULL
 age
                                YES
 sex
              tinyint(1)
                                YES
  is$tudent |
5 rows in set (0.00 sec)
```

```
mysql> SELECT * from person WHERE name = "Tom";
| personID | name | age | sex | isStudent |
| 3 | Tom | NULL | M | 0 |
1 row in set (0.00 sec)
```



```
mysql> DESCRIBE person;
 Field
             Type
                               Null | Key | Default | Extra
              int(11)
                                       PRI
                                             NULL
 personID
                               NO
                                                       auto_increment
              varchar(20)
                               NO
                                             NULL
 name
              int(11)
enum('M','F')
                               YES
                                             NULL
 age
                               YES
 sex
              tinyint(1)
                               YES
  is$tudent |
5 rows in set (0.00 sec)
```



```
mysql> DESCRIBE person;
 Field
             Type
                               Null | Key | Default | Extra
              int(11)
                                       PRI
                                             NULL
 personID
                               NO
                                                        auto_increment
              varchar(20)
                                NO
                                             NULL
 name
              int(11)
enum('M','F')
                               YES
                                             NULL
 age
                                YES
 sex
              tinyint(1)
                                YES
  is$tudent |
5 rows in set (0.00 sec)
```

```
mysql> SELECT * from person WHERE name = "Tom";
| personID | name | age | sex | isStudent |
| 3 | Tom | NULL | M | 0 |
1 row in set (0.00 sec)
```



```
mysql> DESCRIBE person;
 Field
             Type
                               Null | Key | Default | Extra
              int(11)
                                       PRI
                                              NULL
 personID
                               NO
                                                        auto_increment
              varchar(20)
                                NO
                                             NLIL
 name
              int(11)
enum('M','F')
                               YES
                                             (NULL)
 age
                                YES
 sex
              tinyint(1)
                                YES
  is$tudent |
5 rows in set (0.00 sec)
```

```
mysql> SELECT * from person WHERE name = "Tom";
| personID | name | age | sex | isStudent |
| 3 | Tom | NULL | M | 0 |
1 row in set (0.00 sec)
```



```
mysql> DESCRIBE person;
 Field
             Type
                               Null I
                                      Key | Default | Extra
              int(11)
                                       PRI
                                             NULL
 personID
                               NO
                                                        auto_increment
              varchar(20)
                               NO
                                             NULL
 name
              int(11)
enum('M','F')
                               YES
                                             NULL
 age
                                            M
                               YES
 sex
              tinyint(1)
                               YES
  isStudent |
5 rows in set (0.00 sec)
```

```
mysql> SELECT * from person WHERE name = "Tom";
| personID | name | age | sex | isStudent |
| 3 | Tom | NULL M | 0 |
1 row in set (0.00 sec)
```



```
mysql> DESCRIBE person;
 Field
             Type
                               Null | Key | Default | Extra
              int(11)
                                       PRI
                                              NULL
 personID
                               NO
                                                        auto_increment
              varchar(20)
                                NO
                                              NULL
 name
              int(11)
enum('M','F')
                               YES
                                              NULL
 age
                                YES
 sex
              tinyint(1)
                                YES
                                            (0)
  is$tudent |
5 rows in set (0.00 sec)
```

```
mysql> SELECT * from person WHERE name = "Tom";
| personID | name | age | sex | isStudent |
| 3 | Tom | NULL | M | 0 |
1 row in set (0.00 sec)
```



```
mysql> DESCRIBE person;
  Field
                                     Null |
                                              Key | Default | Extra
               | Type
                                     NO
NO
                 int(11)
                                              PRI |
                                                     NULL
                                                                  auto_increment
  personID
                varchar(20)
int(11)
enum('M','F')
tinyint(1)
                                                      NULL
  name
                                     YES
YES
YES
                                                      NULL
  age
  sex
  isStudent |
5 rows in set (0.00 sec)
```

mysql> INSERT INTO person (age,sex,isStudent) VALUES (20,"F",0);



```
mysql> DESCRIBE person;
 Field
                                 Null |
                                         Key | Default | Extra
              Type
               int(11)
  personID
                                 NO
                                         PRI I
                                                NULL
                                                           auto_increment
               varchar(20)
                                 NO
                                                NULL
  name
               int(11)
                                 YES
                                                NULL
  age
  sex | enum('M', 'F')
isStudent | tinyint(1)
                                 ŸĒŠ
                                 YES
5 rows in set (0.00 sec)
```

mysql> INSERT INTO person (age,sex,isStudent) VALUES (20,"F",0);

ERROR 1364 (HY000): Field 'name' doesn't have a default value



```
mysql> DESCRIBE person;
                                           Key |
  Field
                                  Null |
                                                  Default | Extra
              Type
                int(11)
  personID
                                   NO
                                           \mathsf{PRI}
                                                  NULL
                                                              auto_increment
                                                  NULL
                varchar(20)
                                   NO
  name
                                   YES
YES
                int(11)
  age
  sex | enum('M', 'F')
isStudent | tinyint(1)
                                   YES
5 rows in set (0.00 sec)
```

mysql> INSERT INTO person (age,sex,isStudent) VALUES (20,"F",0);

ERROR 1364 (HY000): Field 'name' doesn't have a default value



```
mysql> DESCRIBE person;
                                        Key |
 Field
                                 Null |
                                               Default | Extra
             Type
               int(11)
  personID
                                NO
                                         PRI
                                               NULL
                                                           auto_increment
                                NO
YES
                                               NULL
               varchar(20)
  name
               int(11)
  age
  sex | enum('M','F')
isStudent | tinyint(1)
                                 YES
                                 YES
5 rows in set (0.00 sec)
```

mysql> INSERT INTO person (age,sex,isStudent) VALUES (20,"F",0);

ERROR 1364 (HY000): Field 'name' doesn't have a default value



