Part 3: Dynamic Data: Querying the Database

In this section you will learn to

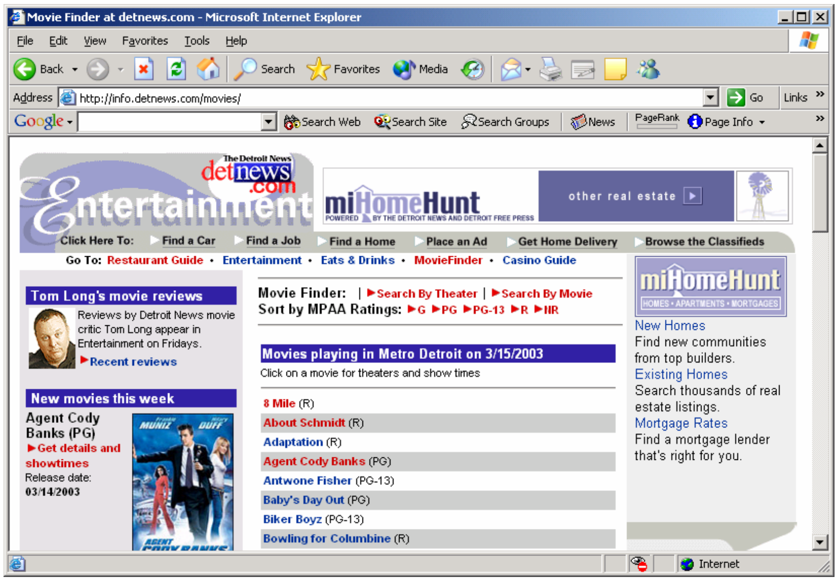
- Write basic SQL statements
- Create a Data Source Name (DSN) in the ColdFusion Administrator
- Turn on debugging in the ColdFusion Administrator
- Send a SQL statement to the database
- Display resulting records using the <cfdump> tag
- Display resulting records in a customized table using the <cfoutput> tag

Database Basics

Databases are used on many websites. Most web users probably do not give it much thought. Databases play a vital role any time customers view product information, bid on an online auction, submit an online expense report, sign up for a newsletter, or view current movie times.

Often this information is available in a database before the website is even created. For example, a company's product information is likely in a database for the accounting software, the fulfillment department or others.

Consider the example of the Detroit News *Movie Finder:*


Movie Finder at detnews.com - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://info.detnews.com/movies/
Go Links
Google Search Web Search Site Search Groups News PageRank Page Info
The Detroit News detnews.com Entertainment
miHomeHunt
other real estate
Internet

Click Here To: Find a Car Find a Job Find a Home Place an Ad Get Home Delivery Browse the Classifieds

Go To: Restaurant Guide • Entertainment • Eats & Drinks • MovieFinder • Casino Guide

Tom Long's movie reviews

Reviews by Detroit News movie critic Tom Long appear in Entertainment on Fridays.

▶Recent reviews

New movies this week

Agent Cody Banks (PG)
▶Get details and showtimes
Release date:
03/14/2003

Movie Finder: | ▶Search By Theater | ▶Search By Movie
Sort by MPAA Ratings: ▶G ▶PG ▶PG-13 ▶R ▶NR

Movies playing in Metro Detroit on 3/15/2003

Click on a movie for theaters and show times

8 Mile (R)
About Schmidt (R)
Adaptation (R)
Agent Cody Banks (PG)
Antwone Fisher (PG-13)
Baby's Day Out (PG)
Biker Boyz (PG-13)
Bowling for Columbine (R)

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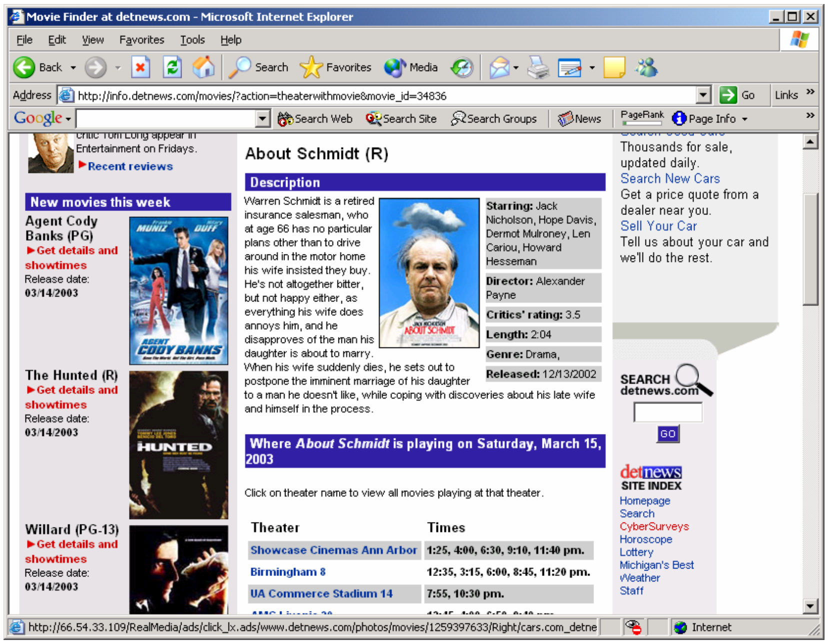
New Homes
Find new communities from top builders.

Existing Homes
Search thousands of real estate listings.

Mortgage Rates
Find a mortgage lender that's right for you.

When readers visit the site, they find a list of all movies currently playing in the Detroit area. By clicking on any movie, a list of theaters and times is shown. This information changes daily, but since it is stored in a database, it need only be updated in one spot – the database. In fact, the data in this case likely comes from an outside service. So, as far as the Detroit News staff is concerned, nothing on the site needs to change, yet the site is always current. For someone to manually change the times on each single static HTML page for each movie would take an extraordinary amount of time.


