CS 200

Lecture 10
FileMaker Scripting

Miscellaneous Notes

Abbreviations

aka	Also Known As
DBMS	DataBase Management System

Administrivia

Please read and highlight BEFORE lab

- Assignment 10
- Lecture Notes

This week

- Scripting in FileMaker
- Regular Expressions
- Project Pearl

Please ask questions if there’s something you don’t understand

Assumptions

- You have completed Assignment 9 and have an understanding of FileMaker.
- You have an understanding of scripting and automating tasks in an application.

Things to Think about

How do we manipulate the data objects with a script?

Is there more than one way to create a script?

What are the deficiencies of the scripting interface?

What are the efficiencies of the scripting interface?

Application Scripting

Application scripting is a way

- to automate lengthy manual procedures
- to automate error prone manual procedures

  eg sort & enter Preview Mode to display/print a report in FileMaker
- to customize / extend an application
- to create a different interface
- for an application designer to hide details from an application user

Using a "textual representation" of every possible user action

- or at least most user actions...

"Digital player pianos"

Before we look at scripting in Filemaker...

- "why scripting again?" and
- "what do we *expect*?"

- **DEMO 1 and 2**

What do we expect to find? (“What’s our model of scripting?”)

Commands (statements) equivalent to user actions

Variables

Loops & Conditionals

- loops so we can do something repeatedly
- if-stmts so we can make decisions about what to do

The ability to invoke one script from another, so we can

- easily reuse scripts
- write small scripts to do simple things, & combine them

The ability to (manually) create and edit scripts

Recordability

A way to attach scripts to buttons, menus, and/or keystrokes

Debugging support

The ability to customize the user interface

FileMaker Script Steps (= “statements”)

Control

- Perform Script
- Pause/Resume Script
- Exit Script
- Halt Script
- If
- Else If
- Else
- End If
- Loop
- Exit Loop If
- End Loop
- Allow User to Abort
- Set Error Capture
- Set Variable
- Install OnTimer Script

Navigation

- Go to Layout
- Go to Record/Request/Page
- Go to Related Record
- Go to Portal Row
- Go to Field
- Go to Object
- Go to Next Field
- Go to Previous Field
- Enter Browse Mode
- Enter Find Mode
- Enter Preview Mode

Editing

- Undo/Redo
- Cut
- Copy
- Paste
- Clear
- Set Selection
- Select All
- Perform Find/Replace

Fields

- Set Field
- Set Field by Name
- Set Next Serial Value
- Insert Text
- Insert Calculated Result
- Insert from Index
- Insert from Last Visited
- Insert from URL
- Insert Current Date
- Insert Current Time
- Insert Current User Name
- Insert Picture
- Insert QuickTime
- Insert Audio/Video
- Insert PDF
- Insert File
- Replace Field Contents
- Relookup Field Contents
- Export Field Contents

Records

- New Record/Request
- Duplicate Record/Request
- Delete Record/Request
- Delete Portal Row
- Delete All Records
- Open Record/Request
- Revert Record/Request
- Commit Records/Requests
- Copy Record/Request
- Copy All Records/Requests
- Import Records
- Export Records
- Save Records As Excel
- Save Records As PDF
- Save Records as Snapshot Link

Found Sets

- Perform Find
- Constrain Found Set
- Extend Found Set
- Modify Last Find
- Show All Records
- Show Omitted Only
- Omit Record
- Omit Multiple Records
- Sort Records
- Sort Records by Field
- Unsort Records
- Find Matching Records

Windows

- New Window
- Select Window
- Close Window
- Adjust Window
- Move/Resize Window
- Arrange All Windows
- Freeze Window
- Refresh Window
- Scroll Window
- Show/Hide Toolbars
- Show/Hide Text Ruler
- Set Window Title
- Set Zoom Level
- View As

Files

- New File
- Open File
- Close File
- Convert File
- Set Multi-User
- Set Use System Formats
- Save a Copy as
- Recover File
- Print Setup
- Print

Accounts

- Add Account
- Delete Account
- Reset Account Password
- Change Password
- Enable Account
- Re-Login

Spelling

- Check Selection
- Check Record
- Check Found Set
- Correct Word
- Spelling Options
- Select Dictionaries
- Edit user Dictionary

Open Menu Item

- Open Edit Saved Finds
- Open Preferences
- Open File Options
- Open Manage Containers
- Open Manage Database
- Open Manage Data Sources
- Open Manage Layouts
- Open Manage Value Lists
- Open Find/Replace
- Open Help
- Open Remote
- Open Sharing

Miscellaneous

- Show Custom Dialog
- Allow Formatting Bar
- Beep
- Speak
- Dial Phone
- Install Plug-In File
- Install Menu Set
- Set Web Viewer
- Open URL
- Send Mail
- Perform AppleScript
- Execute SQL
- Send Event
- Comment
- Flush Cache to Disk
- Exit Application

Evaluation

A local variable can only be used in script steps in the currently executing script. The value in a local variable is cleared when the script exits.

A global variable can be used in a calculation or script anywhere in a file— for example, in other scripts or file paths. The value of a global variable is not cleared until the file is closed.

Variables

- the clipboard
- “Global Fields” (see last week’s assignment)
- “local variables” ($name)
- “global variables” ($$name)

Loops & Conditionals →

Control

- Perform Script
- Pause/Resume Script
- Exit Script
- Halt Script
- If
- Else If
- Else
- End If
- Loop
- Exit Loop If
- End Loop
- Allow User Abort
- Set Error Capture
- Set Variable

The ability to invoke one script from another

- “Perform Script” does the trick

The ability to create and edit scripts

- ✔

Recordability

- no (boo....)