```
mvsal> DESCRIBE person:
 Field
            Type
                              Null I
                                      Kev | Default | Extra
              int(11)
 personID
                              NO
                                      PRI I
                                            NULL
                                                       auto_increment
                              NO
                                            NULL
              varchar(20)
 name
                              YES
                                            NULL
              int(11)
 age
              enum('M', 'F')
                               YES
 sex
  is$tudent | tinyint(1)
5 rows in set (0.00 sec)
```

mysql> INSERT INTO person (age,sex,isStudent) VALUES (20,"F",0);

ERROR 1364 (HY000): Field 'name' doesn't have a default value



https://dev.mysql.com/doc/refman/8.0/en/update.html

► UPDATE SET column1 = value1, columnN, valueN;

UPDATE SET column1 = value1, columnN, valueN
WHERE condition;



```
      mysql> select * from person;

      | personID | name | age | sex | isStudent |

      | 1 | John | 23 | M | 1 |

      | 2 | Mary | 30 | F | 0 |

      | 3 | Tom | NULL | M | 0 |

      | 5 | Alan | 18 | M | 1 |

      | 6 | Laura | 17 | F | 1 |

      | 7 | Bob | 18 | M | 0 |

      | 6 rows in set (0.00 sec)
```



mysql> select * from person;				
personID	name	age	sex	is\$tudent
1 2 3 5 6 7	John   Mary   Tom   Alan   Laura   Bob	23   30   NULL   18   17   18	   M   F   M   F	1   0   0   1   1   1   1   1   1   1
6 rows in set (0.00 sec)				



```
mysql> UPDATE person
-> SET age = 23;
```

Query OK, 5 rows affected (0.00 sec) Rows matched: 6 Changed: 5 Warnings: 0



```
mysql> select * from person;
| personID | name | age | sex | isStudent |
| 1 | John | 23 | M | 1 |
| 2 | Mary | 30 | F | 0 |
| 3 | Tom | NULL | M | 0 |
| 5 | Alan | 18 | M | 1 |
| 6 | Laura | 17 | F | 1 |
| 7 | Bob | 18 | M | 0 |

6 rows in set (0.00 sec)
```

```
mysql> UPDATE person
-> SET age = 23;
```

Query OK, 5 rows affected (0.00 sec) Rows matched: 6 Changed: 5 Warnings: 0

mysql> select * from person; 								
personID	name	age	sex	isStudent				
	Mary Tom	23 23 23 23 23 23 23	M   F   M   M   F	1   0   0   1   1   1   0				
6 rows in set (0.00 sec)								





```
      mysql> select * from person;

      | personID | name | age | sex | is$tudent |

      | 1 | John | 23 | M | 1 |

      | 2 | Mary | 30 | F | 0 |

      | 3 | Tom | NULL | M | 0 |

      | 5 | Alan | 18 | M | 1 |

      | 6 | Laura | 17 | F | 1 |

      | 7 | Bob | 18 | M | 0 |

      6 rows in set (0.00 sec)
```

```
mysql> UPDATE person
-> SET age = 23
-> WHERE personID=3;
```



```
      mysql> select * from person;

      | personID | name | age | sex | is$tudent |

      | 1 | John | 23 | M | 1 |

      | 2 | Mary | 30 | F | 0 |

      | 3 | Tom | NULL | M | 0 |

      | 5 | Alan | 18 | M | 1 |

      | 6 | Laura | 17 | F | 1 |

      | 7 | Bob | 18 | M | 0 |

      6 rows in set (0.00 sec)
```

```
mysql> UPDATE person
-> SET age = 23
-> WHERE personID=3;
```

Query OK, 1 row affected (0.00 sec) Rows matched: 1 Changed: 1 Warnings: 0



```
      mysql> select * from person;

      | personID | name | age | sex | isStudent |

      | 1 | John | 23 | M | 1 |

      | 2 | Mary | 30 | F | 0 |

      | 3 | Tom | NULL | M | 0 |

      | 5 | Alan | 18 | M | 1 |

      | 6 | Laura | 17 | F | 1 |

      | 7 | Bob | 18 | M | 0 |

      6 rows in set (0.00 sec)
```

```
mysql> UPDATE person
-> SET age = 23
-> WHERE personID=3;
```

Query OK, 1 row affected (0.00 sec) Rows matched: 1 Changed: 1 Warnings: 0

```
mysql> select * from person;
| personID | name | age | sex | isStudent |
| 1 | John | 23 | M | 1 |
| 2 | Mary | 20 | F | 0 |
| 3 | Tom | 23 | M | 0 |
| 5 | Alan | 18 | M | 1 |
| 6 | Laura | 17 | F | 1 |
| 7 | Bob | 18 | M | 0 |
```



```
      mysql> select * from person;

      | personID | name | age | sex | is$tudent |

      | 1 | John | 23 | M | 1 |

      | 2 | Mary | 30 | F | 0 |

      | 3 | Tom | NULL | M | 0 |

      | 5 | Alan | 18 | M | 1 |

      | 6 | Laura | 17 | F | 1 |

      | 7 | Bob | 18 | M | 0 |

      6 rows in set (0.00 sec)
```



```
mysql> UPDATE person
-> SET age = age + 1;
```



```
      mysql> select * from person;

      | personID | name | age | sex | is$tudent |

      | 1 | John | 23 | M | 1 |

      | 2 | Mary | 30 | F | 0 |

      | 3 | Tom | NULL | M | 0 |

      | 5 | Alan | 18 | M | 1 |

      | 6 | Laura | 17 | F | 1 |

      | 7 | Bob | 18 | M | 0 |

      6 rows in set (0.00 sec)
```

```
mysql> UPDATE person
-> SET age = age + 1;
```

Query OK, 5 rows affected (0.00 sec) Rows matched: 6 Changed: 5 Warnings: 0