Movie Finder at detnews.com - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://info.detnews.com/movies/?action=theaterwithmovie&movie_id=34836
Go Links
Google Search Web Search Site Search Groups News PageRank Page Info
http://66.54.33.109/RealMedia/ads/click_lx.ads/www.detnews.com/photos/movies/1259397633/Right/cars.com_detne
Internet

critic Tom Long appear in Entertainment on Fridays.
▶Recent reviews

New movies this week

Agent Cody Banks (PG)
▶Get details and showtimes
Release date:
03/14/2003

The Hunted (R)
▶Get details and showtimes
Release date:
03/14/2003

Willard (PG-13)
▶Get details and showtimes
Release date:
03/14/2003

About Schmidt (R)

Description

Warren Schmidt is a retired insurance salesman, who at age 66 has no particular plans other than to drive around in the motor home his wife insisted they buy. He's not altogether bitter, but not happy either, as everything his wife does annoys him, and he disapproves of the man his daughter is about to marry. When his wife suddenly dies, he sets out to postpone the imminent marriage of his daughter to a man he doesn't like, while coping with discoveries about his late wife and himself in the process.

Starring: Jack Nicholson, Hope Davis, Dermot Mulroney, Len Cariou, Howard Hesseman
Director: Alexander Payne
Critics' rating: 3.5
Length: 2:04
Genre: Drama,
Released: 12/13/2002

Where *About Schmidt* is playing on Saturday, March 15, 2003

Click on theater name to view all movies playing at that theater.

Theater	Times
Showcase Cinemas Ann Arbor	1:25, 4:00, 6:30, 9:10, 11:40 pm.
Birmingham 8	12:35, 3:15, 6:00, 8:45, 11:20 pm.
UA Commerce Stadium 14	7:55, 10:30 pm.

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Lottery
Michigan's Best
Weather
Staff

With ColdFusion selected as our server-side technology, we need to explore database options. ColdFusion is not a database and cannot store data. It must work with a database software program. Some common database programs include Microsoft Access, Microsoft SQL Server (not to be confused with the language named SQL), MySQL (again, not to be confused with the language SQL) and Oracle.

These programs differ in many ways. However, most databases have adopted the basics of a query language called Structured Query Language (SQL). While SQL does vary from database to database, the basics tend to remain nearly identical. Once you have selected a database program, it is recommended that you learn how to optimize your SQL statements for your database.

Note: *in ColdFusion 5 and earlier, ColdFusion used ODBC DSNs. These DSNs could be created in the Windows ODBC window. This is no longer true. After ColdFusion MX, DSNs must be created in the ColdFusion Administrator Window.*

Introduction to SQL

Structured Query Language (SQL) is the common language that is used in most database programs. Each database has its own version of SQL, but the basics tend to remain similar if not identical.

In this course, you will use SQL's basic statements, including select, insert, update and delete, in your ColdFusion code in order to make changes to the database. Explanations of these statements follow.

Select Statement

In order to select data from a database table we use a SELECT statement. Quotes are needed around any string value:

```
SELECT field1, field2, field3
FROM table_name
WHERE field1 = ‘value’

Or, with real data:

SELECT firstname, lastname, address, city, state, zip
FROM people
WHERE state = ‘PA’
```

Update Statement

To edit an existing record in the database (such as changing someone's address or fixing the spelling of a name), we use and UPDATE statement:

```
UPDATE table_name
SET field1 = ‘stringvalue1’, field2 = numericvalue2
WHERE field3 = numericvalue3

Or, with real data:

UPDATE people
SET firstname = ‘Newname’, age = 34
WHERE person_id = 12
```

Note: the WHERE clause is very important. Without it, ***every*** record in the database will be changed!

Insert Statement

In order to insert new data into a database table we use an INSERT statement:

```
INSERT INTO tablename (field1, field2, field3)
VALUES (‘value1’, ‘value2’, numericvalue3)

Or, with real data:

INSERT INTO people (firstname, lastname, age)
VALUES (‘Andrew, ‘Carnegie, 31)
```

Delete Statement

A DELETE statement is used to delete data from a database table:

```
DELETE FROM table_name
WHERE field1 = ‘value’

Or, with real data:

DELETE FROM people
WHERE person_id = 18
```

