2017
MACADMINS
CONFERENCE
AT PENN STATE®

Bringing bash to Xcode

i.e., letting the genie out of the bottle

Leslie N. Helou

Senior Professional Services Engineer
Jamf

What we will accomplish:

- Create an application based on a bash script.
- Customized GUI asking for the computer name, providing feed back to the user.
- Build the application so that it is properly signed.

Goal 1: Create the app.

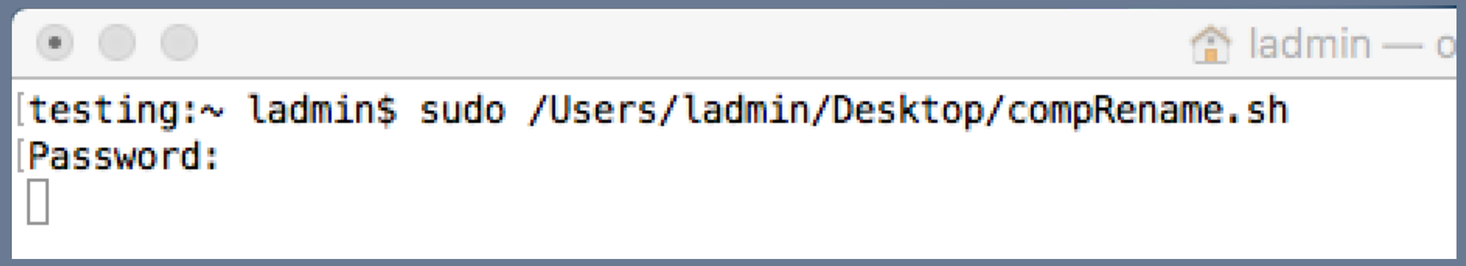
Start with a bash script* to rename a computer:

```
#!/bin/bash
# check that script is run as root user
if [ $EUID -ne 0 ]
then
	/bin/echo $'\nThis script must be run as the root user!\n'
	exit
fi
# capture user input name
while true;do
	name=$(osascript -e 'Tell application "System Events" to display dialog "Please enter the name for your computer or select Cancel." default answer "" ' -e 'text returned of result' 2>/dev/null)
	if [ $? -ne 0 ];then # user hit cancel
		exit
	elif [ -z "$name" ];then # loop until input or cancel
		osascript -e 'Tell application "System Events" to display alert "Please enter a name or select Cancel... Thanks!" as warning'
	elif [ -n "$name" ];then
		# user input
		break
	fi
done
scutil --set ComputerName "$name"
scutil --set LocalHostName "$name"
scutil --set HostName "$name"

jamf recon
```

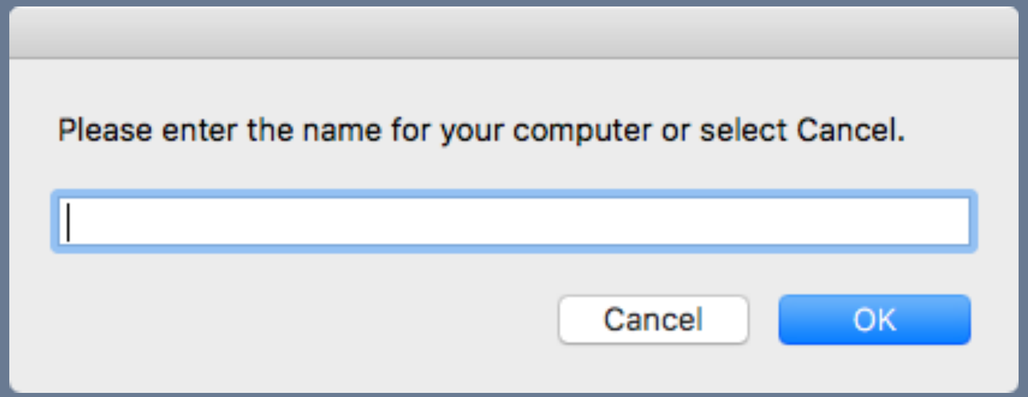
*Author - Daniel Mintz

https://github.com/BIG-RAT/MacAdmins2017/blob/master/compRename.sh

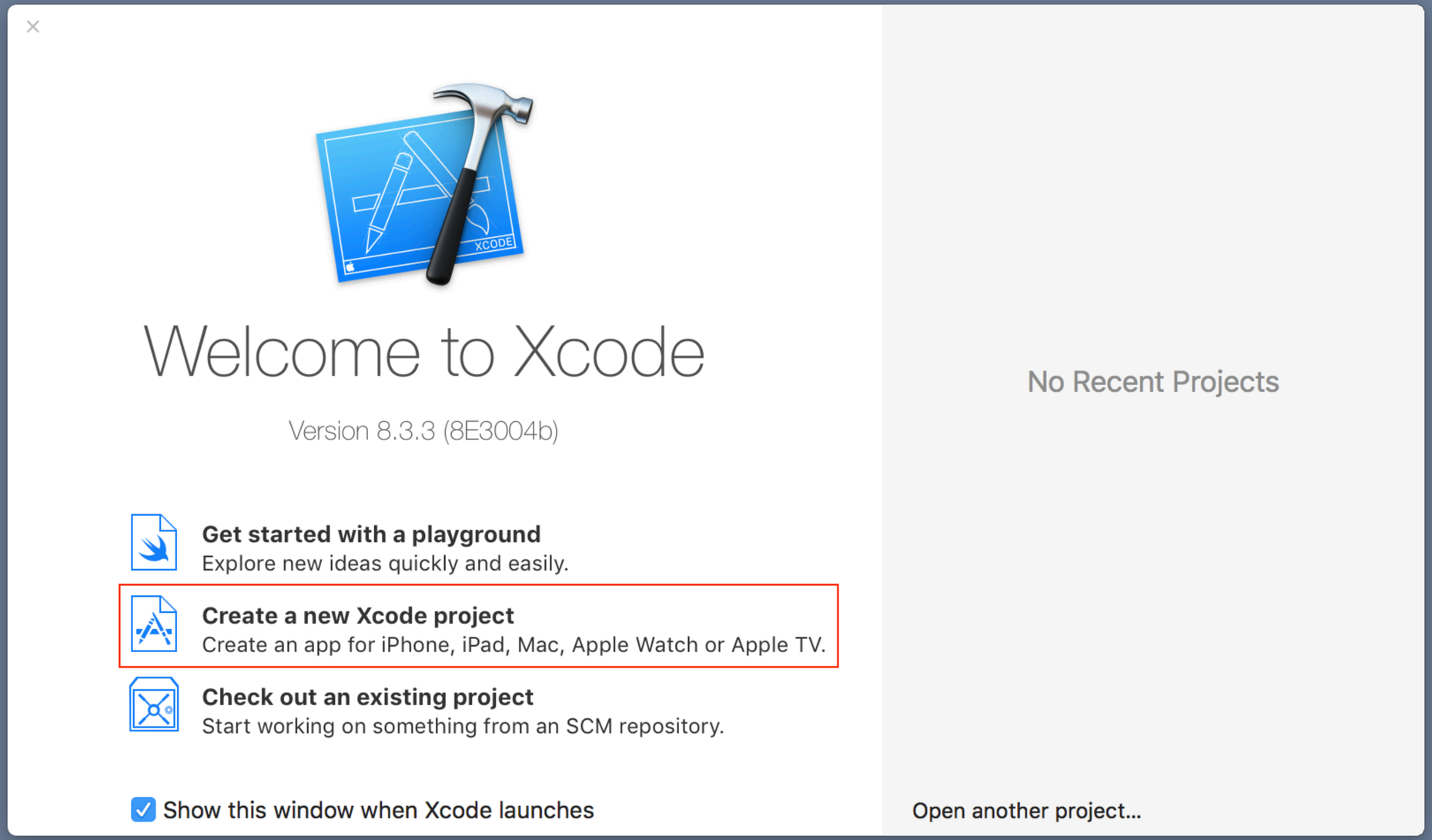
Quick look at the script



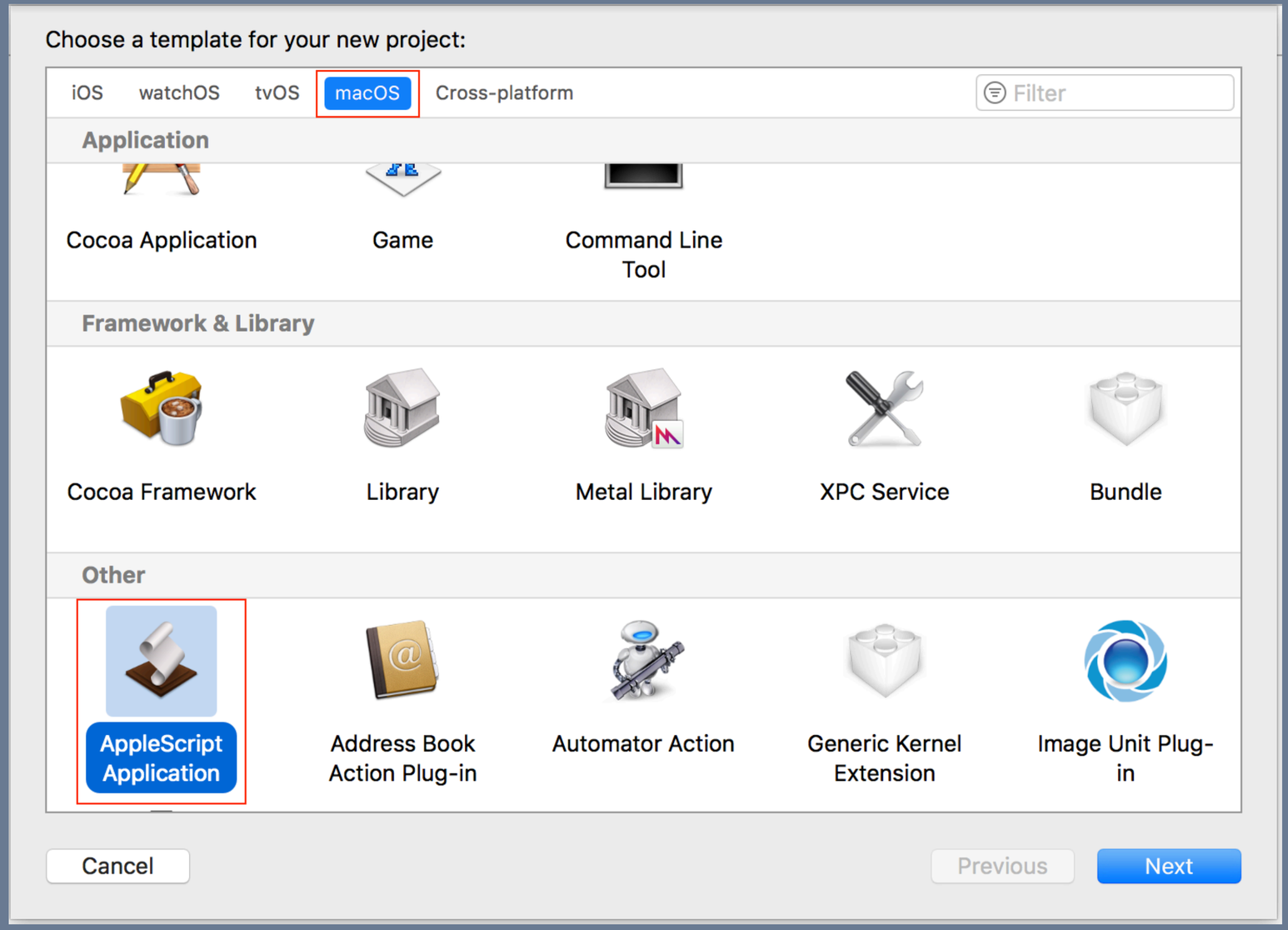
We’re greeted with a simple window.