```
      mysql> select * from person;

      | personID | name | age | sex | isStudent |

      | 1 | John | 23 | M | 1 |

      | 2 | Mary | 30 | F | 0 |

      | 3 | Tom | NULL | M | 0 |

      | 5 | Alan | 18 | M | 1 |

      | 6 | Laura | 17 | F | 1 |

      | 7 | Bob | 18 | M | 0 |

      6 rows in set (0.00 sec)
```

```
mysql> UPDATE person
-> SET age = age + 1;
```

Query OK, 5 rows affected (0.00 sec) Rows matched: 6 Changed: 5 Warnings: 0

```
mysql> select * from person;
  personID |
                                       isStudent
              name
                       age
                               sex
                         24
31
              John
         2356
              Mary
                       NUĽĽ
              Tom
                         19
18
19
              Alan
              Laura
              Bob
 rows in set (0.00 sec)
```



```
      mysql> select * from person;

      | personID | name | age | sex | isStudent |

      | 1 | John | 23 | M | 1 |

      | 2 | Mary | 30 | F | 0 |

      | 3 | Tom | NULL | M | 0 |

      | 5 | Alan | 18 | M | 1 |

      | 6 | Laura | 17 | F | 1 |

      | 7 | Bob | 18 | M | 0 |

      6 rows in set (0.00 sec)
```



```
      mysql> select * from person;

      | personID | name | age | sex | isStudent |

      | 1 | John | 23 | M | 1 |

      | 2 | Mary | 30 | F | 0 |

      | 3 | Tom | NULL | M | 0 |

      | 5 | Alan | 18 | M | 1 |

      | 6 | Laura | 17 | F | 1 |

      | 7 | Bob | 18 | M | 0 |

      6 rows in set (0.00 sec)
```

```
mysql> UPDATE person
-> set name = CONCAT(IF(sex="M","Mr.","Ms."),name);
Query OK, 6 rows affected (0.00 sec)
Rows matched: 6 Changed: 6 Warnings: 0
```



```
      mysql> select * from person;

      | personID | name | age | sex | isStudent |

      | 1 | John | 23 | M | 1 |

      | 2 | Mary | 30 | F | 0 |

      | 3 | Tom | NULL | M | 0 |

      | 5 | Alan | 18 | M | 1 |

      | 6 | Laura | 17 | F | 1 |

      | 7 | Bob | 18 | M | 0 |

      6 rows in set (0.00 sec)
```

```
mysql> UPDAIF person

- set name = CONCAT(IF(sex="M","Mr.","Ms."),name);
Query UK, 6 rows affected (0.00 sec)
Rows matched: 6 Changed: 6 Warnings: 0
```



```
      mysql> select * from person;

      | personID | name | age | sex | isStudent |

      | 1 | John | 23 | M | 1 |

      | 2 | Mary | 30 | F | 0 |

      | 3 | Tom | NULL | M | 0 |

      | 5 | Alan | 18 | M | 1 |

      | 6 | Laura | 17 | F | 1 |

      | 7 | Bob | 18 | M | 0 |

      6 rows in set (0.00 sec)
```

```
mysql> UPDATE person
-> set name = CONCAT(&F(sex="M","Mr.","Ms."),name);
Query OK, 6 rows affected (0.00 sec)
Rows matched: 6 Changed: 6 Warnings: 0
```



```
      mysql> select * from person;

      | personID | name | age | sex | isStudent |

      | 1 | John | 23 | M | 1 |

      | 2 | Mary | 30 | F | 0 |

      | 3 | Tom | NULL | M | 0 |

      | 5 | Alan | 18 | M | 1 |

      | 6 | Laura | 17 | F | 1 |

      | 7 | Bob | 18 | M | 0 |

      6 rows in set (0.00 sec)
```

```
mysql> UPDATE person
-> set name = CONCAT(IF(sex="M","Mr.","Ms."),name);
Query OK, 6 rows affected (0.<del>00 se</del>c)
Rows matched: 6 Changed: 6 Warnings: 0
```



```
      mysql> select * from person;

      | personID | name | age | sex | isStudent |

      | 1 | John | 23 | M | 1 |

      | 2 | Mary | 30 | F | 0 |

      | 3 | Tom | NULL | M | 0 |

      | 5 | Alan | 18 | M | 1 |

      | 6 | Laura | 17 | F | 1 |

      | 7 | Bob | 18 | M | 0 |

      6 rows in set (0.00 sec)
```

```
mysql> UPDATE person
-> set name = CONCAT(IF(sex="M", Mr.'), "Ms."),name);
Query OK, 6 rows affected (0.00 sec)
Rows matched: 6 Changed: 6 Warnings: 0
```



```
      mysql> select * from person;

      | personID | name | age | sex | isStudent |

      | 1 | John | 23 | M | 1 |

      | 2 | Mary | 30 | F | 0 |

      | 3 | Tom | NULL | M | 0 |

      | 5 | Alan | 18 | M | 1 |

      | 6 | Laura | 17 | F | 1 |

      | 7 | Bob | 18 | M | 0 |

      6 rows in set (0.00 sec)
```

```
mysql> UPDATE person
-> set name = CONCAT(IF(sex="M","Mr."("Ms."),name);
Query OK, 6 rows affected (0.00 sec)
Rows matched: 6 Changed: 6 Warnings: 0
```



```
      mysql> select * from person;

      | personID | name | age | sex | isStudent |

      | 1 | John | 23 | M | 1 |

      | 2 | Mary | 30 | F | 0 |

      | 3 | Tom | NULL | M | 0 |

      | 5 | Alan | 18 | M | 1 |

      | 6 | Laura | 17 | F | 1 |

      | 7 | Bob | 18 | M | 0 |

      6 rows in set (0.00 sec)
```

```
mysql> UPDATE person

→> set name = CONCAT(IF(sex="M","Mr.","Ms."),nameD>
Query OK, 6 rows affected (0.00 sec)
Rows matched: 6 Changed: 6 Warnings: 0
```