A way to attach scripts to buttons, menus, and/or keystrokes

- ✔, ✔, ✔

Debugging support

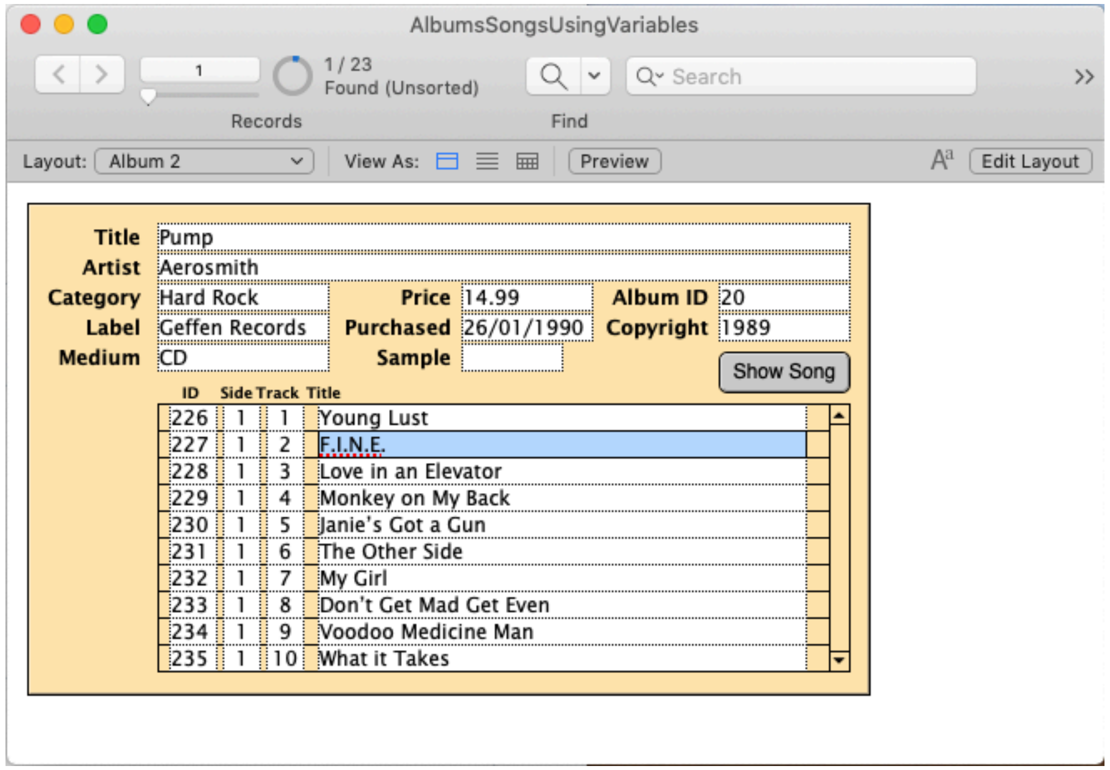
- only in FileMaker Pro Advanced (sigh...)

Customize the interface

Creating and Editing Scripts in FileMaker

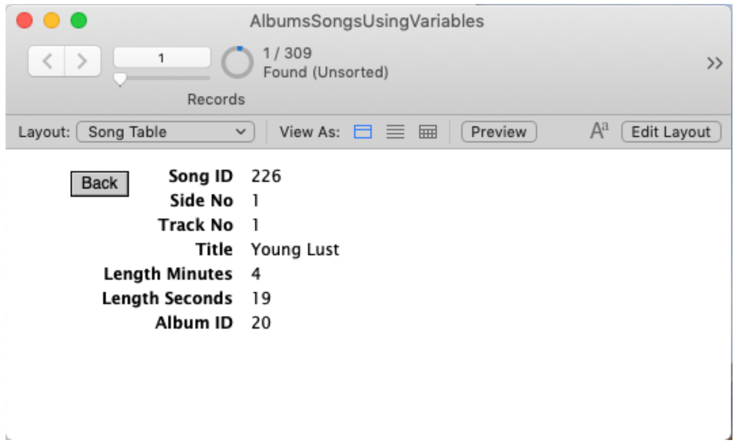
Let's look at a script that

- starting in the Album table
- and assuming you've selected a song,
- opens the Song table and
- displays detailed information about that selected song



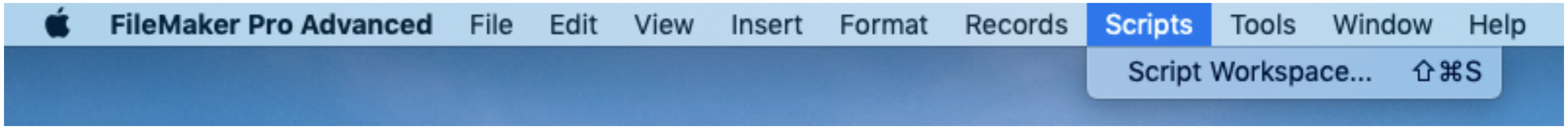
Title	Pump				
Artist	Aerosmith				
Category	Hard Rock	Price	14.99	Album ID	20
Label	Geffen Records	Purchased	26/01/1990	Copyright	1989
Medium	CD	Sample			

ID	Side	Track	Title
226	1	1	Young Lust
227	1	2	F.I.N.E.
228	1	3	Love in an Elevator
229	1	4	Monkey on My Back
230	1	5	Janie's Got a Gun
231	1	6	The Other Side
232	1	7	My Girl
233	1	8	Don't Get Mad Get Even
234	1	9	Voodoo Medicine Man
235	1	10	What it Takes



Song ID	226
Side No	1
Track No	1
Title	Young Lust
Length Minutes	4
Length Seconds	19
Album ID	20

To see the script, select Manage Scripts from the Scripts menu...



to open...