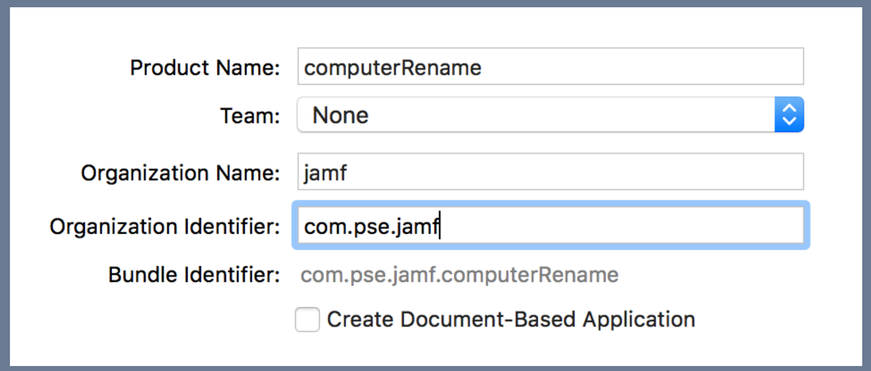
Launch Xcode and create a new project

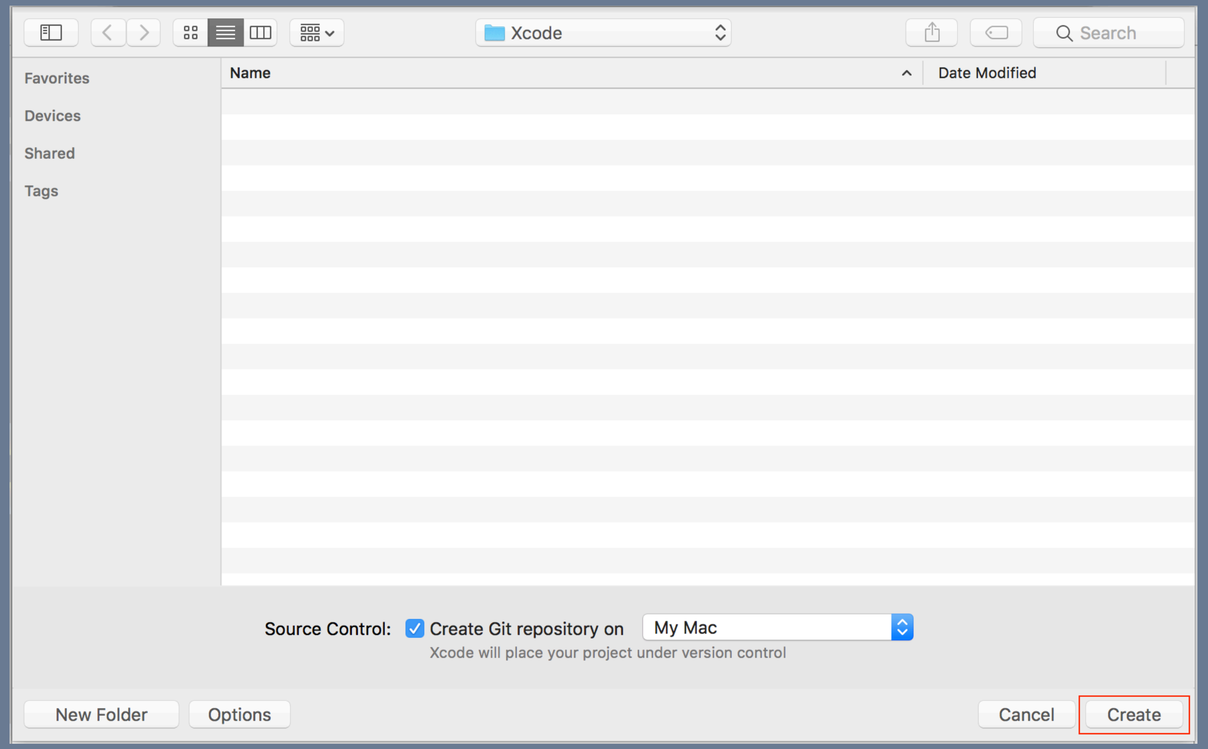


Select macOS and AppleScript Application

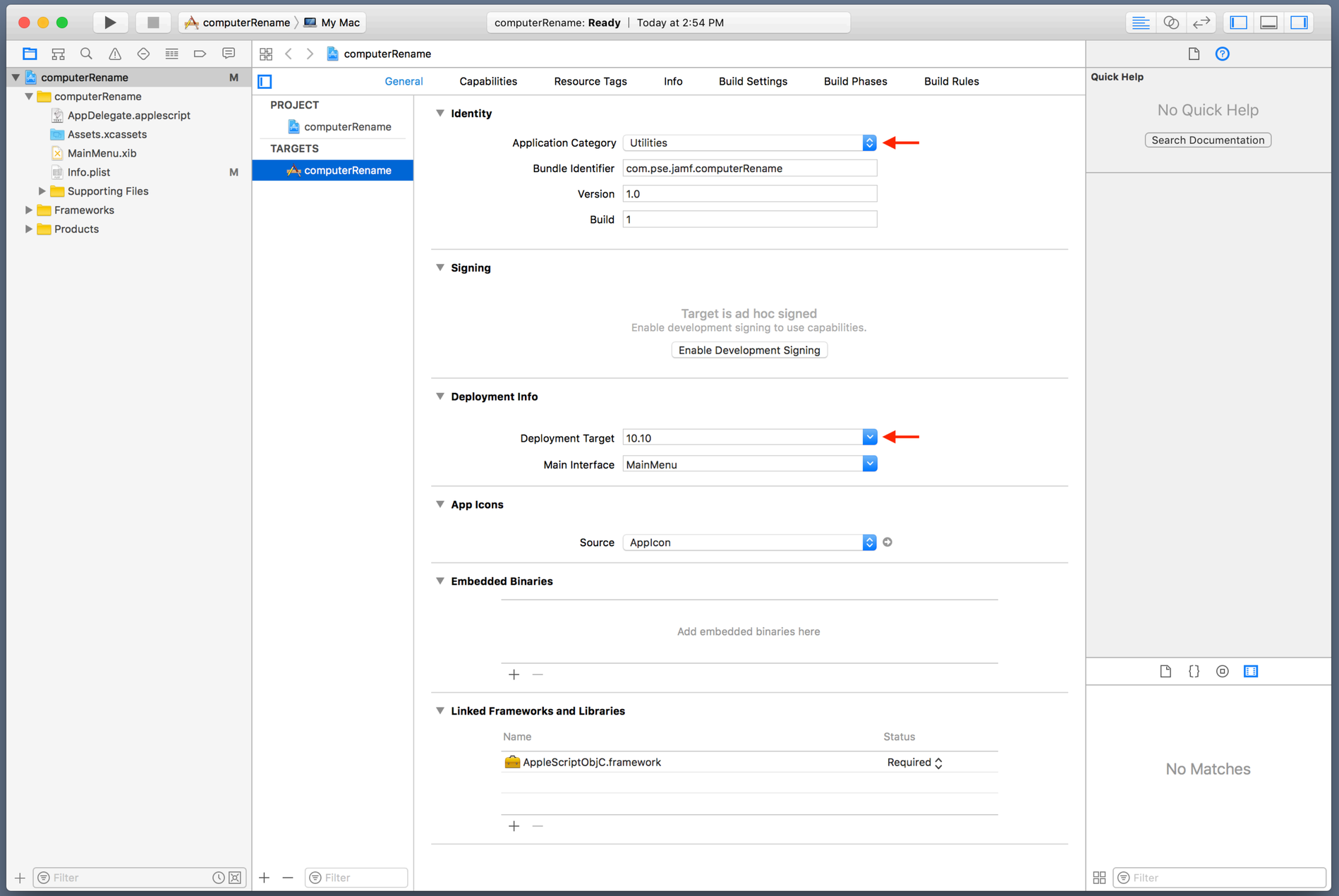


Name and save project

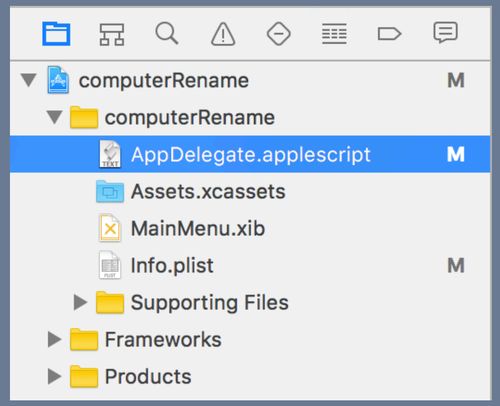




The main window for our project:



Bring the bash script into our project my first clicking AppDelegate.applescript, then paste the script into the applicationWillFinishLaunching_ section.



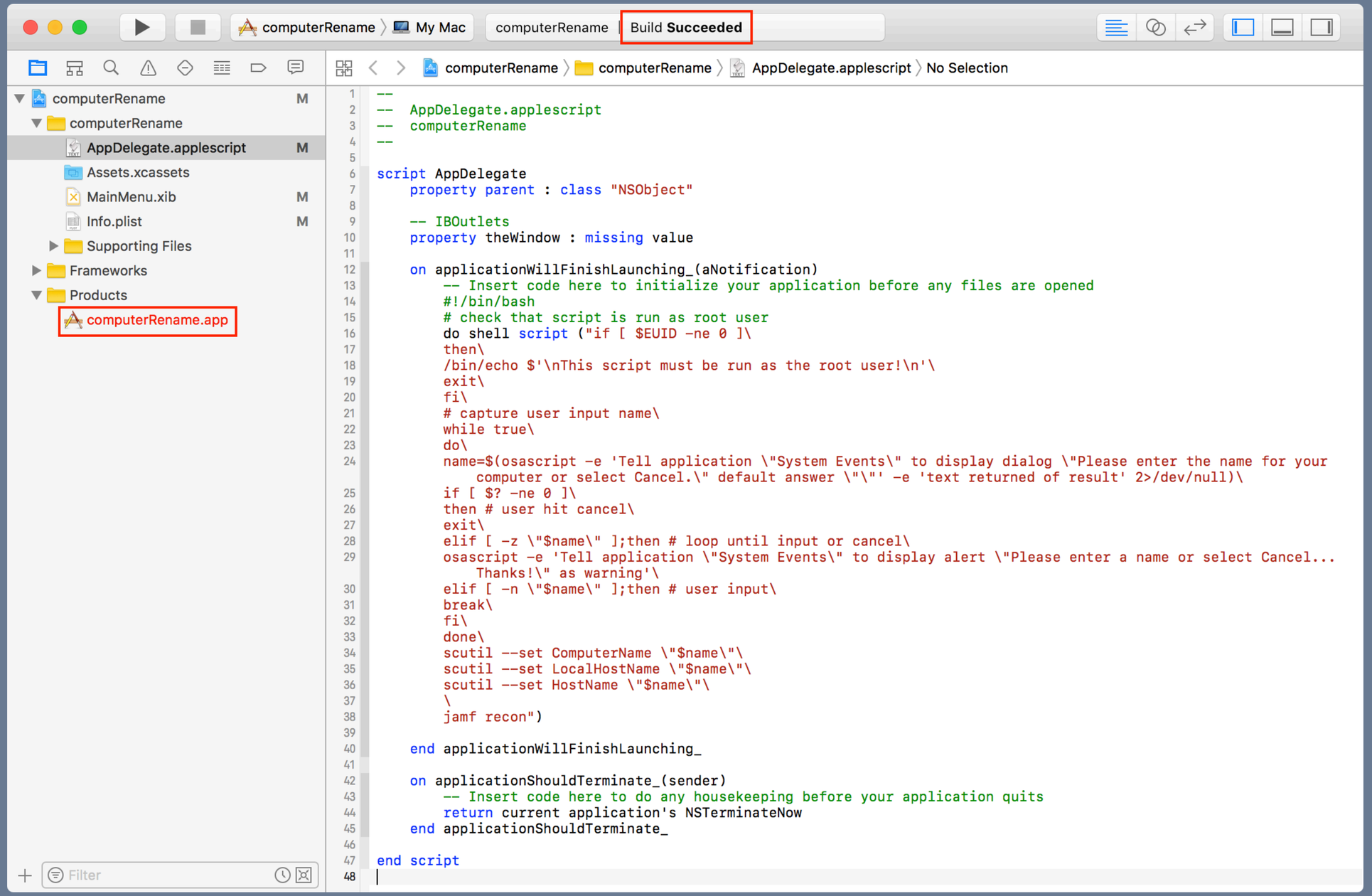

```
on applicationWillFinishLaunching_(aNotification)
    -- Insert code here to initialize your application before any files are opened
    #!/bin/bash
    # check that script is run as root user
    if [ $EUID -ne 0 ]
    then
    /bin/echo $'\nThis script must be run as the root user!\n'
    exit
    fi
    # capture user input name
    while true;do
    name=$(osascript -e 'Tell application "System Events" to display dialog "Please enter the name for your computer
        or select Cancel." default answer ""' -e 'text returned of result' 2>/dev/null)
    if [ $? -ne 0 ];then # user hit cancel
    exit
    elif [ -z "$name" ];then # loop until input or cancel
    osascript -e 'Tell application "System Events" to display alert "Please enter a name or select Cancel... Thanks!"
        as warning'
    elif [ -n "$name" ];then
    # user input
    break
    fi
    done
    scutil --set ComputerName "$name"
    scutil --set LocalHostName "$name"
    scutil --set HostName "$name"

    jamf recon

end applicationWillFinishLaunching_
```

As we’re in an AppleScript environment we need to enclose the bash script in a ‘do shell script(“…”)’. Escape existing quotes (\”) and newlines (add \ to the end of each line).

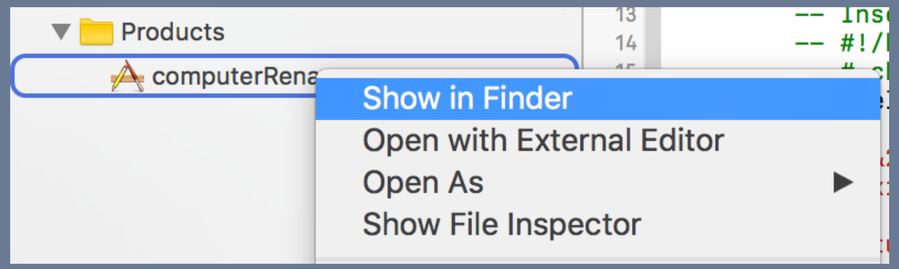
```
    --Insert code here to initialize your application before any files are opened
        #!/bin/bash
        # check that script is run as root user
        do shell script ("if [ $EUID -ne 0 ]\
        then\
        /bin/echo $'\nThis script must be run as the root user!\n'\
        exit\
        fi\
        # capture user input name\
        while true\
        do\
        name=$(osascript -e 'Tell application \"System Events\" to display dialog \"Please enter the name for your
computer or select Cancel.\" default answer \"\"' -e 'text returned of result' 2>/dev/null)\
        if [ $? -ne 0 ]\
        then # user hit cancel\
        exit\
        elif [ -z \"$name\" ];then # loop until input or cancel\
        osascript -e 'Tell application \"System Events\" to display alert \"Please enter a name or select Cancel...
Thanks!\" as warning'\
        elif [ -n \"$name\" ];then # user input\
        break\
        fi\
        done\
        scutil --set ComputerName \"$name\"\
        scutil --set LocalHostName \"$name\"\
        scutil --set HostName \"$name\"\
        \
        jamf recon")
```

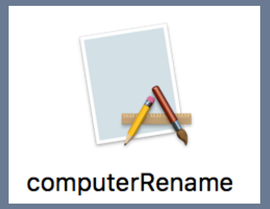
https://github.com/BIG-RAT/MacAdmins2017/blob/master/applicationWillFinishLaunching_1.txt

Let’s see if we can build the application - command+b



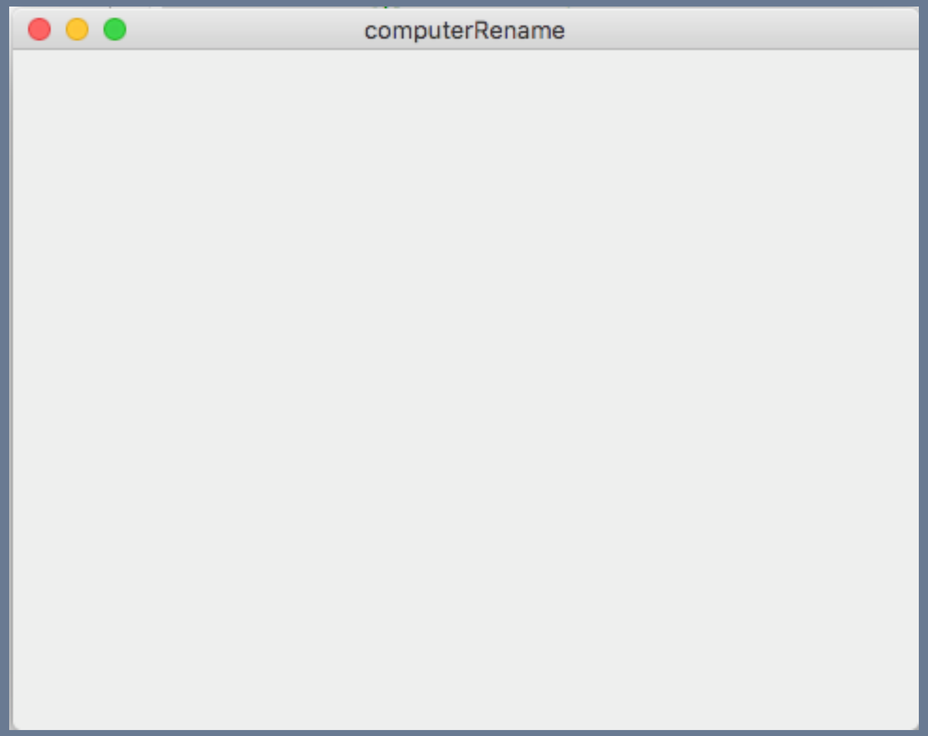
Now let’s give it run - on a test machine of course.



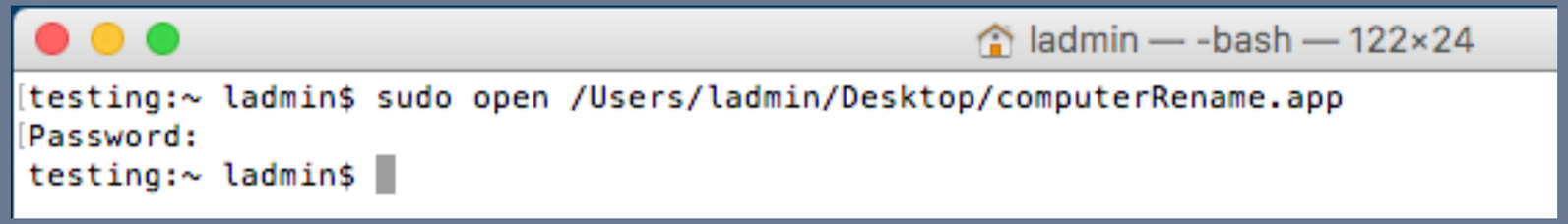


Double-click to launch.

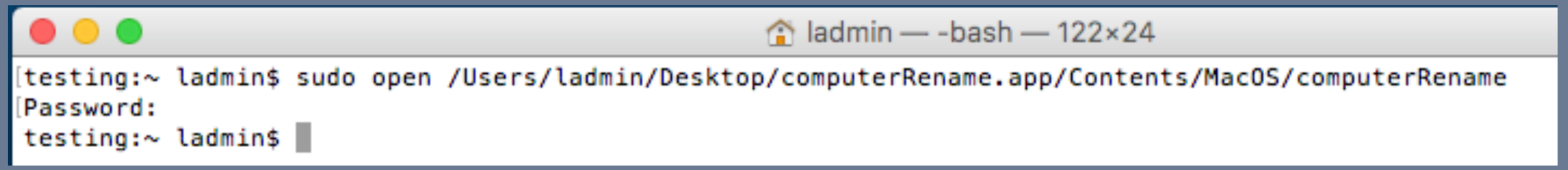
We should see the following, just a blank window.



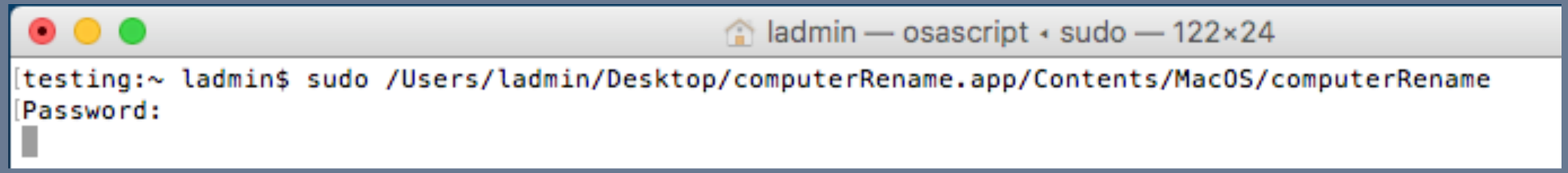
So let’s launch the application with elevated



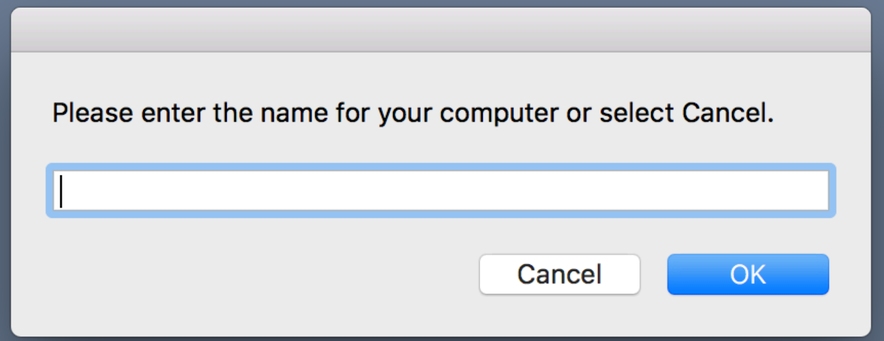
Nope, try a different approach.



Third time’s a charm?



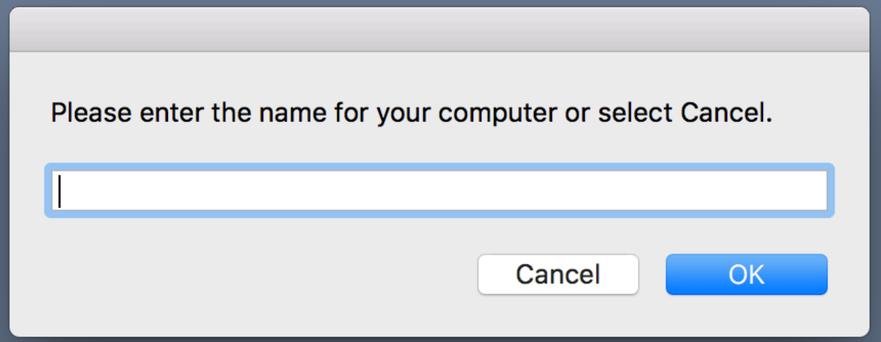
SCORE! We now get prompted for the computer name.