```
      mysql> select * from person;

      | personID | name | age | sex | isStudent |

      | 1 | John | 23 | M | 1 |

      | 2 | Mary | 30 | F | 0 |

      | 3 | Tom | NULL | M | 0 |

      | 5 | Alan | 18 | M | 1 |

      | 6 | Laura | 17 | F | 1 |

      | 7 | Bob | 18 | M | 0 |

      6 rows in set (0.00 sec)
```

```
mysql> UPDATE person
-> set name = CONCAT(TF(sex="M","Mr.","Ms."),name);
Query OK, 6 rows affected (0.00 sec)
Rows matched: 6 Changed: 6 Warnings: 0
```



```
mysql> UPDATE person
-> set name = CONCAT(IF(sex="M","Mr.","Ms.")(name);
Query OK, 6 rows affected (0.00 sec)
Rows matched: 6 Changed: 6 Warnings: 0
```



```
      mysql> select * from person;

      | personID | name | age | sex | isStudent |

      | 1 | John | 23 | M | 1 |

      | 2 | Mary | 30 | F | 0 |

      | 3 | Tom | NULL | M | 0 |

      | 5 | Alan | 18 | M | 1 |

      | 6 | Laura | 17 | F | 1 |

      | 7 | Bob | 18 | M | 0 |

      6 rows in set (0.00 sec)
```

```
mysql> UPDATE person
-> set name = CONCAT(IF(sex="M","Mr.","Ms."),name);
Query OK, 6 rows affected (0.00 sec)
Rows matched: 6 Changed: 6 Warnings: 0
```



```
      mysql> select * from person;

      | personID | name | age | sex | isStudent |

      | 1 | John | 23 | M | 1 |

      | 2 | Mary | 30 | F | 0 |

      | 3 | Tom | NULL | M | 0 |

      | 5 | Alan | 18 | M | 1 |

      | 6 | Laura | 17 | F | 1 |

      | 7 | Bob | 18 | M | 0 |

      6 rows in set (0.00 sec)
```

```
mysql> UPDATE person
-> set name = CONCAT(IF(sex="M","Mr.","Ms."),name);
Query OK, 6 rows affected (0.00 sec)
Rows matched: 6 Changed: 6 Warnings: 0
```

```
mysql> select * from person;
                                           isStudent
  personID
              name
                                   sex
                           age
                             23
              Mr.John
                             30
              Ms.Mary
                           NULL
              Mr.Tom
                             18
              Mr.Alan
              Ms.Laura
                             \overline{18}
              Mr.Bob
 rows in set (0.00 sec)
```

https://dev.mysql.com/doc/refman/8.0/en/delete.html

DELETE FROM ;

DELETE FROM ;
WHERE condition;



```
      mysql> select * from person;

      | personID | name | age | sex | isStudent |

      | 1 | John | 23 | M | 1 |

      | 2 | Mary | 30 | F | 0 |

      | 3 | Tom | NULL | M | 0 |

      | 5 | Alan | 18 | M | 1 |

      | 6 | Laura | 17 | F | 1 |

      | 7 | Bob | 18 | M | 0 |

      6 rows in set (0.00 sec)
```



mysql> select * from person;								
personID   name	age	sex	isStudent					
1   John   2   Mary   3   Tom   5   Alan   6   Laura   7   Bob	23   30   NULL   18   17	M   F   M   M	1   0   1   1   1   1   1   1   1   1					
; 6 rows in set (0.00	sec)	+	- <del>-</del>					

mysql> DELETE FROM person; Query OK, 6 rows affected (0.00 sec)



```
mysql> DELETE FROM person;
Query OK, 6 rows affected (0.00 sec)
```

```
mysql> select * from person;
Empty set (0.00 sec)
```



```
      mysql> select * from person;

      | personID | name | age | sex | is$tudent |

      | 1 | John | 23 | M | 1 |

      | 2 | Mary | 30 | F | 0 |

      | 3 | Tom | NULL | M | 0 |

      | 5 | Alan | 18 | M | 1 |

      | 6 | Laura | 17 | F | 1 |

      | 7 | Bob | 18 | M | 0 |

      6 rows in set (0.00 sec)
```

mysql> DELETE FROM person; Query OK, 6 rows affected (0.00 sec)

mysql> select \* from person; Empty set (0.00 sec)

+	e person;  Type			   Default	 I Fxtra
personID     name   age	int(11) varchar(20) int(11) enum('M','F')	NO   NO   NO   YES	PRI		auto_increment

```
      mysql> select * from person;

      | personID | name | age | sex | isStudent |

      1 | John | 23 | M | 1 |

      2 | Mary | 30 | F | 0 |

      3 | Tom | NULL | M | 0 |

      5 | Alan | 18 | M | 1 |

      6 | Laura | 17 | F | 1 |

      7 | Bob | 18 | M | 0 |

      6 rows in set (0.00 sec)
```

```
mysql> DELETE from PERSON
-> WHERE personID = 6;
Query OK, 1 row affected (0.01 sec)
```



```
      mysql> select * from person;

      | personID | name | age | sex | isStudent |

      | 1 | John | 23 | M | 1 |

      | 2 | Mary | 30 | F | 0 |

      | 3 | Tom | NULL | M | 0 |

      | 5 | Alan | 18 | M | 1 |

      | 6 | Laura | 17 | F | 1 |

      | 7 | Bob | 18 | M | 0 |

      6 rows in set (0.00 sec)
```

```
mysql> DELETE from PERSON
-> WHERE personID = 6;
Query OK, 1 row affected (0.01 sec)
```



```
mysql> select * from person;

| personID | name | age | sex | isStudent |

| 1 | John | 23 | M | 1 |
| 2 | Mary | 30 | F | 0 |
| 3 | Tom | NULL | M | 0 |
| 5 | Alan | 18 | M | 1 |
| 6 | Laura | 17 | F | 1 |
| 7 | Bob | 18 | M | 0 |
```



