LightSolve Development

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When you open Main_screen.fla

it should look something like this:
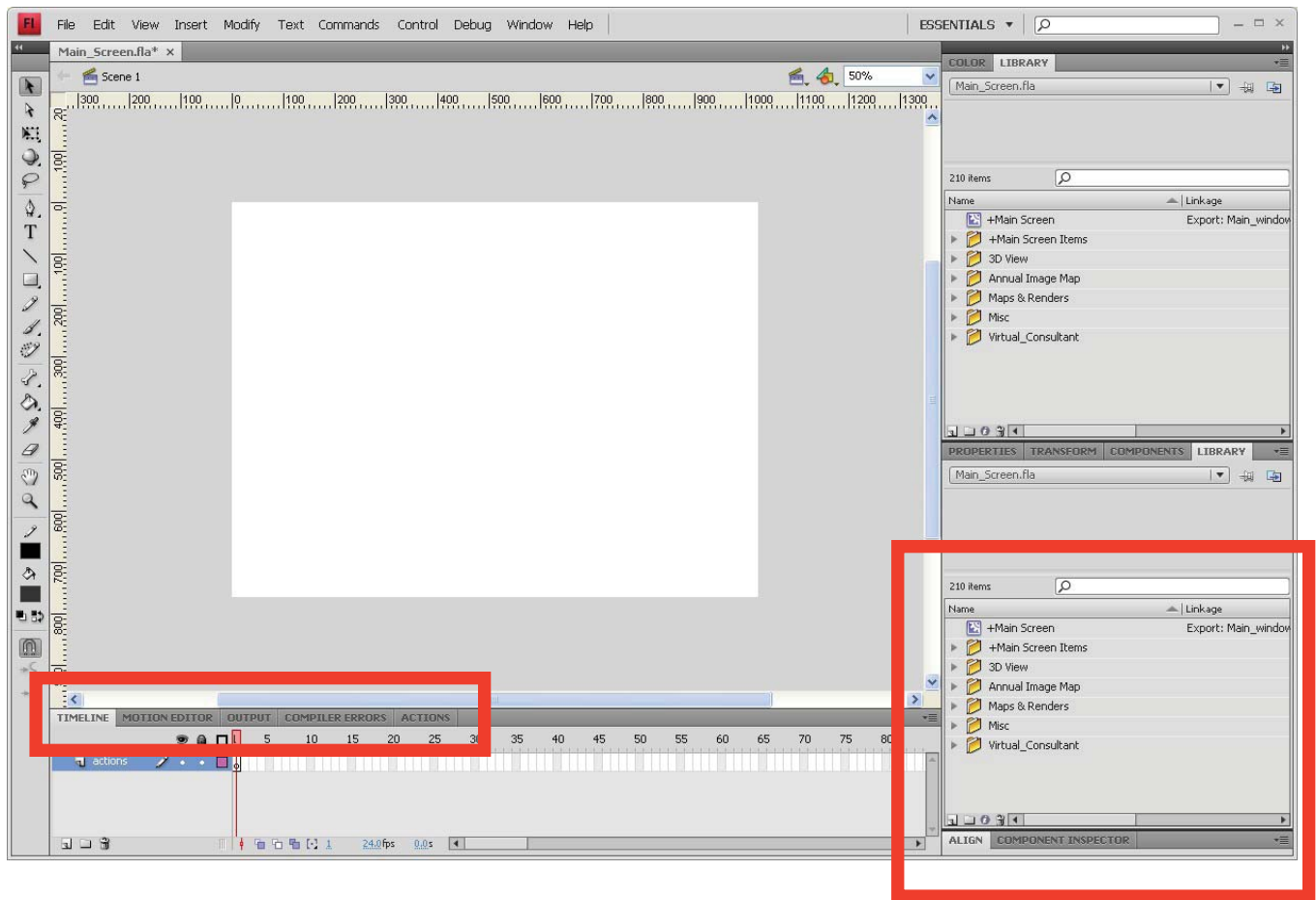
The Library panel on the right contains all of the objects that can appear in lightsolve, organized as well as possible into categories that correspond to the four main screens of lightsolve (Maps&renderings, annual images, 3D view, and Virtual Consultant).

Every .as file included with the development kit corresponds to the "linkage" setting on an identically-named Library item in either Main_screen.fla or optimizer_mainscreen.fla, though many items in the library have no corresponding .as files. For items lacking a corresponding .as file, all actionscript behavior is either the default "MovieClip" behavior, or defined in frame 1 of the object's timeline.

To access actionscript code written in the time line, double-click a library object, then select the "Timeline" tab at the bottom of the screen. Highlight a frame with a small "a" on it, and then switch to the "Actions". If no "a" appears and no linkage is shown, there is no custom behavior.

Setting up the local paths

You'll need to check that a number of path variables are correctly set before making any changes; this is true even if you only want to create a new .air file with a new version of the plugins.