The Define Scripts Dialog Box

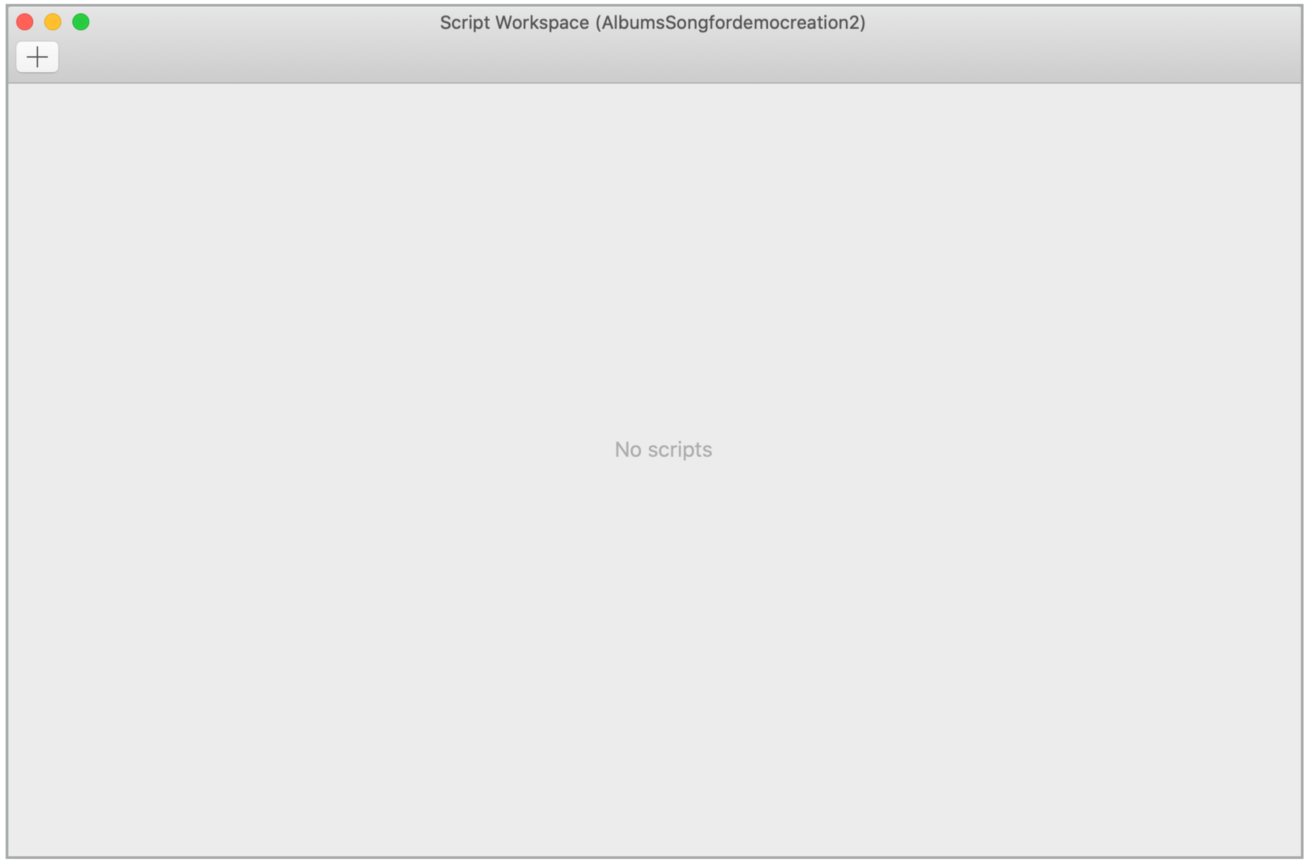
It's straightforward to deduce

- how to edit an existing script
- how to create & start editing a new script
- how to delete a script

What's the basic "interaction model" for this dialog?

Is there anything on this dialog that's particularly worth remembering?