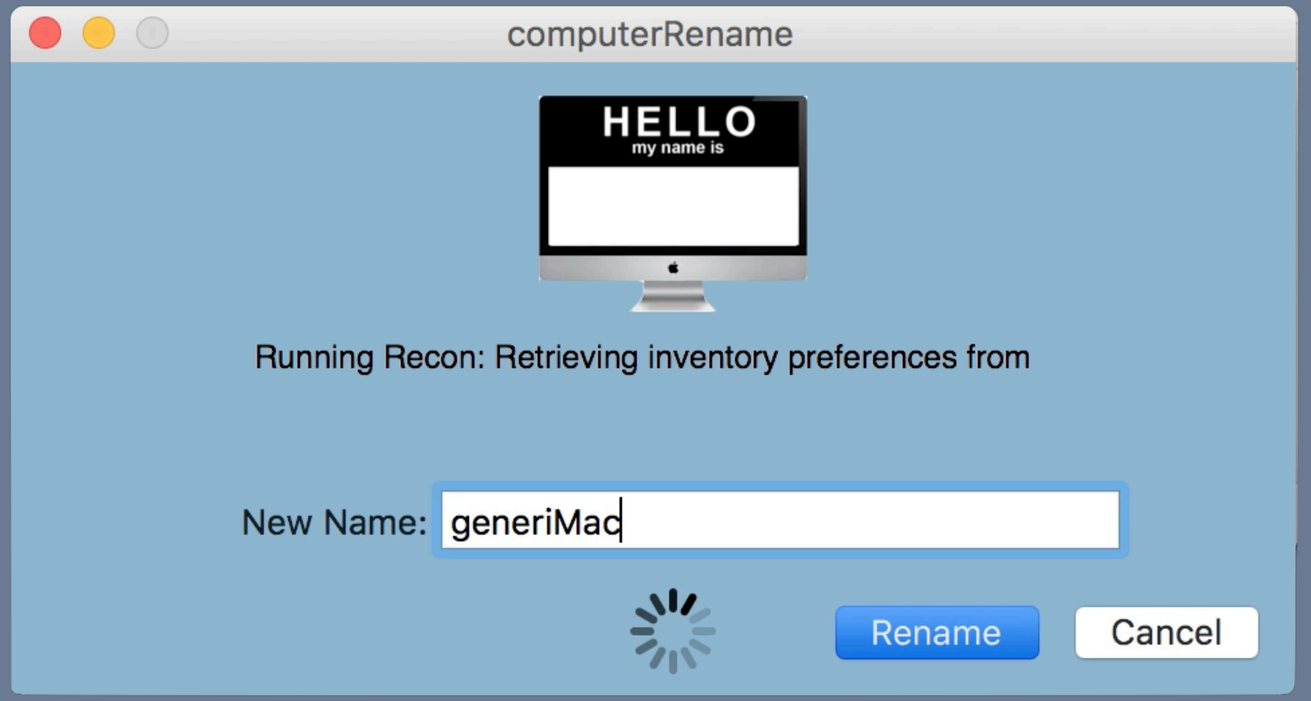
Might as well continue and see if it works…

Now let’s dress it up a bit.

Go from here…



Now let’s dress it up a bit.



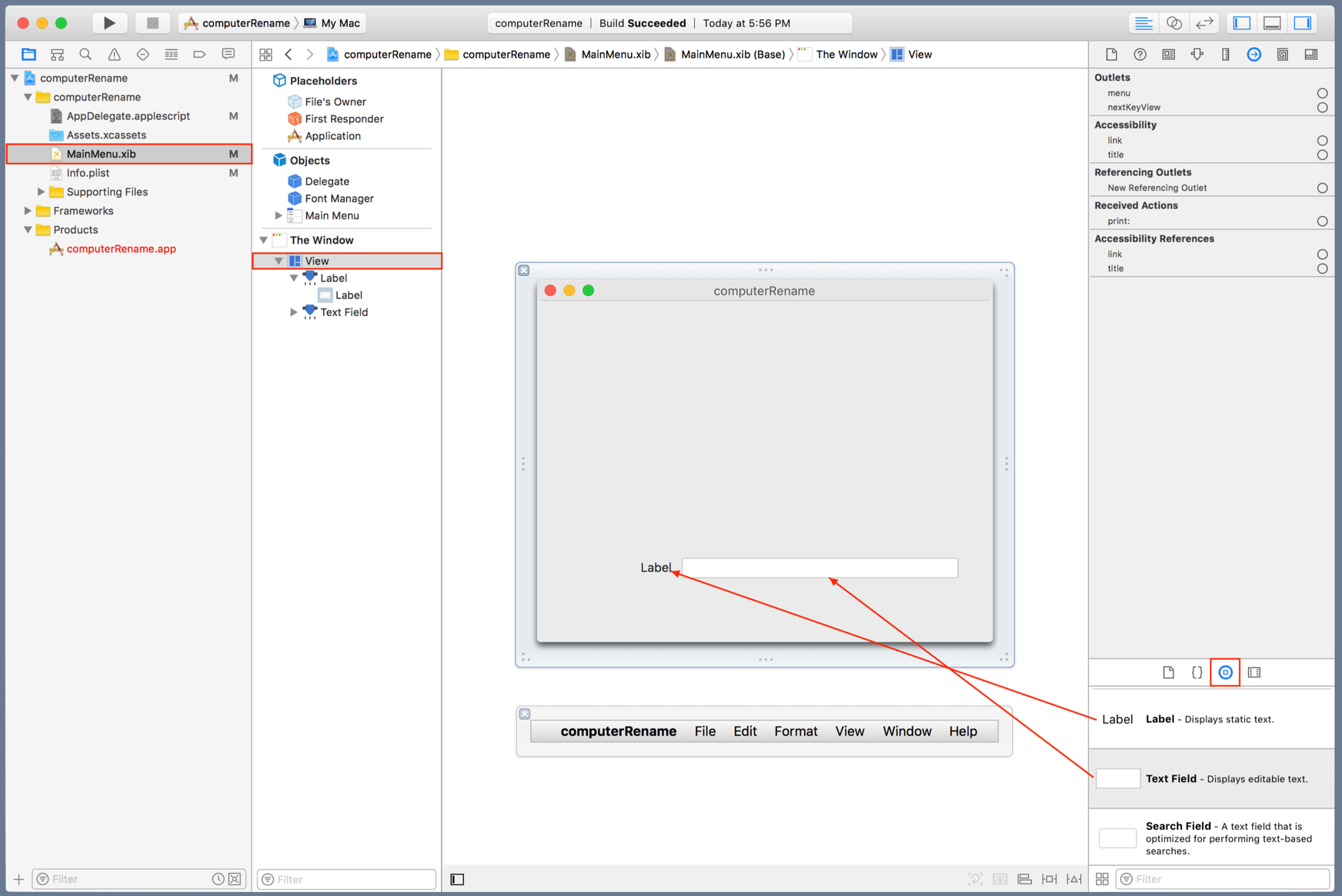
…to here.

Comment out the existing script and add a new section.

```
        -- Insert code here to initialize your application before any files are opened
        #!/bin/bash
        # check that script is run as root user
#        do shell script ("if [ $EUID -ne 0 ]\
#        then\
#        /bin/echo $'\nThis script must be run as the root user!\n'\
#        exit\
#        fi\
#        # capture user input name\
#        while true\
#        do\
#        name=$(osascript -e 'Tell application \"System Events\" to display dialog \"Please
enter the name for your computer or select Cancel.\" default answer \"\"' -e 'text returned
of result' 2>/dev/null)\
#        if [ $? -ne 0 ]\
#        then # user hit cancel\
#        exit\
#        elif [ -z \"$name\" ];then # loop until input or cancel\
#        osascript -e 'Tell application \"System Events\" to display alert \"Please enter a
name or select Cancel... Thanks!\" as warning'\
#        elif [ -n \"$name\" ];then # user input\
#        break\
#        fi\
#        done\
#        scutil --set ComputerName \"$name\"\
#        scutil --set LocalHostName \"$name\"\
#        scutil --set HostName \"$name\"\
#        \
#        jamf recon")
```

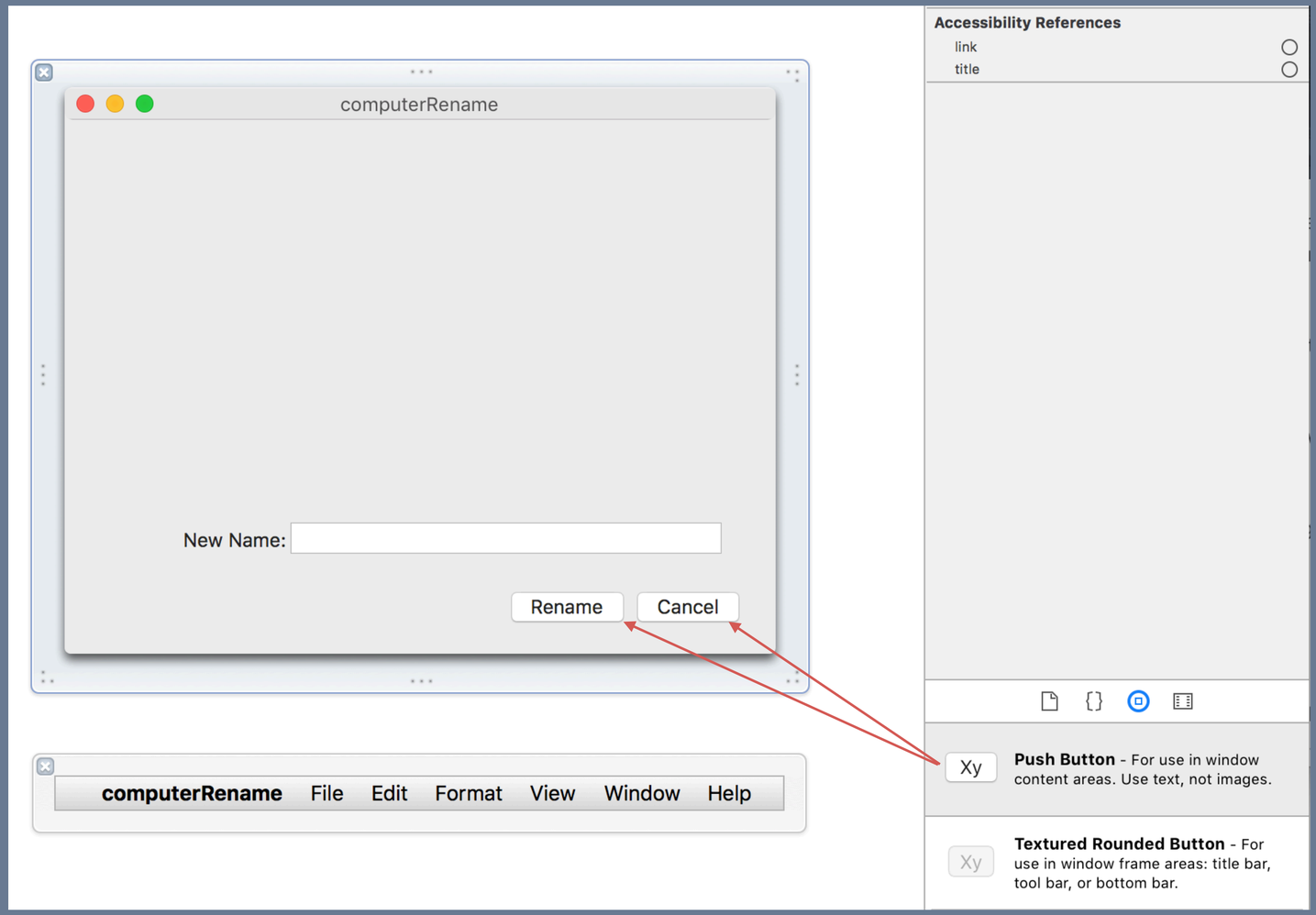
Hint: Select the block of code to comment out, then press command+/

Goal 2: The GUI



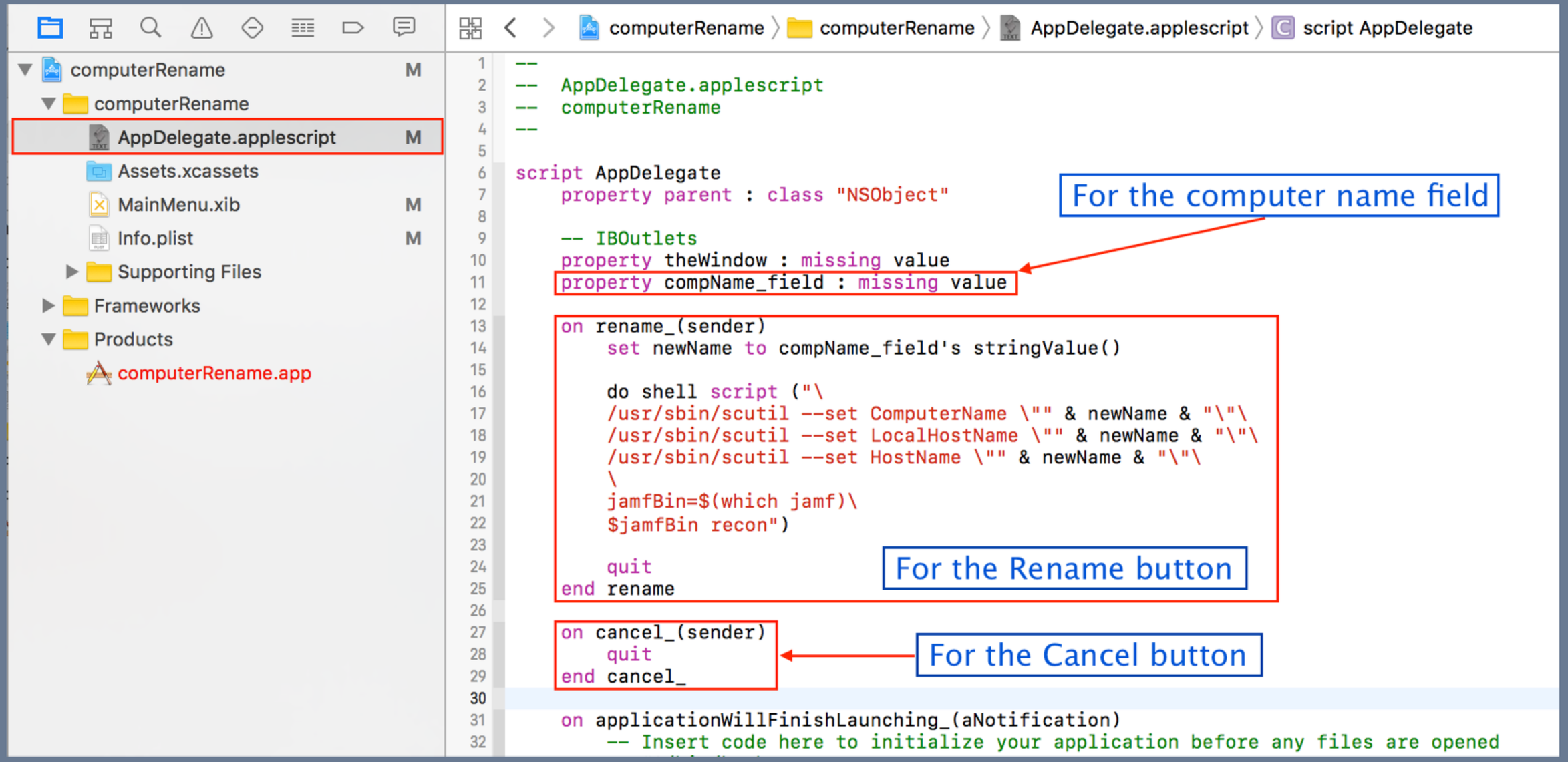
Add a label along with a text field to type the computer name into.

Add a couple buttons.



