HECK YEA, IT'S CCLAB!

Get your projects up and running!

INTRO TO openFrameworks

Intro to oF

C++ versus openFrameworks

What's the difference?

C++ is an imperative, object-oriented programming language.

Intro to oF

Intro to oF

openFrameworks is a collection of C++ libraries wrapped up by a layer that makes them uniform and easier to work with.

Intro to oF

Eyewriter

http://vimeo.com/6376466

Members of Free Art and Technology (FAT), OpenFrameworks and the Graffiti Resarch Lab: Tempt1, Evan Roth, Chris Sugrue, Zach Lieberman,Theo Watson and James Powderly.

Starry Night

http://vimeo.com/39353818

Petros Vrellis

Faces

http://vimeo.com/29279198

Arturo Castro and Kyle McDonald

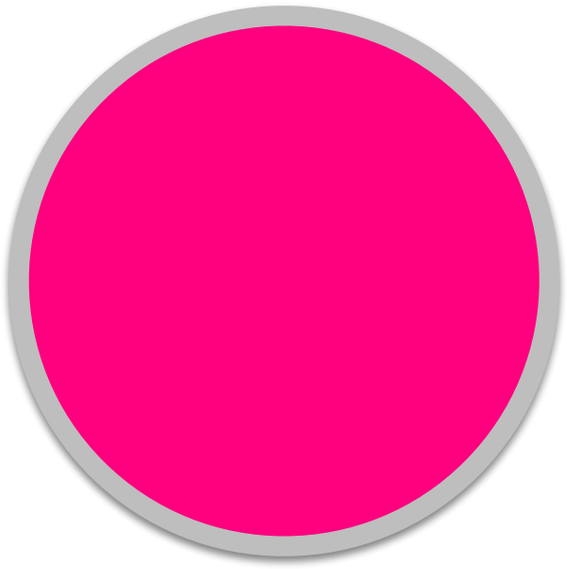
Intro to oF

openFrameworks Syntax

oF Syntax

```
ofRect(x, y, w, h);
```

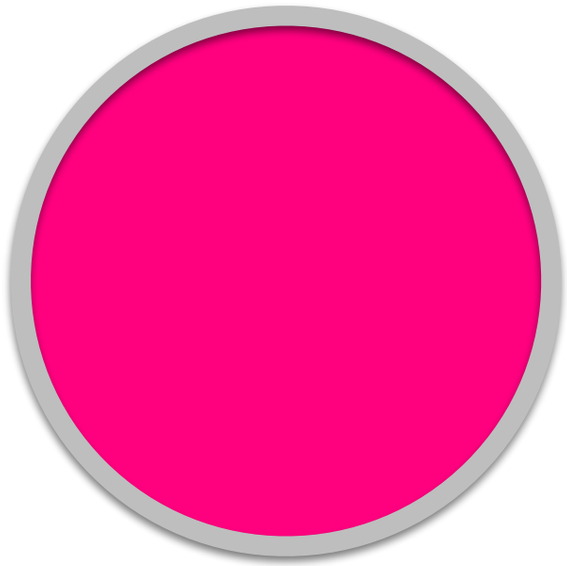
oF Syntax



```
fill(255,0,127);
stroke(255,255,255);
ellipse(100,100,50,70);
```

oF Syntax

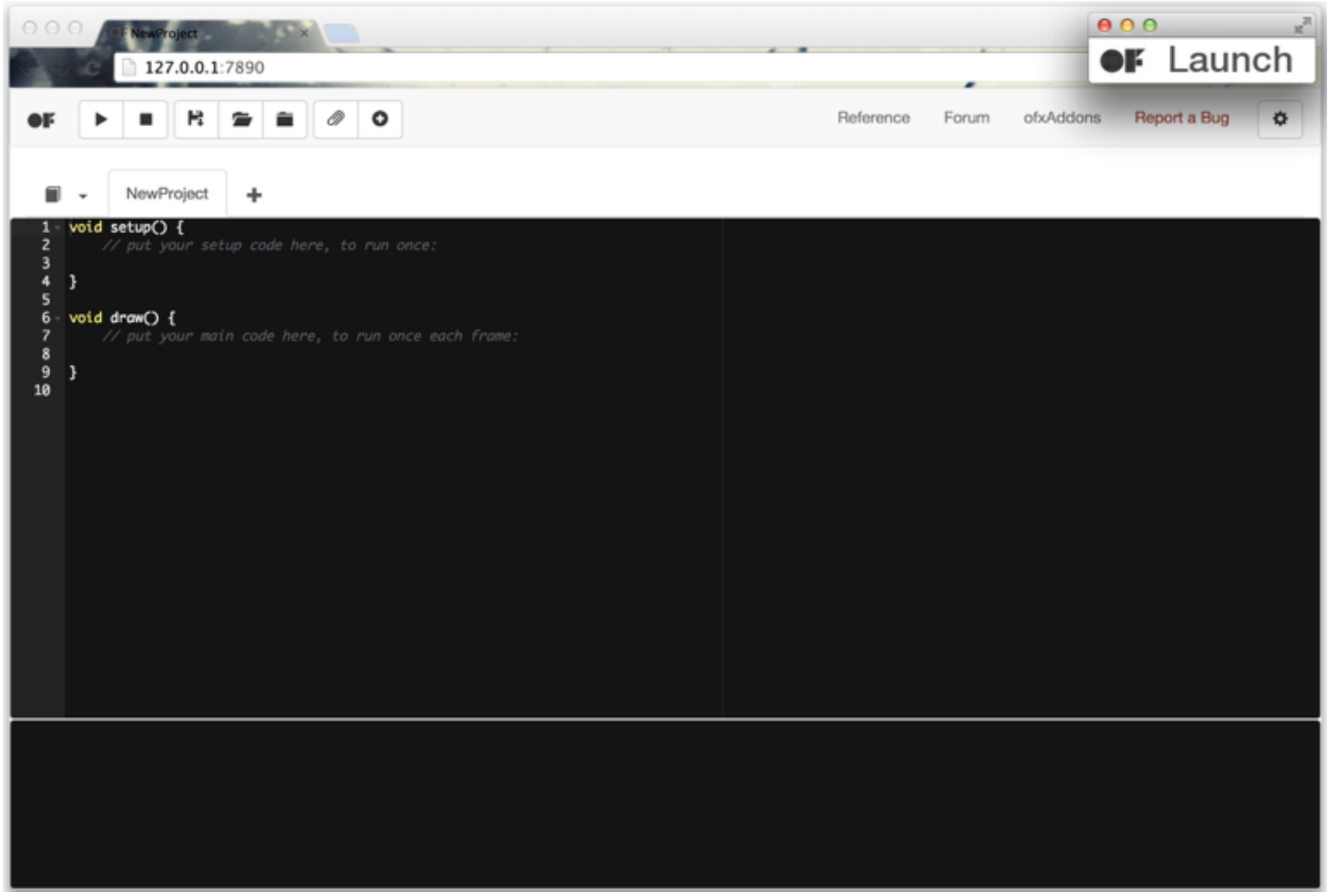
```
// draw the circle fill
ofSetColor(255,0,127);
ofFill();
ofEllipse(100,100,50,70);

// now draw the outline
ofNoFill();
ofSetColor(255,255,255);
ofEllipse(100, 100, 50, 70);
```