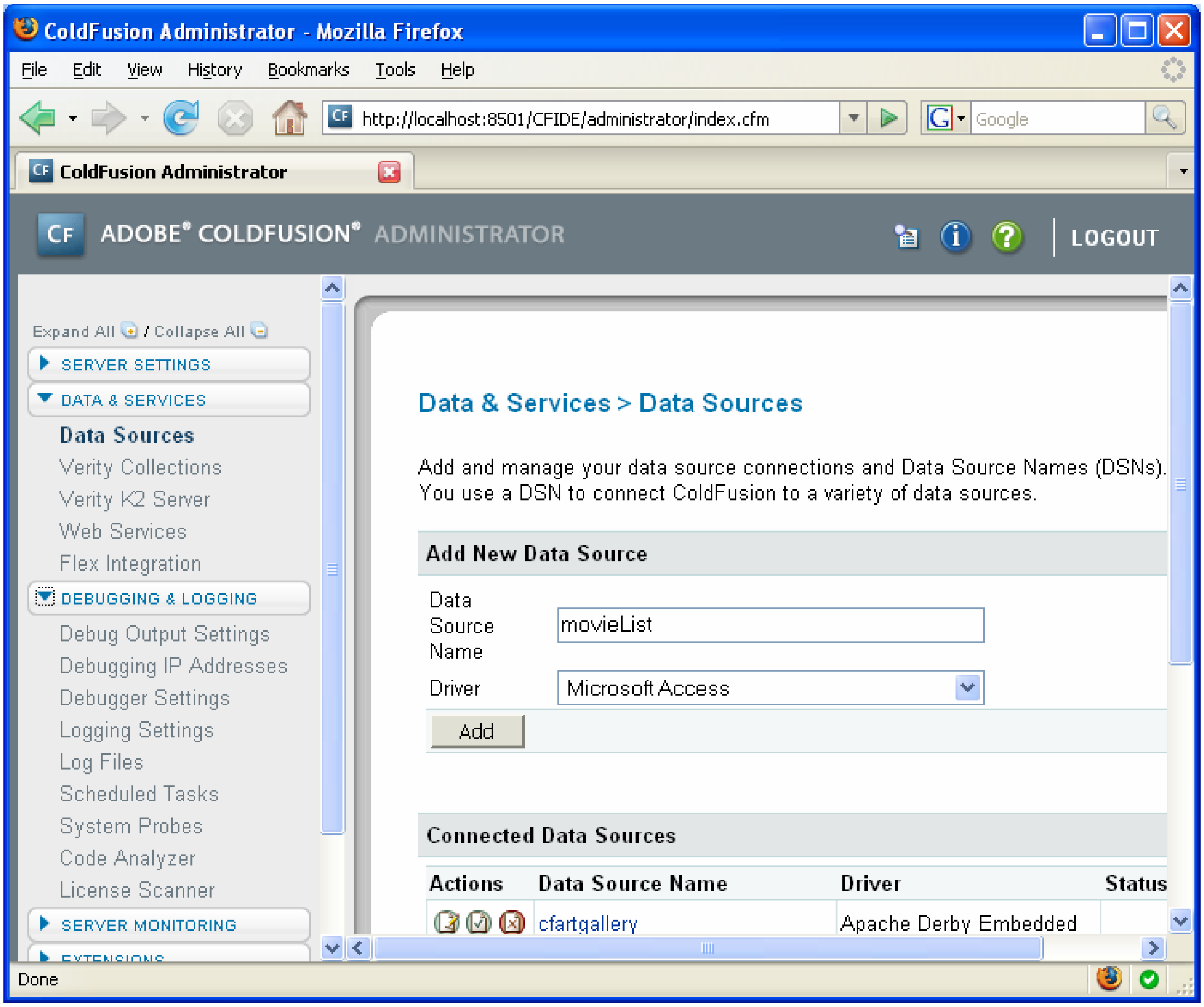
***Note**: the WHERE clause is very important in a DELETE statement. Without it, **every** record in the database will be deleted!*

Data Source Name (DSN) / Remote Development Server (RDS)

ColdFusion requires that a DSN be set up on the server. A DSN is a nickname for a database and holds a few key pieces of information including:

- Path to the database
- Type of driver to use
- Password information, if required

The DSN for this course might have already been created for you. Ask your instructor whether you will need to create a DSN. If you do, you will need access to your site’s ColdFusion Administrator window. A screen shot of the window is shown below:



Data & Services > Data Sources

Add and manage your data source connections and Data Source Names (DSNs). You use a DSN to connect ColdFusion to a variety of data sources.

Add New Data Source

Data Source Name	movieList
Driver	Microsoft Access

Add

Connected Data Sources

Actions	Data Source Name	Driver	Status
	cfartgallery	Apache Derby Embedded	

Note: *Previous versions of ColdFusion worked differently with DSNs. ColdFusion MX uses Java Database Connectivity (JDBC) instead of Open Database Connectivity (ODBC) like versions 5 and earlier used.*

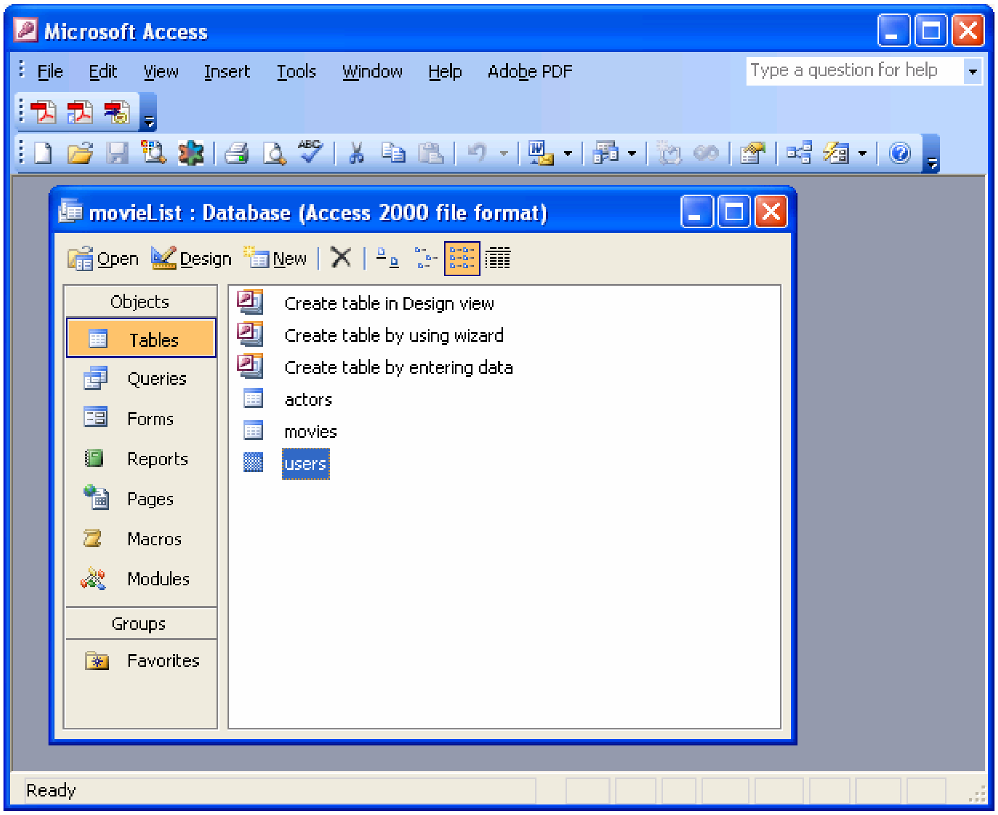
The DSN Used in This Class: movieList

All of the files used in this class require the use of one DSN. It should be called **movieList** and should point to your movieList.mdb file. It is located in the following folder: **[Drive][Path to wwwroot]\ColdFusionIntro\data** for example, C:\Inetpub\wwwroot\ColdFusionIntro\data.