Click File--> Air settings...
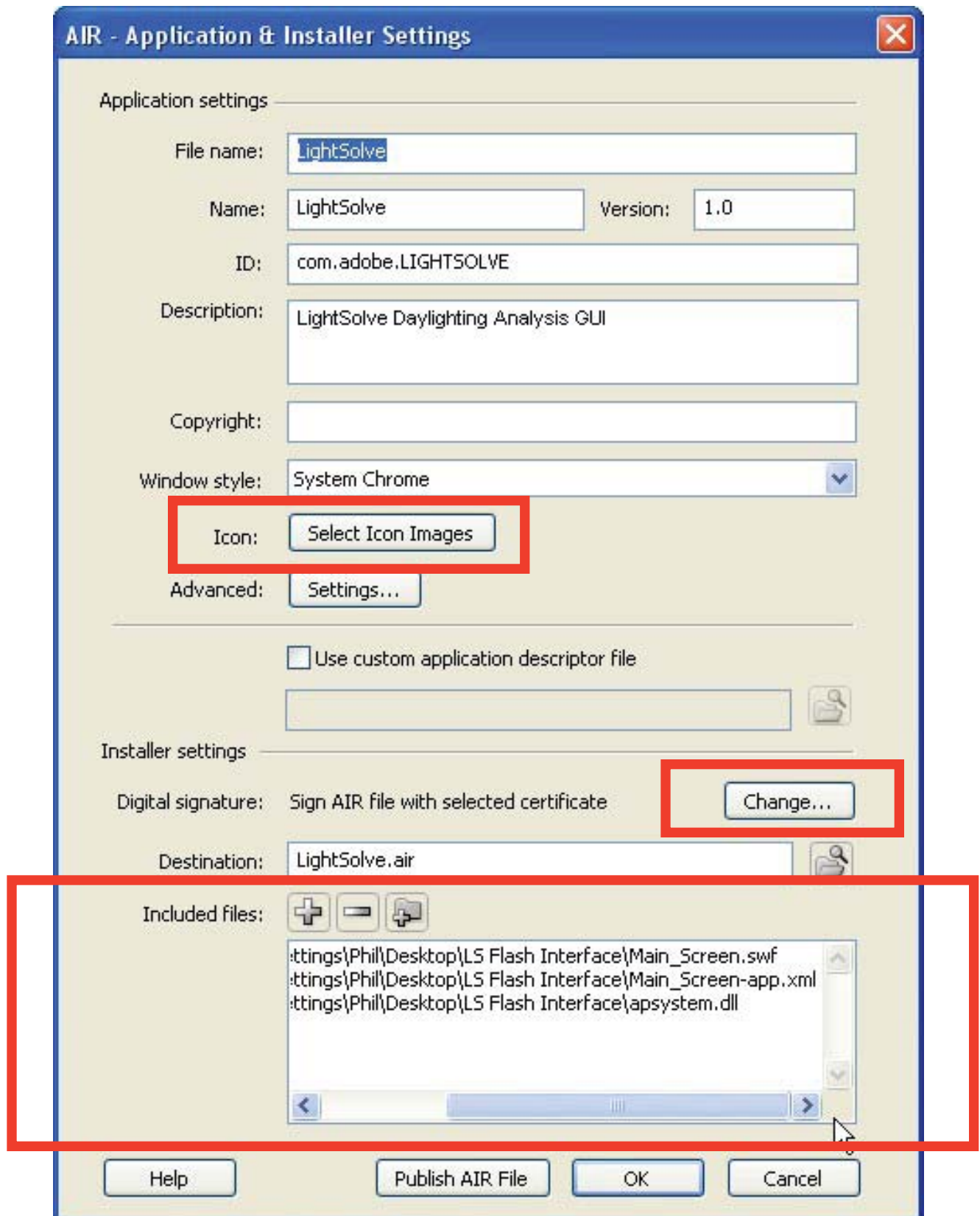
(continued)

1) Add ALL of the following files and folders to the "included files" box:

FOLDERS:
Components (for development)
FirstRun
LS Icons
Render_engine
sky_icons

FILES:
annual_images.as
annual_images_mouseover.as
apsystem.dll *
command.rb
Console.exe *
date_time_loc_chooser.as
fluorinepp.dll *
generateRendering.as
InvokeLightSolve.as
Main_Screen.fla
Main_Screen.swf
Main_Screen-app.xml
Main_window_controls.as
msi.dll *
OBJ_viewer.as
rendering.as
runALVIEW.bat
runskp.bat
SUB.exe
Temporal_Map.as