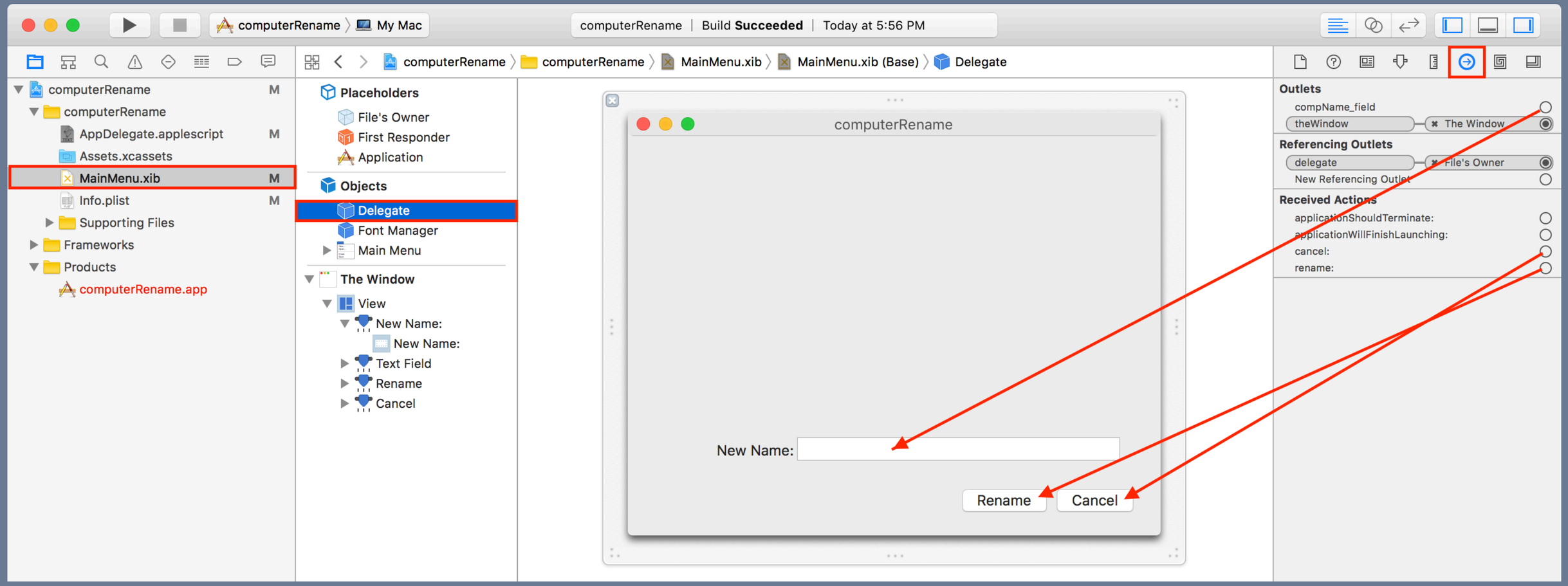
Double click the label and buttons to add appropriate names.

Back to the code, let's add some lines.



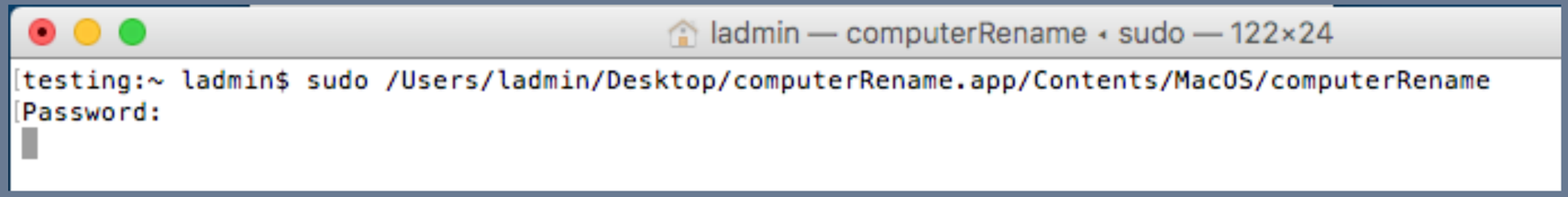
https://github.com/BIG-RAT/MacAdmins2017/blob/master/AppDelegate1.txt

Connect our new lines of code to the GUI objects.

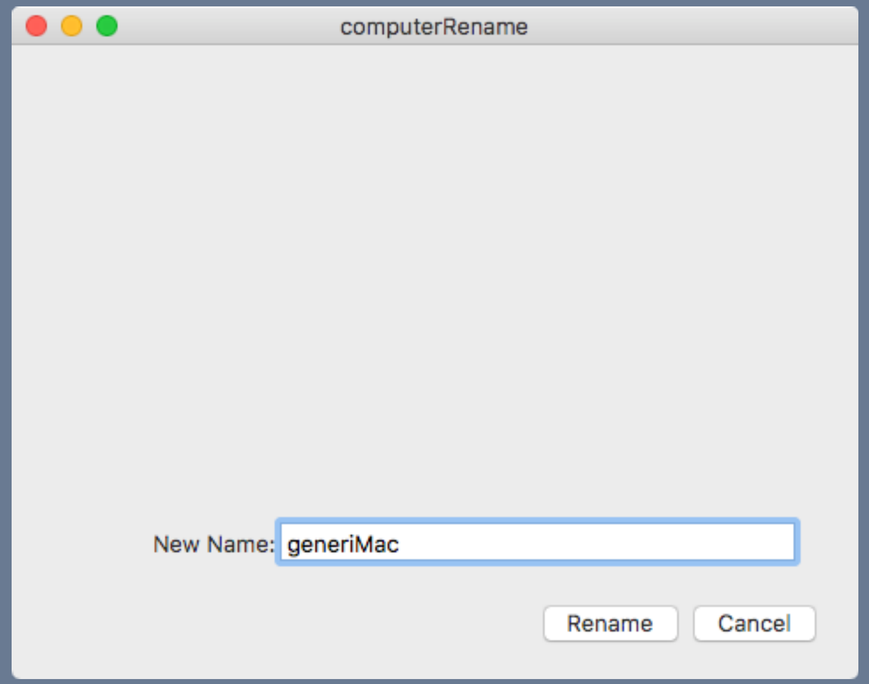


Click and drag the open circle to the associated object.

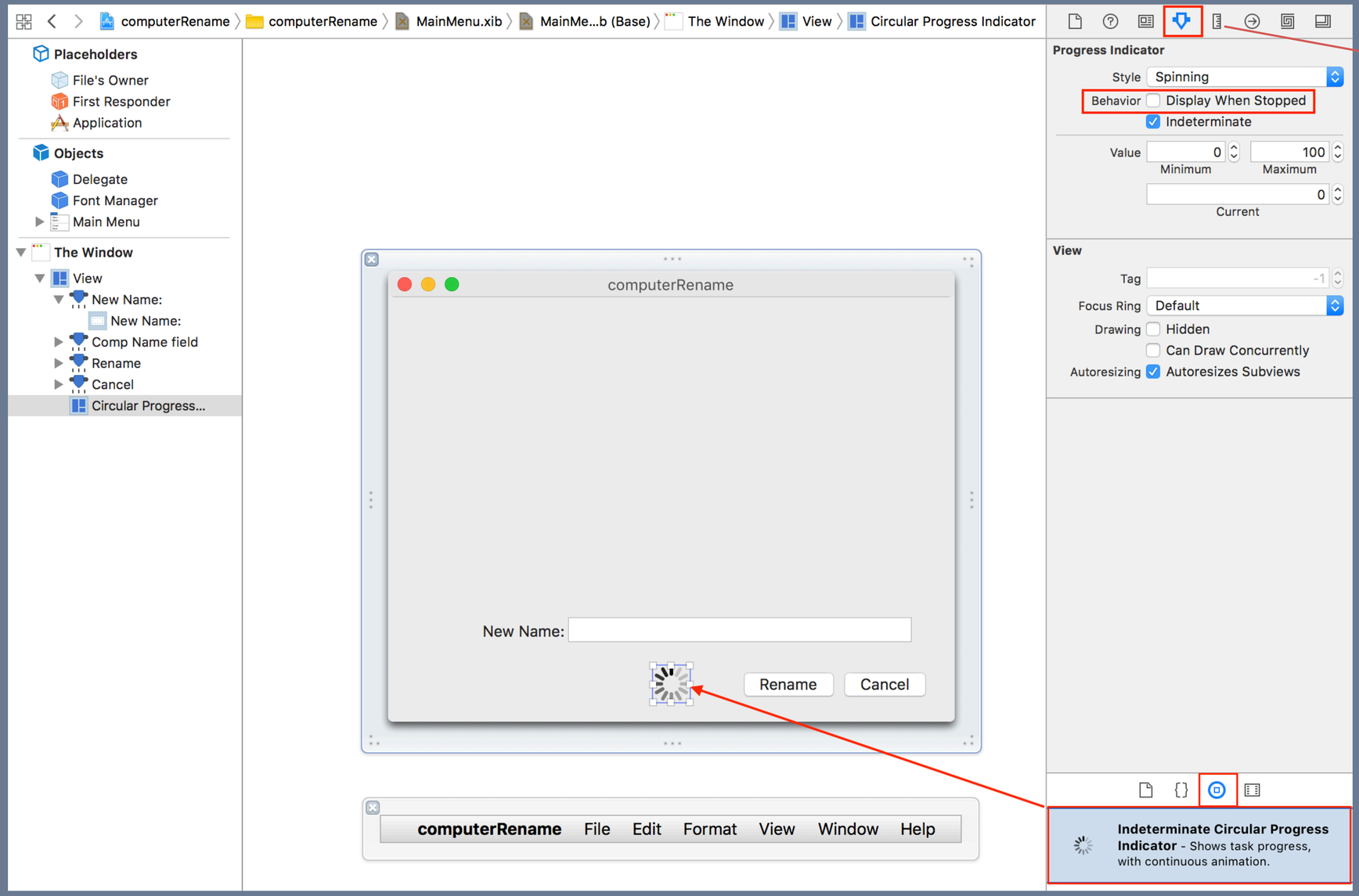
Build the app, command+b, and test it. Remember to launch it through Terminal.

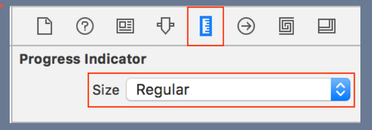


Enter a new name and click ‘Rename’.

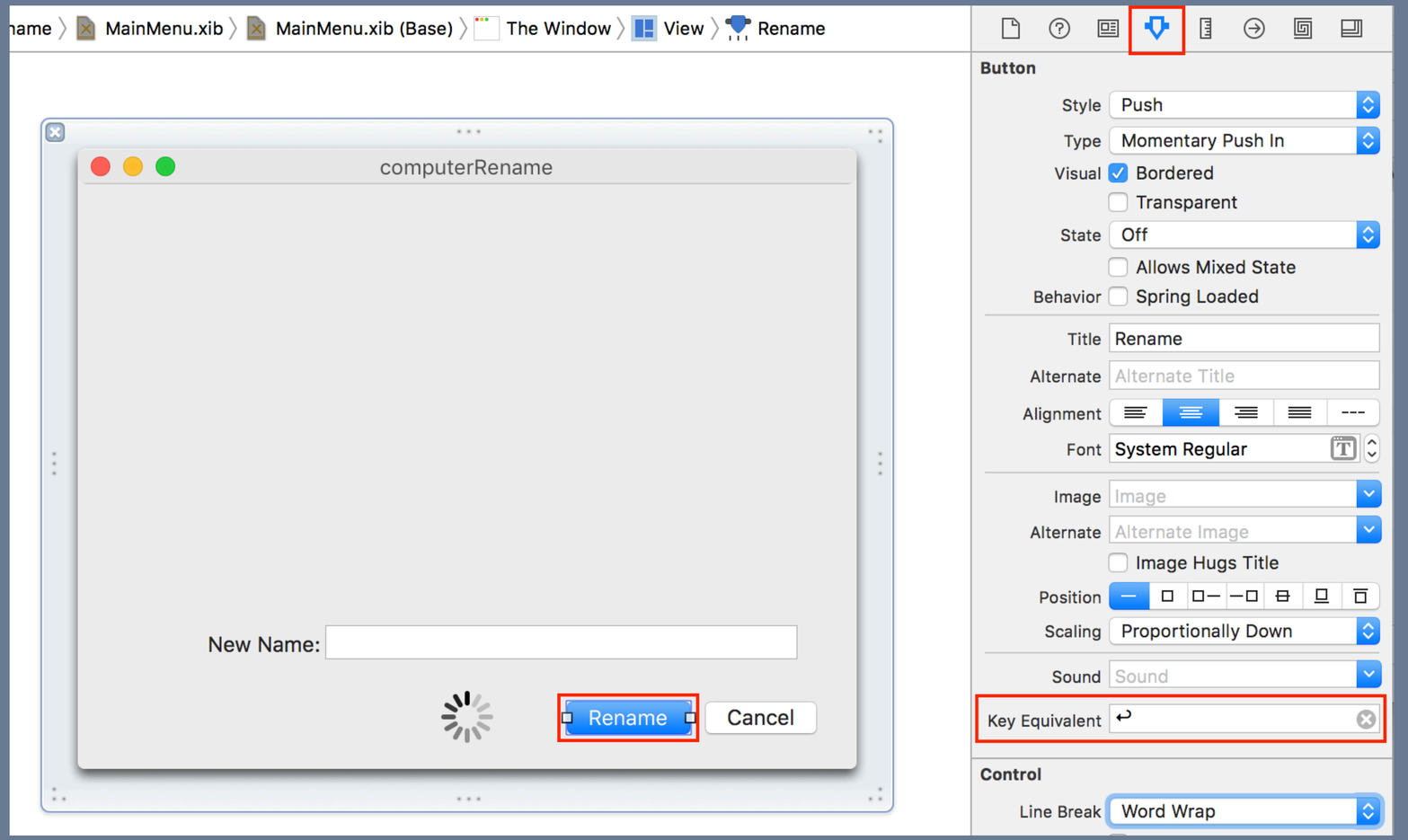


Dress up the GUI a little more, add a progress indicator (spinner).



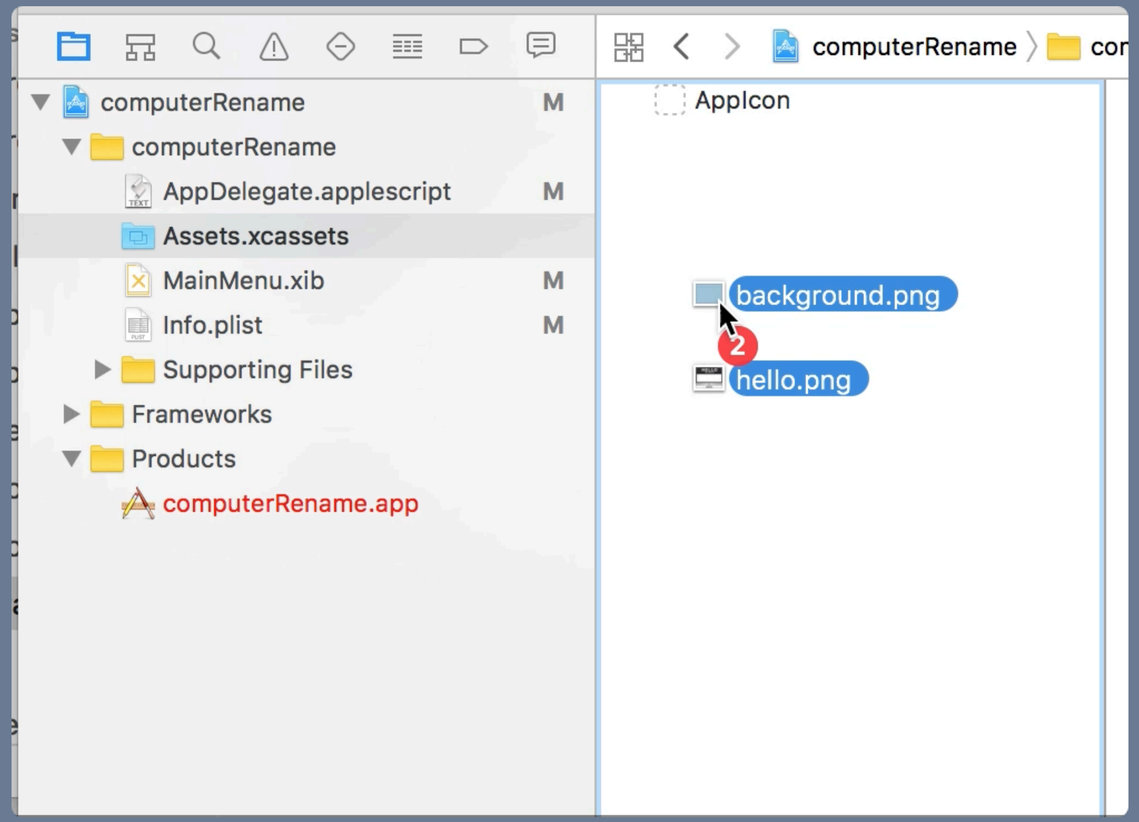


Let’s also set the Rename button as the default.



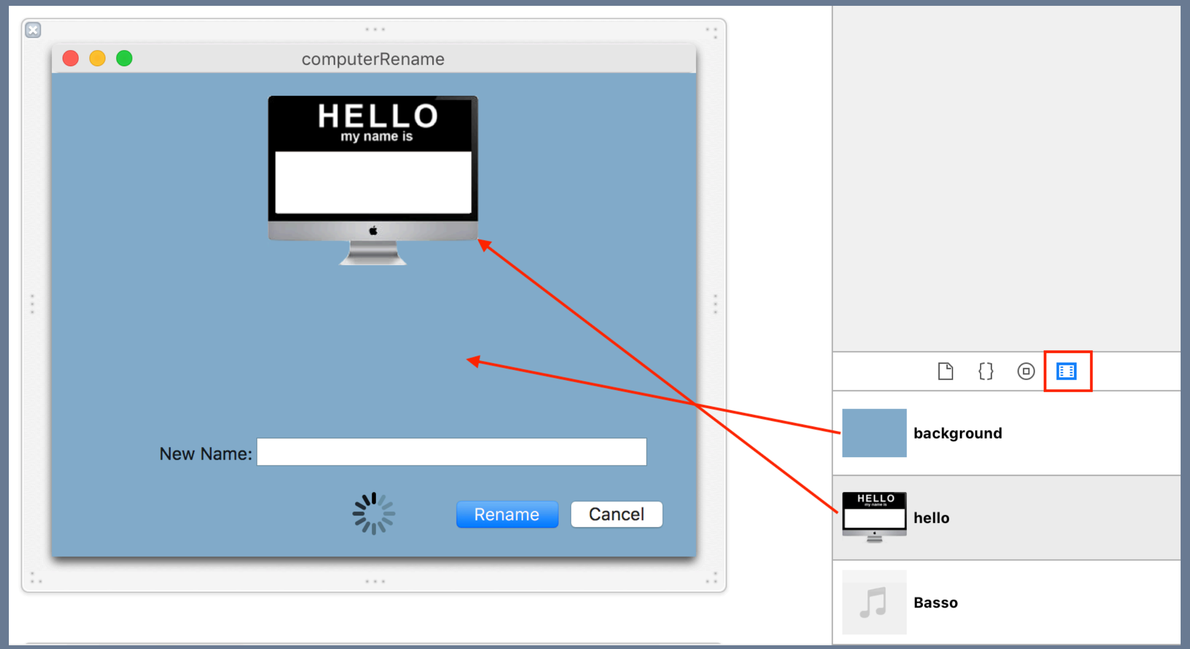
Click in the ‘Key Equivalent’ field and hit return.