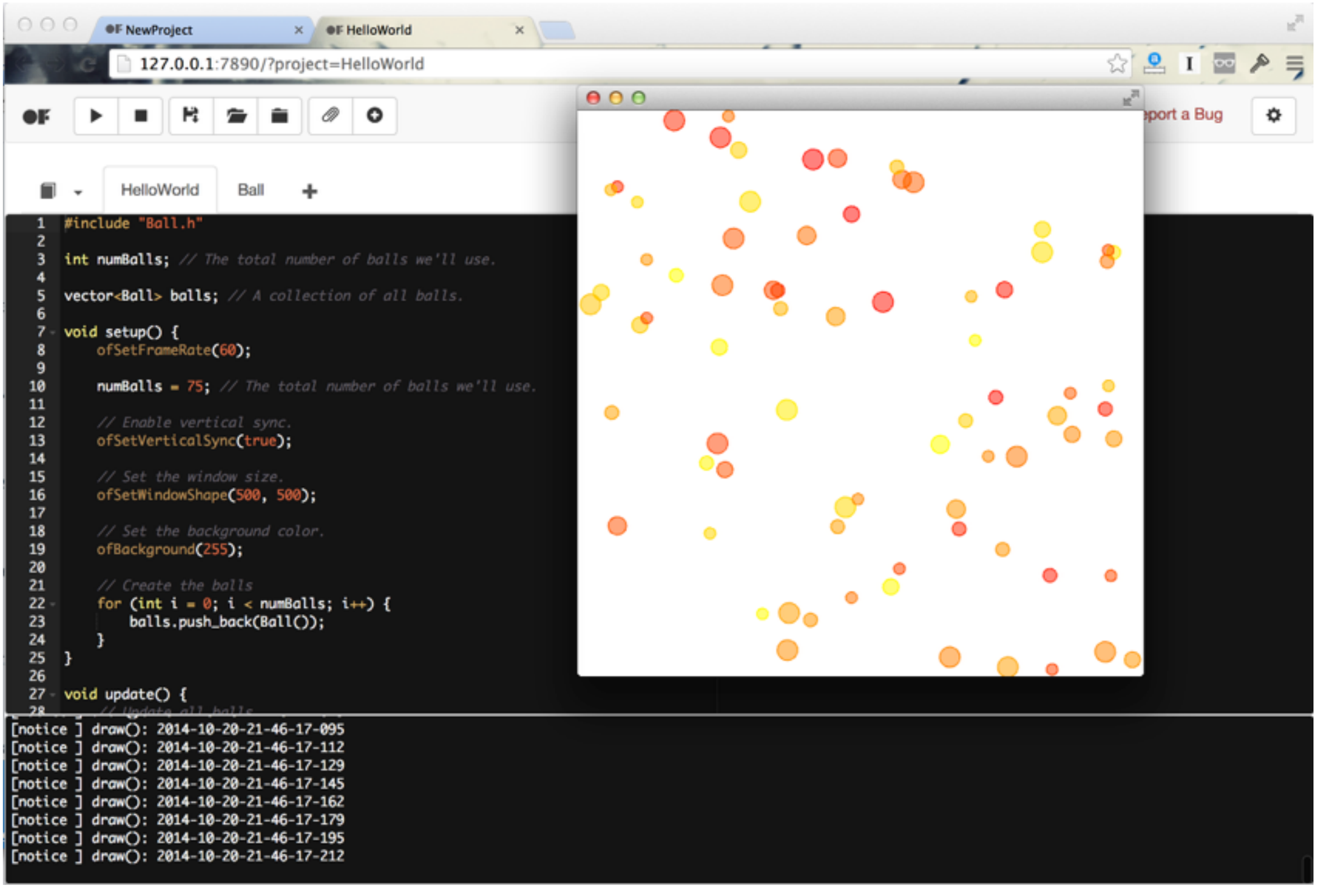
oF Syntax

http://openframeworks.cc/documentation/

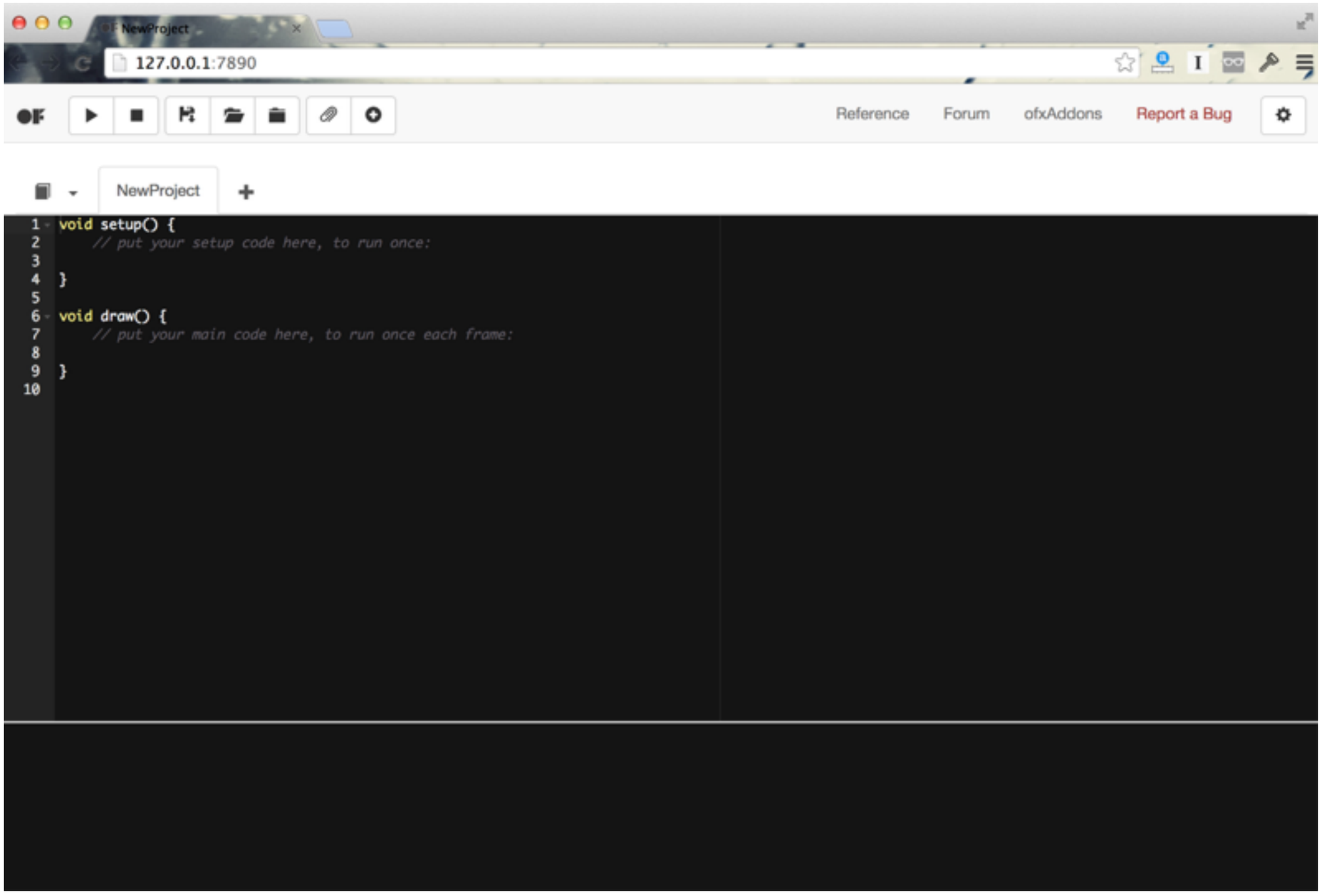
oF Syntax


NewProject
127.0.0.1:7890
Launch
Reference
Forum
ofxAddons
Report a Bug
NewProject
1 void setup() {
2 // put your setup code here, to run once:
3
4 }
5
6 void draw() {
7 // put your main code here, to run once each frame:
8
9 }
10

oF Syntax


NewProject
HelloWorld
127.0.0.1:7890/?project=HelloWorld
HelloWorld
Ball
#include "Ball.h"
int numBalls; // The total number of balls we'll use.
vector<Ball> balls; // A collection of all balls.
void setup() {
ofSetFrameRate(60);
numBalls = 75; // The total number of balls we'll use.
// Enable vertical sync.
ofSetVerticalSync(true);
// Set the window size.
ofSetWindowShape(500, 500);
// Set the background color.
ofBackground(255);
// Create the balls
for (int i = 0; i < numBalls; i++) {
balls.push_back(Ball());
}
}
void update() {
[notice] draw(): 2014-10-20-21-46-17-095
[notice] draw(): 2014-10-20-21-46-17-112
[notice] draw(): 2014-10-20-21-46-17-129
[notice] draw(): 2014-10-20-21-46-17-145
[notice] draw(): 2014-10-20-21-46-17-162
[notice] draw(): 2014-10-20-21-46-17-179
[notice] draw(): 2014-10-20-21-46-17-195
[notice] draw(): 2014-10-20-21-46-17-212

oF Syntax


NewProject
127.0.0.1:7890
Reference
Forum
ofxAddons
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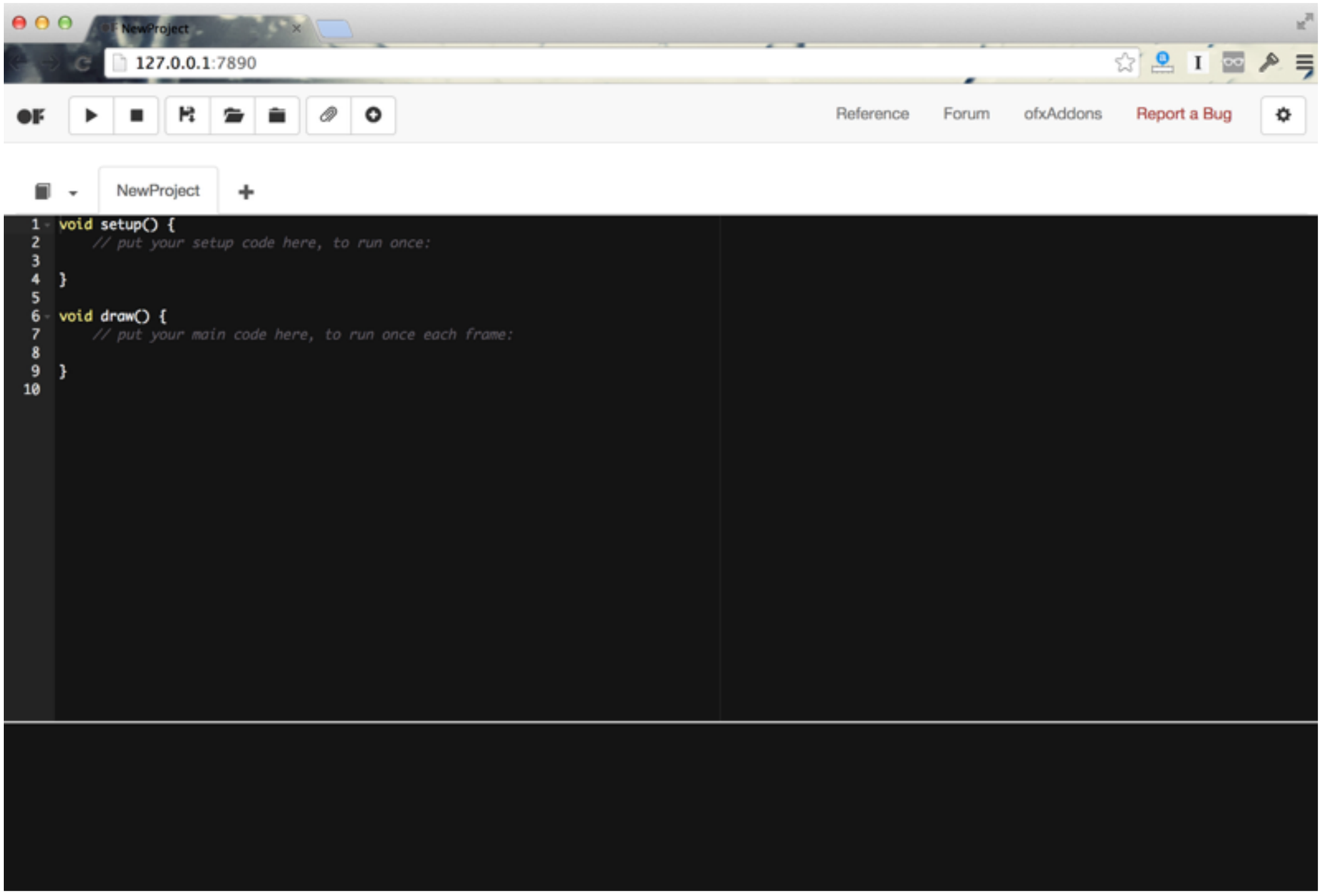
oF Syntax