DEMO 2A and 2B

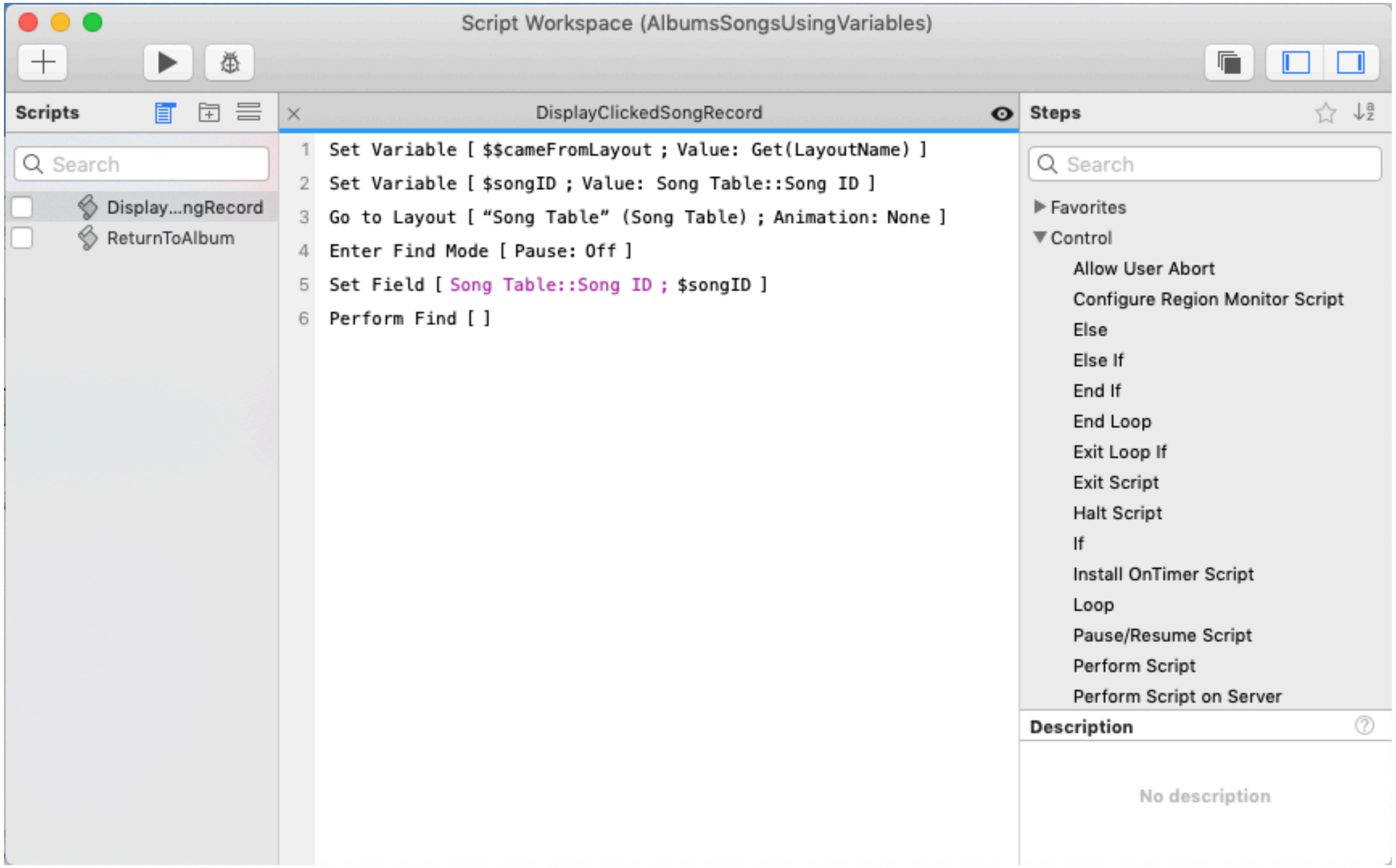


Script Workspace (AlbumsSongfordemocreation2)

No scripts

Editing A FileMaker Script

What's the basic "interaction model" for this dialog?



```
Set Variable [ $$cameFromLayout ; Value: Get(LayoutName) ]
Set Variable [ $songID ; Value: Song Table::Song ID ]
Go to Layout [ “Song Table” (Song Table) ; Animation: None ]
Enter Find Mode [ Pause: Off ]
Set Field [ Song Table::Song ID ; $songID ]
Perform Find [ ]
```

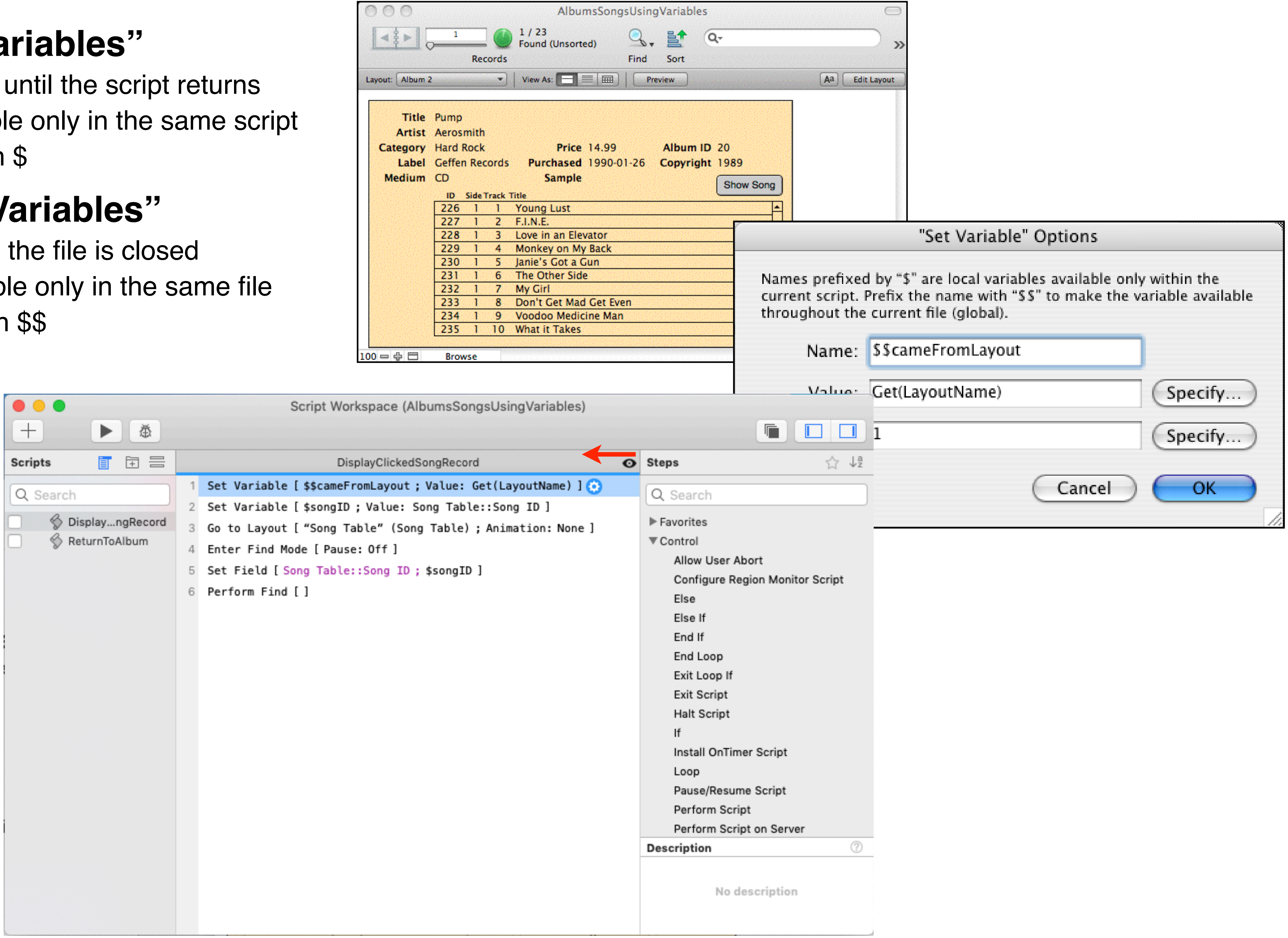
Script Step Parameters

“Local Variables”

- last only until the script returns
- are usable only in the same script
- start with $

“Global Variables”

- last until the file is closed
- are usable only in the same file
- start with $$



Title Pump
Artist Aerosmith
Category Hard Rock
Label Geffen Records
Medium CD
Price 14.99
Purchased 1990-01-26
Sample
Album ID 20
Copyright 1989

ID	Side	Track	Title
226	1	1	Young Lust
227	1	2	F.I.N.E.
228	1	3	Love in an Elevator
229	1	4	Monkey on My Back
230	1	5	Janie's Got a Gun
231	1	6	The Other Side
232	1	7	My Girl
233	1	8	Don't Get Mad Get Even
234	1	9	Voodoo Medicine Man
235	1	10	What it Takes

"Set Variable" Options

Names prefixed by "$" are local variables available only within the current script. Prefix the name with "$$" to make the variable available throughout the current file (global).

