Introduction to Views

Definition:
Views are stored queries that when referenced produce a result set. A view is a virtual table.

A view can be created from many kinds of SELECT statements. It can refer to base (normal) tables or other views. It can use joins, UNION, and subqueries. The SELECT need not even refer to any tables. The following example defines a view that selects two columns from another table, as well as an expression calculated from those columns:

```
mysql> CREATE TABLE t (qty INT, price INT);
mysql> INSERT INTO t VALUES(3, 50), (5, 60);
mysql> CREATE VIEW v AS SELECT qty, price, qty * price AS value FROM t;
mysql> SELECT * FROM v;
+------+-------+-------+
| qty | price | value |
+------+-------+-------+
| 3 | 50 | 150 |
| 5 | 60 | 300 |
+------+-------+-------+

mysql> SELECT * FROM v WHERE qty = 5;
+------+-------+-------+
| qty | price | value |
+------+-------+-------+
| 5 | 60 | 300 |
+------+-------+-------+
```

Moreover, views can be read-only, or under certain conditions, updatable. INSERT, UPDATE and DELETE statements may be used on updateable views. The operation is then performed on the base table upon which the view is defined.

Creating:
CREATE VIEW, plus the view name, plus the SELECT statement that defines the view.

Example:
mysql> CREATE VIEW v AS SELECT column1 FROM t;

Depending upon user privileges a user can SELECT from a view. Also, depending upon the type of view, and user privileges, some views are updatable -- that is, a user can perform UPDATE and DELETE operations on them. And some updatable views are also "insertable-into" -- that is, you can perform INSERT operations on them. For example:

mysql> INSERT INTO v VALUES (1);

mysql> SELECT * FROM v;

```
+---------+
| column1 |
+---------+
| 1 |
+---------+
```

Advantages:

- Security: restricts user access to stored data (data hiding)
- Simplify complex schemas and/or queries
- Views take little space to store; the database contains only the definition of a view, not a copy of all the data it presents.

Disadvantages:

- Performance: must translate queries against the view into queries against the underlying source tables—the problem is that a simple view may contain a complex query (and various joins) that take time and processing power to perform.
- Manageability: Like other database objects, wiews must be managed. Users with the ability to create views make the DBA's job more difficult—especially when trying to resolve problems with views that reference other views.
- Update restrictions: some views are updateable, others are not. Depends upon the DBMS restrictions, and well as the restrictions on views.

Example:

```
CREATE TABLE employee
(
    empid INT(4) not null auto_increment,
    fname VARCHAR(15),
    lname VARCHAR(20),
    salary decimal(8,2),
    ssn CHAR(9),
primary key (empid)
);

INSERT INTO employee
VALUES
(NULL,'Doe','John',103590.00,'123456789');

/* Do not show salary or ssn */
CREATE VIEW v_empinfo
AS
    SELECT empid, fname, lname
        FROM employee;
```

Views vs. Tables:

```
mysql> SELECT * FROM v_empinfo;
+-------+-------+-------+
| empid | fname | lname |
+-------+-------+-------+
|     1 | Doe   | John  |
+-------+-------+-------+
1 row in set (0.00 sec)

mysql> select empid from v_empinfo;
+-------+
| empid |
+-------+
|     1 |
+-------+
1 row in set (0.01 sec)
```

```
mysql> select ssn from v_empinfo;
ERROR 1054 (42S22): Unknown column 'ssn' in 'field list'

mysql> select ssn from employee;
+-----------+
| ssn       |
+-----------+
| 123456789 |
+-----------+
1 row in set (0.00 sec)

drop view if exists v_emp_info;
```

In addition, MySQL provides the SHOW statement to allow you to display a view definition.

```
SHOW CREATE VIEW v_emp_info;
```

Updatable and Insertable Views:
http://dev.mysql.com/doc/refman/5.0/en/view-updatability.html

Some views are updatable. That is, you can use them in statements such as **UPDATE**, **DELETE**, or **INSERT** to update the contents of the underlying table. For a view to be updatable, there must be a one-to-one relationship between the rows in the view and the rows in the underlying table. There are also certain other constructs that make a view nonupdatable. To be more specific, a view is **not** updatable if it contains any of the following:

- Aggregate functions (**SUM()**, **MIN()**, **MAX()**, **COUNT()**, and so forth)
- **DISTINCT**
- **GROUP BY**
- **HAVING**
- **UNION** or **UNION ALL**
- Subquery in the select list
- Certain joins
- Nonupdatable view in the **FROM** clause
- A subquery in the **WHERE** clause that refers to a table in the **FROM** clause
- Refers only to literal values (in this case, there is no underlying table to update)
- Uses **ALGORITHM = TEMPTABLE** (use of a temporary table always makes a view nonupdatable)
- Multiple references to any column of a base table.
- … etc., etc., etc..

References

http://dev.mysql.com/doc/refman/5.1/en/views.html

http://net.tutsplus.com/tutorials/databases/introduction-to-mysql-views/

http://www.mysqltutorial.org/create-sql-views-mysql.aspx