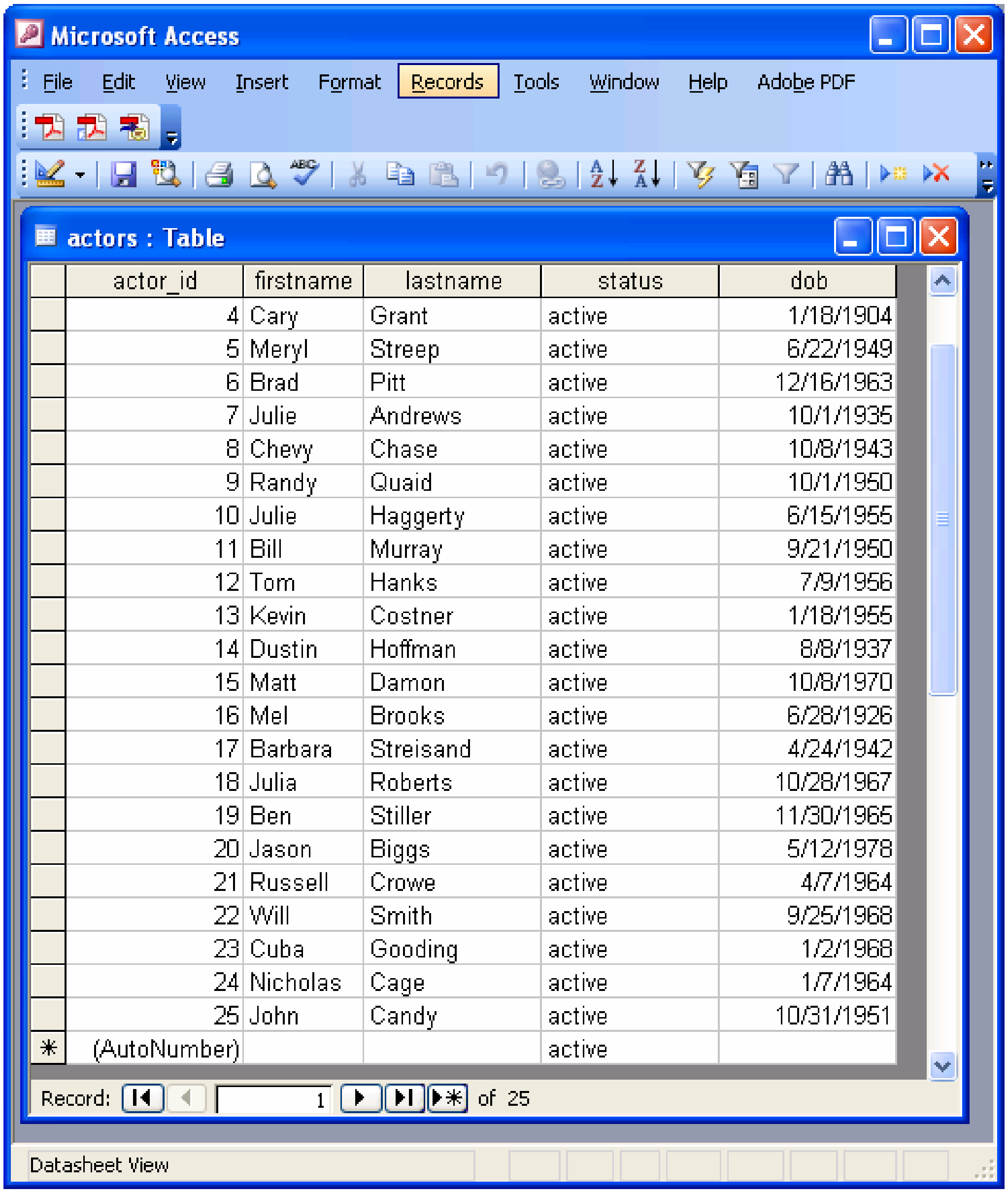
Course Project Database

The database we will use in class is an Access database and holds three tables: movies, actors and users.

If you have Access installed on your machine, feel free to open your copy of the database file. If you do you will find the following screen. Screenshots of each of the tables is below:

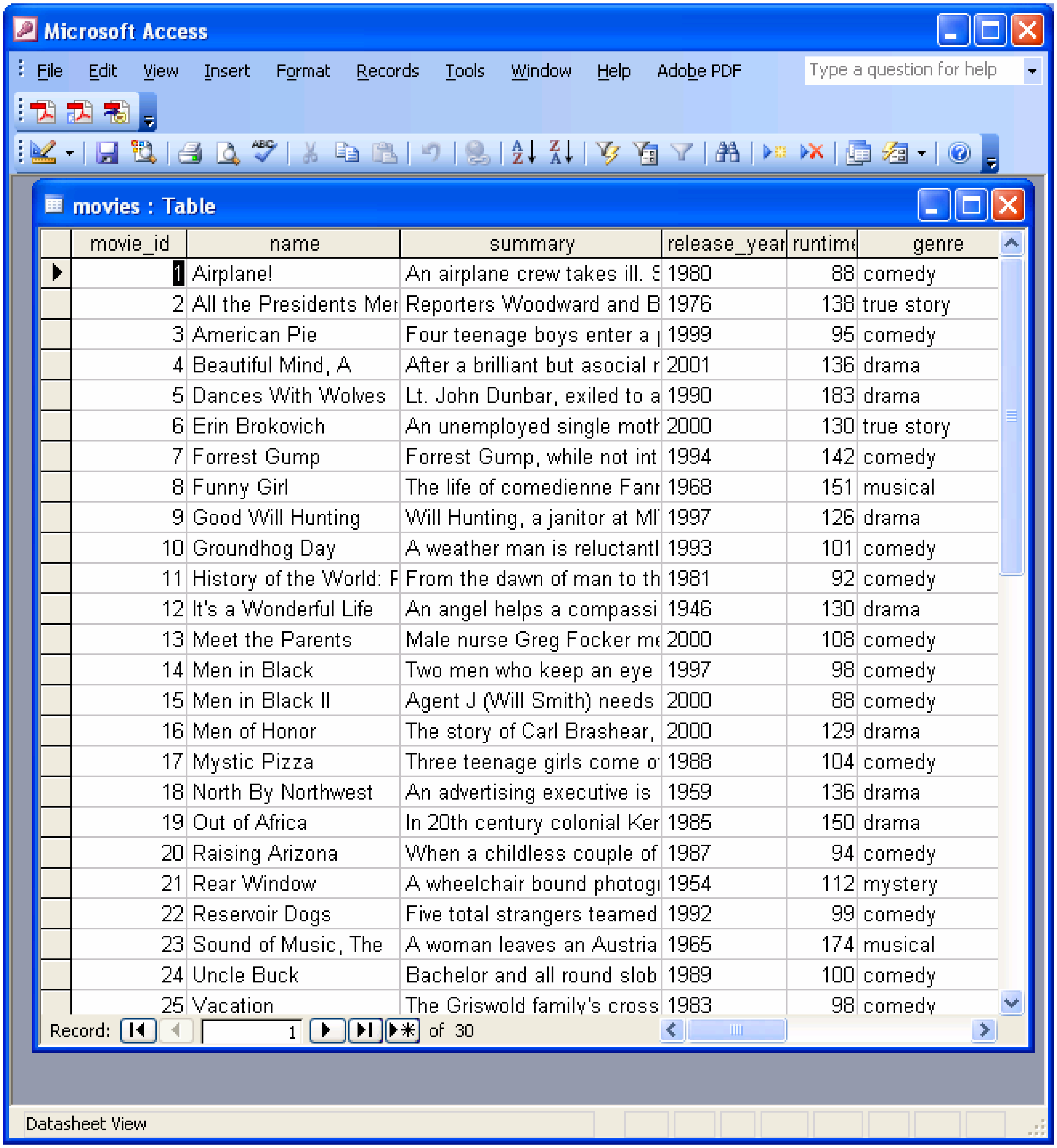


Actors Table:


Microsoft Access
File Edit View Insert Format Records Tools Window Help Adobe PDF
actors : Table
Record: 1 of 25
Datasheet View

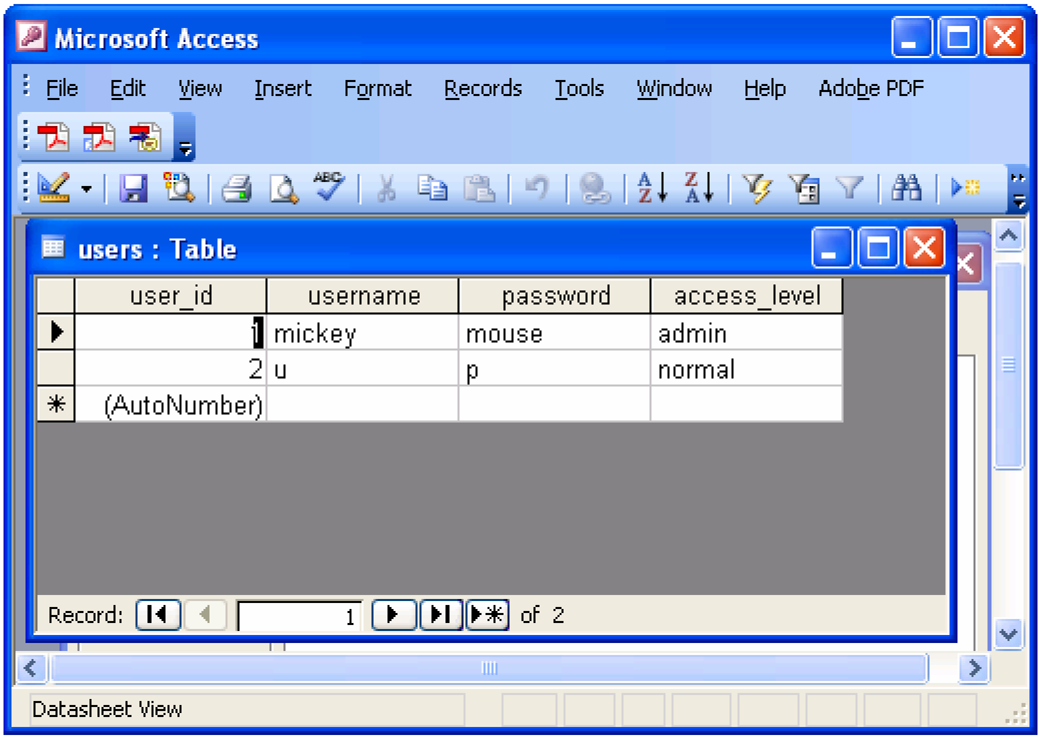
actor_id	firstname	lastname	status	dob
4	Cary	Grant	active	1/18/1904
5	Meryl	Streep	active	6/22/1949
6	Brad	Pitt	active	12/16/1963
7	Julie	Andrews	active	10/1/1935
8	Chevy	Chase	active	10/8/1943
9	Randy	Quaid	active	10/1/1950
10	Julie	Haggerty	active	6/15/1955
11	Bill	Murray	active	9/21/1950
12	Tom	Hanks	active	7/9/1956
13	Kevin	Costner	active	1/18/1955
14	Dustin	Hoffman	active	8/8/1937
15	Matt	Damon	active	10/8/1970
16	Mel	Brooks	active	6/28/1926
17	Barbara	Streisand	active	4/24/1942
18	Julia	Roberts	active	10/28/1967
19	Ben	Stiller	active	11/30/1965
20	Jason	Biggs	active	5/12/1978
21	Russell	Crowe	active	4/7/1964
22	Will	Smith	active	9/25/1968
23	Cuba	Gooding	active	1/2/1968
24	Nicholas	Cage	active	1/7/1964
25	John	Candy	active	10/31/1951
(AutoNumber)			active	