Name: $$cameFromLayout

Value: Get(LayoutName)

1

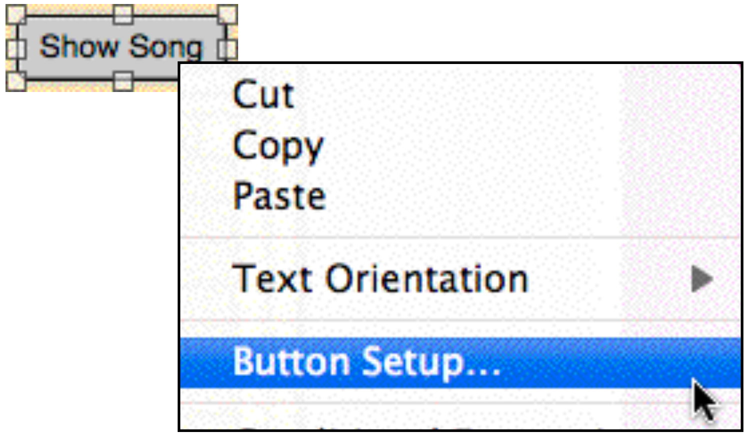
Script Workspace (AlbumsSongsUsingVariables)


```
Set Variable [ $$cameFromLayout ; Value: Get(LayoutName) ]
Set Variable [ $songID ; Value: Song Table::Song ID ]
Go to Layout [ “Song Table” (Song Table) ; Animation: None ]
Enter Find Mode [ Pause: Off ]
Set Field [ Song Table::Song ID ; $songID ]
Perform Find [ ]
```

Running A Script

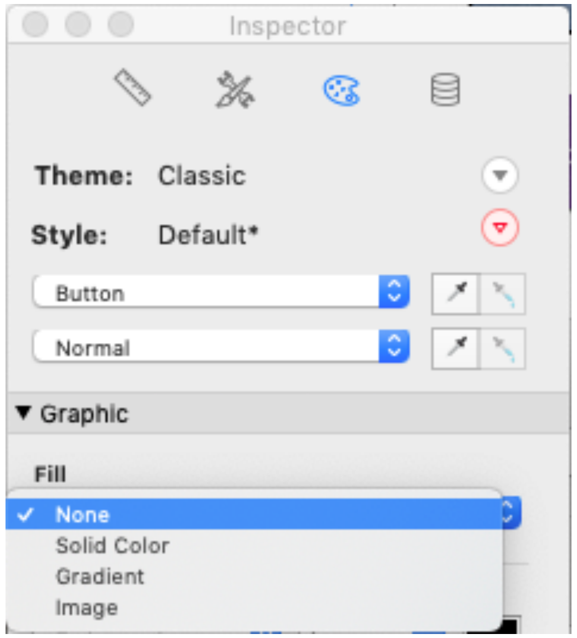
Remember the menu checkbox in the Define Scripts dialog box?

Or, attach a script to a button



A useful button trick

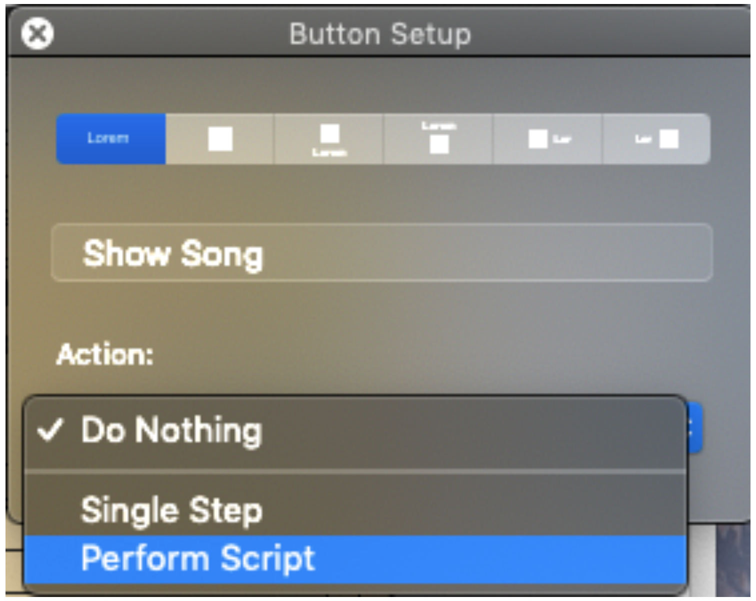
- make the button transparent



Theme: Classic

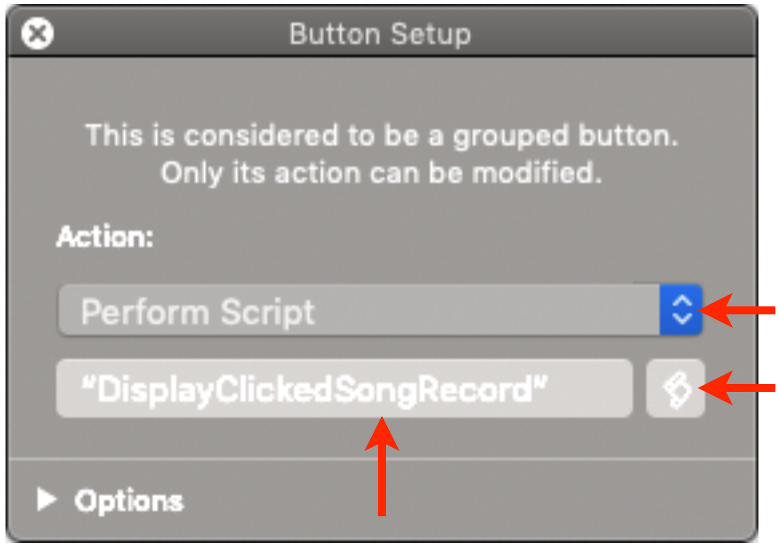
Style: Default*

✓ None



Show Song

Action:



This is considered to be a grouped button. Only its action can be modified.