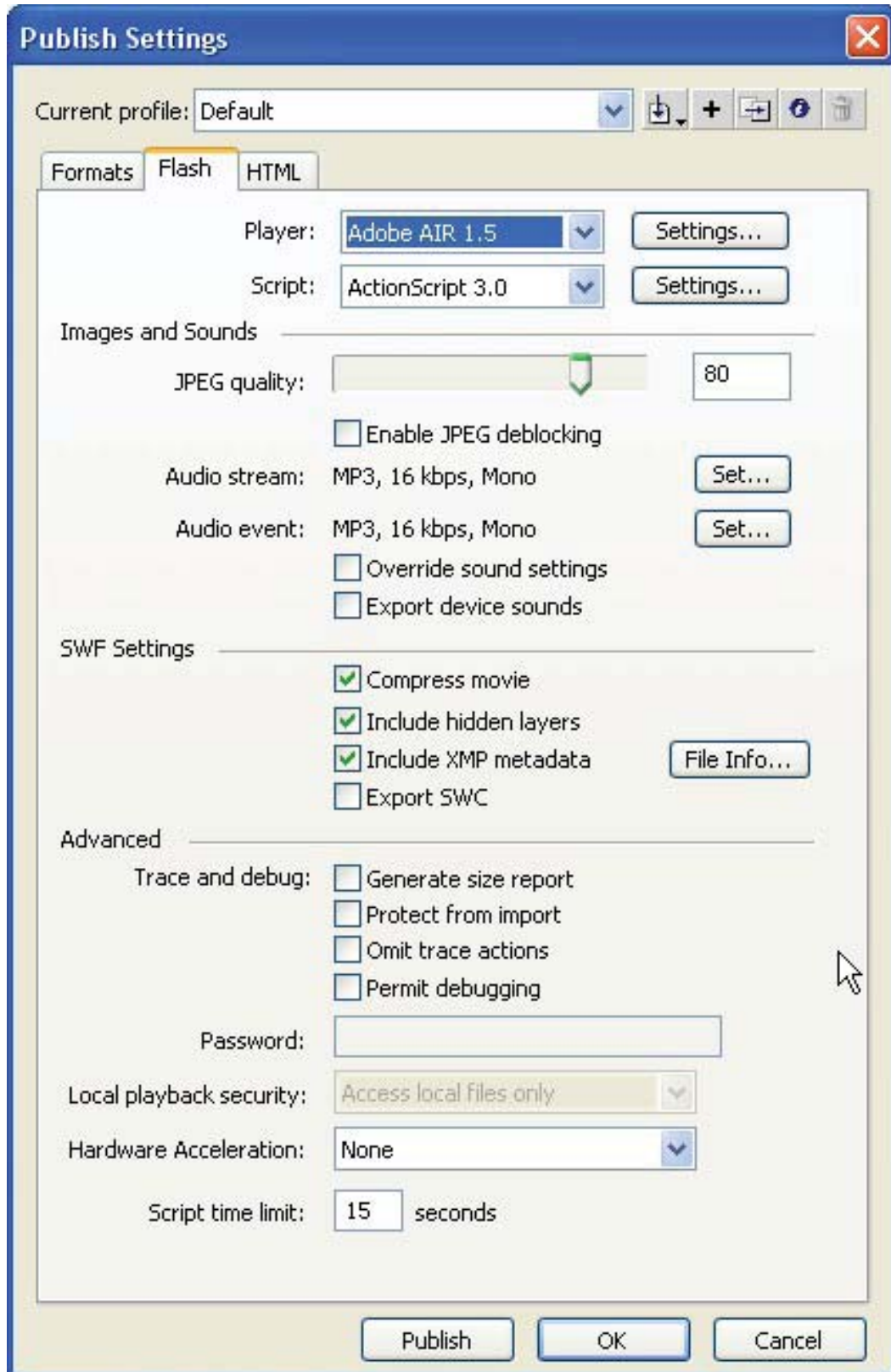* This file is a necessary component of FluorineFX Aperture, discussed breifly under add-in components.

2) Select a "digital signature" file, or make a new self-signed certificate and then select it. To make a new self-signed certificate, click "create" inside the "change..." dialog.

3) Don't forget to choose your icon images individually, if you want!

(continued)

Close out of the Air Settings menu (click OK).

Click File--> Publish settings...

Publish Settings

Current profile: Default

Formats | **Flash** | **HTML**

Player: Adobe AIR 1.5 — Settings...

Script: ActionScript 3.0 — Settings...

Images and Sounds

JPEG quality: 80

☐ Enable JPEG deblocking

Audio stream: MP3, 16 kbps, Mono — Set...

Audio event: MP3, 16 kbps, Mono — Set...

☐ Override sound settings
☐ Export device sounds

SWF Settings

☑ Compress movie
☑ Include hidden layers
☑ Include XMP metadata — File Info...
☐ Export SWC

Advanced

Trace and debug: ☐ Generate size report
☐ Protect from import
☐ Omit trace actions
☐ Permit debugging

Password:

Local playback security: Access local files only

Hardware Acceleration: None

Script time limit: 15 seconds

Publish | OK | Cancel

3) Make sure that "Player" shows Adobe AIR 1.5

4) Make sure that "Script" says Actionscript 3.0, then click "Settings" for actionscript.