Next we'll add some graphics to our project so that we're able to set a background along with a custom image. Click on Assets.xcassets and drag in the images, drop them just below 'AppIcon'.



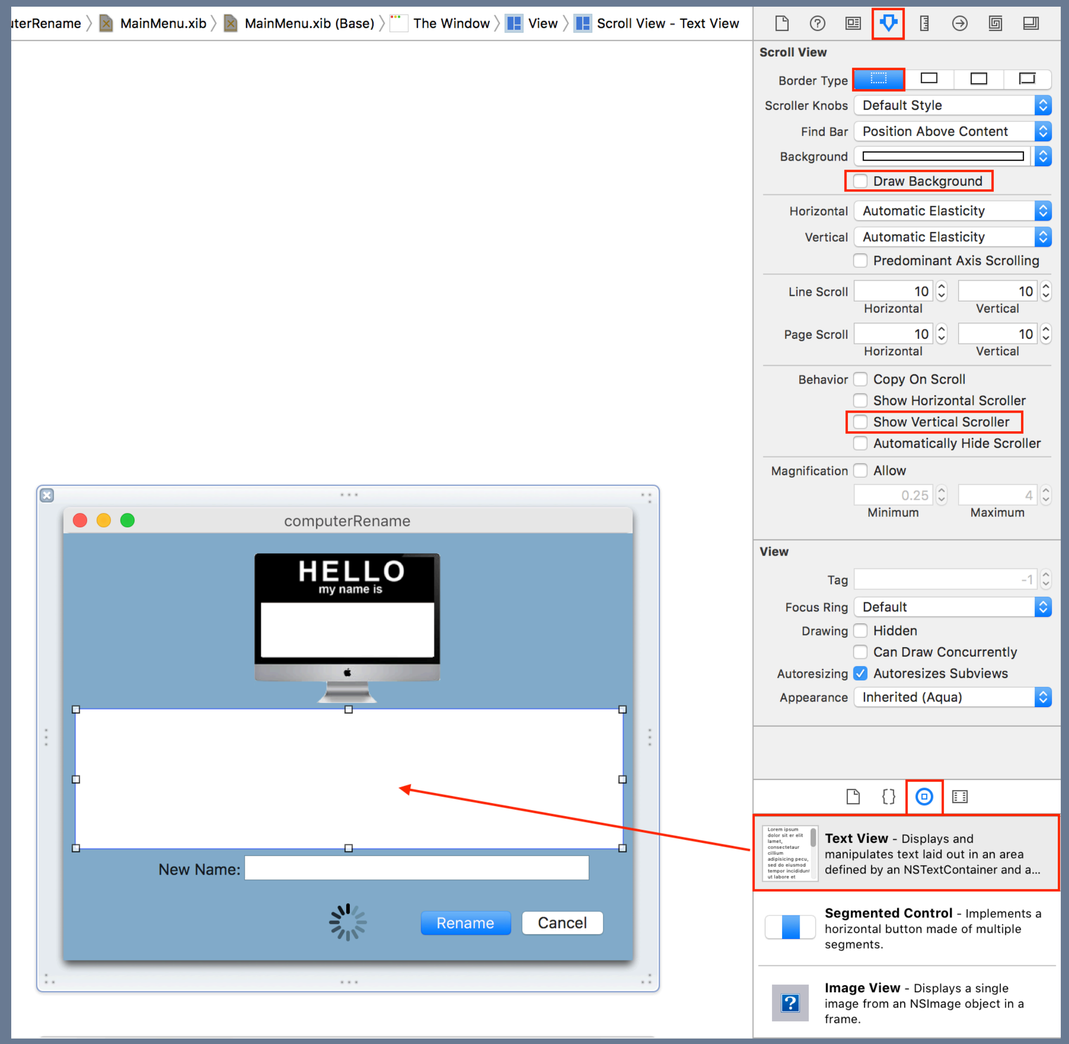
https://github.com/BIG-RAT/MacAdmins2017/blob/master/images.zip

Back to the MainMenu.xib, add the images.

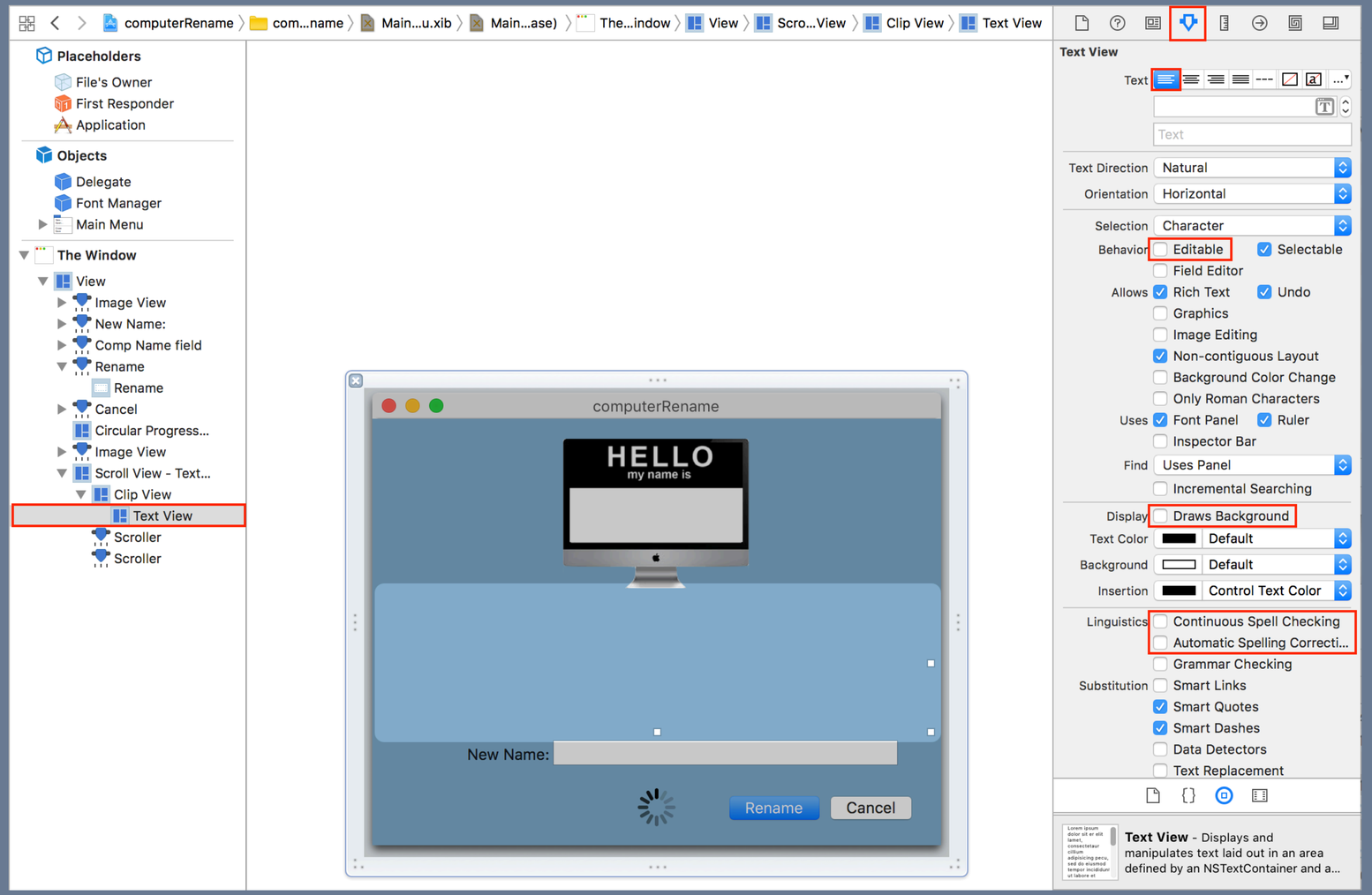


Click and drag the objects into the GUI. Be sure to move the background to the back:
Editor —> Arrange —> Send to Back

In addition to the spinner providing evidence the application is running, let's add a text field to display recon output.



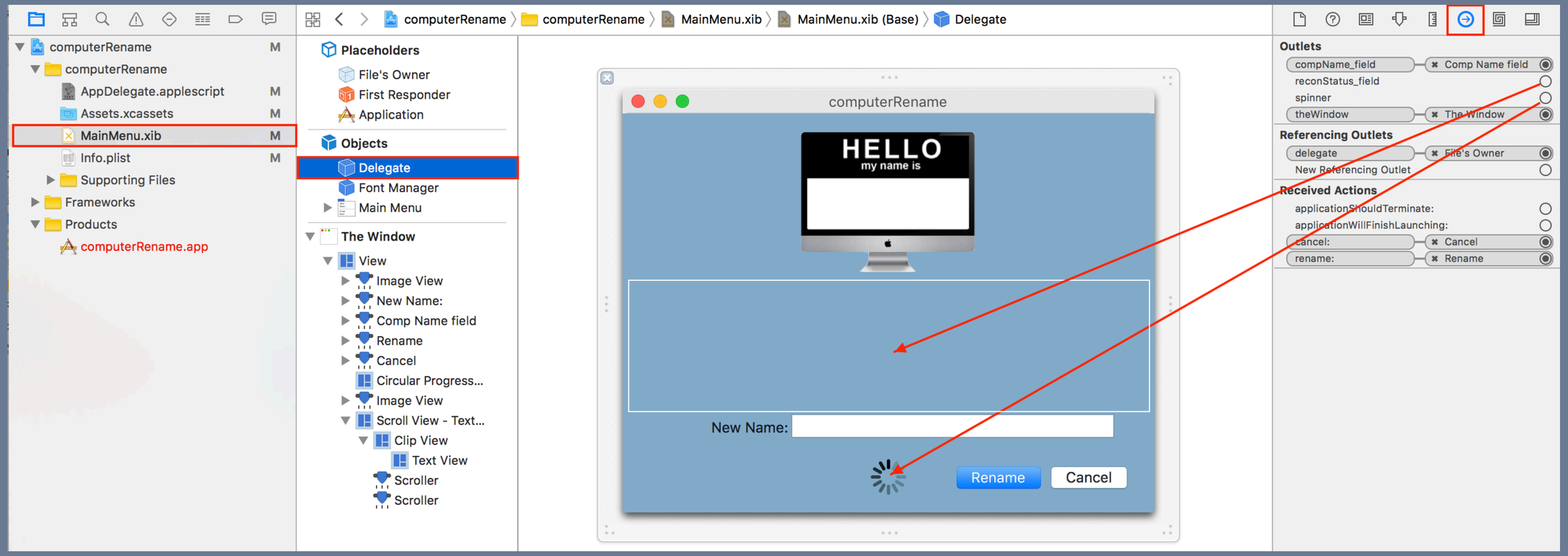
Set the text field to blend into the background.



Now, back to coding. We added a spinner and text field to display some output, let's utilize them.

```
script AppDelegate
    property parent : class "NSObject"

    -- IBOutlets
    property theWindow : missing value
    property compName_field : missing value
    property spinner : missing value
    property reconStatus_field : missing value
```

Two new properties. We need to link them to their objects in the GUI.



Update the rename_ function:

Make sure we don't have a blank name.

start the spinner

output redirection

Display output as recon is running.

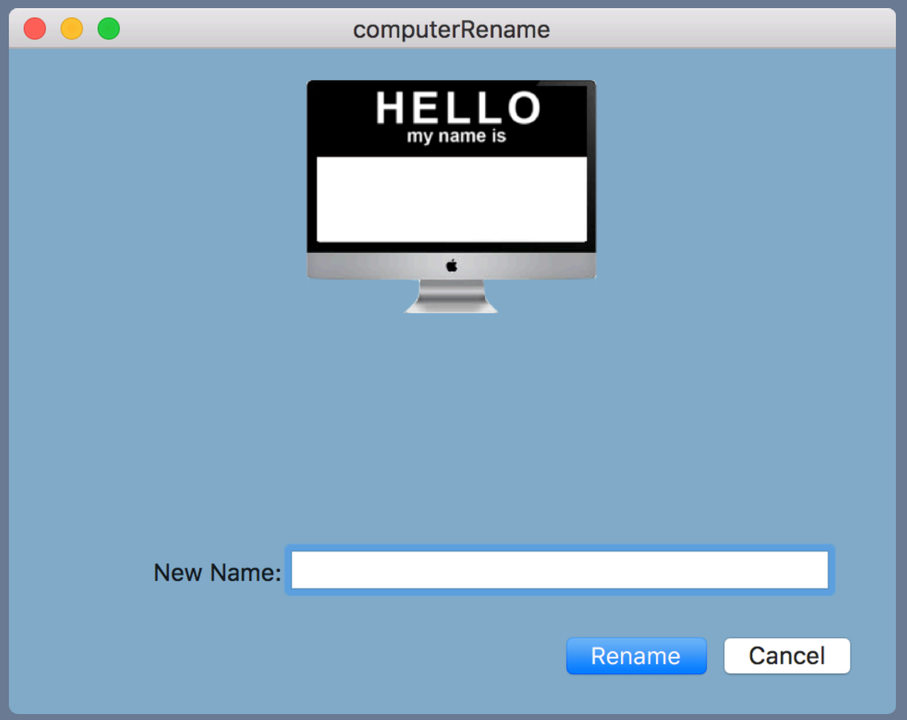
stop the spinner

```
on rename_(sender)
    set newName to compName_field's stringValue()
    if newName as string is equal to "" then
        display dialog "Oops, forgot to enter a computer name."
        return
    end if

    spinner's startAnimation_(me)

    do shell script ("\
    /usr/sbin/scutil --set ComputerName \"" & newName & "\"\
    /usr/sbin/scutil --set LocalHostName \"" & newName & "\"\
    /usr/sbin/scutil --set HostName \"" & newName & "\"\
    \
    jamfBin=$(which jamf)\
    $jamfBin recon > /tmp/recon.txt 2>&1 &")

    try
        set recon_check to do shell script ("ps -ax | grep recon | grep -v grep")
        on error
        set recon_check to "complete"
    end try

    repeat while recon_check is not equal to "complete"
        set log_text to do shell script ("tail -n3 /tmp/recon.txt")
        reconStatus_field's setString_("Running Recon: " & text of log_text)
        delay 0.2
        try
            set recon_check to do shell script ("ps -ax | grep recon | grep -v \"grep\\|tail\"")
            on error
            set recon_check to "complete"
        end try
    end repeat

    reconStatus_field's setString_(text of log_text & return & "Updated.")

    spinner's stopAnimation_(me)

    display dialog "Rename complete!" buttons {"OK"}
    quit
end rename
```

Lastly, cleanup the code we're not using in applicationWillFinishLaunching_ and add a function to bring the application to the foreground when launched.

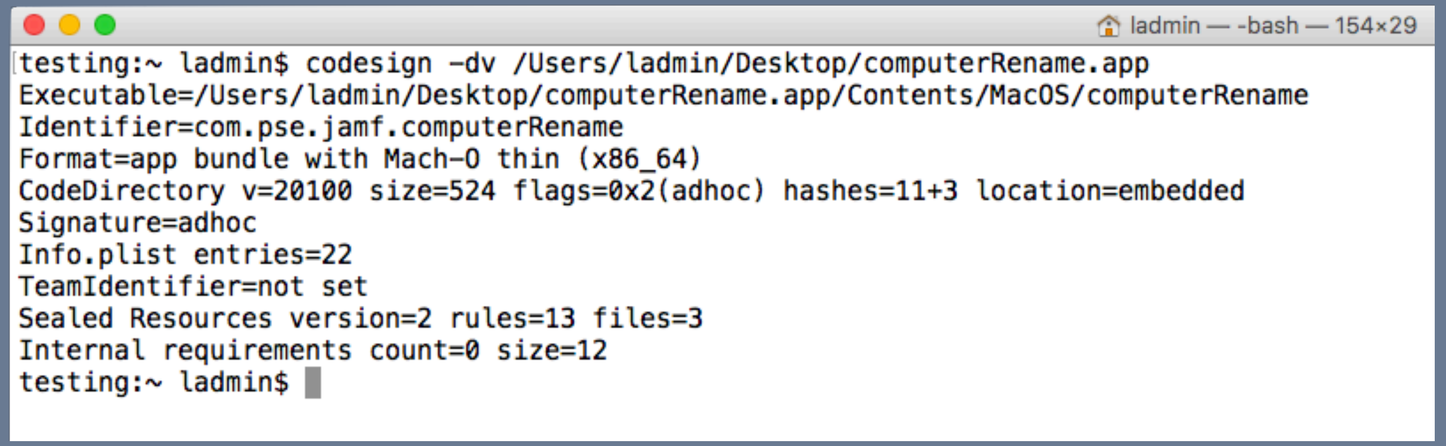
```
on applicationWillFinishLaunching_(aNotification)
-- Insert code here to initialize your application before any files are opened
end applicationWillFinishLaunching_

on applicationDidFinishLaunching_(sender)
    activate me
    theWindow's makeFirstResponder_(compName_field)
end applicationDidFinishLaunching_
```

Build (command+b) then launch the application through Terminal.