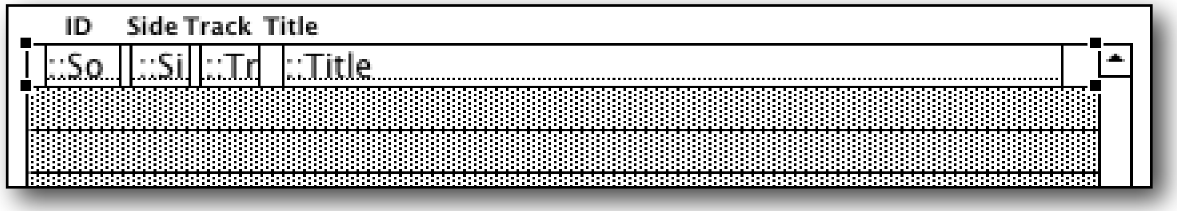
Action:

Perform Script

"DisplayClickedSongRecord"

- overlay it on another item

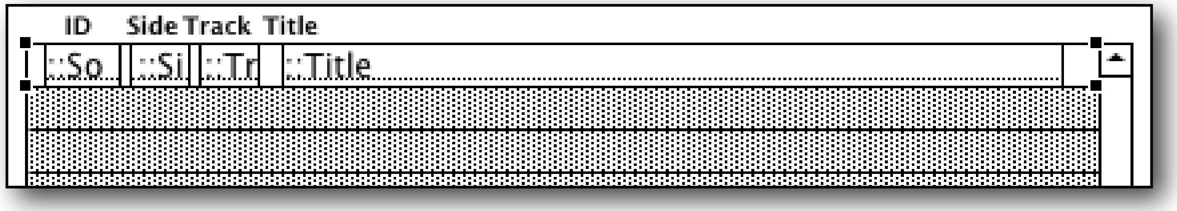
  eg a picture, or the top portal row



- or place the button *behind* fields for which editing has been turned off in Browse mode,making it easier to manipulate those fields in layout mode

Using the Transparent Button Trick in the Albums & Songs Database

The selected rectangle shown below is actually a transparent button

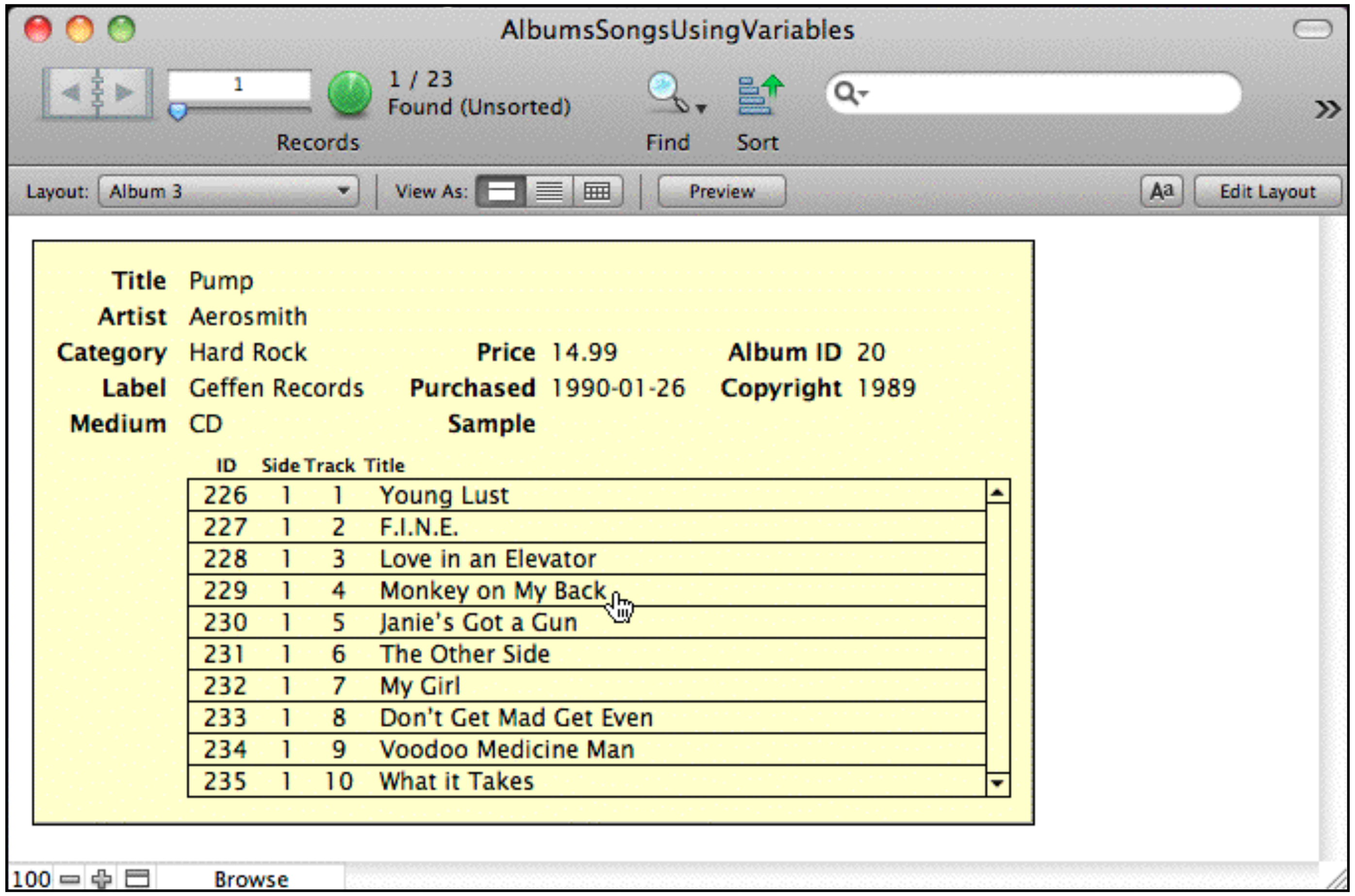


ID Side Track Title

::So ::Si ::Tr ::Title

In Browse mode, the icon shown while hovering over a portal row now indicates you're over a button