```
      mysql> select * from person;

      | personID | name | age | sex | isStudent |

      | 1 | John | 23 | M | 1 |

      | 2 | Mary | 30 | F | 0 |

      | 3 | Tom | NULL | M | 0 |

      | 5 | Alan | 18 | M | 1 |

      | 6 | Laura | 17 | F | 1 |

      | 7 | Bob | 18 | M | 0 |

      | 6 rows in set (0.00 sec)
```

```
mysql> SELECT * FROM person
-> WHERE sex = "M"
-> AND isStudent
-> AND age > 20;

| personID | name | age | sex | isStudent |
| 1 | John | 23 | M | 1 |
1 row in set (0.00 sec)
```



```
      mysql> select * from person;

      | personID | name | age | sex | isStudent |

      | 1 | John | 23 | M | 1 |

      | 2 | Mary | 30 | F | 0 |

      | 3 | Tom | NULL | M | 0 |

      | 5 | Alan | 18 | M | 1 |

      | 6 | Laura | 17 | F | 1 |

      | 7 | Bob | 18 | M | 0 |

      6 rows in set (0.00 sec)
```

```
mysql> SELECT * FROM person
-> WHERE sex = "M"
-> AND isStudent
-> AND age > 20;

| personID | name | age | sex | isStudent |
| 1 | John | 23 | M | 1 |
1 row in set (0.00 sec)
```

```
mysql> DELETE FROM person

-> WHERE sex = "M"

-> AND isStudent

-> AND age > 20;
Query OK, 1 row affected (0.00 sec)
```

```
      mysql> select * from person;

      | personID | name | age | sex | isStudent |

      | 1 | John | 23 | M | 1 |

      | 2 | Mary | 30 | F | 0 |

      | 3 | Tom | NULL | M | 0 |

      | 5 | Alan | 18 | M | 1 |

      | 6 | Laura | 17 | F | 1 |

      | 7 | Bob | 18 | M | 0 |

      | 6 rows in set (0.00 sec)
```

```
mysql> select * from person;
| personID | name | age | sex | isStudent |
| 2 | Mary | 30 | F | 0 |
| 3 | Tom | NULL | M | 0 |
| 5 | Alan | 18 | M | 1 |
| 6 | Laura | 17 | F | 1 |
| 7 | Bob | 18 | M | 0 |
| 5 rows in set (0.00 sec)
```

```
mysql> SELECT * FROM person
-> WHERE sex = "M"
-> AND isStudent
-> AND age > 20;
| personID | name | age | sex | isStudent |
| 1 | John | 23 | M | 1 |
1 row in set (0.00 sec)
```

```
mysql> DELETE FROM person

-> WHERE sex = "M"

-> AND isStudent

-> AND age > 20;
Query OK, 1 row affected (0.00 sec)
```

#### SHOW CREATE TABLE bus;



#### SHOW CREATE TABLE bus;

#### SHOW CREATE TABLE driver;

```
| driver | CREATE TABLE 'driver' (
    'licenceNo' varchar(20) NOT NULL,
    'name' varchar(30) DEFAULT NULL,
    'busReg' varchar(15) DEFAULT NULL,
    PRIMARY KEY ('licenceNo'),
    KEY 'busReg' ('busReg'),
    CONSTRAINT 'driver_ibfk_1' FOREIGN KEY ('busReg') REFERENCES 'bus' ('eg')
) ENGINE=InnoDB DEFAULT CHARSET=latin1 |
```

#### SHOW CREATE TABLE bus;

#### SHOW CREATE TABLE driver;

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#### SHOW CREATE TABLE driver;

```
| driver | CREATE TABLE 'driver' (
    'licenceNo' varchar(20) NOT NULL,
    'name' varchar(30) DEFAULT NULL,
    'busReg' varchar(15) DEFAULT NULL,
    PRIMARY KEY ('licenceNo'),
    KEY 'busReg' ('busReg'),
    CONSTRAINT 'driver_ibfk_1' €OREIGN KEY ('busReg') REFERENCES (bus' ('veg'))
} ENGINE=InnoDB DEFAULT CHARSET=latini |
```

```
SHOW CREATE TABLE bus;
```

```
| bus | CREATE TABLE 'bus' (
'reg' varchar(15) NOT NULL,
'maxPassengers' int(11) DEFAULT NULL,
'fuel' enum('Diesel','Petrol','Electric') DEFAULT 'Diesel',
PRIMARY KEY ('reg')
| ENGINE=InnoDB DEFAULT CHARSET=latin1 |
```

```
SHOW CREATE TABLE bus;
```

# ql> select \* from driver;

```
SHOW CREATE TABLE bus;
```

```
bus | CREATE TABLE 'bus' (
'reg' varchar(15) NOT NULL,
'maxPassengers' int(11) DEFAULT NULL,
'fuel' enum('Diesel','Petrol','Electric') DEFAULT 'Diesel',
PRIMARY KEY ('reg')
ENGINE=InnoDB DEFAULT CHARSET=latin1 |
```

#### 

mysal> select \* from driver:

rows in set (0.00 sec)

```
| driver | CREATE TABLE 'driver' (
    'licenceNo' varchar(20) NOT NULL,
    'name' varchar(30) DEFAULT NULL,
    'busReg' varchar(15) DEFAULT NULL,
    PRIMARY KEY ('licenceNo'),
    KEY 'busReg' ('busReg'),
    CONSTRAINT 'driver_ibfk_1' FOREIGN KEY ('busReg') REFERENCES 'bus' ('eg')
) ENGINE=InnoDB DEFAULT CHARSET=latin1 |
```

```
SHOW CREATE TABLE bus;
```

```
bus | CREATE TABLE 'bus' (
'reg' varchar(15) NOT NULL,
'maxPassengers' int(11) DEFAULT NULL,
'fuel' enum('Diesel','Petrol','Electric') DEFAULT 'Diesel',
PRIMARY KEY ('reg')
ENGINE=InnoDB DEFAULT CHARSET=latin1 |
```