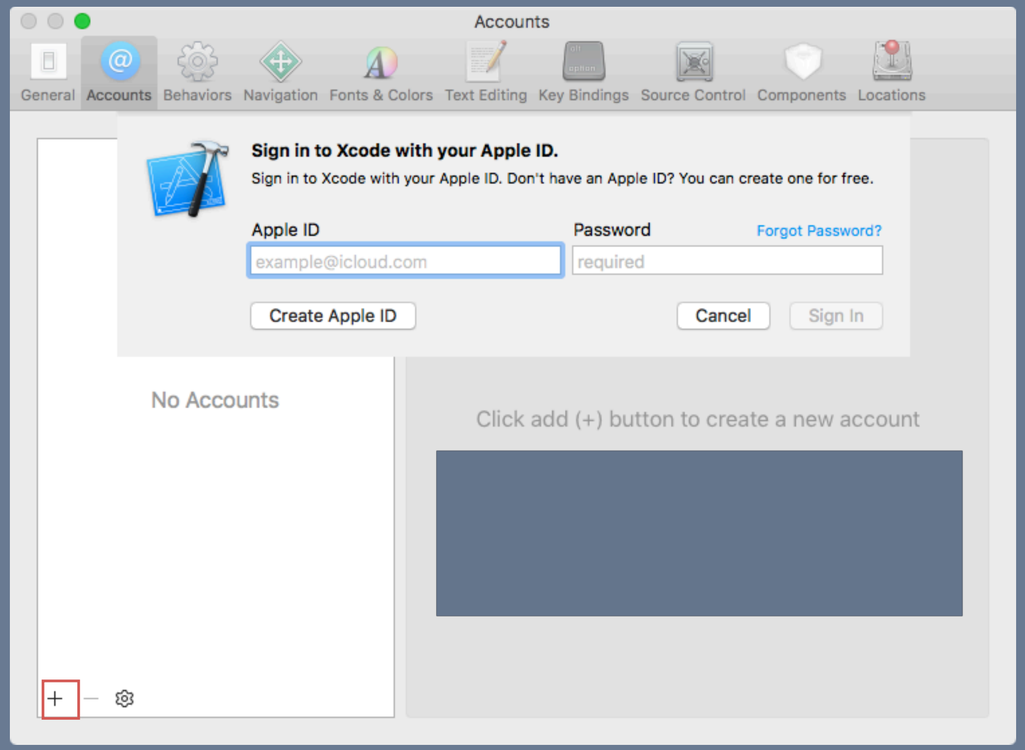
Goal 3: Properly sign the application.

We can check the application signature current state using codesign -dv in Terminal.



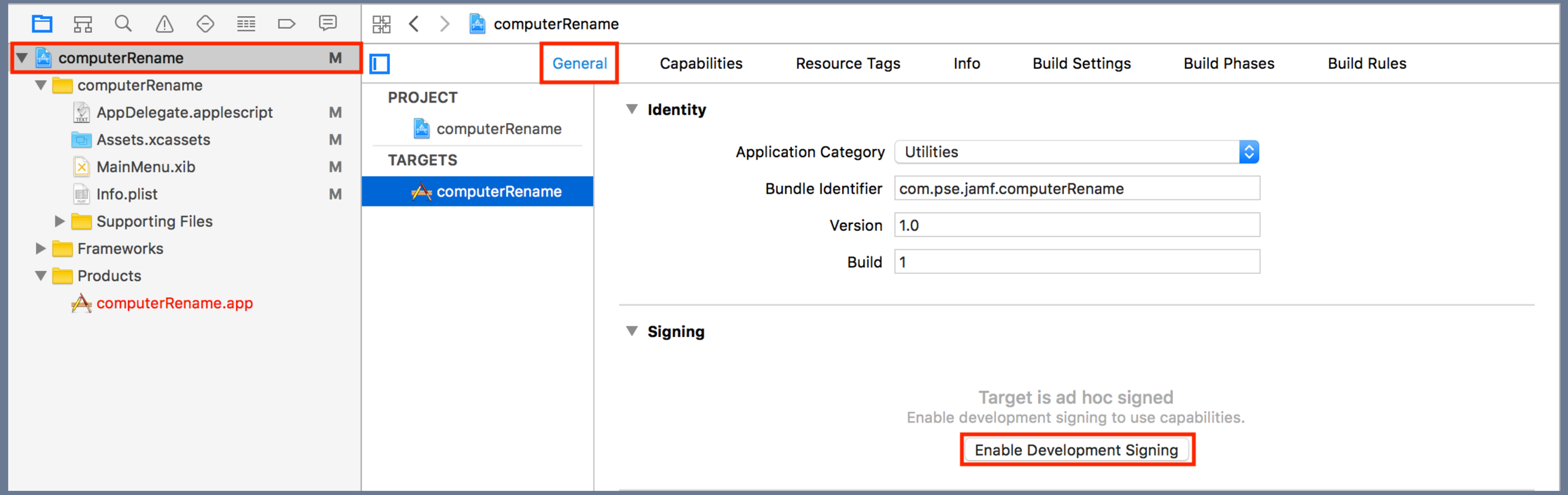
Signature=adhoc tells us the application is not signed by a known developer.

If you haven't already, add your (paid) developer account to Xcode. From the menu bar, Xcode -> Preferences -> Accounts, then click the + sign.



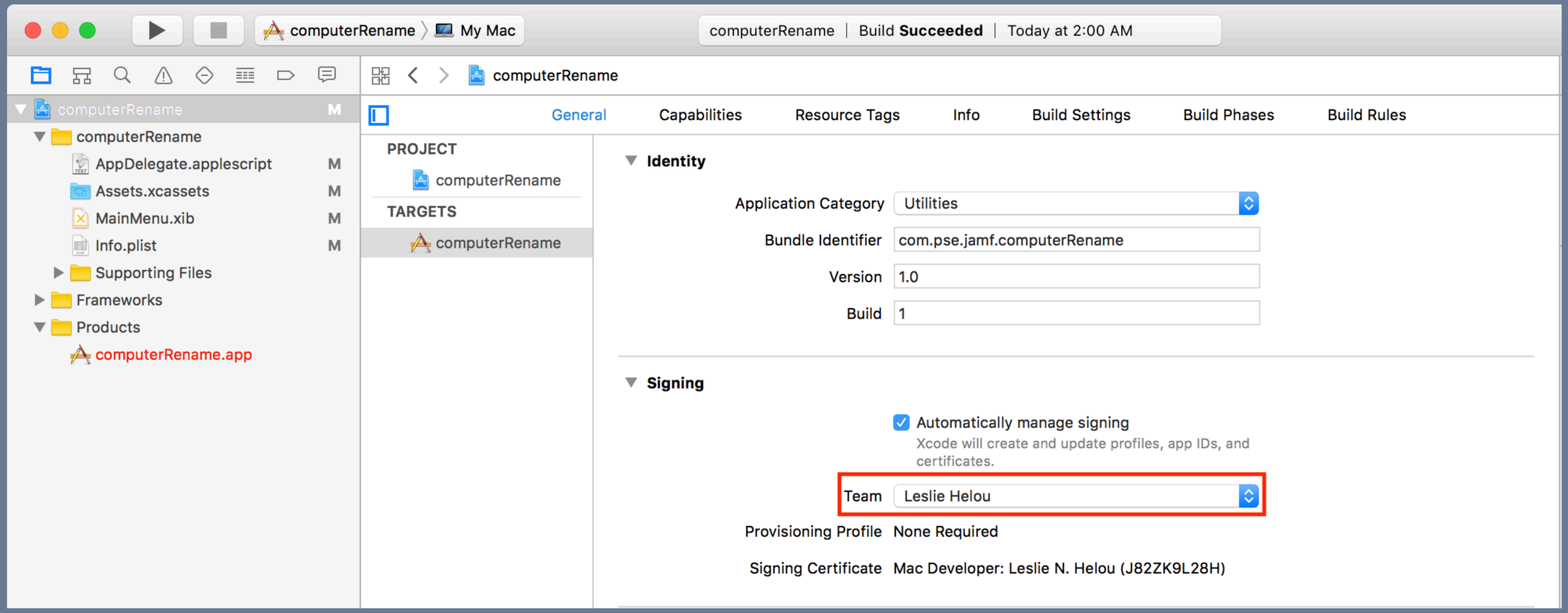
Enter the appropriate credentials and click 'Sign In'. Close the preferences window.

Back to the main window, click the top level of the project and make sure we're on the General tab.

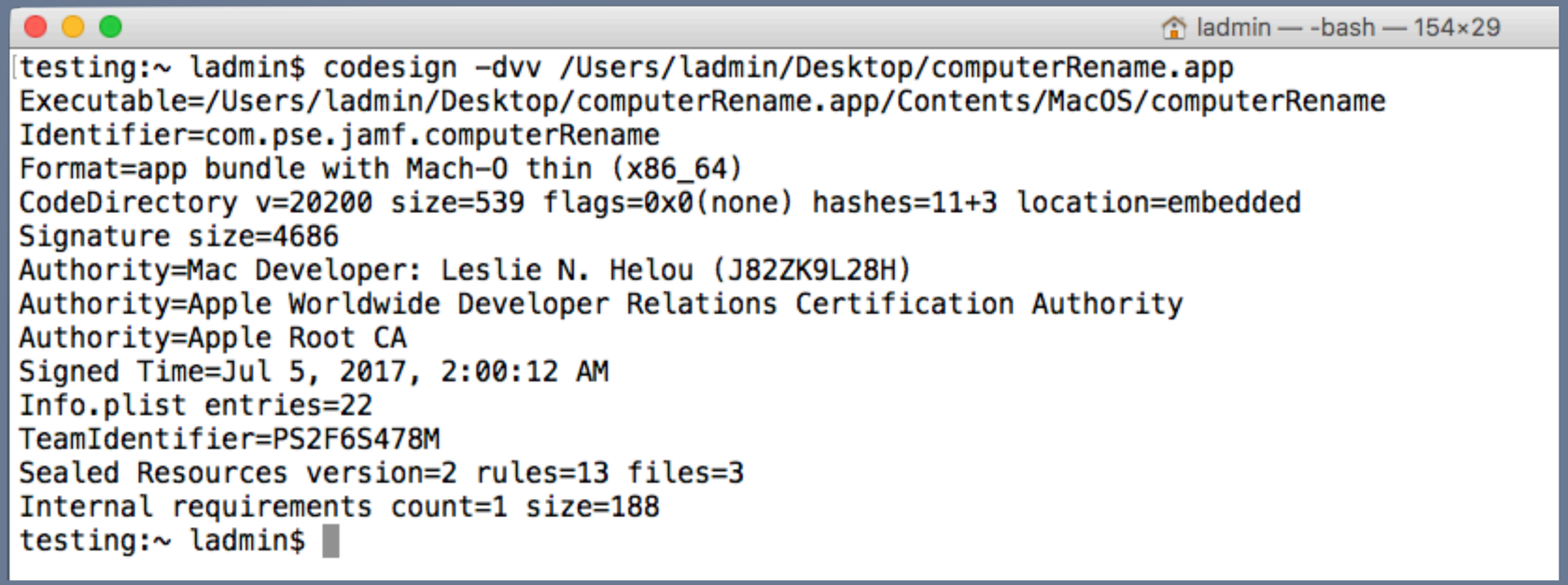


Click 'Enable Development Signing'.

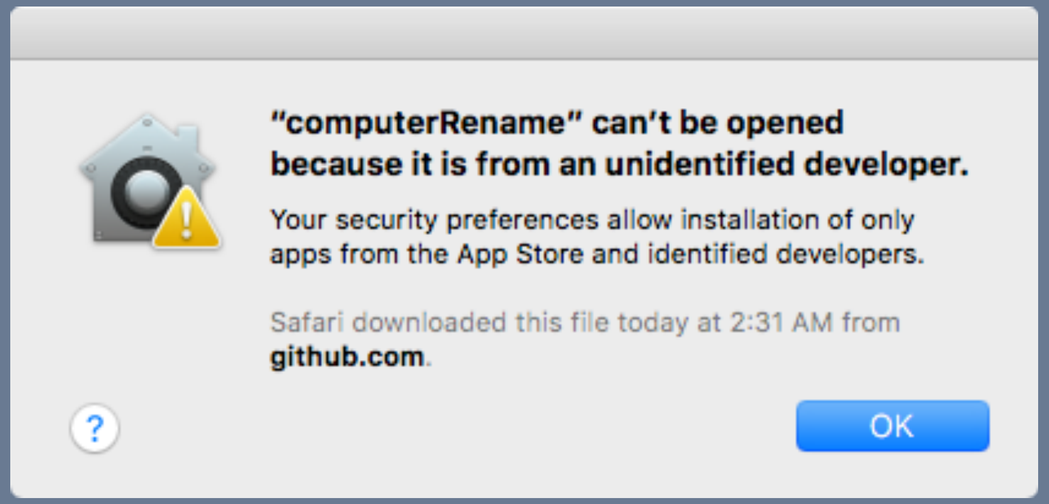
If necessary select a team from the drop-down.



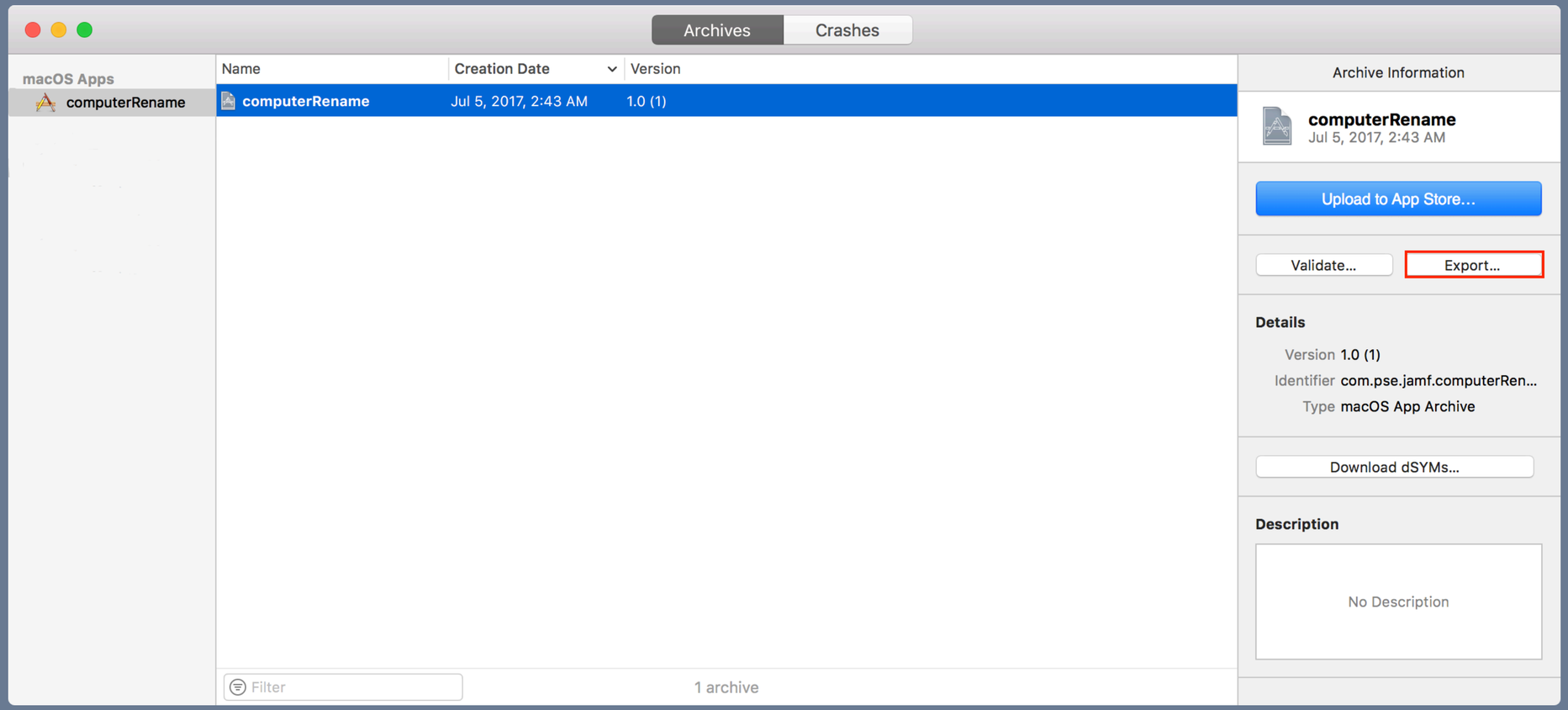
Build and check the application to see if it is signed. Use codesign -dvv to get a little extra info.