Put your away 3D source files in a location you remember, and then select that folder in the "source path" tab of the advanced actionscript settings tab.
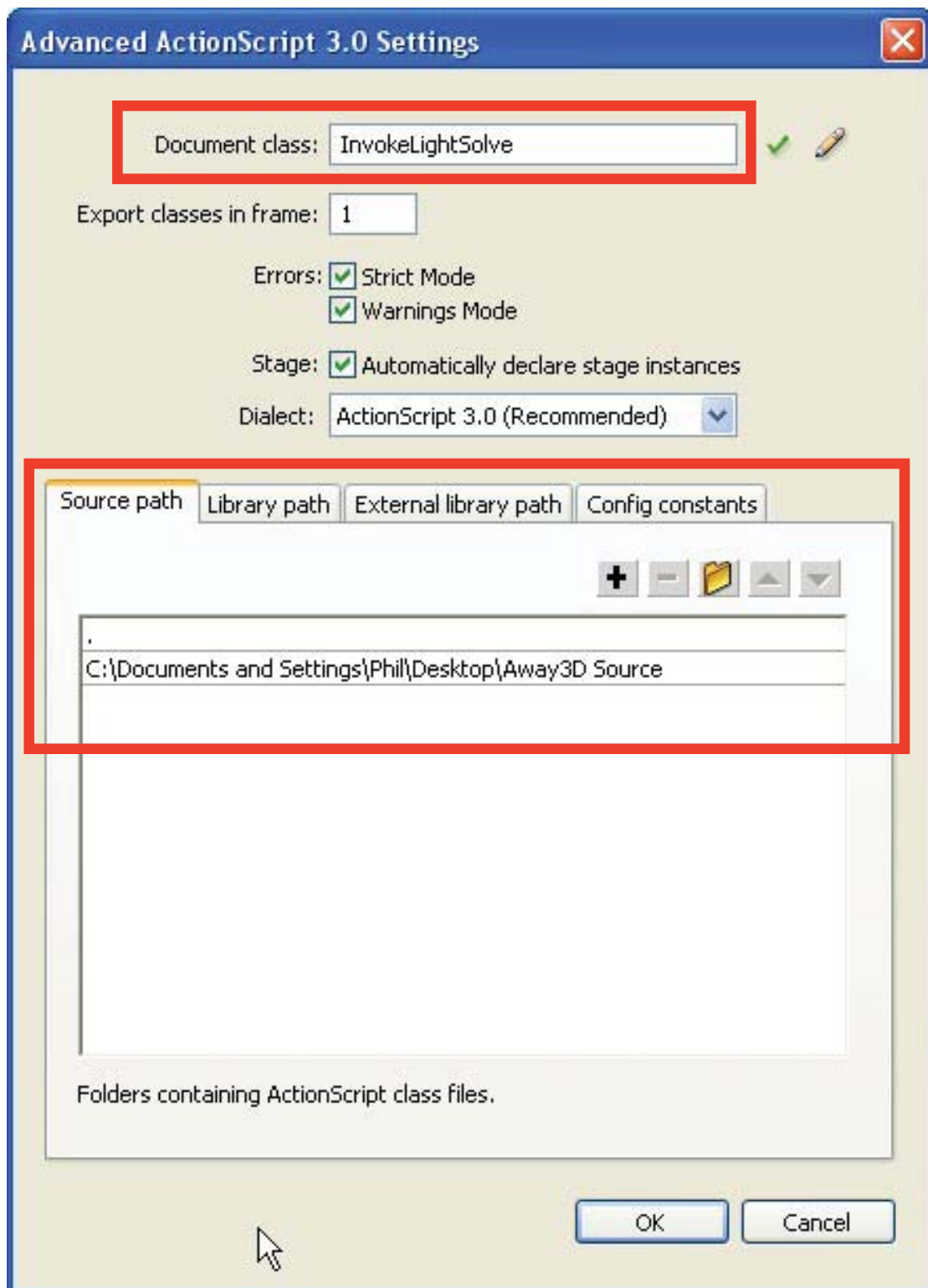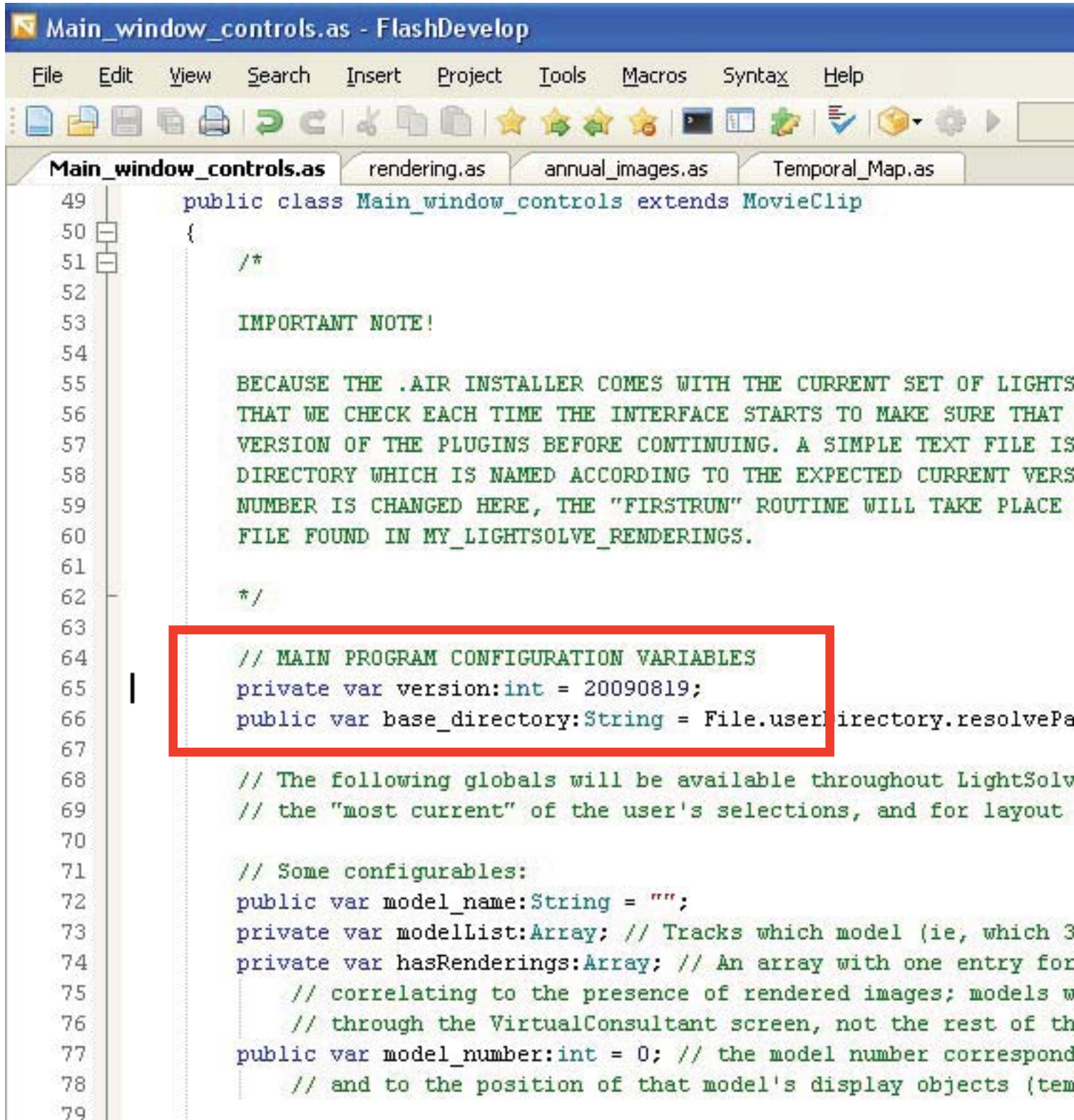
How to package a new version of the sketchup plugins:

There are four things you'll need to do:

1) Replace all files in FirstRun\Plugins with the new versions.