```
| driver | CREATE TABLE 'driver' (
    'licenceNo' varchar(20) NOT NULL,
    'name' varchar(30) DEFAULT NULL,
    'busReg' varchar(15) DEFAULT NULL,
    PRIMARY KEY ('licenceNo'),
    KEY 'busReg' ('busReg'),
    CONSTRAINT 'driver_ibfk_1' FOREIGN KEY ('busReg') REFERENCES 'bus' ('eg')
) ENGINE=InnoDB DEFAULT CHARSET=latin1 |
```

```
SHOW CREATE TABLE bus;
```

```
| bus | CREATE TABLE 'bus' (
'reg' varchar(15) NOT NULL,
'maxPassengers' int(11) DEFAULT NULL,
'fuel' enum('Diesel','Petrol','Electric') DEFAULT 'Diesel',
PRIMARY KEY ('reg')
| ENGINE=InnoDB DEFAULT CHARSET=latin1 |
```

```
| driver | CREATE TABLE 'driver' (
    'licenceNo' varchar(20) NOT NULL,
    'name' varchar(30) DEFAULT NULL,
    'busReg' varchar(15) DEFAULT NULL,
    PRIMARY KEY ('licenceNo'),
    KEY 'busReg' ('busReg'),
    CONSTRAINT 'driver_ibfk_1' FOREIGN KEY ('busReg') REFERENCES 'bus' ('ser')
) ENGINE=InnoDB DEFAULT CHARSET-latin1 |
```

# Foreign Keys - ON DELETE RESTRICT

#### SHOW CREATE TABLE bus;

```
bus | CREATE TABLE 'bus' (
'reg' varchar(15) NOT NULL,
'maxPassengers' int(11) DEFAULT NULL,
'fuel' enum('Diesel','Petrol','Electric') DEFAULT 'Diesel',
PRIMARY KEY ('reg')
ENGINE=InnoDB DEFAULT CHARSET=latin1 |
```



# Foreign Keys - ON DELETE RESTRICT

#### SHOW CREATE TABLE bus;

```
bus | CREATE TABLE 'bus' (
'reg' varchar(15) NOT NULL,
'maxPassengers' int(11) DEFAULT NULL,
'fuel' enum('Diesel','Petrol','Electric') DEFAULT 'Diesel',
PRIMARY KEY ('reg')
ENGINE=InnoDB DEFAULT CHARSET=latin1 |
```

#### 

musal> select \* from driver:

rows in set (0.00 sec)

```
23 |
23 |
23 |
23 |
```

```
SHOW CREATE TABLE driver:
```

```
| driver | CREATE TABLE 'driver' (
    'licenceNo' varchar(20) NOT NULL,
    'name' varchar(30) DEFAULT NULL,
    'busReg' varchar(15) DEFAULT NULL,
    PRIMARY KEY ('licenceNo'),
    KEY 'busReg' ('busReg'),
    CONSTRAINT 'driver_ibfk_1' FOREIGN KEY ('busReg') REFERENCES 'bus' ('reg') ON DELETE RESTRICT
) ENGINE=InnoDB DEFAULT CHARSET=latin1 |
```

# Foreign Keys - ON DELETE RESTRICT

#### SHOW CREATE TABLE bus;

```
| driver | CREATE TABLE 'driver' (
    'licenceNo' varchar(20) NOT NULL,
    'name' varchar(30) DEFAULT NULL,
    'busReg' varchar(15) DEFAULT NULL,
    PRIMARY KEY ('licenceNo'),
    KEY 'busReg' ('busReg'),
    CONSTRAINT 'driver_ibfk_1' FOREIGN KEY ('busReg') REFERENCES 'bus' ('reg')
) ENGINE=InnoDB DEFAULT CHARSET=latin1 |
```

#### SHOW CREATE TABLE bus;

```
| driver | CREATE TABLE 'driver' (
   'licenceNo' varchar(20) NOT NULL,
   'name' varchar(30) DEFAULT NULL,
   'busReg' varchar(15) DEFAULT NULL,
   PRIMARY KEY ('licenceNo'),
   KEY 'busReg' ('busReg'),
   CONSTRAINT 'driver_ibfk_1' FOREIGN KEY ('busReg') REFERENCES 'bus' ('reg')
) ENGINE=InnoDB DEFAULT CHARSET=latin1 |
```



#### SHOW CREATE TABLE bus;

```
bus | CREATE TABLE 'bus' (
'reg' varchar(15) NOT NULL,
'maxPassengers' int(11) DEFAULT NULL,
'fuel' enum('Diesel','Petrol','Electric') DEFAULT 'Diesel',
PRIMARY KEY ('reg')
ENGINE=InnoDB DEFAULT CHARSET=latin1 |
```

```
| driver | CREATE TABLE 'driver' (
    'licenceNo' varchar(20) NOT NULL,
    'name' varchar(30) DEFAULT NULL,
    'busReg' varchar(15) DEFAULT NULL,
    PRIMARY KEY ('licenceNo'),
    KEY 'busReg' ('busReg'),
    CONSTRAINT 'driver_ibfk_1' FOREIGN KEY ('busReg') REFERENCES 'bus' ('reg') ON DELETE CASCAGE
) ENGINE=InnoDB DEFAULT CHARSET=latin1 |
```

#### SHOW CREATE TABLE bus;

```
bus | CREATE TABLE 'bus' (
'reg' varchar(15) NOT NULL,
'maxPassengers' int(11) DEFAULT NULL,
'fuel' enum('Diesel','Petrol','Electric') DEFAULT 'Diesel',
PRIMARY KEY ('reg')
ENGINE=InnoDB DEFAULT CHARSET=latin1 |
```

```
| driver | CREATE TABLE 'driver' (
    'licenceNo' varchar(20) NOT NULL,
    'name' varchar(30) DEFAULT NULL,
    'busReg' varchar(15) DEFAULT NULL,
    PRIMARY KEY ('licenceNo'),
    KEY 'busReg' ('busReg'),
    CONSTRAINT 'driver_ibfk_1' FOREIGN KEY ('busReg') REFERENCES 'bus' ('reg') ON DELETE CASTAGE
) ENGINE=InnoDB DEFAULT CHARSET=latin1 |
```

#### SHOW CREATE TABLE bus;