NewProject
127.0.0.1:7890
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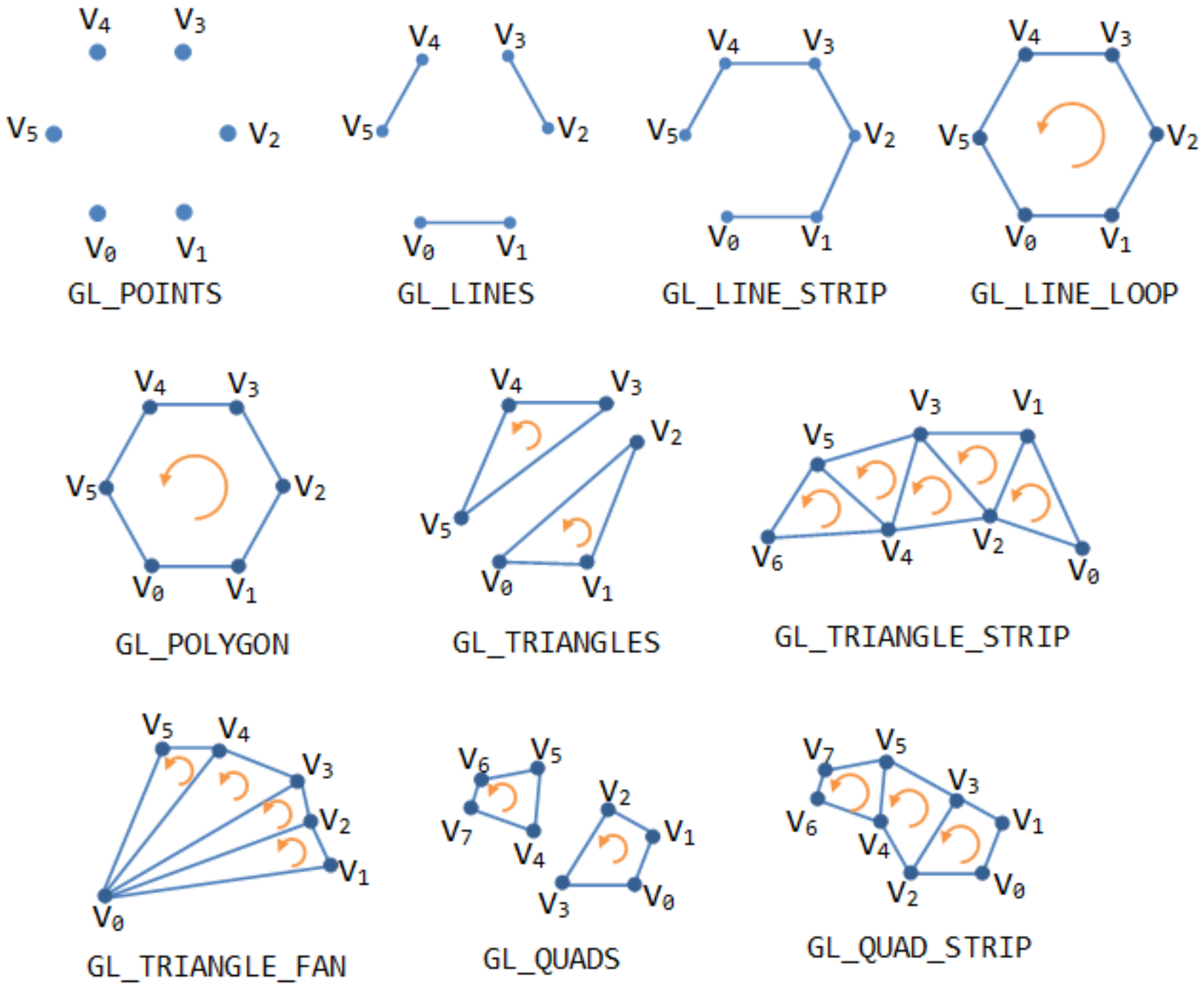
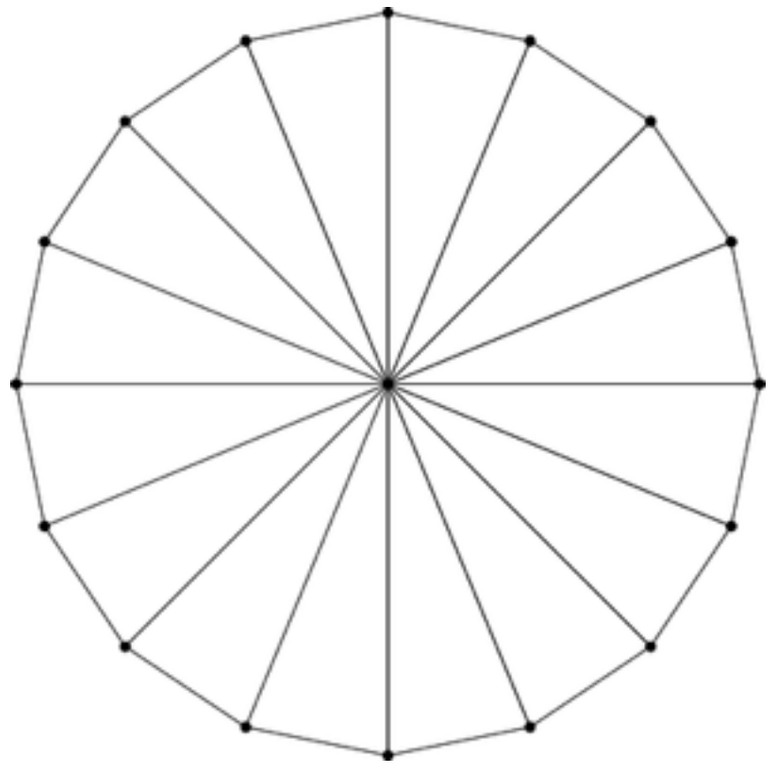
oF Syntax



OpenGL Primitives

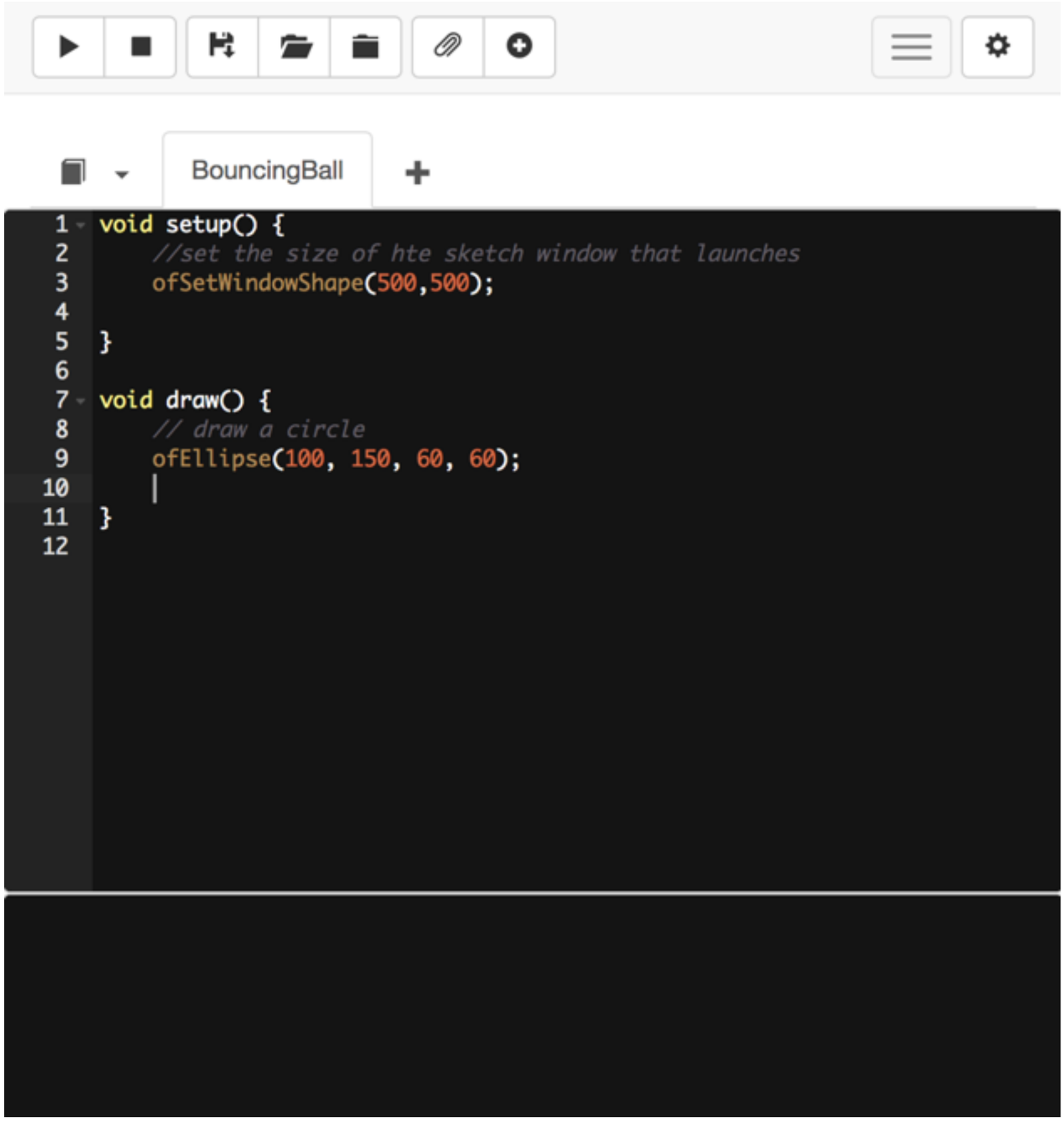
oF Syntax

so how do we draw a circle?