Movies Table:



movie_id	name	summary	release_year	runtim	genre
1	Airplane!	An airplane crew takes ill. S	1980	88	comedy
2	All the Presidents Mer	Reporters Woodward and B	1976	138	true story
3	American Pie	Four teenage boys enter a	1999	95	comedy
4	Beautiful Mind, A	After a brilliant but asocial r	2001	136	drama
5	Dances With Wolves	Lt. John Dunbar, exiled to a	1990	183	drama
6	Erin Brokovich	An unemployed single moth	2000	130	true story
7	Forrest Gump	Forrest Gump, while not int	1994	142	comedy
8	Funny Girl	The life of comedienne Fanr	1968	151	musical
9	Good Will Hunting	Will Hunting, a janitor at MI	1997	126	drama
10	Groundhog Day	A weather man is reluctantl	1993	101	comedy
11	History of the World: F	From the dawn of man to th	1981	92	comedy
12	It's a Wonderful Life	An angel helps a compassi	1946	130	drama
13	Meet the Parents	Male nurse Greg Focker me	2000	108	comedy
14	Men in Black	Two men who keep an eye	1997	98	comedy
15	Men in Black II	Agent J (Will Smith) needs	2000	88	comedy
16	Men of Honor	The story of Carl Brashear,	2000	129	drama
17	Mystic Pizza	Three teenage girls come o	1988	104	comedy
18	North By Northwest	An advertising executive is	1959	136	drama
19	Out of Africa	In 20th century colonial Ker	1985	150	drama
20	Raising Arizona	When a childless couple of	1987	94	comedy
21	Rear Window	A wheelchair bound photogr	1954	112	mystery
22	Reservoir Dogs	Five total strangers teamed	1992	99	comedy
23	Sound of Music, The	A woman leaves an Austria	1965	174	musical
24	Uncle Buck	Bachelor and all round slob	1989	100	comedy
25	Vacation	The Griswold family's cross	1983	98	comedy

Users Table:



Microsoft Access
File Edit View Insert Format Records Tools Window Help Adobe PDF
users : Table
Record: 1 of 2
Datasheet View

	user_id	username	password	access_level
▶	1	mickey	mouse	admin
	2	u	p	normal
*	(AutoNumber)			

Querying the database with <cfquery>

Any time you want to get information from the database, you will use the <cfquery> tag. This tag passes a SQL Statement, also known as a "query," to the database that you specify. ColdFusion does not interpret or execute the SQL Statement. It merely passes it on to the database.

A simple query may look something like this:

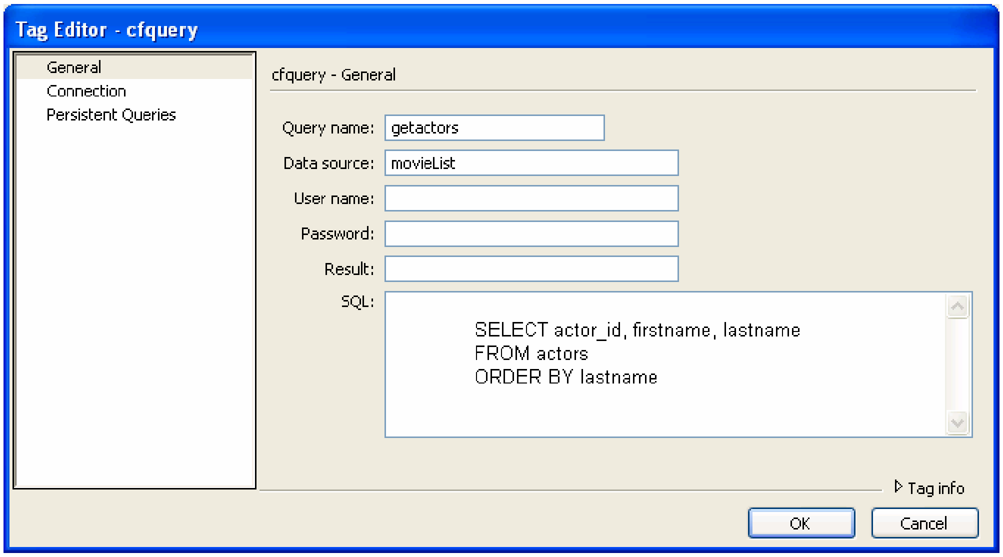
```
<cfquery name="getactors" datasource="movieList ">
   SELECT actor_id, firstname, lastname
   FROM actors
   ORDER BY lastname
</cfquery>
```

The tag editor dialog box presents the available attributes. In addition to the SQL statement, a query name and data source must be specified.

The "Data Source" field is where you will enter the name of your DSN. This tells ColdFusion where your data is located. The Query Name gives the resulting recordset a name so it may be referred to later in this page.

