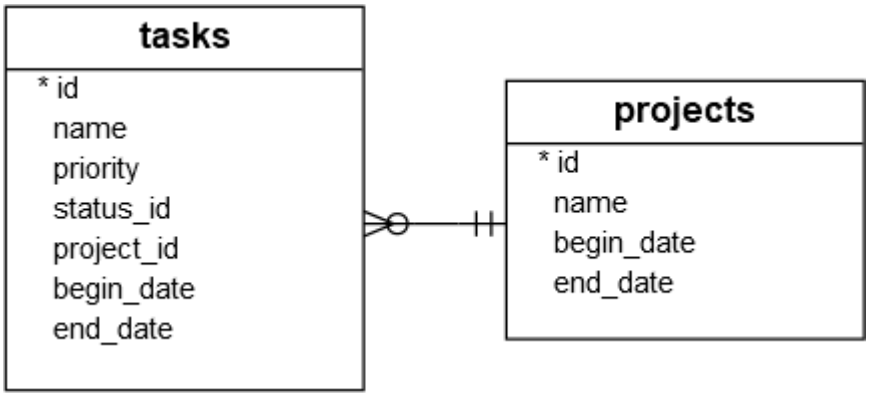
Summary:

In this tutorial, we will show you how to create tables in the SQLite database from the Python program using the sqlite3 module.

To create a new table in an SQLite database from a Python program, you use the following steps:

1. First, create a Connection object using the connect() function of the sqlite3 module.
2. Second, create a Cursor object by calling the cursor() method of the Connection object.
3. Third, pass the CREATE TABLE statement to the execute() method of the Cursor object and execute this method.

For the demonstration, we will create two tables: projects and tasks as shown in the following database diagram:



The following `CREATE TABLE` statements create these two tables:

```
-- projects table
CREATE TABLE IF NOT EXISTS projects (
        id integer PRIMARY KEY,
        name text NOT NULL,
        begin_date text,
        end_date text
);

-- tasks table
CREATE TABLE IF NOT EXISTS tasks (
        id integer PRIMARY KEY,
        name text NOT NULL,
        priority integer,
        project_id integer NOT NULL,
        status_id integer NOT NULL,
        begin_date text NOT NULL,
        end_date text NOT NULL,
        FOREIGN KEY (project_id) REFERENCES projects (id)
);
```

Let’s see how to create new tables in Python.

First, develop a function called `create_connection()` that returns a `Connection` object which represents an SQLite database specified by the database file parameter db_file.

```
def create_connection(db_file):
    """ create a database connection to the SQLite database
        specified by db_file
    :param db_file: database file
    :return: Connection object or None
    """
    conn = None
    try:
        conn = sqlite3.connect(db_file)
        return conn
    except Error as e:
        print(e)

    return conn
```

Second, develop a function named `create_table()` that accepts a `Connection` object and an SQL statement. Inside the function, we call the `execute()` method of the `Cursor` object to execute the `CREATE TABLE` statement.

```
def create_table(conn, create_table_sql):
    """ create a table from the create_table_sql statement
    :param conn: Connection object
    :param create_table_sql: a CREATE TABLE statement
    :return:
    """
    try:
        c = conn.cursor()
        c.execute(create_table_sql)
    except Error as e:
        print(e)
```

Third, create a `main()` function to create the `projects` and `tasks` tables.

```
def main():
    database = r"C:\sqlite\db\pythonsqlite.db"

    sql_create_projects_table = """ CREATE TABLE IF NOT EXISTS projects (
                                        id integer PRIMARY KEY,
                                        name text NOT NULL,
                                        begin_date text,
                                        end_date text
                                    ); """

    sql_create_tasks_table = """CREATE TABLE IF NOT EXISTS tasks (
                                    id integer PRIMARY KEY,
                                    name text NOT NULL,
                                    priority integer,
```

```
                                    status_id integer NOT NULL,
                                    project_id integer NOT NULL,
                                    begin_date text NOT NULL,
                                    end_date text NOT NULL,
                                    FOREIGN KEY (project_id) REFERENCES projects
(id)
                                );"""

    # create a database connection
    conn = create_connection(database)

    # create tables
    if conn is not None:
        # create projects table
        create_table(conn, sql_create_projects_table)

        # create tasks table
        create_table(conn, sql_create_tasks_table)
    else:
        print("Error! cannot create the database connection.")
```