ofSetCircleResolution(16);

oF Syntax


BouncingBall
1 void setup() {
2 //set the size of hte sketch window that launches
3 ofSetWindowShape(500,500);
4
5 }
6
7 void draw() {
8 // draw a circle
9 ofEllipse(100, 150, 60, 60);
10
11 }
12

oF Syntax

BouncingBall

```
1  void setup() {
2      //set the size of hte sketch window that launches
3      ofSetWindowShape(500,500);
4
5      //openGL is drawing this circle as a series of triangles.
6      //We can specify how many triangles to fan per circle
7      ofSetCircleResolution(6);
8  }
9
10 void draw() {
11     // draw a circle
12     ofEllipse(100, 150, 60, 60);
13
14 }
15
```

oF Syntax

BouncingBall

```
1
2  // in ofSketch, you can declare your variables before your functions,
3  // just like Processing.
4
5  int xPos;
6  int xVel;
7
8  void setup() {
9      //set the size of hte sketch window that launches
10     ofSetWindowShape(500,500);
11
12     // initialize postion and speed varaibles
13     xPos = 0;
14     xVel = 5;
15 }
16
17 void draw() {
18     // draw an ellipse or a circle that is located in the middle of
19     //the Y axis, has a varying x position and a radius of 10
20     ofCircle(xPos, ofGetHeight()/2, 10);
21
22     //increase the position by the "velocity" amount every frame
23     //so that it animates across the screen.
24     //shorthand for this would be xPos += xVel;
25     xPos = xPos + xVel;
26 }
27
```

oF Syntax

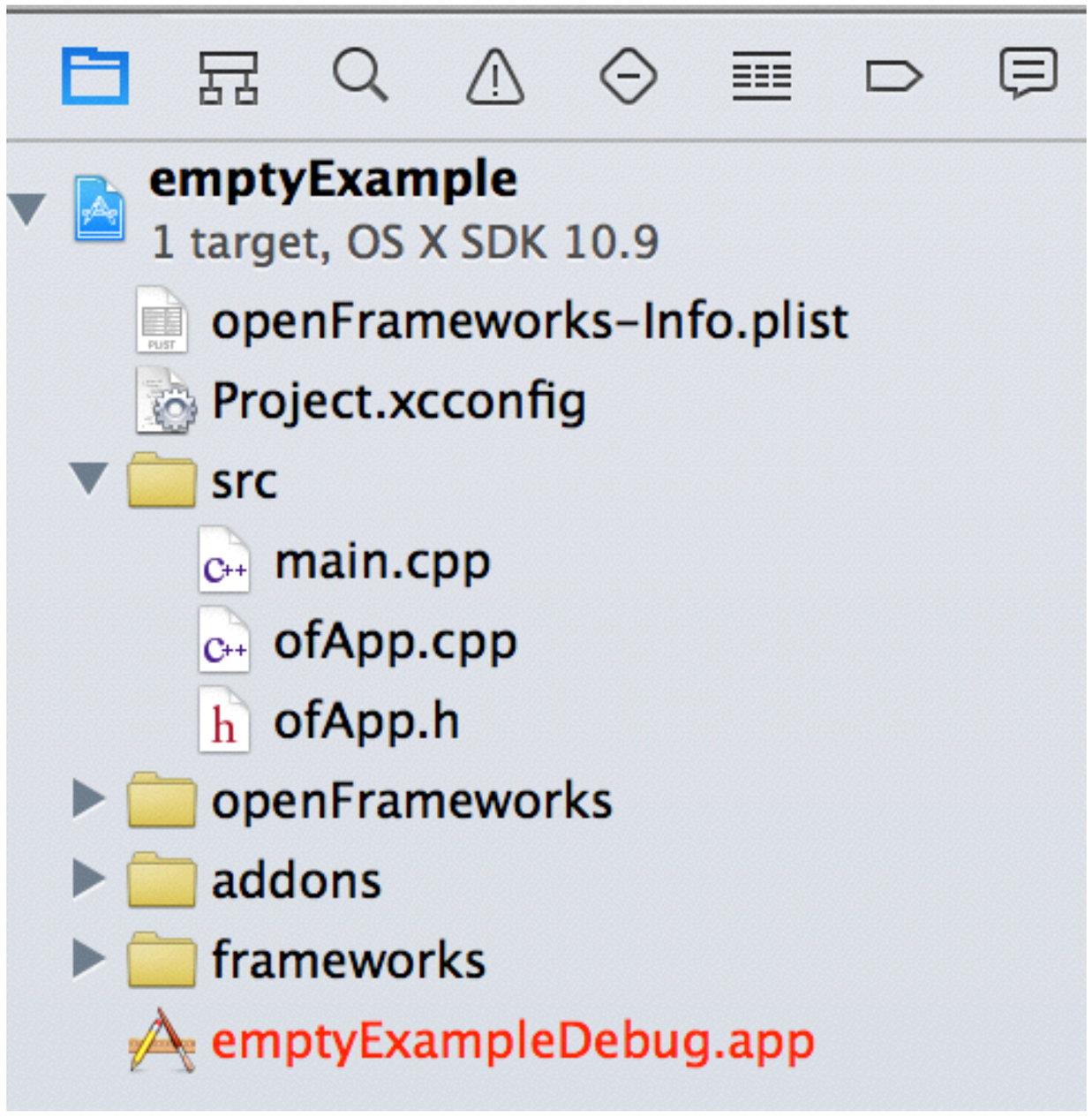
oF IDE

Using the IDE

oF IDE

oF > apps > myApps > emptyExample

oF IDE


emptyExample
1 target, OS X SDK 10.9
openFrameworks-Info.plist
Project.xcconfig
src
main.cpp
ofApp.cpp
ofApp.h
openFrameworks
addons
frameworks
emptyExampleDebug.app

oF IDE

.h stands for **.header**

the “definition” file

.cpp stands for **C++**

the “implementation” file

oF IDE

Pressure Cooker Short Ribs

Servings: 2-4 **Time:** 2 hours **Difficulty:** Easy Print

2 tbsp ghee
1-2 lbs short ribs, cut at the rib (I used 4 ribs)
1 onion, coarsely chopped
1 carrot, coarsely chopped
2 cloves garlic, minced
1 tsp dried thyme
1 tsp salt
1/2 tsp black pepper
2 tbsp brandy (1/4 cup white wine okay)
1 tbsp maple syrup
2 cups chicken broth

.h

1. Heat the ghee in your pressure cooker over medium heat (or under the "Sauté" setting in an Instant Pot). Add the short ribs and brown, in batches if needed, about 3 minutes per side, then set aside. Add the chopped onion and carrot and sauté until softened, about 5 minutes.

2. Add the garlic and sauté for another minute, then add the thyme, salt, pepper, brandy, and maple syrup. Allow to sauté until the liquid mostly evaporates, about a minute, then add the chicken broth. Scrape up any browned bits with your spoon, then return the short ribs to the pot. You should have enough liquid to reach halfway up the ribs.

3. Secure the lid and bring to high pressure over med/high heat (or select the "Meat/Stew" option on your Instant Pot). Cook for 50 minutes. If you're using a conventional pressure cooker, be sure to reduce heat and adjust as needed to maintain pressure. If you're using a dutch oven, cover and simmer on low until tender, about 3 hours.

4. After depressurizing, remove the lid and carefully remove the short ribs (they'll be falling off the bone) and place on a plate; loosely cover with tin foil. Pour the braising liquid into a blender and blend until smooth, then transfer back to the pressure cooker. Bring to a simmer over med/high heat and reduce by 1/4, about five minutes. Taste for salt and pepper, adding if needed.

5. Plate your dish by pouring the liquid into a shallow bowl and placing the ribs on top. Serve with rice, potatoes, or just about anything.

.cpp

Putting the files together (3 Step Process)

oF IDE

```
#pragma once

#include "ofMain.h"
```

STEP TWO: COMPILE

STEP THREE: LINK

ofEllipse(x,y,w,h);

ofApp.o

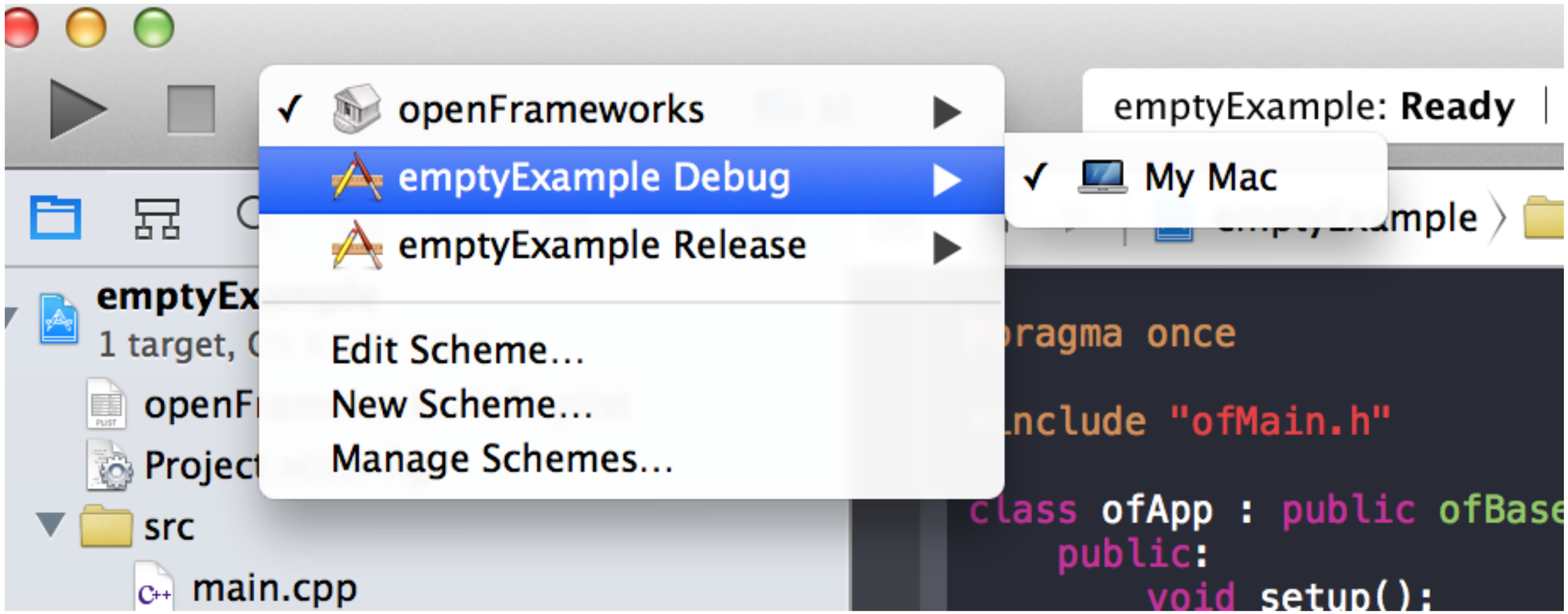
ofGraphics.o,

Writing oF

Let’s try coding!