2) Change the "version" variable in Main_window_controls. This variable stores a file on the user's machine which keeps track of the version of the plugin variables they have. If LightSolve finds, on running, that this file does not match the hard-coded value here, all files in the Firstrun\Plugins folder are copied to the user's Sketchup Plugins directory.

```
Main_window_controls.as - FlashDevelop

File   Edit   View   Search   Insert   Project   Tools   Macros   Syntax   Help

Main_window_controls.as    rendering.as    annual_images.as    Temporal_Map.as

49        public class Main_window_controls extends MovieClip
50        {
51            /*
52
53            IMPORTANT NOTE!
54
55            BECAUSE THE .AIR INSTALLER COMES WITH THE CURRENT SET OF LIGHTS
56            THAT WE CHECK EACH TIME THE INTERFACE STARTS TO MAKE SURE THAT
57            VERSION OF THE PLUGINS BEFORE CONTINUING. A SIMPLE TEXT FILE IS
58            DIRECTORY WHICH IS NAMED ACCORDING TO THE EXPECTED CURRENT VERS
59            NUMBER IS CHANGED HERE, THE "FIRSTRUN" ROUTINE WILL TAKE PLACE
60            FILE FOUND IN MY_LIGHTSOLVE_RENDERINGS.
61
62            */
63
64            // MAIN PROGRAM CONFIGURATION VARIABLES
65            private var version:int = 20090819;
66            public var base_directory:String = File.userDirectory.resolvePa
67
68            // The following globals will be available throughout LightSolv
69            // the "most current" of the user's selections, and for layout
70
71            // Some configurables:
72            public var model_name:String = "";
73            private var modelList:Array; // Tracks which model (ie, which 3
74            private var hasRenderings:Array; // An array with one entry for
75                // correlating to the presence of rendered images; models w
76                // through the VirtualConsultant screen, not the rest of th
77            public var model_number:int = 0; // the model number correspond
78                // and to the position of that model's display objects (tem
79
```

(cont'd)

**3) Pack .air file.** Click File-->AIR Settings...

Click "Publish AIR File".
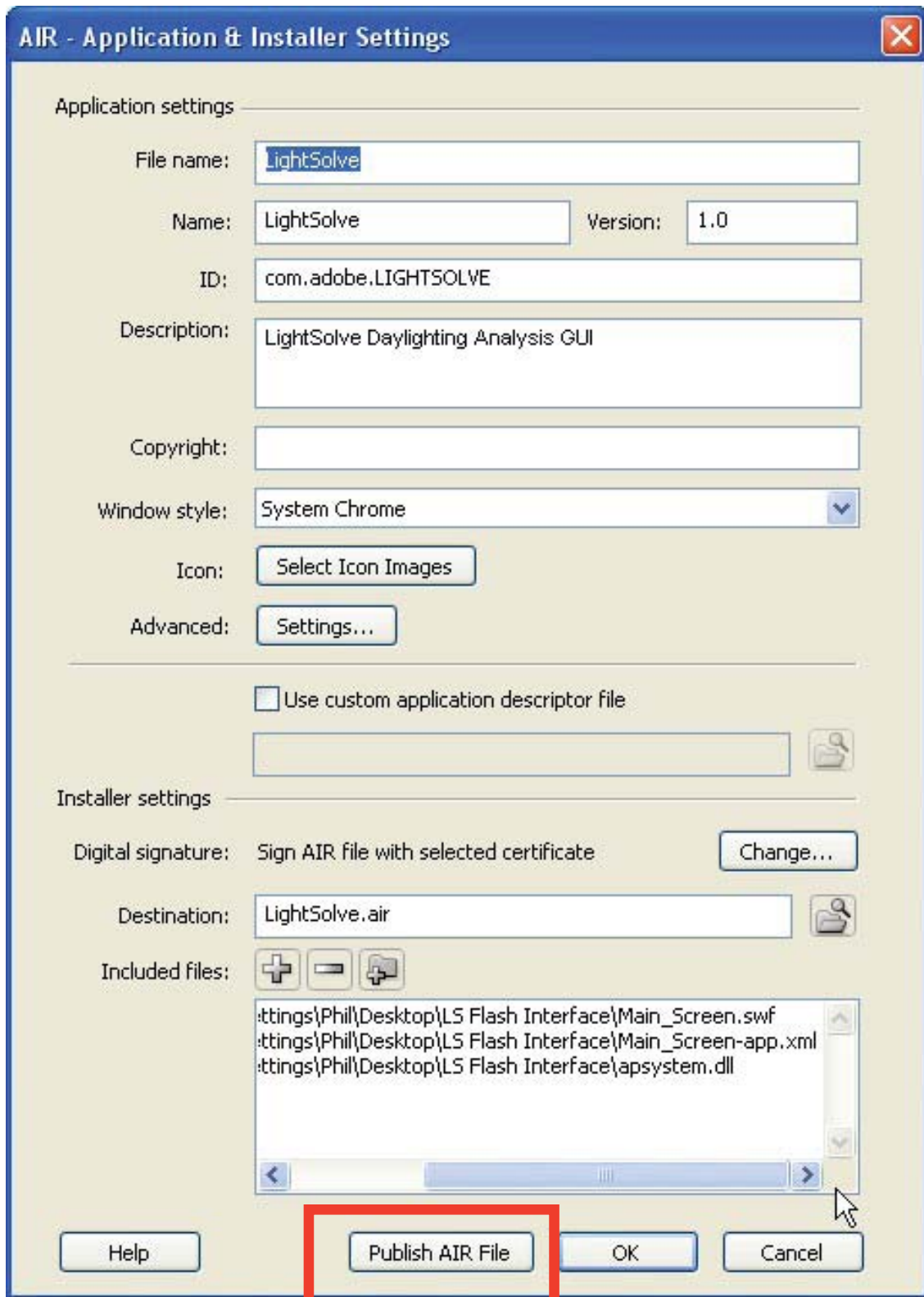
Pre-compiled clips:

The Virtual Consultant was originally developed as a separate application from the rest of lightsolve; the SWF movie that was this application's output is "pre-compiled" and placed into the Library of Main_screen.fla. If you want to make changes to the virtual consultant's behavior, you cannot simply edit (for example) scalable_graph.as (Components for development\VirtualConsultant\scalable_graph.as), and re-compile. Instead:

1) Open both Main_screen.fla and Optimizer_mainscreen.fla in Flash.

2) Open two library menus, one for each file.

3) Make changes to the actionscript behavior you wish to modify.

4) In the library tab for Optimizer_mainscreen.fla, right click "optimizer" and then select "Convert to compiled clip".

5) DO NOT SAVE OPTIMIZER_MAINSCREEN.FLA

6) A new library symbol called optimizer should appear. Drag it from this library panel into the Main_screen.fla library panel, and click replace when prompted.
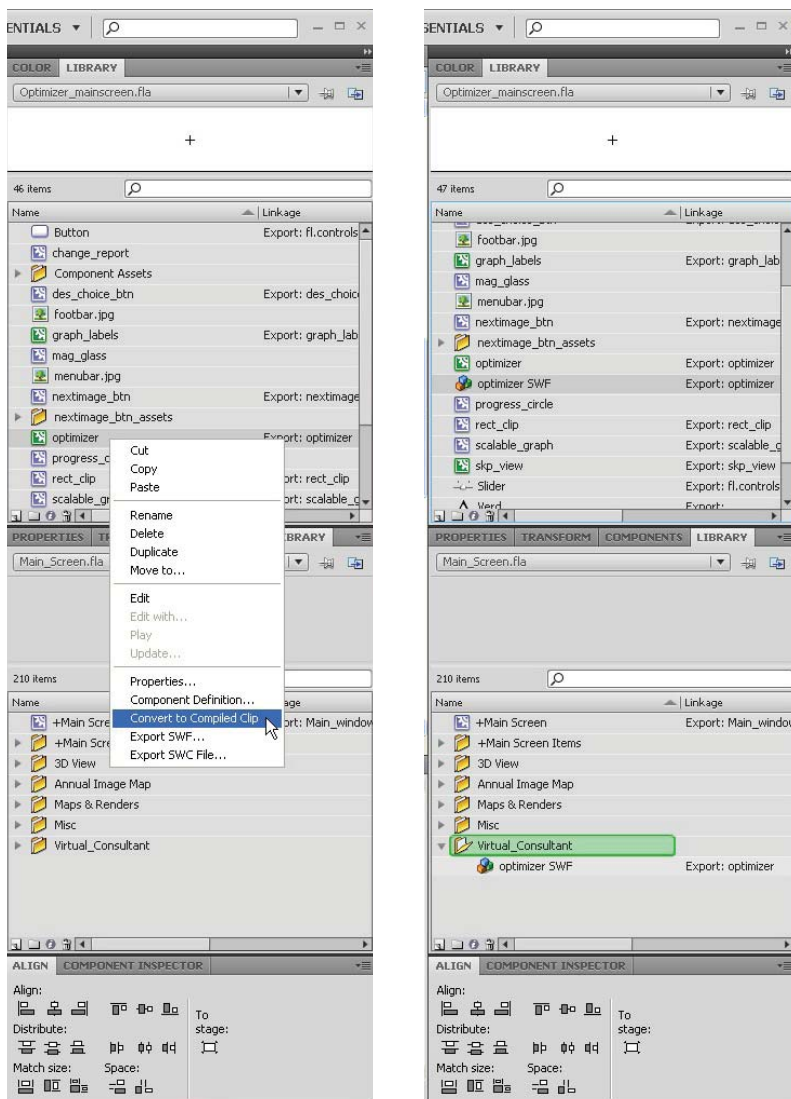
Structure of the code / Actionscript Classes

To allow all of the screens that are a part of LightSolve to share information with each other, a relatively flat class hierarchy evolved.

InvokeLightSolve (document class)

This class opens in an invisible window. It only serves to
1) Open the first Main_window_controls window
2) Handle future "invoke" events (user launches application from outside LightSolve.

Main_window_controls

This is the main class which contains all the items on screen. It sets up the menus, checks to make sure that Sketchup plugins are up to date, provides functions for the various objects on screen to talk to each other, etc. Global variables for time, date, weather, and current view settings are stored here. Temporal map and rendering objects are stored in a 3-D array called ProjectWindows (see code comments)

rendering

Rendering class stores all loaded renderings, and provides the frame that appears in the Maps and renders view. It loads image sets recursively on demand using the function loadimage.