```
| driver | CREATE TABLE 'driver' (
    'licenceNo' varchar(20) NOT NULL,
    'name' varchar(30) DEFAULT NULL,
    'busReg' varchar(15) DEFAULT NULL,
    PRIMARY KEY ('licenceNo'),
    KEY 'busReg' ('busReg'),
    CONSTRAINT 'driver_ibfk_1' FOREIGN KEY ('busReg') REFERENCES 'bus' ('reg')
) ENGINE=InnoDB DEFAULT CHARSET=latin1 |
```

#### SHOW CREATE TABLE bus;

#### 

```
| driver | CREATE TABLE 'driver' (
    'licenceNo' varchar(20) NOT NULL,
    'name' varchar(30) DEFAULT NULL,
    'busReg' varchar(15) DEFAULT NULL,
    PRIMARY KEY ('licenceNo'),
    KEY 'busReg' ('busReg'),
    CONSTRAINT 'driver_ibfk_1' FOREIGN KEY ('busReg') REFERENCES 'bus' ('reg') ON DELETE CASTAGE
) ENGINE=IppeDR DEFOULT CHOPSET=Latio1 |
```

#### SHOW CREATE TABLE bus;

```
| bus | CREATE TABLE 'bus' (
'reg' varchar(15) NOT NULL,
'maxPassengers' int(11) DEFAULT NULL,
'fuel' enum('Diesel','Petrol','Electric') DEFAULT 'Diesel',
PRIMARY KEY ('reg')
| ENGINE=InnoDB DEFAULT CHARSET=latin1 |
```



#### SHOW CREATE TABLE bus;

```
bus | CREATE TABLE 'bus' (
'reg' varchar(15) NOT NULL,
'maxPassengers' int(11) DEFAULT NULL,
'fuel' enum('Diesel','Petrol','Electric') DEFAULT 'Diesel',
PRIMARY KEY ('reg')
ENGINE=InnoDB DEFAULT CHARSET=latin1 |
```

SHOW CREATE TABLE driver:

#### 

musal> select \* from driver:

rows in set (0.00 sec)

```
| driver | CREATE TABLE 'driver' (
    'licenceNo' varchar(20) NOT NULL,
    'name' varchar(30) DEFAULT NULL,
    'busReg' varchar(15) DEFAULT NULL,
    PRIMARY KEY ('licenceNo'),
    KEY 'busReg' ('busReg'),
    CONSTRAINT 'driver_ibfk_1' FOREIGN KEY ('busReg') REFERENCES 'bus' ('reg') ON DELETE SET
```

#### SHOW CREATE TABLE bus;

```
bus | CREATE TABLE 'bus' (
'reg' varchar(15) NOT NULL,
'maxPassengers' int(11) DEFAULT NULL,
'fuel' enum('Diesel','Petrol','Electric') DEFAULT 'Diesel',
PRIMARY KEY ('reg')
ENGINE=InnoDB DEFAULT CHARSET=latin1 |
```

```
| driver | CREATE TABLE 'driver' (
    'licenceNo' varchar(20) NOT NULL,
    'name' varchar(30) DEFAULT NULL,
    'busReg' varchar(15) DEFAULT NULL,
    PRIMARY KEY ('licenceNo'),
    KEY 'busReg' ('busReg'),
    CONSTRAINT 'driver_ibfk_1' FOREIGN KEY ('busReg') REFERENCES 'bus' ('reg') ON DELETE SET)
    ENGINE=InnoDB DEFAULT CHARSET=latin1 |
```

#### SHOW CREATE TABLE bus;

```
| driver | CREATE TABLE 'driver' (
    'licenceNo' varchar(20) NOT NULL,
    'name' varchar(30) DEFAULT NULL,
    'busReg' varchar(15) DEFAULT NULL,
    PRIMARY KEY ('licenceNo'),
    KEY 'busReg' ('busReg'),
    CONSTRAINT 'driver_ibfk_1' FOREIGN KEY ('busReg') REFERENCES 'bus' ('reg') ON DELETE SET)
) ENGINE=InnoDB DEFAULT CHARSET=latin1 |
```



### show create table employees;

```
| employees | CREATE TABLE 'employees' (
    'emp_no' int(11) NOT NULL,
    'birth_date' date NOT NULL,
    'first_name' varchar(14) NOT NULL,
    'last_name' varchar(16) NOT NULL,
    'gender' enum('M','F') NOT NULL,
    'hire_date' date NOT NULL,
    PRIMARY KEY ('emp_no')
) ENGINE=InnoDB DEFAULT CHARSET=utf8 |
```

### show create table salaries;

```
| salaries | CREATE TABLE 'salaries' (
    'emp_no' int(11) NOT NULL,
    'salary' int(11) NOT NULL,
    'from_date' date NOT NULL,
    'to_date' date NOT NULL,
    'to_date' date NOT NULL,
    PRIMARY KEY ('emp_no','from_date'),
    KEY 'emp_no' ('emp_no'),
    CONSTRAINT 'salaries_ibfk_1' FOREIGN KEY ('emp_no') REFERENCES 'employees' ('emp_no') ON DELETER
ASCADE
) ENGINE=InnoDB DEFAULT CHARSET=utf8 |
```

### show create table salaries;

```
| salaries | CREATE TABLE 'salaries' (
    'emp_no' int(11) NOT NULL,
    'salary' int(11) NOT NULL,
    'from_date' date NOT NULL,
    'to_date' date NOT NULL,
    'to_date' date NOT NULL,
    PRIMARY KEY ('emp_no', 'from_date'),
    KEY 'emp_no' ('emp_no'),
    CONSTRAINT 'salaries_ibfk_1' FOREIGN KEY ('emp_no') REFERENCES 'employees' ('emp_no') ON DELITER
ASCADE
) ENGINE=InnoDB DEFAULT CHARSET=utf8 |
```