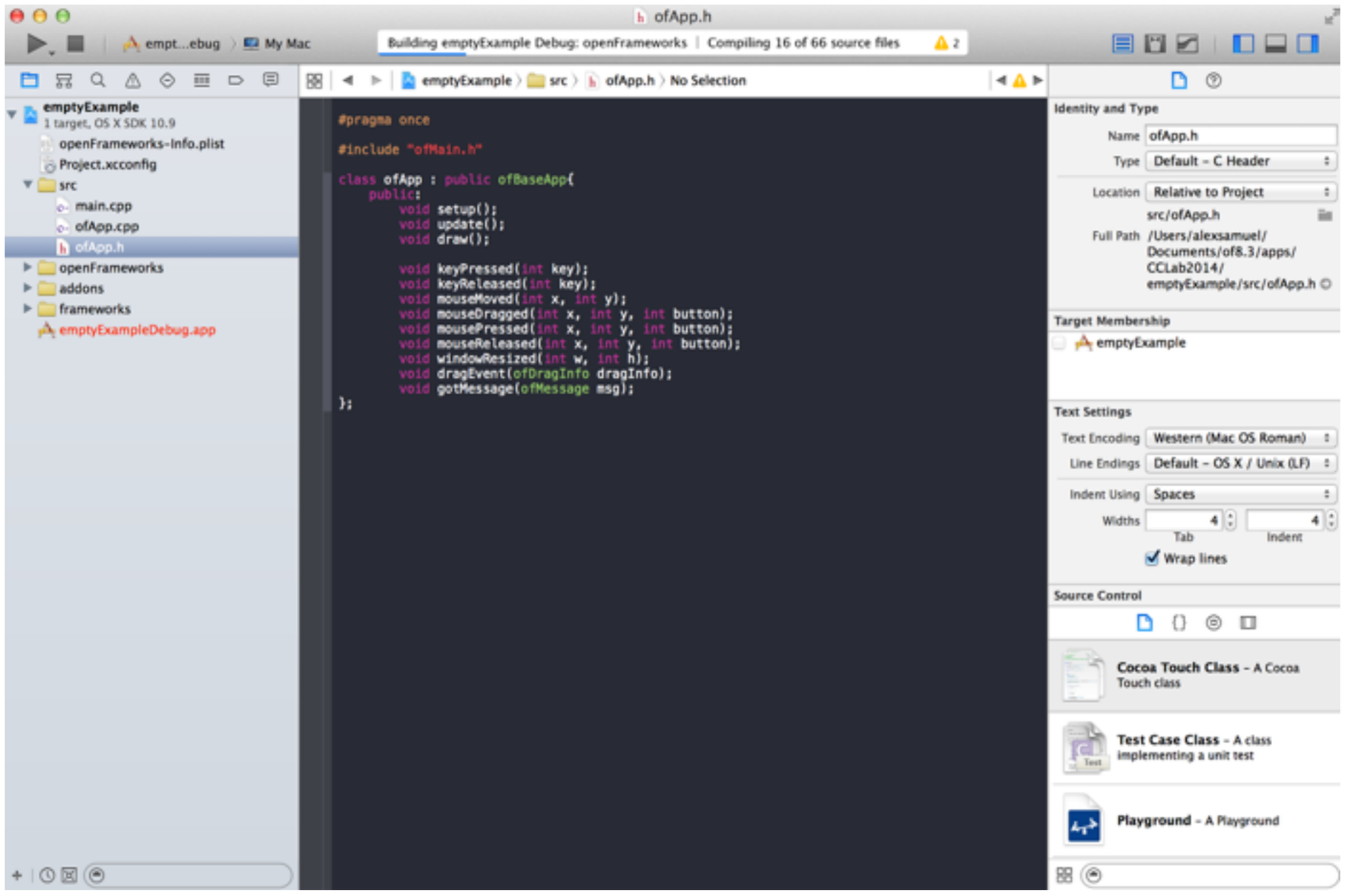
Writing oF

Double check the debugger.



Writing oF

Run the empty example.



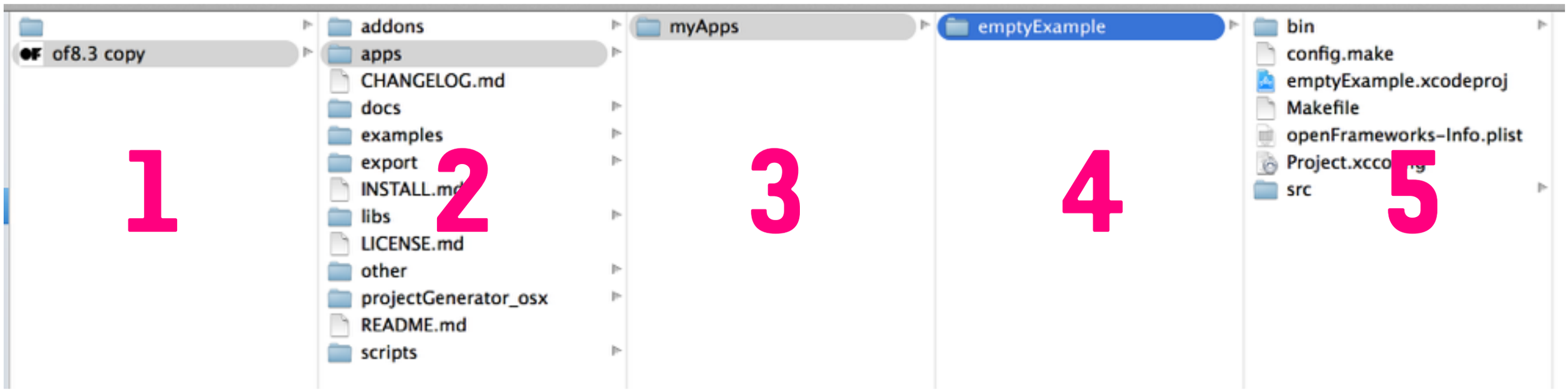
Writing oF

Main functions in ofApp.cpp
(setup / update / draw)

Writing oF

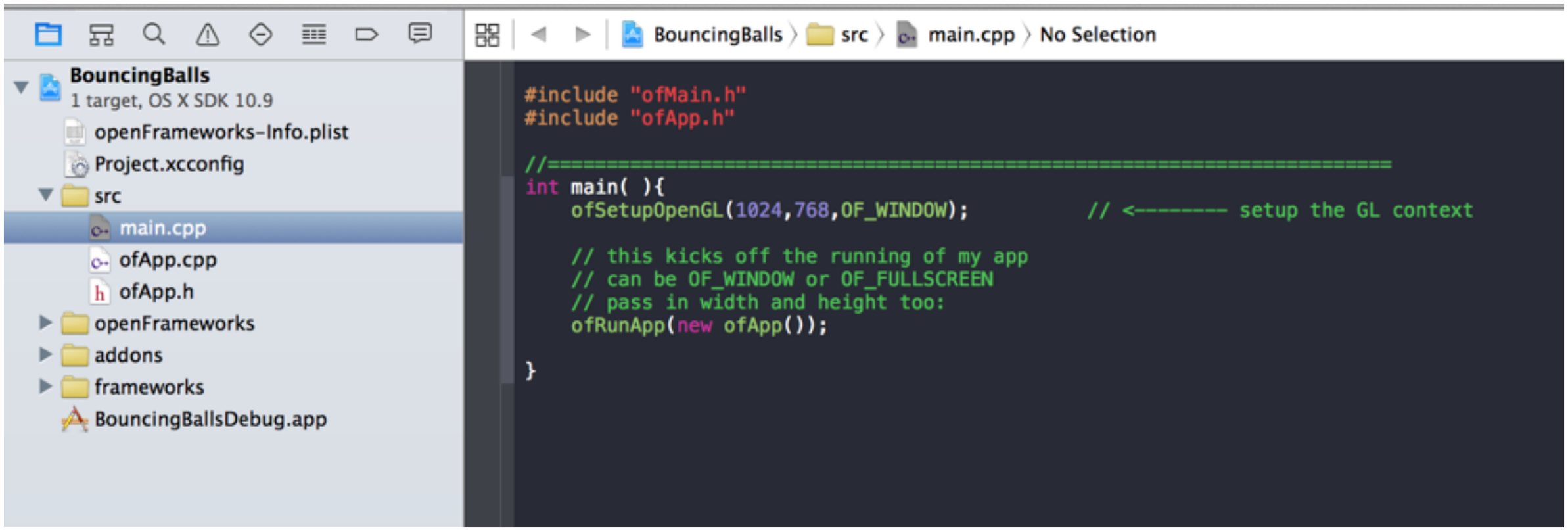

PROJECT
GENERATOR
Name: BouncingBalls
<< CLICK TO CHANGE THE NAME
Path: /Users/alexsamuel/Documents/of_v0.8.4_osx_release/
apps/ccLab
<< CLICK TO CHANGE THE DIRECTORY
Platforms: osx (xcode)
Addons:
<< CLICK TO SELECT ADDONS
GENERATE PROJECT
generated: /Users/alexsamuel/Documents/of_v0.8.4_osx_release/apps/ccLab/BouncingBalls