Title_top (compiled clip)

Temporal_Map

Displays a temporal map and creates the mouse-over functionality including crosshairs, 56 "listening points", and functions to set the global time & date variables of Main_window_controls.

Title_top (compiled clip)

annual_images

Displays a full set of rendered views, small. It borrows the JPGs, which are already loaded, from a corresponding "rendering" object. To do so, it employs functions in Main_window_controls that allow the two classes to relate. annual_images_mouseover refers to the large pop-up image that follows the mouse around on this page.

annual_image_mouseover

OBJ_viewer

The 3D viewer window, including all buttons at the bottom of the screen and all sun settings, and the functionality to load, store, and begin rendering unrendered views. Generate_rendering is called to format commands and do the actual work related to rendering new views.

generate_rendering

optimizer (compiled clip)

The virtual consultant parent class.

scalable_graph contains both the scalable graph and the menu to its right which the user can interact with to select future iterations of her model.

scalable_graph

skp_view

skp_view is used to display the sketchup screenshots and temporal maps that appear on the VirtualConsultant screen. nextimage_btn defines the behavior for the semi-transparent "left" and "right" buttons that appear on top of the screenshots and temporal maps.

nextimage_btn

des_choice_btn

des_choice_btn is the small round button that appears on the scalable graph, allowing the user to switch between related virtualconsultant models.

DashedLine

DashedLine is a script found online (credits left in tact on the code page) that enables the scalable graph to have dashed lines.

# Objects without actionscript classes / objects on stage:

Many objects exist as static graphics, or otherwise do not need custom behavior coded for them. One big benefit of flash is that it lets you create these objects and use them programmatically without having to write numerous extra .as documents. If you see something referenced in the code that does not appear anywhere to be added to the stage, try double-clicking the library item you're hunting in to see what's on stage. For example, Main_window_controls has an extensive actionscript definition, but the panel showing skytypes and the panel for setting the time data manually and simulating time, these:

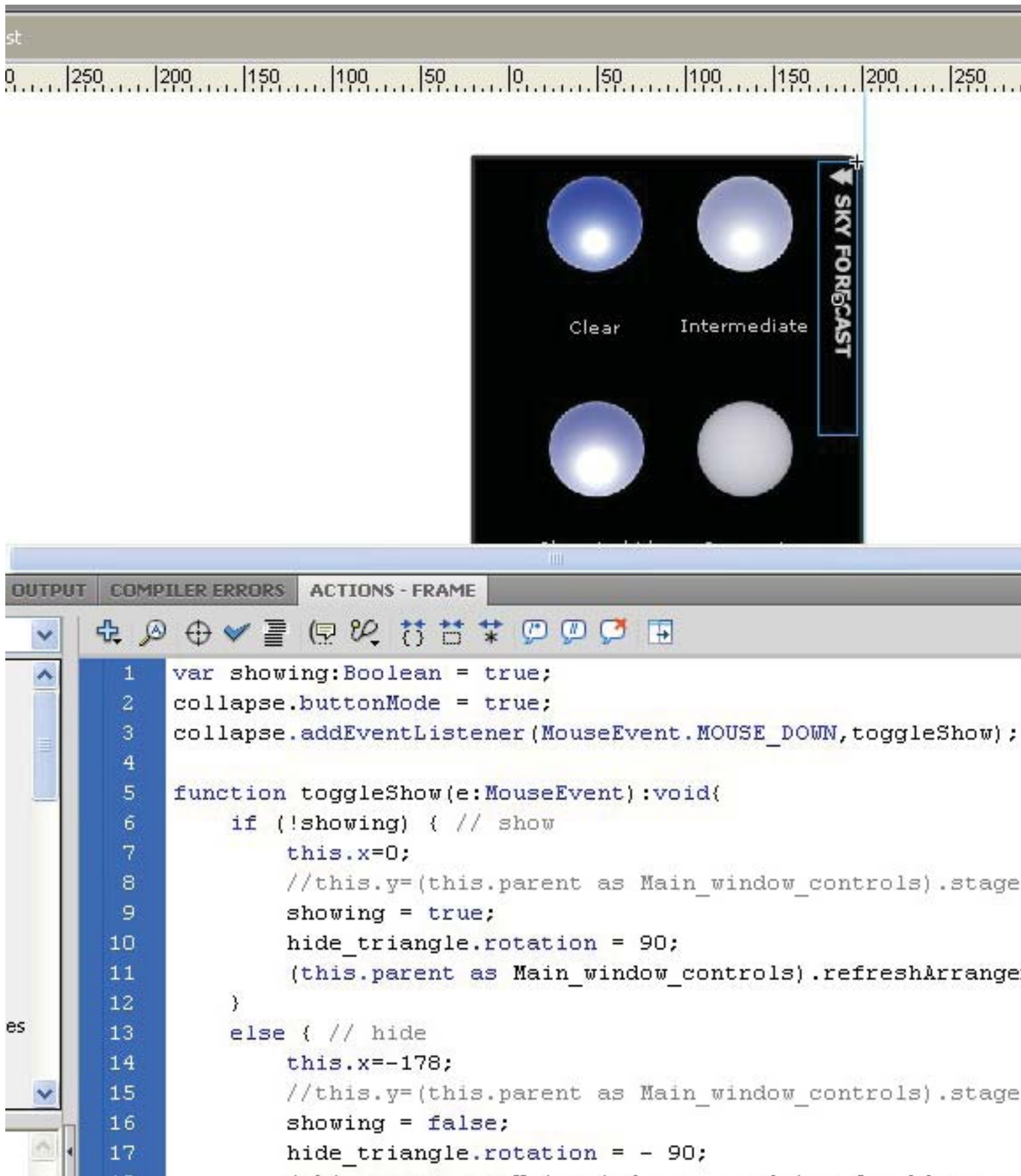are NOT created anywhere in the actionscript code. I.e., **these lines never** occur:

```
var sky_percents:skyForecast = new skyForecast();
addChild(sky_percents);
```