- for this to work, however, the button must be *in front of* the portal fields, *or* editing of the portal fields must be turned off (Inspector > Data > Behavior)



Title Pump
Artist Aerosmith
Category Hard Rock
Label Geffen Records
Medium CD
Price 14.99
Purchased 1990-01-26
Sample
Album ID 20
Copyright 1989

ID	Side	Track	Title
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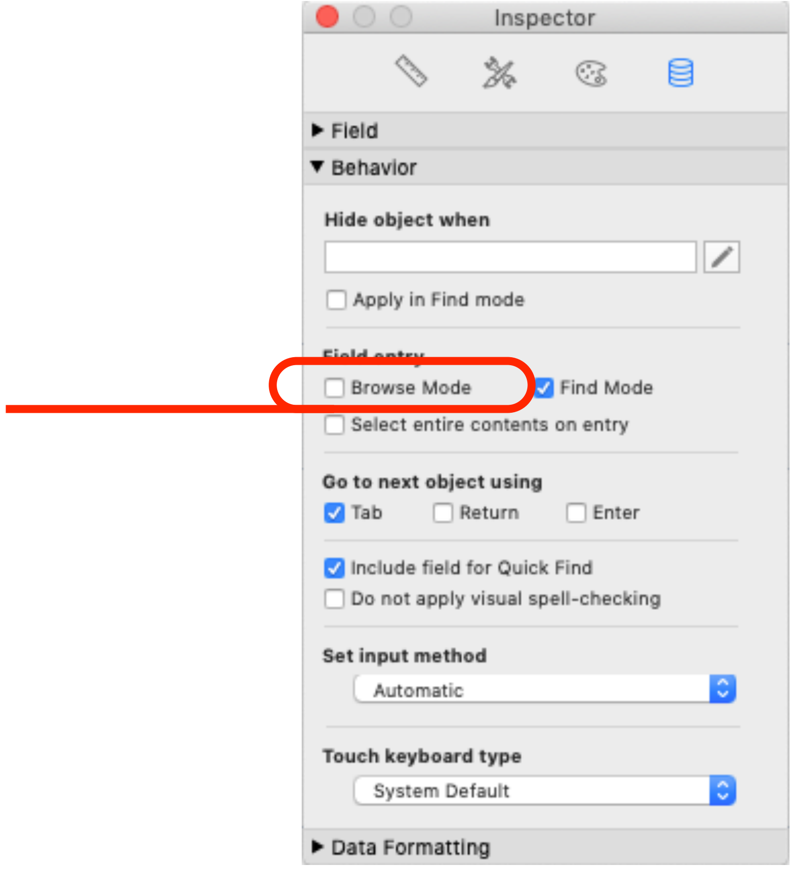
233	1	8	Don't Get Mad Get Even
234	1	9	Voodoo Medicine Man
235	1	10	What it Takes