Writing oF

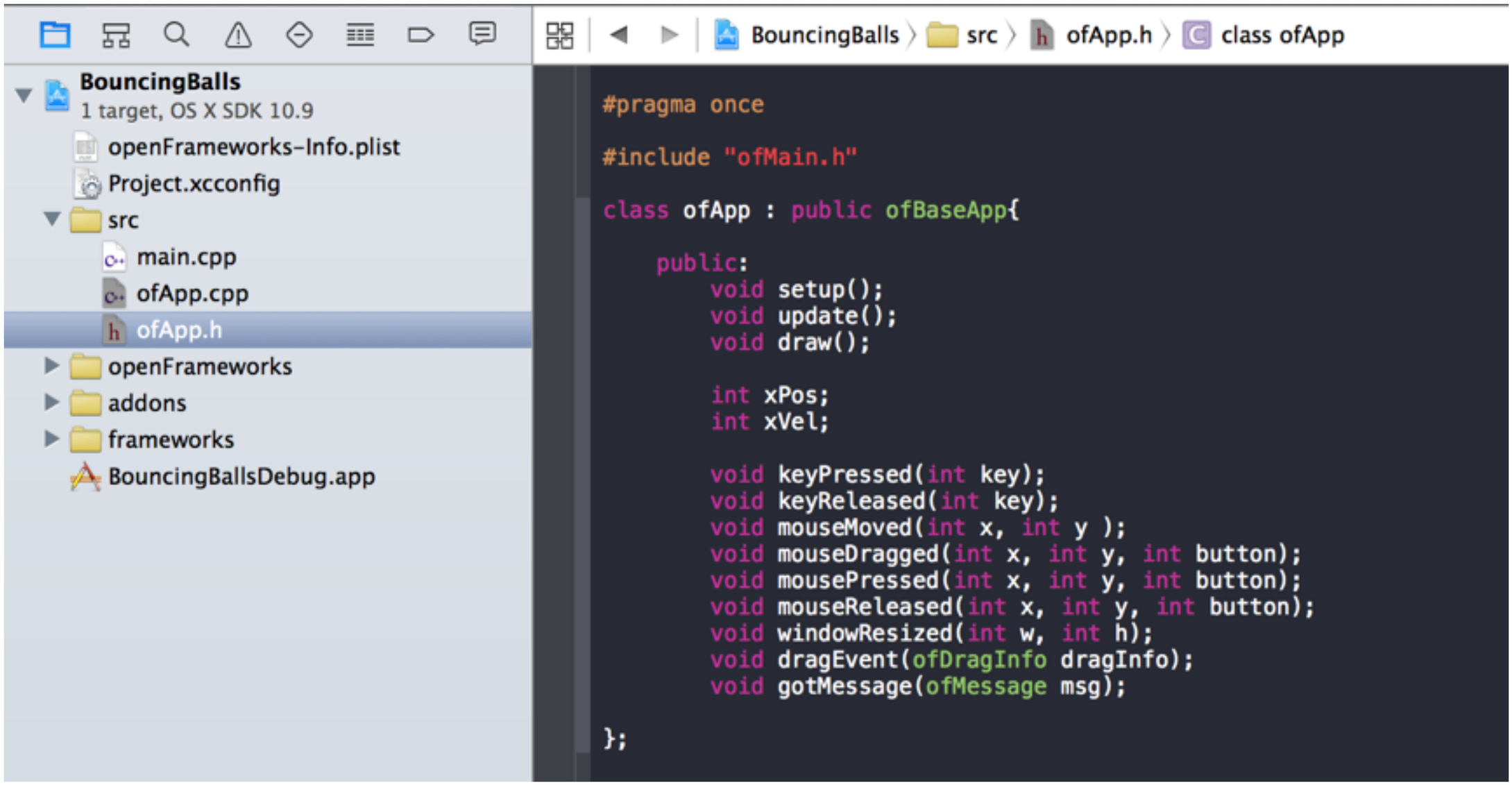


(always!)

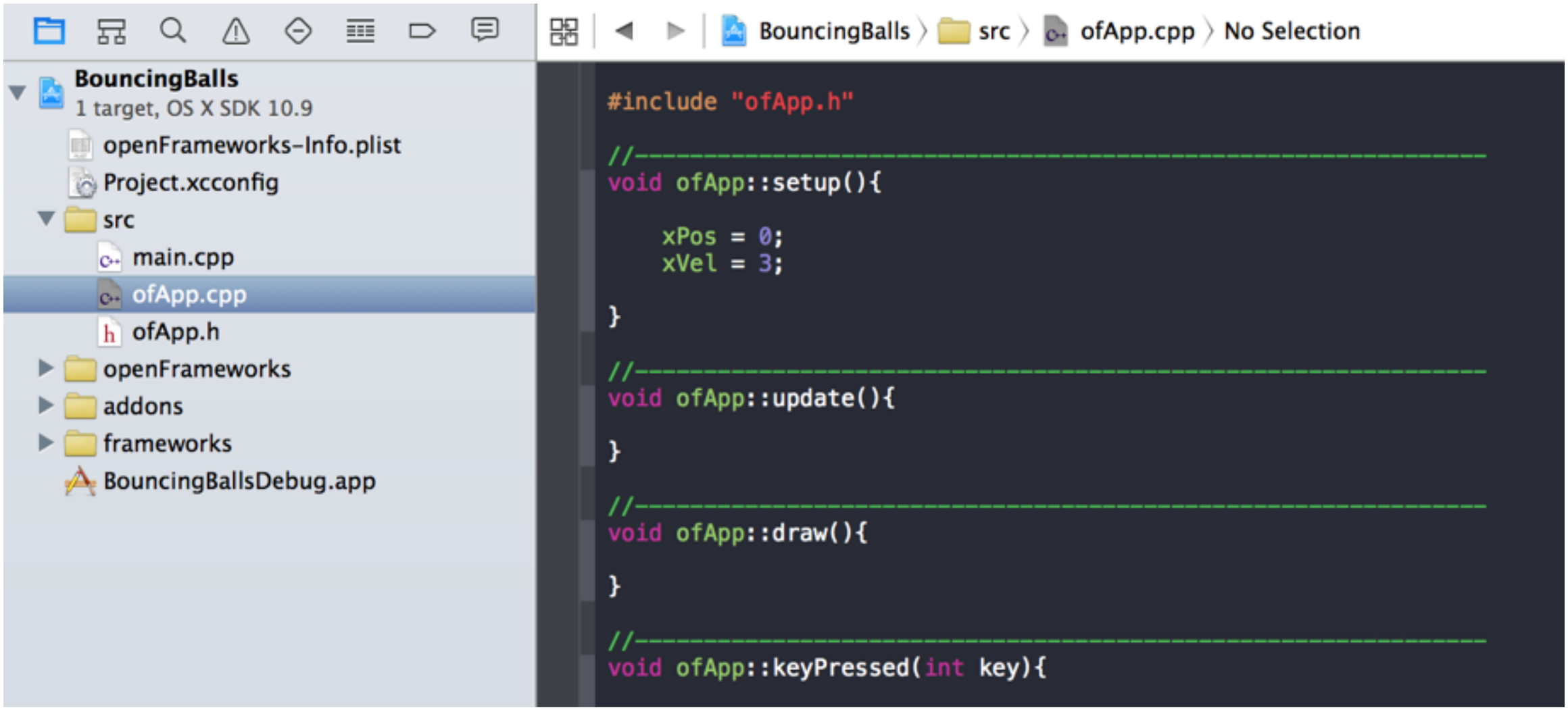
Writing oF


BouncingBalls
1 target, OS X SDK 10.9
openFrameworks-Info.plist
Project.xcconfig
src
main.cpp
ofApp.cpp
ofApp.h
openFrameworks
addons
frameworks
BouncingBallsDebug.app
BouncingBalls
src
main.cpp
No Selection
#include "ofMain.h"
#include "ofApp.h"
//==
int main( ){
ofSetupOpenGL(1024,768,OF_WINDOW); // <-------- setup the GL context
// this kicks off the running of my app
// can be OF_WINDOW or OF_FULLSCREEN
// pass in width and height too:
ofRunApp(new ofApp());
}

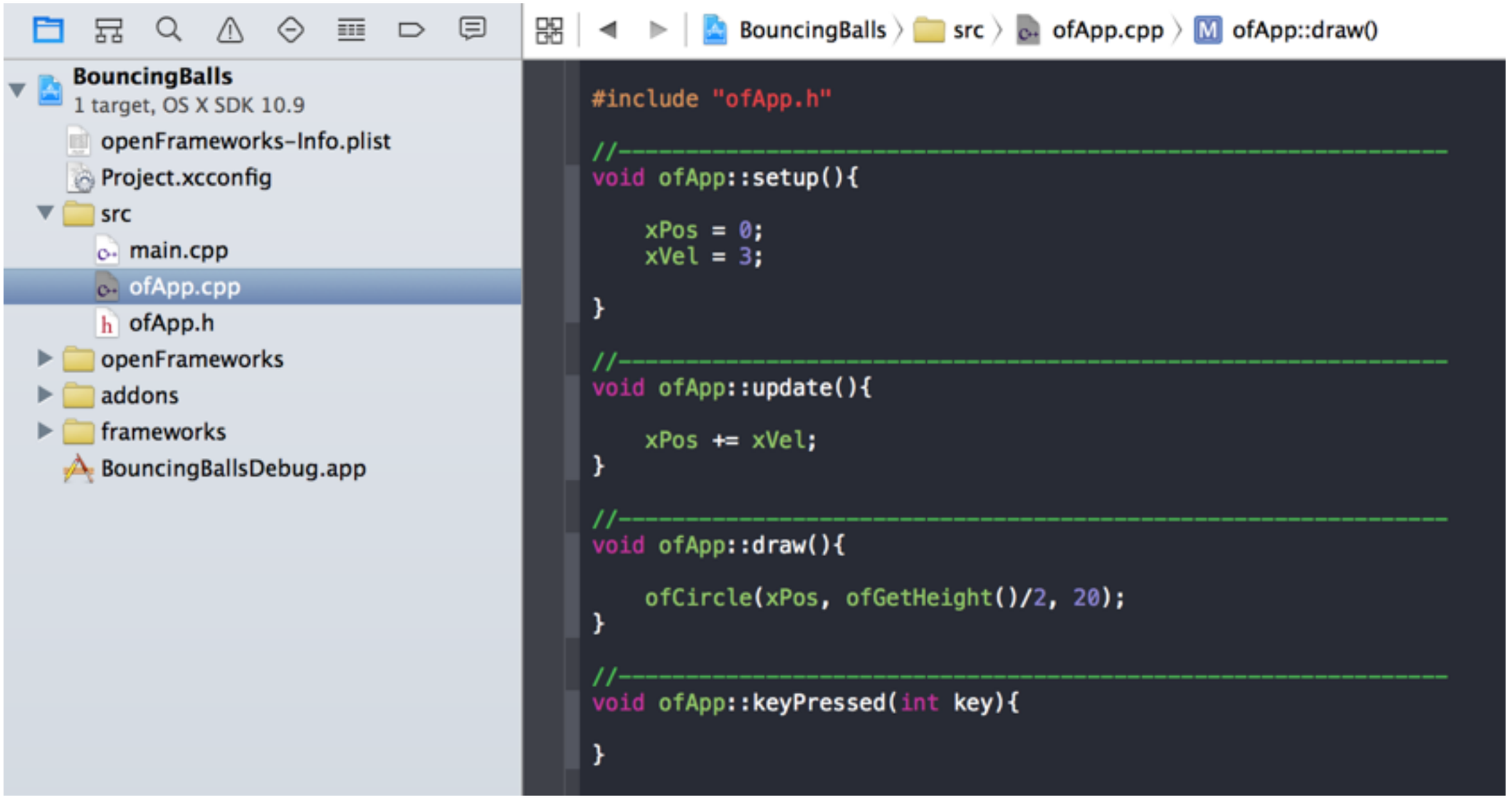
Writing oF


BouncingBalls
1 target, OS X SDK 10.9
openFrameworks-Info.plist
Project.xcconfig
src
main.cpp
ofApp.cpp
ofApp.h
openFrameworks
addons
frameworks
BouncingBallsDebug.app
BouncingBalls
src
ofApp.h
class ofApp
#pragma once
#include "ofMain.h"
class ofApp : public ofBaseApp{
public:
void setup();
void update();
void draw();
int xPos;
int xVel;
void keyPressed(int key);
void keyReleased(int key);
void mouseMoved(int x, int y);
void mouseDragged(int x, int y, int button);
void mousePressed(int x, int y, int button);
void mouseReleased(int x, int y, int button);
void windowResized(int w, int h);
void dragEvent(ofDragInfo dragInfo);
void gotMessage(ofMessage msg);
};