```
show create table salaries;
```

```
| salaries | CREATE TABLE 'salaries' (
    'emp_no' int(11) NOT NULL,
    'salary int(11) NOT NULL,
    'trom_date' date NOT NULL,
    'to_date' date NOT NULL,
    'to_date' date NOT NULL,
    PRIMARY KEY ('emp_no','from_date'),
    KEY 'emp_no' ('emp_no'),
    CONSTRAINT 'salaries_ibfk_1' FOREIGN KEY ('emp_no') REFERENCES 'employees' ('emp_no') ON DELITER
ASCADE
) ENGINE=InnoDB DEFAULT CHARSET=utf8 |
```





```
mysql> SELECT s.emp_no
-> FROM salaries s
-> WHERE s.salary BETWEEN 99000 AND 99999;

------
| emp_no |
-------
| 10017 |
| 10066 |
| 10100 |
-------
3 rows in set (0.00 sec)
```



```
mysql> SELECT s.emp_no
-> FROM salaries s
-> WHERE s.salary BETWEEN 99000 AND 99999;

------
| emp_no |
+-----+
| 10017 |
| 10100 |
+-----+
3 rows in set (0.00 sec)
```

```
mysql> SELECT e.emp_no, first_name, last_name
    -> FROM employees e
    -> WHERE e.emp_no IN
         SELECT s.emp_no
        FROM salaries s
        WHERE s.salary BETWEEN 99000 AND 99999
 emp_no | first_name | last_name
          Cristinel
                        Bouloucos
  10066
         i Kwee
                        Schusler
         l Hironobu
                        Haraldson
 rows in set (0.00 sec)
mysql> SELECT e.emp_no, first_name, last name
    -> FROM employees e
    -> WHERE e.emp no IN (
    -> 10017, 10<del>0</del>66, 10100
  emp_no | first_name | last_name
                         Bouloucos
   10017
           Cristinel
          Kwee
   10066
                         Schusler
         l Hironobu
                         Haraldson
3 rows in set (0.00 sec)
```

### show create table employees;

### show create table salaries;

```
| salaries | CREATE TABLE 'salaries' (
    'emp_no' int(11) NOT NULL,
    'salary' int(11) NOT NULL,
    'from_date' date NOT NULL,
    'to_date' date NOT NULL,
    'to_date' date NOT NULL,
    PRIMARY KEY ('emp_no','from_date'),
    KEY 'emp_no' ('emp_no'),
    CONSTRAINT 'salaries_ibfk_1' FOREIGN KEY ('emp_no') REFERENCES 'employees' ('emp_no') ON DELETER
ASCADE
) ENGINE=InnoDB DEFAULT CHARSET=utf8 |
```

```
show create table employees;

| employees | CREATE TABLE 'employees' (
    emp_no int(11) NOT NULL,
    'birth_date' date NOT NULL,
    first_name varchar(14) NOT NULL,
    last_name varchar(16) NOT NULL,
    'gender' enum('M','F') NOT NULL,
    'hire_date' date NOT NULL,
    PRIMARY KEY ('emp_no')
) ENGINE=InnoDB DEFAULT CHARSET=utf8 |
```

### show create table salaries;

```
| salaries | CREATE TABLE 'salaries' (
    'emp_no' int(11) NOT NULL,
    'salary int(11) NOT NULL,
    'trom_date' date NOT NULL,
    'to_date' date NOT NULL,
    'to_date' date NOT NULL,
    PRIMARY KEY ('emp_no','from_date'),
    KEY 'emp_no' ('emp_no'),
    CONSTRAINT 'salaries_ibfk_1' FOREIGN KEY ('emp_no') REFERENCES 'employees' ('emp_no') ON DELITER
ASCADE
) ENGINE=InnoDB DEFAULT CHARSET=utf8 |
```

```
mysql> SELECT emp_no, first_name, last_name
    -> FROM employees
    -> WHERE emp_no IN (
        SELECT emp_no
        FROM salaries
        WHERE salary = (
    -> SELECT MAX(salary)
      FROM salaries
  emp_no | first_name | last_name |
  10068 | Charlene
                     | Brattka
 row in set (0.00 sec)
```



```
mysql> SELECT emp_no, first_name, last_name
    -> FROM employees
   -> WHERE emp_no IN (
        SELECT emp_no
        FROM salaries
        WHERE salary = (
   → SELECT MAX(salary)
      FROM salaries
  emp_no | first_name | last_name
  10068 | Charlene | Brattka
 row in set (0.00 sec)
```



```
mysql> SELECT emp_no, first_name, last_name
    -> FROM employees
    -> WHERE emp_no IN (
        SELECT emp_no
        FROM salaries
        WHERE salarv = (
          113229
  emp_no | first_name | last_name
  10068 | Charlene | Brattka
  row in set (0.00 sec)
```



```
mysql> SELECT emp_no, first_name, last_name
    -> FROM employees
    -> WHERE emp_no IN (
        SELECT emp_no
        FROM salaries
        WHERE salarv = (
          113229
  emp_no | first_name | last_name
   10068 | Charlene | Brattka
  row in set (0.00 sec)
```

```
SELECT MAX(salary)
mysql>
          FROM salaries;
 MAX(salary)
      113229
 row in set (0.00 sec)
mysql>
         SELECT emp_no
         FROM salaries
         WHERE salary =
             113229
  emp_no
   10068
 row in set (0.00 sec)
```



```
mysql> SELECT emp_no, first_name, last_name
    -> FROM employees
    -> WHERE emp no IN (
        10068
  emp_no | first_name | last_name
  10068 | Charlene | Brattka
  row in set (0.00 sec)
```

```
SELECT MAX(salary)
mysql>
          FROM salaries;
 MAX(salary) |
      113229
 row in set (0.00 sec)
mysql>
         SELECT emp_no
         FROM salaries
         WHERE salary =
             113229
  emp_no
   10068
 row in set (0.00 sec)
```