Instead, an instance of the skyForecast object is placed on stage inside the +Main Screen / Main_window_controls object in flash. You can find the skyForecast symbol inside the Library of Main_Screen.fla:
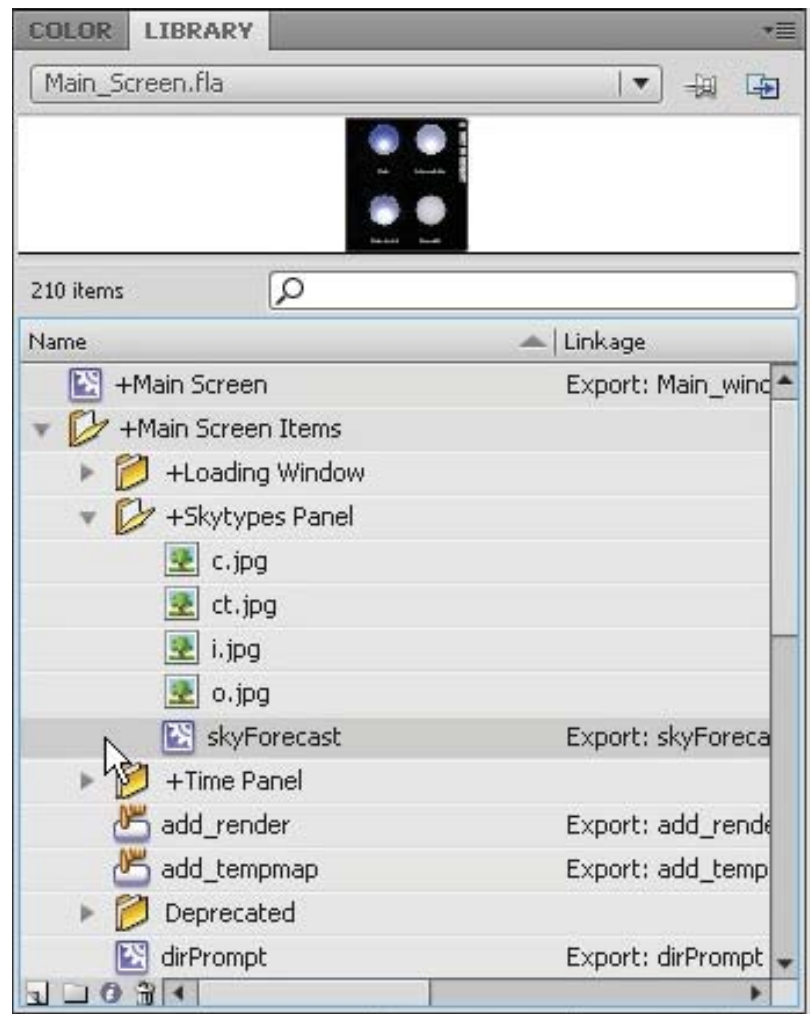
objects on stage (cont'd):

In this case, the skyForecast panel is an example of an object which needed a very small amount of actionscript behavior added; that actionscript can be found in the actions panel inside Flash:


```actionscript
1   var showing:Boolean = true;
2   collapse.buttonMode = true;
3   collapse.addEventListener(MouseEvent.MOUSE_DOWN,toggleShow);
4
5   function toggleShow(e:MouseEvent):void{
6       if (!showing) { // show
7           this.x=0;
8           //this.y=(this.parent as Main_window_controls).stage
9           showing = true;
10          hide_triangle.rotation = 90;
11          (this.parent as Main_window_controls).refreshArrange
12      }
13      else { // hide
14          this.x=-178;
15          //this.y=(this.parent as Main_window_controls).stage
16          showing = false;
17          hide_triangle.rotation = - 90;
```

Add-in stuff:

Away3D Away3D is an open-source 3D engine for flash. Its source code, which is used to power the OBJ viewer, can be downloaded from http://www.away3d.com. There is some documentation available there, as well. You'll need to have a copy of this on your computer, and you'll need to set up Main_screen.fla to point to it, before you make changes to anything.

http://www.away3d.com

Sketchup Bridge The file SUB.exe enables the interface to communicate with an open sketchup window, executing ruby commands to continue the VirtualConsultant process, etc. Help for sketchup bridge can be found at

http://suburbanrevolt.com/suwiki/index.php?title=SketchUp_Bridge

Fluorine FX Aperture consists of a set of .dll files located in the same directory as Main_Screen. fla, and referenced as "included files" in the AIR settings (see setup above). It is a work-around that allows LightSolve to execute external commands, such as sub.exe and the various batch files that are needed to start rendering operations. The feature to launch external commands is not included in Adobe AIR 1.5, under which LightSolve was originally developed.

http://aperture.fluorinefx.com/

Remesher / rendering engine. A current copy should be stored in the Rendering_engine directory. See Appropriate documentation from Barb & Yu Sheng.

Actionscript Help. Adobe's LiveDocs reference for Actionscript 3.0 / Flash CS4 are extremely helpful, as are their "quick start" guides that teach you how to set up your files at the beginning.

http://help.adobe.com/en_US/AS3LCR/Flash_10.0/
http://www.adobe.com/devnet/air/flash/quickstart/