Writing oF

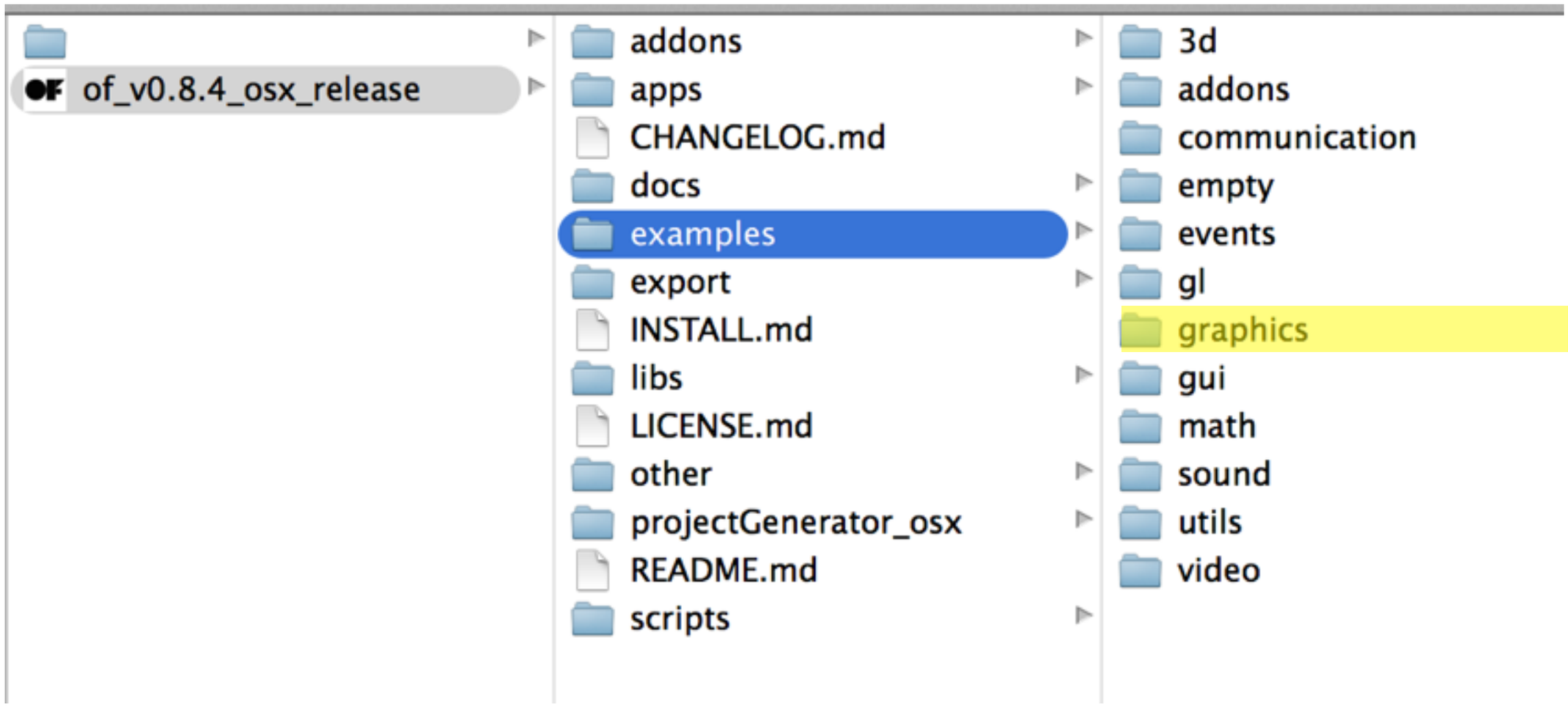

BouncingBalls
1 target, OS X SDK 10.9
openFrameworks-Info.plist
Project.xcconfig
src
main.cpp
ofApp.cpp
ofApp.h
openFrameworks
addons
frameworks
BouncingBallsDebug.app
BouncingBalls
src
ofApp.cpp
No Selection
#include "ofApp.h"
//--
void ofApp::setup(){
xPos = 0;
xVel = 3;
}
//--
void ofApp::update(){
}
//--
void ofApp::draw(){
}
//--
void ofApp::keyPressed(int key){

Writing oF


BouncingBalls
1 target, OS X SDK 10.9
openFrameworks-Info.plist
Project.xcconfig
src
main.cpp
ofApp.cpp
ofApp.h
openFrameworks
addons
frameworks
BouncingBallsDebug.app
BouncingBalls
src
ofApp.cpp
ofApp::draw()
#include "ofApp.h"
//--
void ofApp::setup(){
xPos = 0;
xVel = 3;
}
//--
void ofApp::update(){
xPos += xVel;
}
//--
void ofApp::draw(){
ofCircle(xPos, ofGetHeight()/2, 20);
}
//--
void ofApp::keyPressed(int key){
}