Note: *In ColdFusion 5.0 and earlier, "dbtype" was a required attribute. Since ColdFusion MX now requires the use of JDBC drivers, this attribute has been deprecated (eliminated).*

This is the tag editing dialog box for <cfquery> in Dreamweaver:



Tag Editor - cfquery

cfquery - General

Query name: getactors

Data source: movieList

User name:

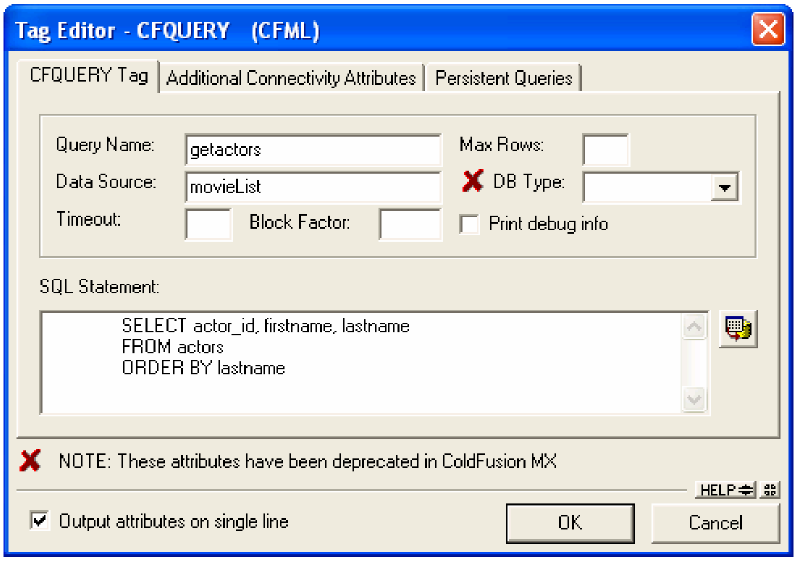
Password:

Result:

SQL:

```
SELECT actor_id, firstname, lastname
FROM actors
ORDER BY lastname
```

This is the tag editing dialog box for <cfquery> in HomeSite+ / ColdFusion Studio:



Query Name: getactors

Data Source: movieList

☐ Print debug info

SQL Statement:

```
SELECT actor_id, firstname, lastname
FROM actors
ORDER BY lastname
```

NOTE: These attributes have been deprecated in ColdFusion MX

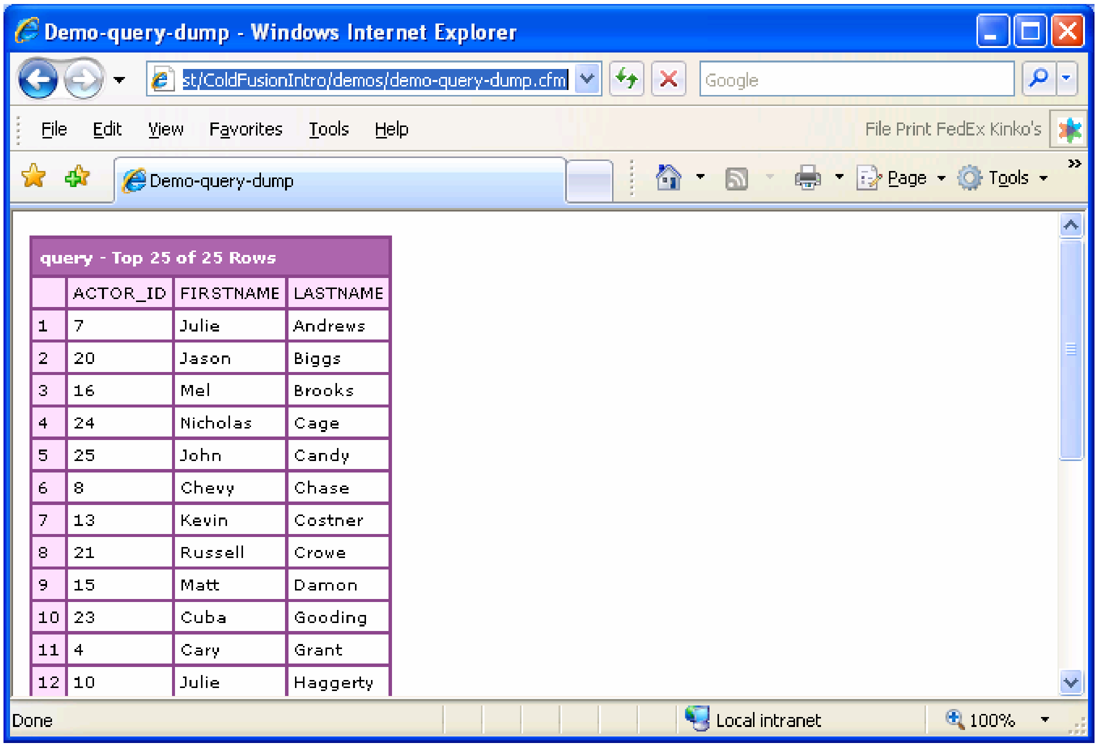
☑ Output attributes on single line

<cfdump> for Quick Output

In order to test that the query is working, we need a way to display the resulting data. A quick debugging tool called <cfdump> can be handy here. It is unlikely you will want to use this in production since you have no control of the layout. The name is actually quite accurate since it simply dumps out all of the data for your review.

In the next few sections, we will explore other ways to display resulting data. But first, take a look at the <cfdump> results for the simple "getactors" query.

```
<cfdump var="#query_name#">
```



query - Top 25 of 25 Rows

	ACTOR_ID	FIRSTNAME	LASTNAME
1	7	Julie	Andrews
2	20	Jason	Biggs
3	16	Mel	Brooks
4	24	Nicholas	Cage
5	25	John	Candy
6	8	Chevy	Chase
7	13	Kevin	Costner
8	21	Russell	Crowe
9	15	Matt	Damon
10	23	Cuba	Gooding
11	4	Cary	Grant
12	10	Julie	Haggerty

Saved as **demos/demo-query-dump.cfm**:

```
<html>
<head>
   <title>Demo-query-dump</title>
</head>

<body>
<cfquery name="getactors" datasource="movieList ">
   SELECT actor_id, firstname, lastname
   FROM actors
   ORDER BY lastname
</cfquery>

<cfdump var="#getactors#">
</body>
</html>
```

Note: *<cfdump> was introduced in ColdFusion 5.0 and is not recognized by earlier versions.*

Exercise 2: Query the database

15 to 20 minutes

In this exercise, you will build a page that queries the database for all movies. We want to display each movie's ID, name and genre. The data will be displayed by using the <cfdump> tag.