Now even though the application is sign, it is not ready to be shared, say through GitHub. If the application is download in its current state, we'll likely see the following when it is opened.

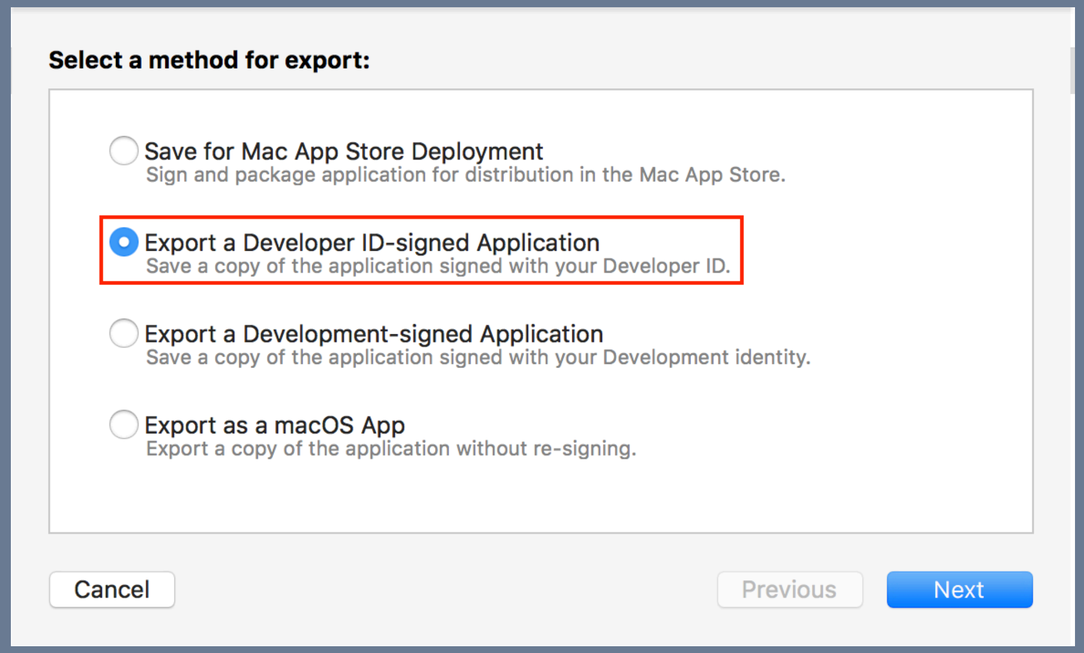


As the final task, we need to ‘Archive’ the project. From the menu bar, Product -> Archive.

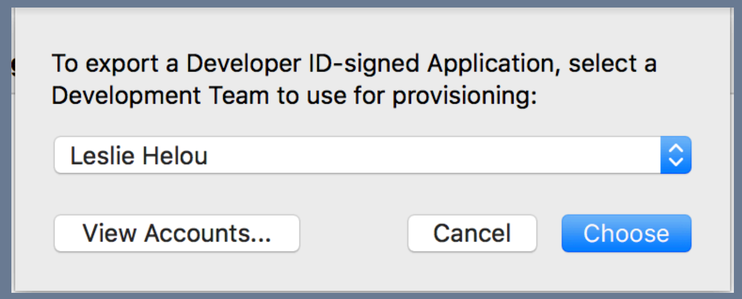


Click Export…

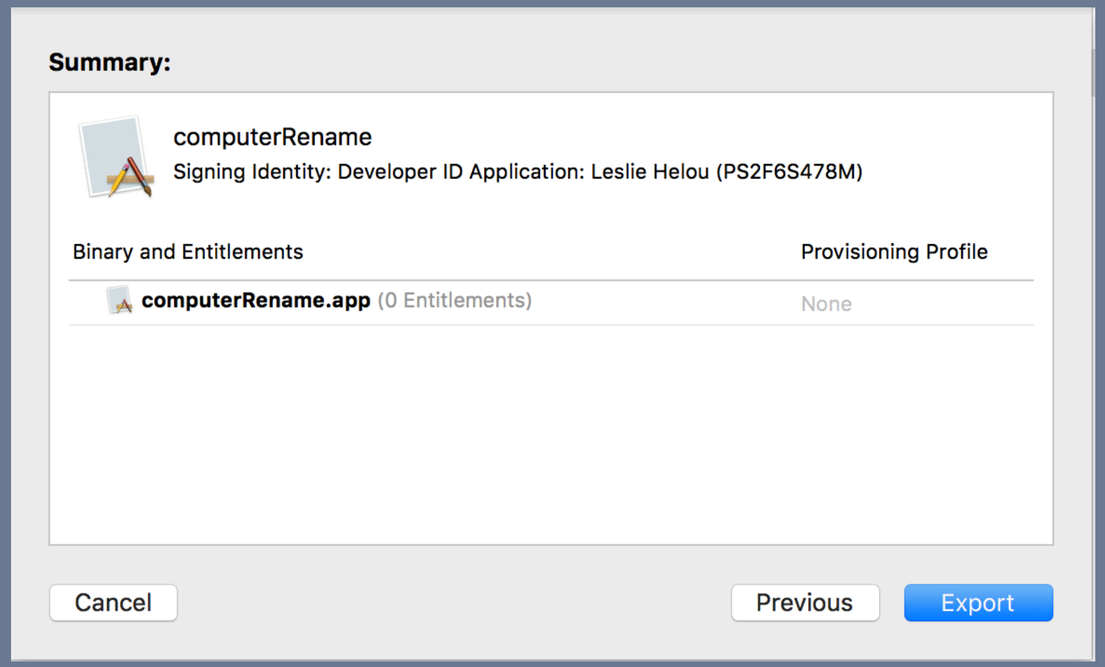
Select Export a Developer ID-signed Application



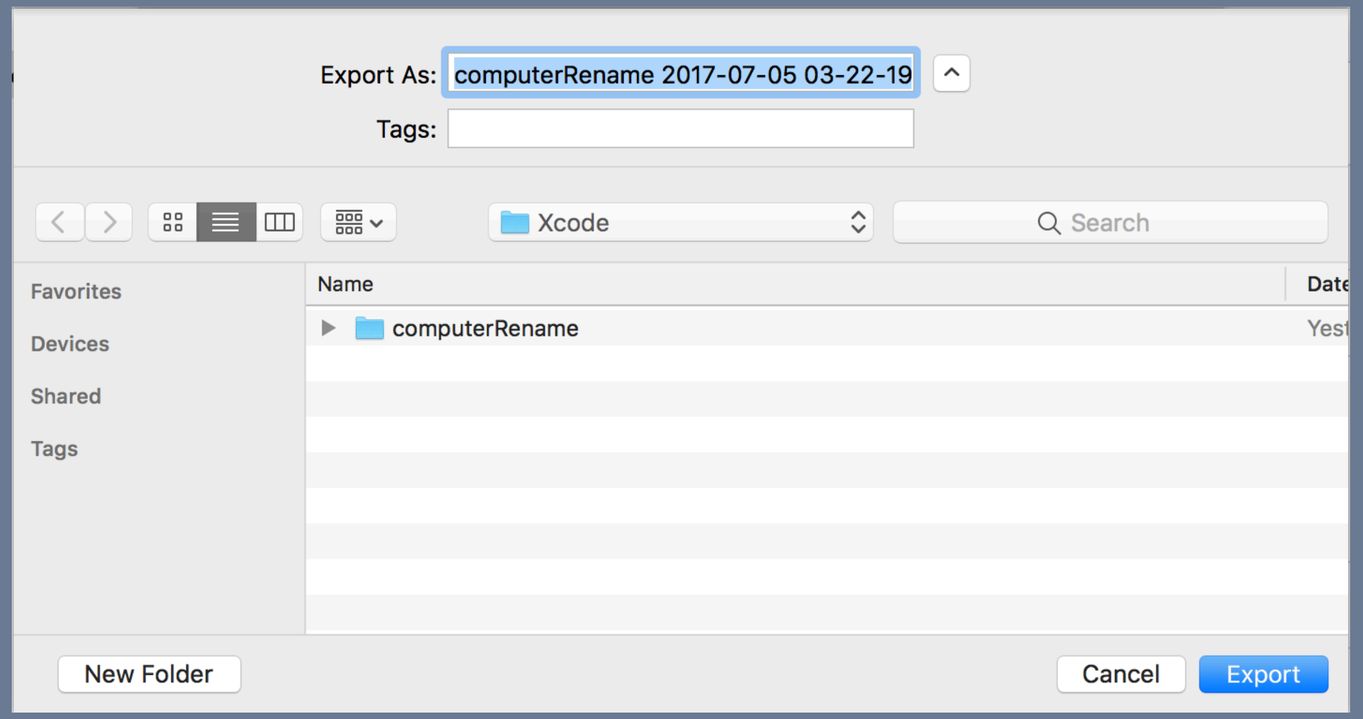
Click Next, ensure we have the right developer account and click Next again.



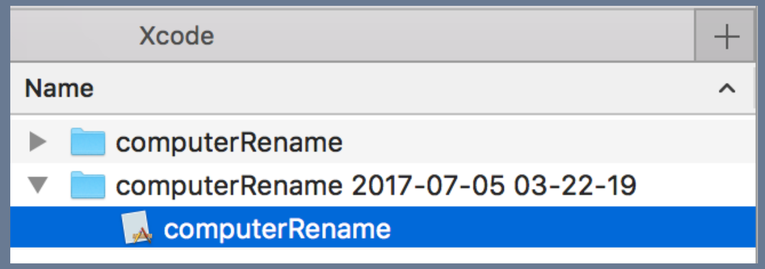
There will be some processing then you'll be presented with the application to export.



Select a name and location for the application and click Export.



The application is now ready to be shared.

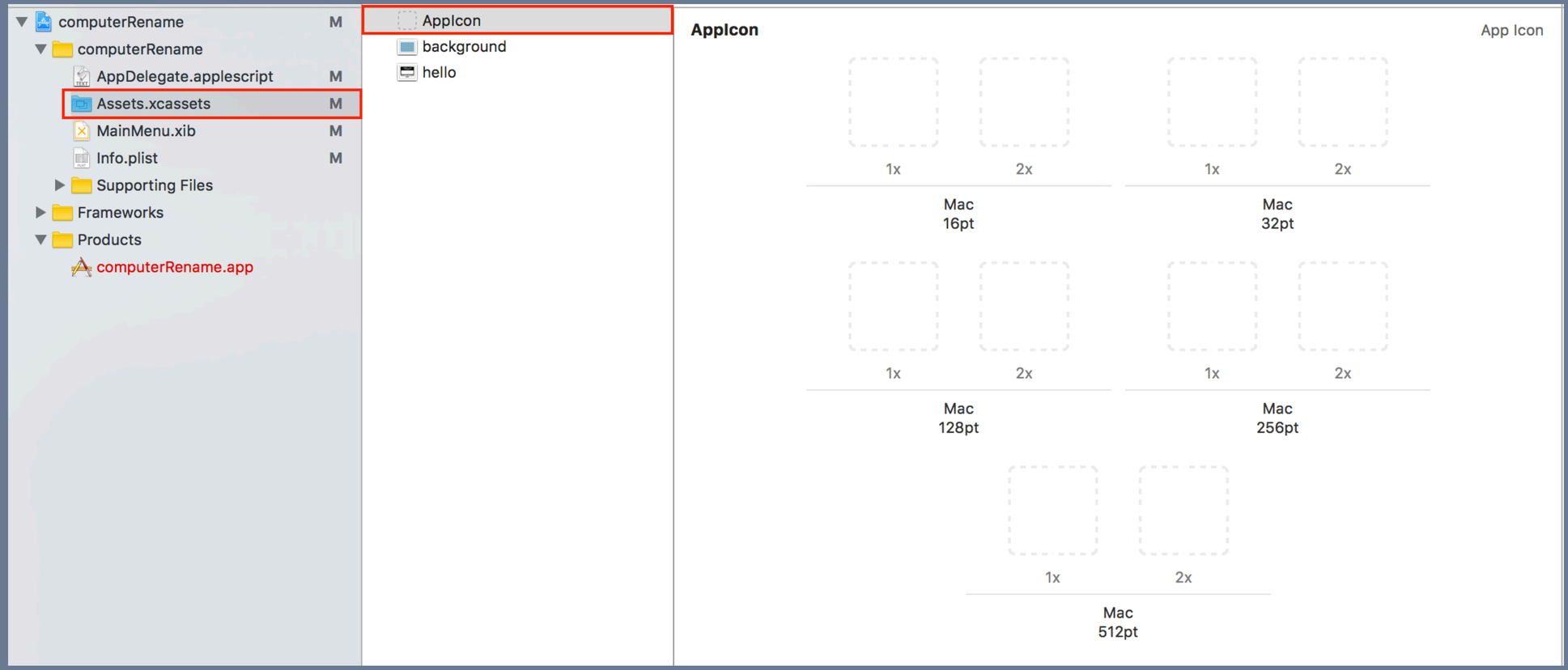


Thank you!

Extra time, extra credit…

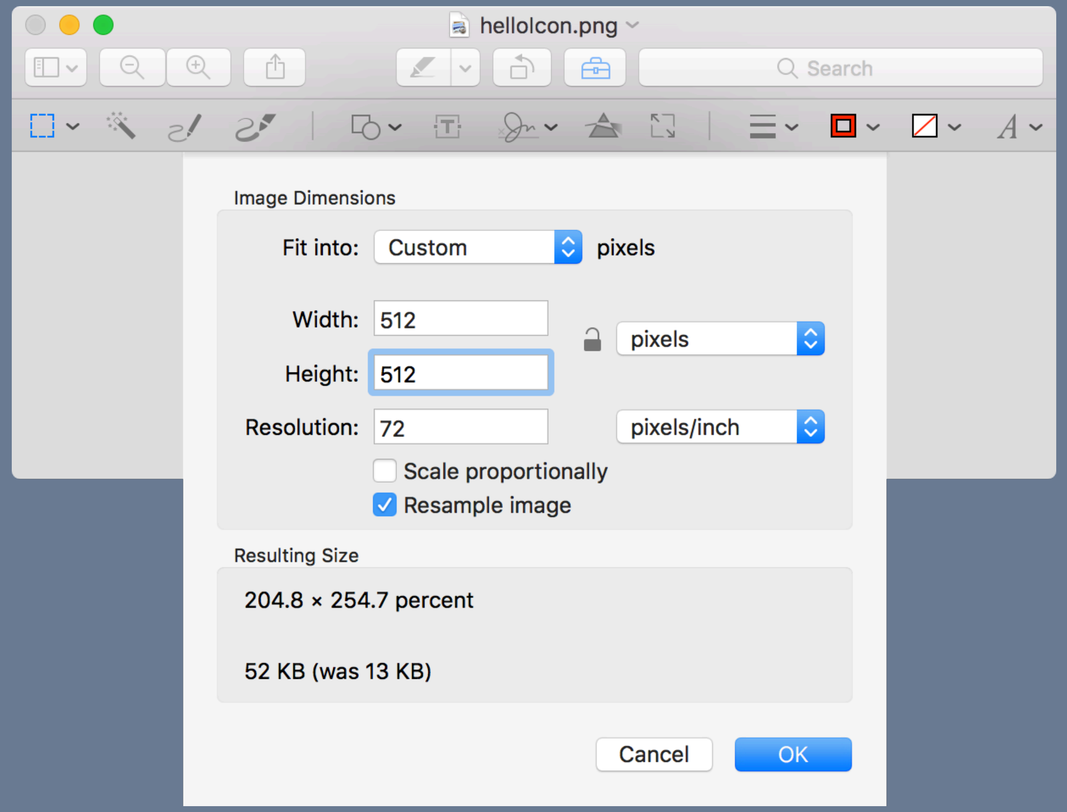
- Add an icon for the application.
- Enable the application to work when launched from the Finder.
- Tweak the application window.

Looking at the options for icons for the application we see several sizes are available.



Start with the hello.png from the application. Open with Preview and resize the image to 512x512 pixels.