Fourth, execute the `main()` function.

```
if __name__ == '__main__':
    main()
```

Here is the full program:

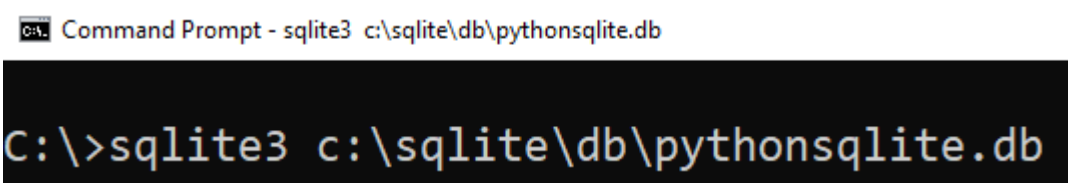
```
import sqlite3
from sqlite3 import Error


def create_connection(db_file):
    """ create a database connection to the SQLite database
        specified by db_file
    :param db_file: database file
    :return: Connection object or None
    """
    conn = None
    try:
        conn = sqlite3.connect(db_file)
        return conn
    except Error as e:
        print(e)

    return conn


def create_table(conn, create_table_sql):
    """ create a table from the create_table_sql statement
    :param conn: Connection object
    :param create_table_sql: a CREATE TABLE statement
    :return:
    """
    try:
```

```
        c = conn.cursor()
        c.execute(create_table_sql)
    except Error as e:
        print(e)


def main():
    database = r"C:\sqlite\db\pythonsqlite.db"

    sql_create_projects_table = """ CREATE TABLE IF NOT EXISTS projects (
                                        id integer PRIMARY KEY,
                                        name text NOT NULL,
                                        begin_date text,
                                        end_date text
                                    ); """

    sql_create_tasks_table = """CREATE TABLE IF NOT EXISTS tasks (
                                    id integer PRIMARY KEY,
                                    name text NOT NULL,
                                    priority integer,
                                    status_id integer NOT NULL,
                                    project_id integer NOT NULL,
                                    begin_date text NOT NULL,
                                    end_date text NOT NULL,
                                    FOREIGN KEY (project_id) REFERENCES projects
(id)
                                );"""

    # create a database connection
    conn = create_connection(database)

    # create tables
    if conn is not None:
        # create projects table
        create_table(conn, sql_create_projects_table)

        # create tasks table
        create_table(conn, sql_create_tasks_table)
    else:
        print("Error! cannot create the database connection.")


if __name__ == '__main__':
    main()
```

Let's verify if the program has created those tables successfully in the `pythonsqlite.db` database.

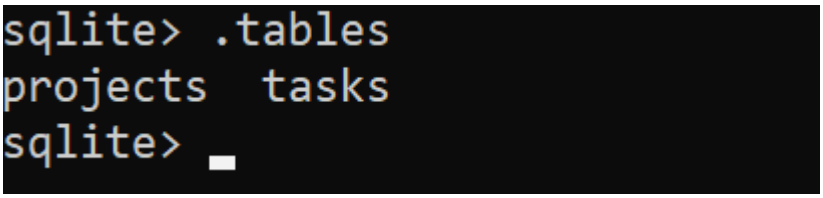
First, launch the command line and connect to the `pythonsqlite.db` database:

```
>sqlite3 c:\sqlite\db\pythonsqlite.db
```



Then, use the `.tables` command to display the tables in the database.

```
sqlite> .tables
projects  tasks
```



As you can see clearly from the output, we are having the `projects` and `tasks` tables in the `pythonsqlite.db` database. And the program works as expected.

In this tutorial, you have learned how to create new tables in the SQLite database using the `execute()` method of the `Cursor` object.