1. Open "**allmovies.cfm**."

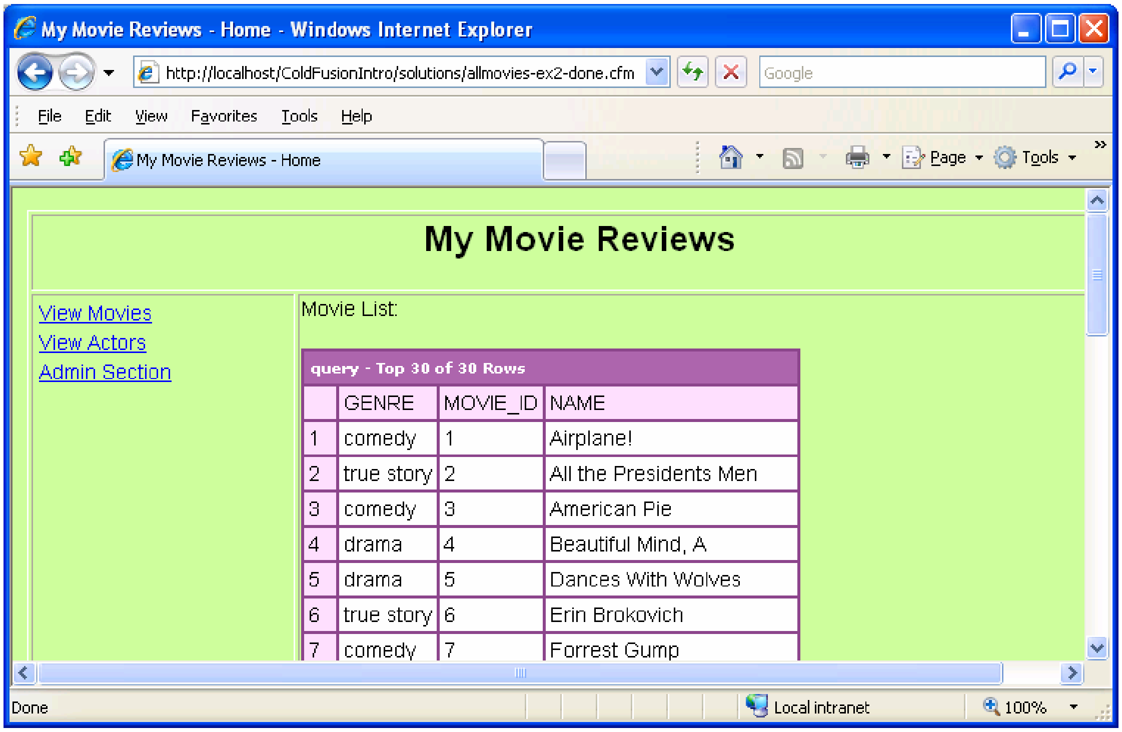
2. Beneath the words "Movie List" in the main table cell, add a <cfquery> tag either by typing it or by clicking on the icon in the CF Basic toolbar. Your datasource needs to be "**movieList**" (unless your instructor gives you a different DSN). Your query might look something like this:

```
<cfquery name="getMovies" datasource="movieList ">
     SELECT name, movie_id, genre
     FROM movies
     ORDER BY name
</cfquery>
```

3. Add a <cfdump> tag that refers to the query name you just added.

4. Finally, test it in the browser!

It should look something like this when you are done:



My Movie Reviews

Movie List:

query - Top 30 of 30 Rows			
	GENRE	MOVIE_ID	NAME
1	comedy	1	Airplane!
2	true story	2	All the Presidents Men
3	comedy	3	American Pie
4	drama	4	Beautiful Mind, A
5	drama	5	Dances With Wolves
6	true story	6	Erin Brokovich
7	comedy	7	Forrest Gump

Challenge

- Can you alter your query so that it sorts the movies in descending alphabetical order?
- Write a similar page that will display all of the actors from the actors table.

Possible Solution to Exercise 2

Saved as **solutions /allmovies-ex-02-done.cfm**

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN">
<html>
<head>
<title>My Movie Reviews - Home</title>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">
<link href="mymovies.css" rel="stylesheet" type="text/css">
</head>

<body>
<table width="750" border="1">
  <tr>
    <td colspan="2" valign="top"> <h2 align="center">My Movie
Reviews</h2>
      </td>
  </tr>
  <tr valign="top">
    <td width="175" valign="top">

   <!--- Navigation Table --->
   <table width="100%" border="0">
        <tr>
        <td><a href="allmovies.cfm">View Movies</a></td>
        </tr>
        <tr>
          <td><a href="allactors.cfm">View Actors</a></td>
        </tr>
        <tr>
          <td><a href="admin.cfm">Admin Section</a></td>
        </tr>
        <tr>
          <td>&nbsp;</td>
        </tr>
      </table>

    </td>
    <td><p>Movie List:</p>
      <cfquery name="getMovies" datasource="movieList">
         SELECT name, movie_id, genre
         FROM movies
         ORDER BY name
      </cfquery>

     <cfdump var="#getMovies#">
      </td>
  </tr>
  <tr>
    <td colspan="2" valign="top">
   <cfinclude template="footer-date.cfm">
   </td>
  </tr>
</table>

</body>
</html>
```