- Make a copy of hello.png, call it something like helloIcon.png
- Open helloIcon.png with Preview, click Tools -> Adjust Size…
- Click the lock so that it is unlocked and select pixels from the drop down next to the lock
- Set the width and height to 512

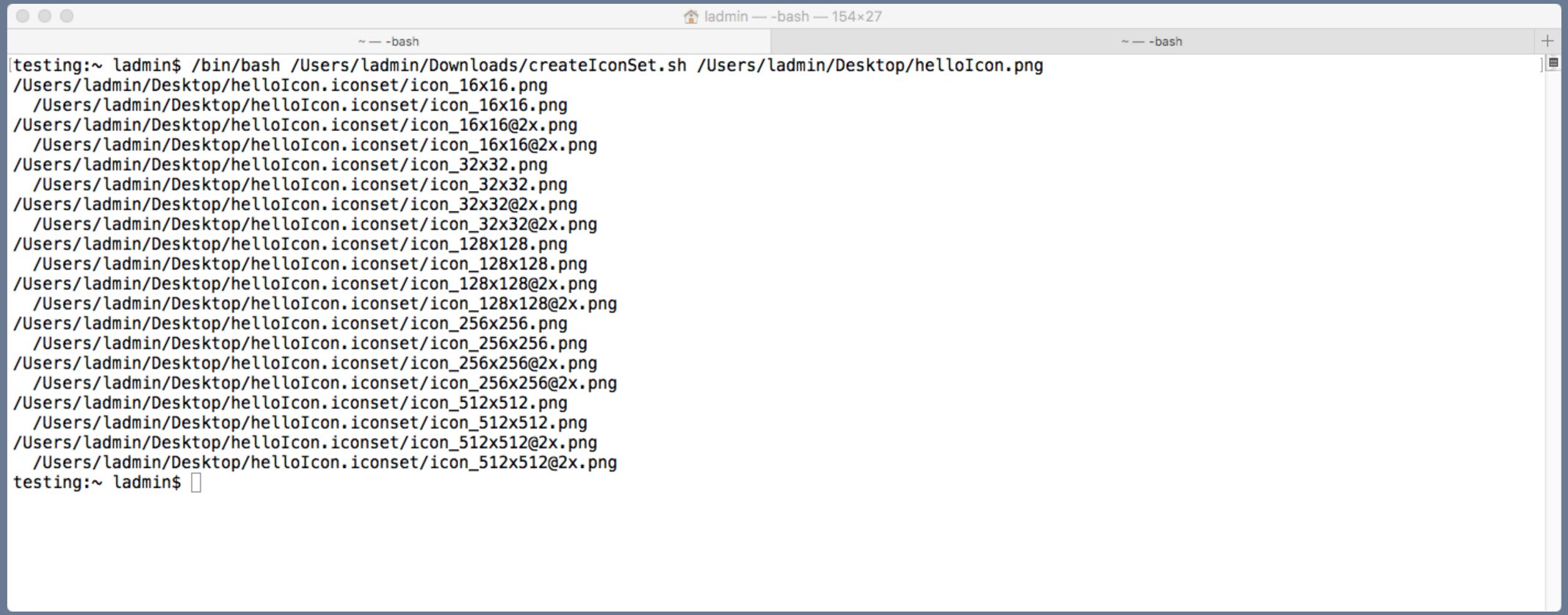


We’ll need several other sizes, but rather than creating them manually let’s use a script.

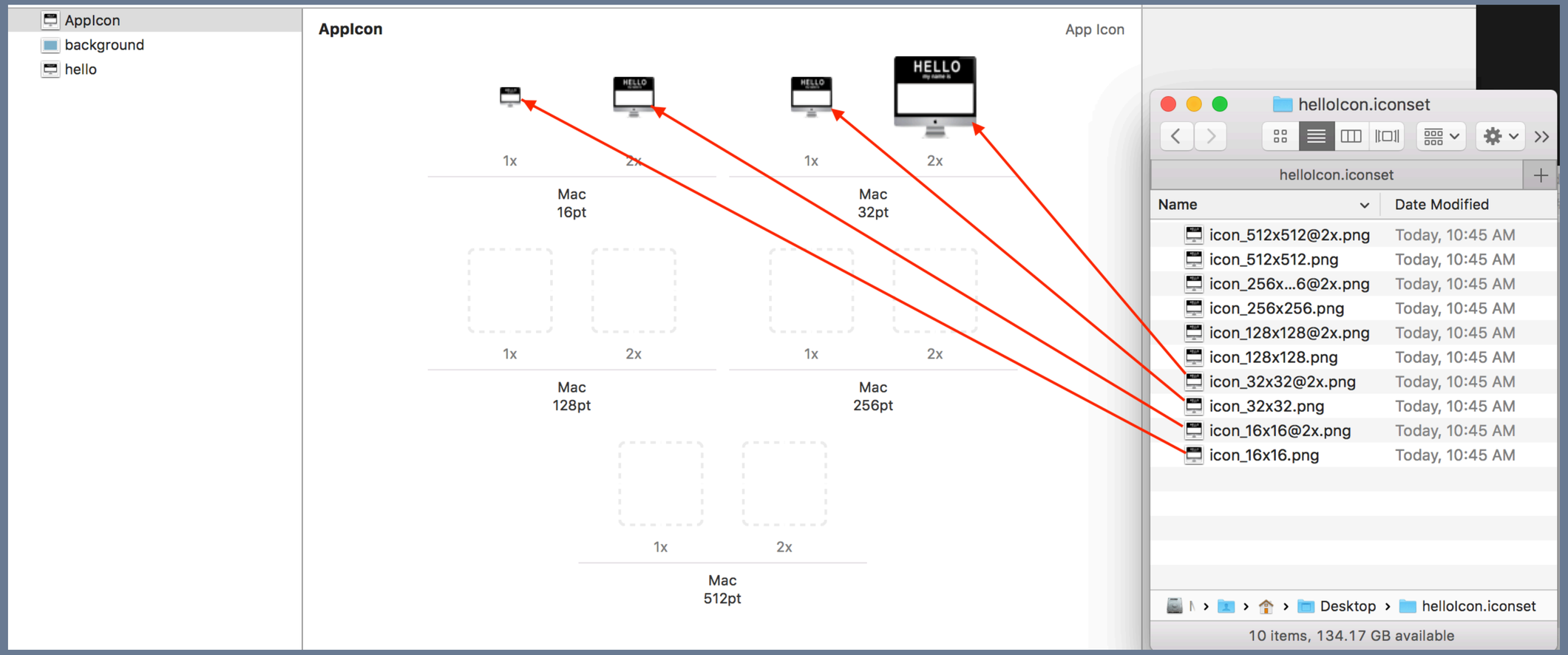
https://github.com/BIG-RAT/MacAdmins2017/blob/master/createIconSet.sh.zip

```
#!/bin/bash

## used to create square png files from single png file
## helpful when creating icons for Xcode apps

theImage="$1"
fileName=$(basename "$1" | sed -e 's/.png//')
username=$(stat -f%Su /dev/console)
mkdir "/Users/$username/Desktop/$fileName.iconset"

for i in 16 32 128 256 512; do
        newName="icon_"$i"x"$i".png"
        retinaName="icon_"$i"x"$i"@2x.png"
        /bin/cp "$1" "/Users/$username/Desktop/$fileName.iconset/$newName"
        /bin/cp "$1" "/Users/$username/Desktop/$fileName.iconset/$retinaName"
        /usr/bin/sips "/Users/$username/Desktop/$fileName.iconset/$newName" -z $i $i
        /usr/bin/sips "/Users/$username/Desktop/$fileName.iconset/$retinaName" -z $(( i*2 )) $(( i*2 ))
done

/usr/bin/iconutil -c icns "/Users/$username/Desktop/$fileName.iconset"
```

Run the script in Terminal, passing the helloIcon.png as a parameter.

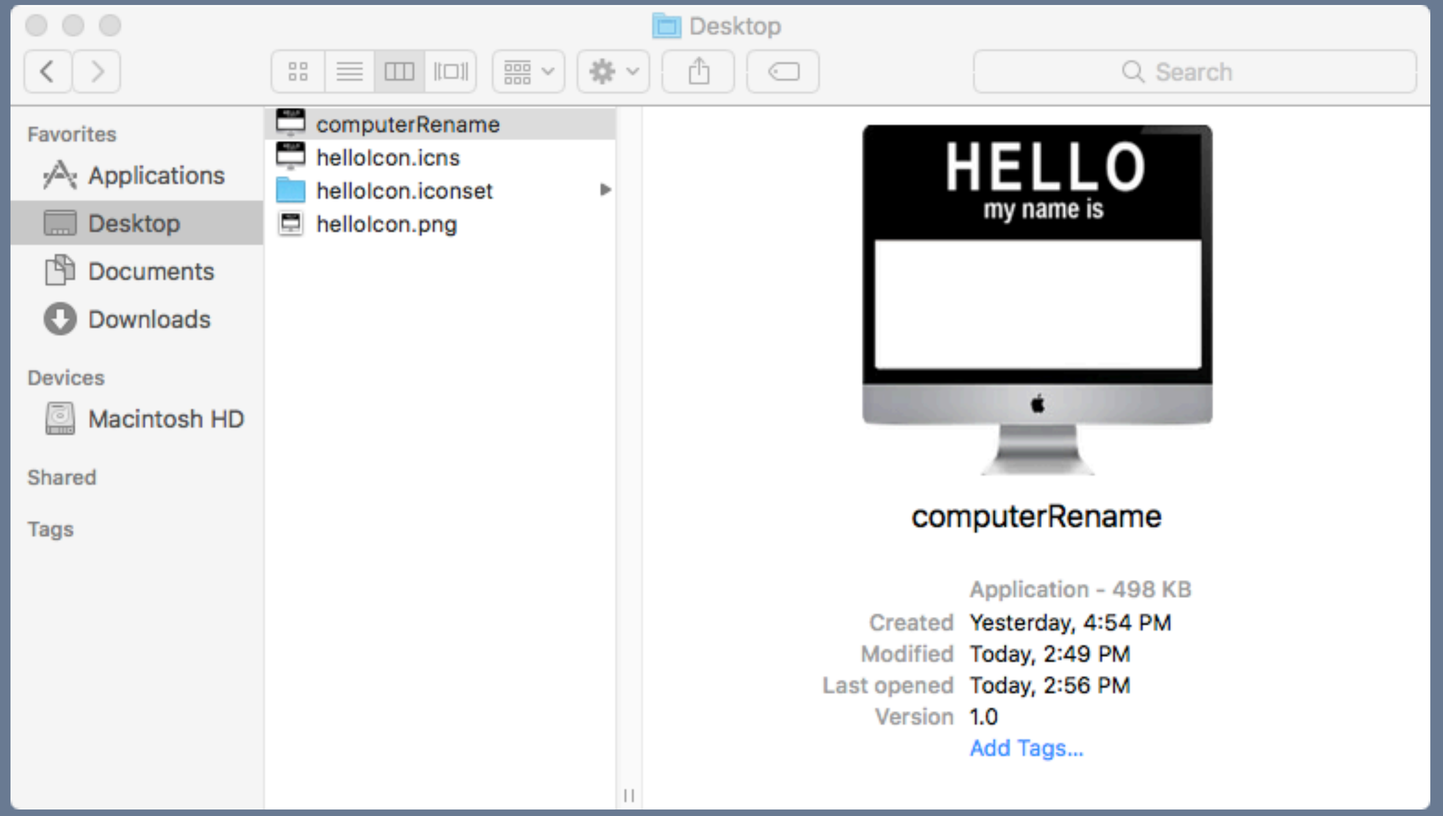


From the folder created on the Desktop, drag the images to the appropriate location in the project.



Once all the images have been placed rebuild the application.

Locate the application in the Finder, the new icon should be displayed.



Time now to make the application function properly if double-clicked.

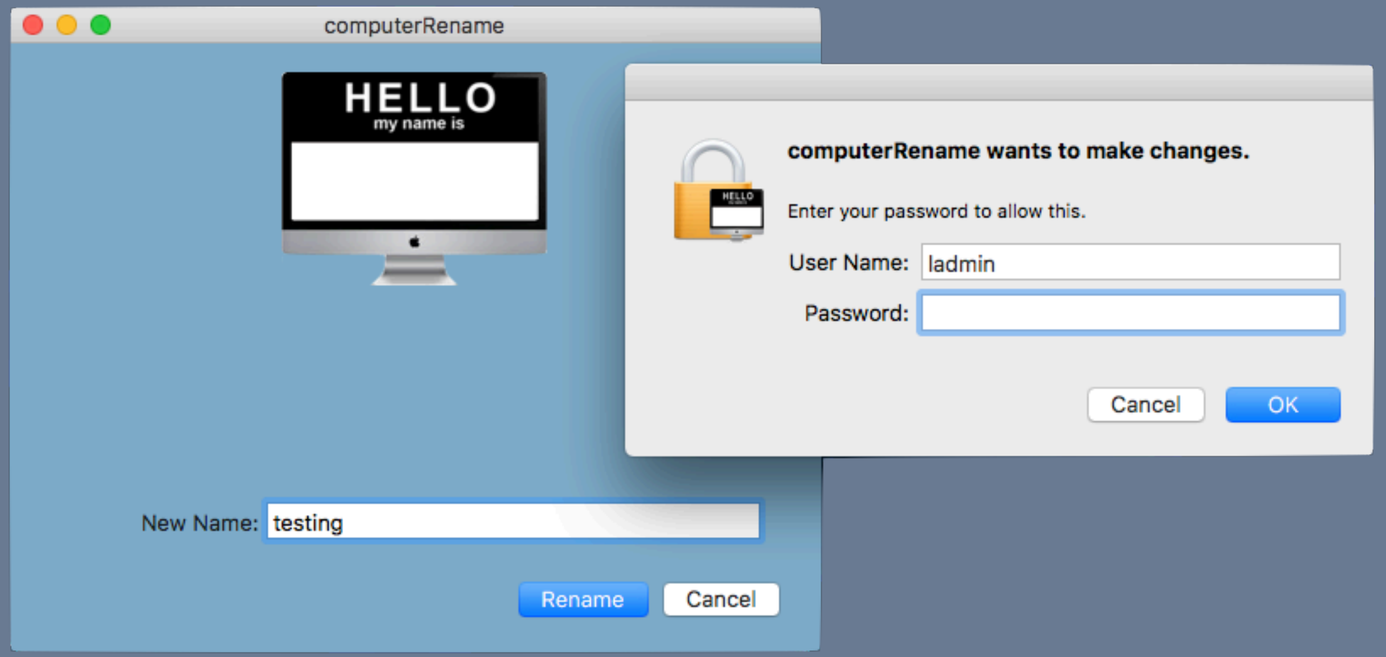
Current Code:

```
spinner's startAnimation_(me)

do shell script ("\
/usr/sbin/scutil --set ComputerName \"" & newName & "\"\
/usr/sbin/scutil --set LocalHostName \"" & newName & "\"\
/usr/sbin/scutil --set HostName \"" & newName & "\"\
\
jamfBin=$(which jamf)\
$jamfBin recon > /tmp/recon.txt 2>&1 &")
```

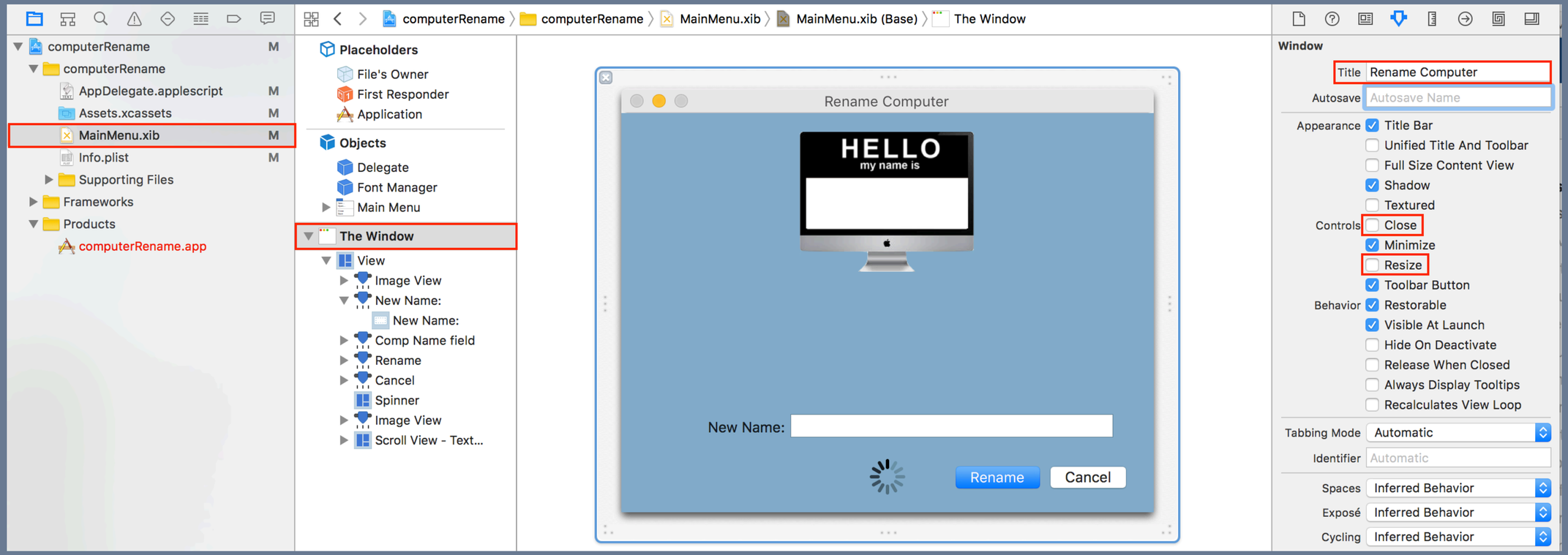
Updated Code:

```
do shell script ("\
/usr/sbin/scutil --set ComputerName \"" & newName & "\"\
/usr/sbin/scutil --set LocalHostName \"" & newName & "\"\
/usr/sbin/scutil --set HostName \"" & newName & "\"\
\
/usr/local/bin/jamf recon > /tmp/recon.txt 2>&1 &") with administrator privileges

spinner's startAnimation_(me)
```

Let’s build the application and launch it from the Finder.



Minor adjustments to the application window.



One more time, build the application. How does it look? Can we resize the window?

Thank you!

(again)

Feedback: https://bit.ly/psumac2017-141