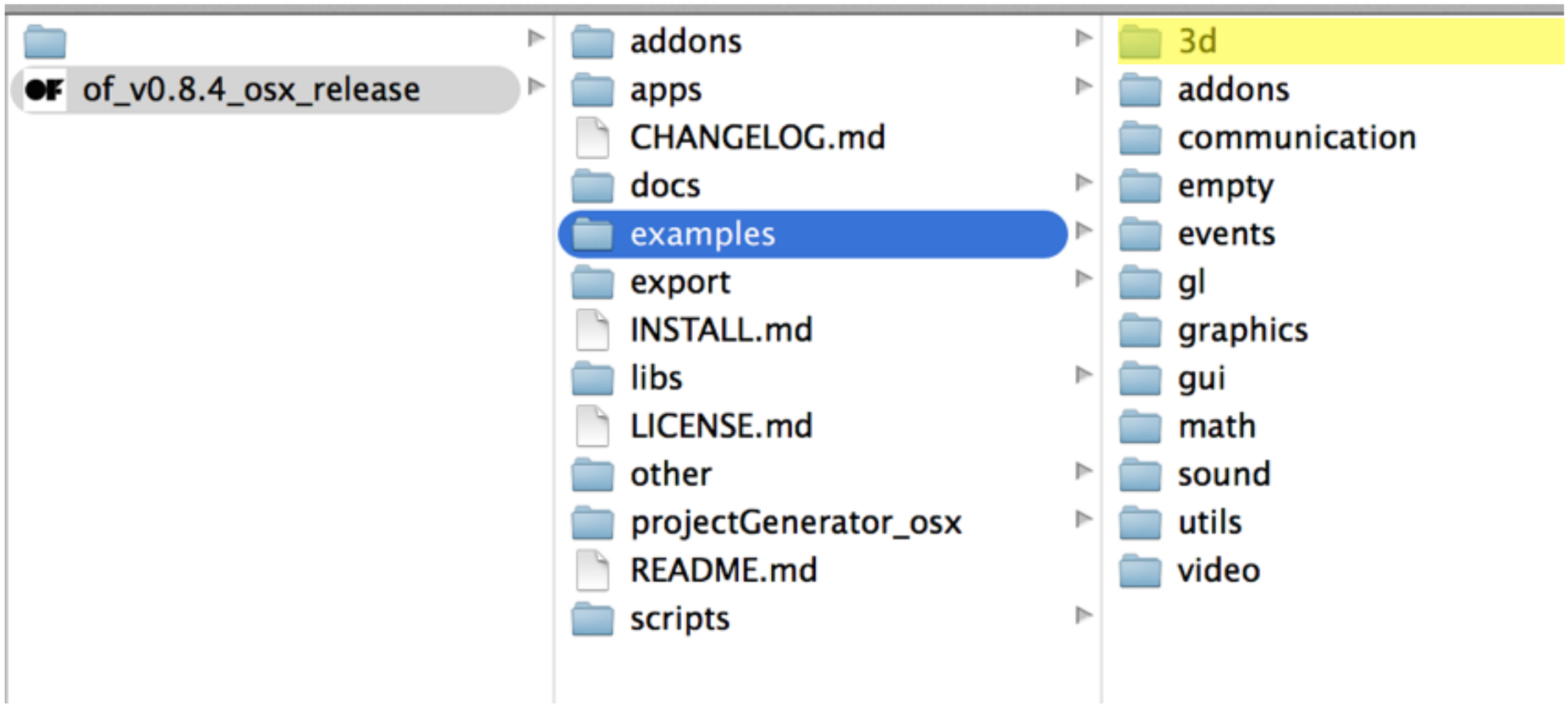
Writing oF

oF examples



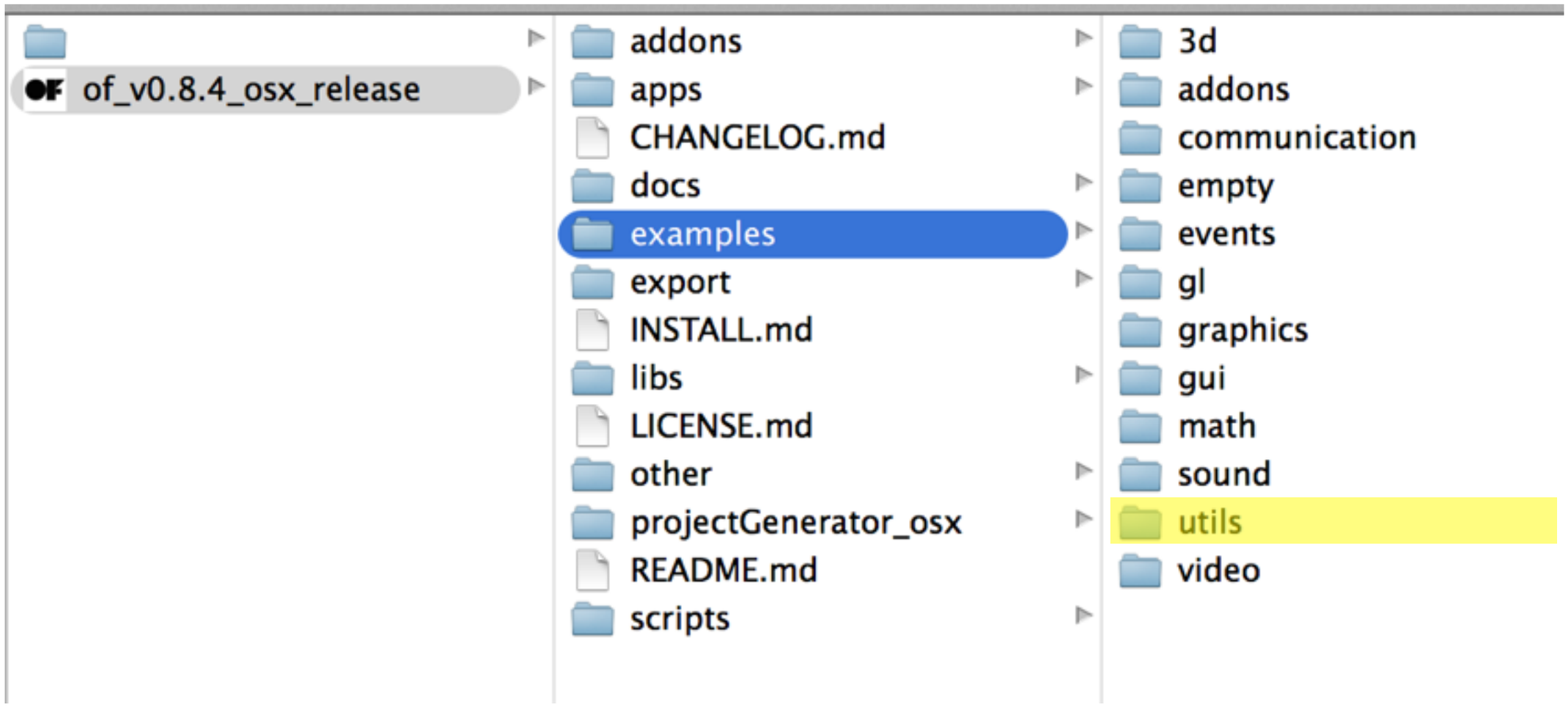
loading + saving images, 2D drawing methods, colors and styles, rendering to PDFs, typography and fonts.

oF examples



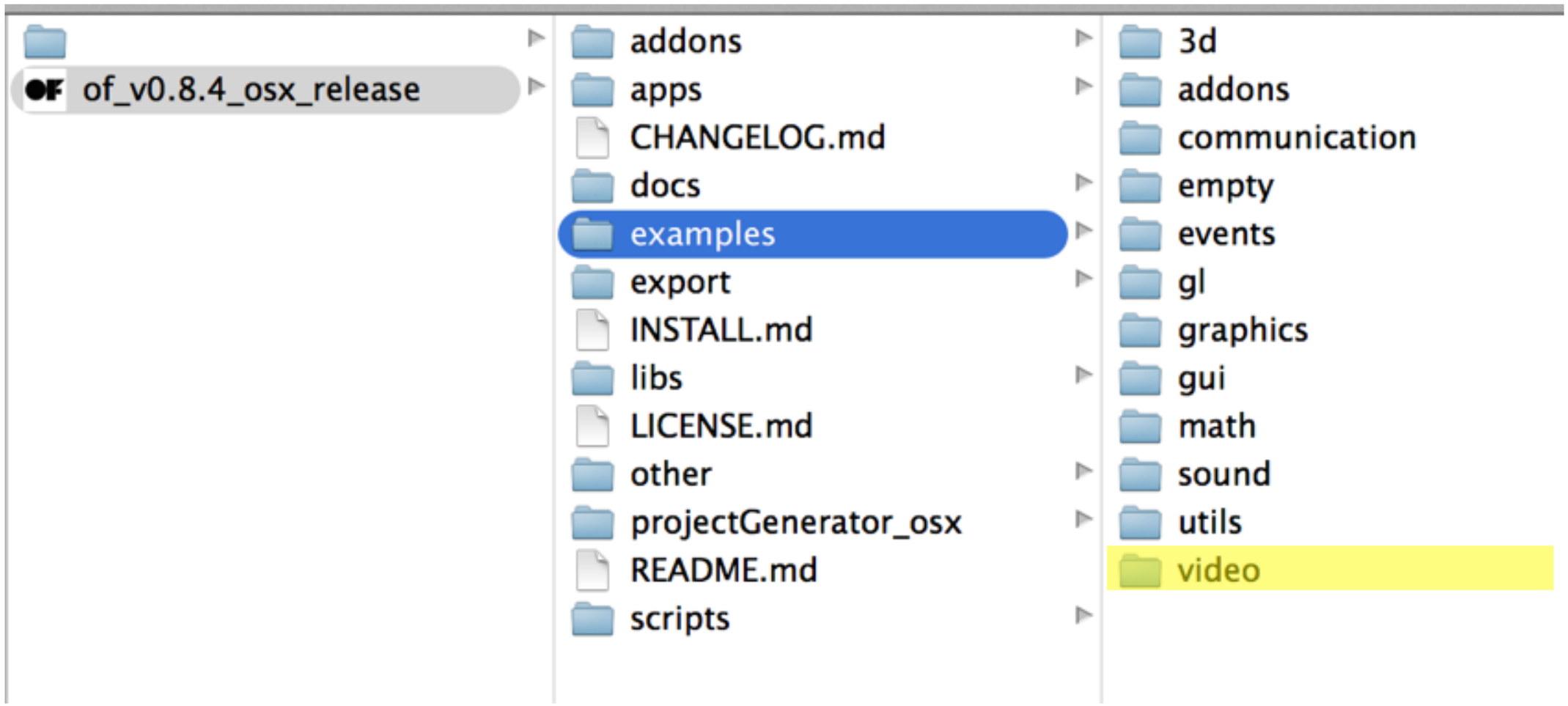
working with + navigating 3D spaces, virtual cameras, meshes and 3D models

oF examples



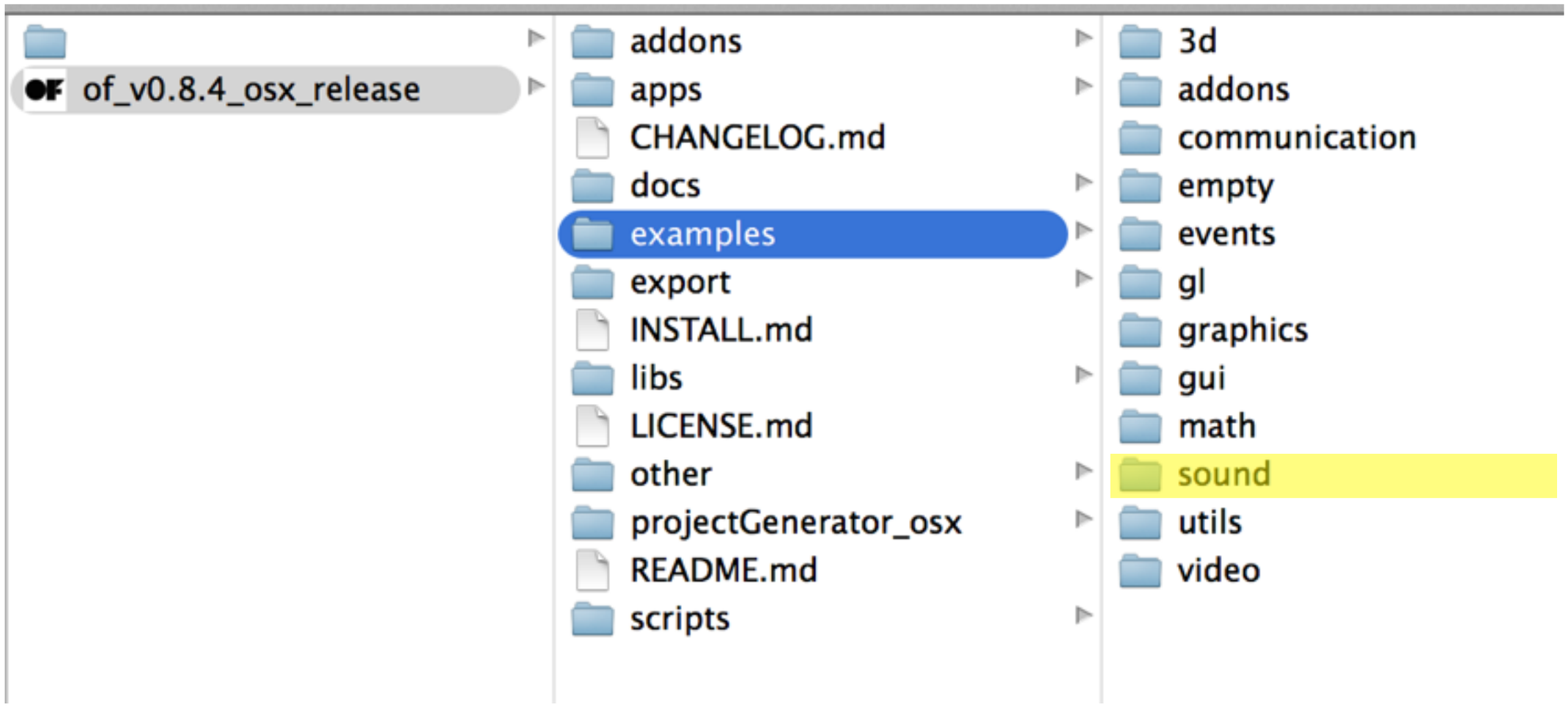
file input + output, loading files from URL, writing and saving XML files, launching different window types

oF examples



grabbing videos from a camera, playing video files, basic video analysis + video manipulation.

oF examples



direct access to the sound card, higher level code (soundPlayer) for samples and sound effects

Here's your Homework

Homework

Make the ball bounce.

Merge two example sketches into one, cohesive sketch.

Upload both files to your homework repo before next class with a README.md file explaining what example you used and what you changed.