Hide object when

□ Apply in Find mode

Field entry

□ Browse Mode ☑ Find Mode

□ Select entire contents on entry

Go to next object using

☑ Tab □ Return □ Enter

☑ Include field for Quick Find

□ Do not apply visual spell-checking

Set input method

Automatic

Touch keyboard type

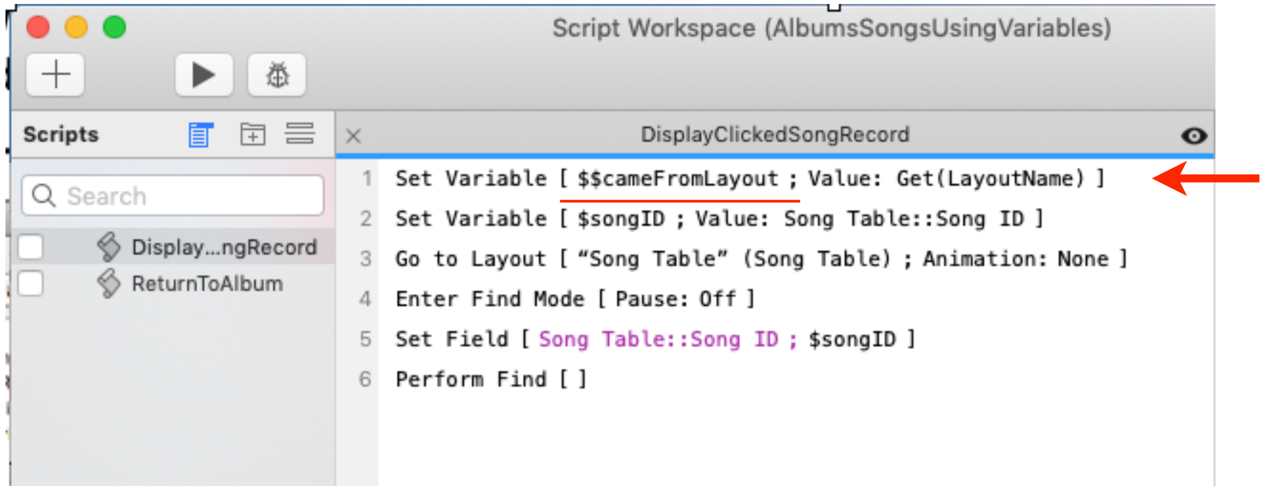
System Default

Returning to the Correct Layout

T

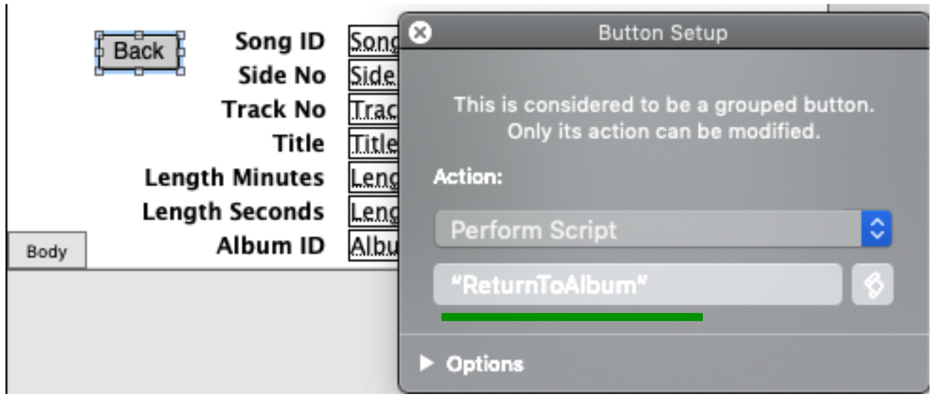
We now have two layouts that use the DisplayClickedSongRecord script to display Song info

Here’s how we arrange to return easily to the Album layout whence we came



```
Set Variable [ $$cameFromLayout ; Value: Get(LayoutName) ]
Set Variable [ $songID ; Value: Song Table::Song ID ]
Go to Layout [ “Song Table” (Song Table) ; Animation: None ]
Enter Find Mode [ Pause: Off ]
Set Field [ Song Table::Song ID ; $songID ]
Perform Find [ ]
```

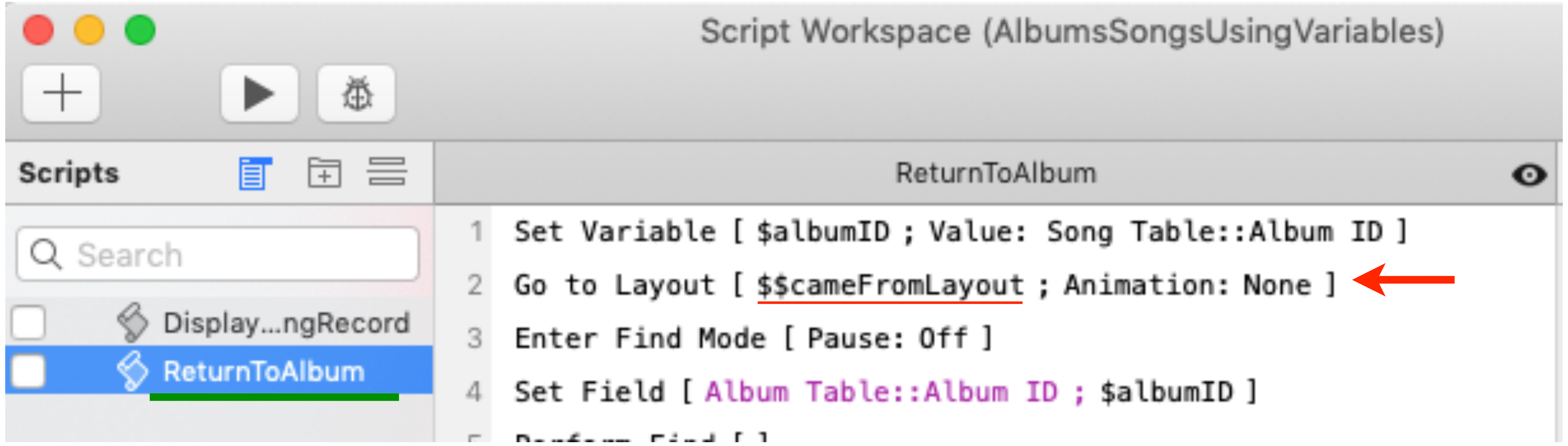
Note that we’ve had to use a global field because we need to save a value from this script and make it available in another (namely ReturnToAlbum).



This is considered to be a grouped button. Only its action can be modified.

Action: Perform Script

“ReturnToAlbum”



```
Set Variable [ $albumID ; Value: Song Table::Album ID ]
Go to Layout [ $$cameFromLayout ; Animation: None ]
Enter Find Mode [ Pause: Off ]
Set Field [ Album Table::Album ID ; $albumID ]
Perform Find [ ]
```

Debugging Techniques in FileMaker

“Print Statements”

- the Show Message script step
- the Beep script step
- create a global text field M on a visible layout & use Set Field to write msgs / values into M

  both append and replace are supported

  eg in the Marks Demo’s Choose layout

“Breakpoints”

- the Pause/Resume Script script step
- the Show Message script step
- the Show Custom Dialog step
- *or use FileMaker Pro Advanced*

FileMaker's Scripting As Compared to Excel's

Similarities

- you can automate most manual manipulations
- you can attach scripts to buttons & put them in a menu
- so you can extend both applications
- FileMaker Pro has a step-by-step debugger like Excel's

Differences

- in FM recording is non-existent
- in FM editing is very constrained

  is this good or bad?
- in FM you *can* pass parameters explicitly to user-defined scripts
  but the mechanism is clumsy

  see online help for the Get(ScriptParameter), Let(...) and Evaluate(...) functions
  if you're interested
- Excel has a larger set of script steps & functions

Other Important DBMS Features

Network access

Field- or record-locking

- prevent simultaneous modification by two users

Transaction support

- several steps treated as an “atomic action”
- eg: – $1000 from this account, + $1000 into that account
- — all are executed (or not) as if a single step

Large amounts of data

- eg gigabytes (billions) or terabytes (trillions)