# F1 Database Setup: Visual Tutorial Script

This script walks through the key visual steps for setting up and viewing your F1 database in Docker.

## 1. Project Setup

### Creating the Directory Structure

1. Open your terminal
2. Create and navigate to project directory:

```
mkdir f1-database-project
cd f1-database-project
```

3. Create all required files (as listed in the main guide)

## 2. Starting Docker

### Docker Desktop (Windows/Mac)

- Open Docker Desktop
- Ensure it's running (look for the whale icon in system tray)

### Linux

- Check Docker status:

```
systemctl status docker
```

- If not running:

```
sudo systemctl start docker
```

## 3. Building and Starting Containers

### Terminal Commands

Run these commands in your project directory:

```
docker-compose up -d
```

You should see output similar to:

```
Creating network "f1-database-project_f1network" with driver "bridge"
Creating volume "f1-database-project_postgres-data" with default driver
Creating f1-database ... done
Creating f1-pgadmin ... done
Creating f1-data-collector ... done
```

## 4. Monitoring Data Collection Progress

### Check Logs

Run this command to see data collection happening:

```
docker logs -f f1-data-collector
```

You should see output like:

```
Building F1 database for 2023...
Connected to PostgreSQL!
Inserted 10 rows into constructors
Inserted 20 rows into drivers
Inserted 23 rows into tracks
Found 23 meetings for 2023
Processing meeting: Bahrain Grand Prix
Processing meeting: Saudi Arabian Grand Prix
...
```

## 5. Accessing pgAdmin Web Interface

### Browser Navigation

1. Open your web browser
2. Go to: `http://localhost:8080`
3. You'll see the pgAdmin login page

### Login Screen

Enter the following credentials:

- Email: `user@example.com`
- Password: `pgadmin`

## 6. Connecting to Your F1 Database

### Adding a Server Connection

1. Right-click on "Servers" in the left sidebar
2. Select "Register" → "Server..."
3. In the dialog that appears:
   - General tab: Enter "F1 Database" as the Name
   - Connection tab:
     - Host: `postgres`
     - Port: `5432`
     - Maintenance database: `f1data`
     - Username: `f1user`
     - Password: `f1password`
4. Click "Save"

## 7. Browsing Data in pgAdmin

### Navigating the Database Structure

1. Expand the following items in the left sidebar:
   - Servers
   - F1 Database
   - Databases
   - f1data
   - Schemas
   - public
   - Tables

### Viewing Table Data

1. Right-click on a table (e.g., "constructors")

2. Select "View/Edit Data" → "All Rows"
3. You'll see a spreadsheet-like view of the data

## 8. Running SQL Queries

### Opening Query Tool

1. Click the "Query Tool" button in the toolbar (Looks like a lightning bolt or SQL icon)

### Example Query: View Constructors

1. Enter this SQL:

```sql
SELECT * FROM constructors;
```

2. Click the "Execute/Refresh" button (play icon)
3. View results in the Data Output panel

### Example Query: Race Results

1. Enter this SQL:

```sql
SELECT
    t.track_name as circuit,
    r.date,
    d.driver_name,
    c.constructor_name,
    pos.position
FROM race_results r
JOIN tracks t ON r.circuit_key = t.circuit_key
CROSS JOIN LATERAL jsonb_array_elements(r.race_positions::jsonb) WITH ORDINALITY AS pos(dat
JOIN drivers d ON (pos.data->>'driver_id')::int = d.driver_id
JOIN constructors c ON (pos.data->>'constructor_id')::int = c.constructor_id
WHERE t.track_name = 'Monaco'
ORDER BY pos.position;
```

2. Click "Execute/Refresh"
3. View the formatted race results

## 9. Troubleshooting Common Issues

### Issue: pgAdmin Can't Connect

Visual indication:

- Error message "Could not connect to server: Connection refused"
- Solution: Check Docker container logs for postgres service

### Issue: No Data in Tables

Visual indication:

- Tables exist but show 0 rows
- Solution: Check data collector logs for errors

## 10. Stopping the Environment

### Terminal Command

When you're done, you can stop all containers:

```
docker-compose down
```

If you want to completely reset and remove all data:

```
docker-compose down -v
```