

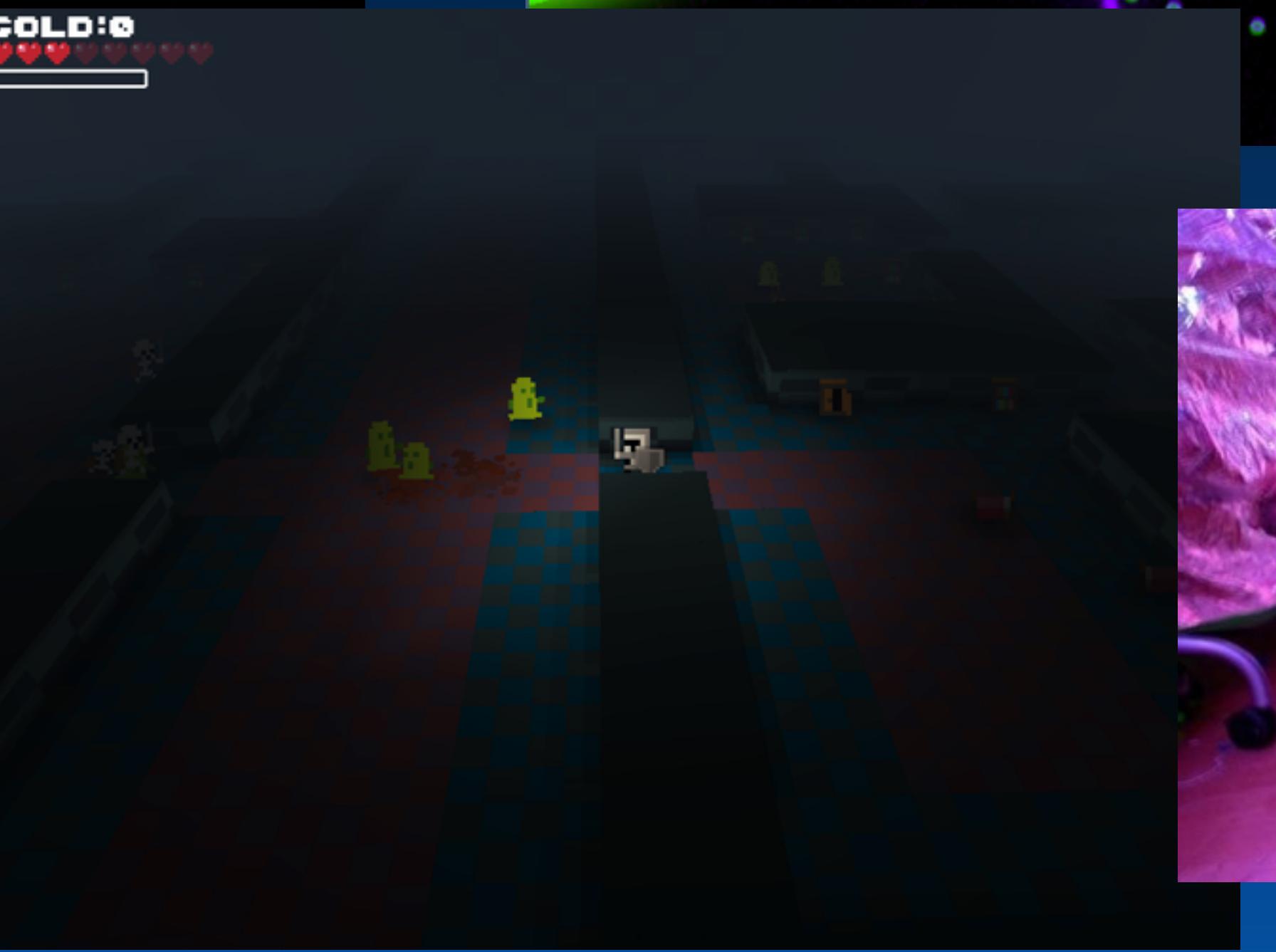
CS3113

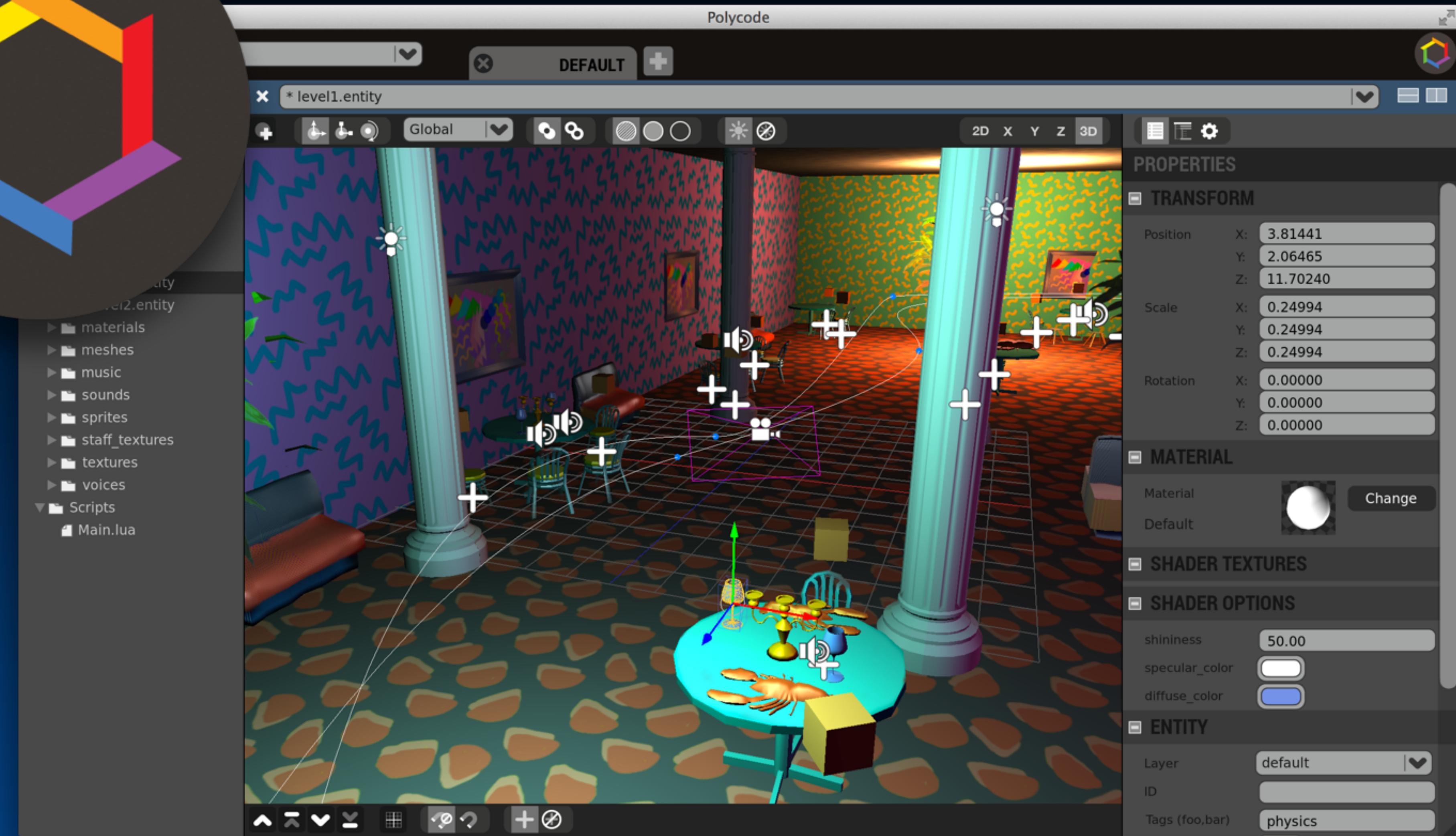
Introduction to game programming



Hello!

Prof. Ivan Safrin





TRANSFORM

Position X: 3.81441
Y: 2.06465
Z: 11.70240

Scale X: 0.24994
Y: 0.24994
Z: 0.24994

Rotation X: 0.00000
Y: 0.00000
Z: 0.00000

MATERIAL

Material Default Change

SHADER TEXTURES

SHADER OPTIONS

shininess 50.00
specular_color
diffuse_color

ENTITY

Layer default
ID
Tags (foo,bar) physics

Prerequisites

CS2134 Data Structures and Algorithms.

Reading materials

None required. All needed information will be provided in class and online, however the books below are recommended supplementary reading.

Class slides and other helpful materials are available on Github at
<https://github.com/ivansafrin/CS3113>

Very comprehensive book covering in great depth many of the concepts of graphics programming that we will be studying:

Foundations of 3D Computer Graphics (Steven J. Gortler)
<http://www.amazon.com/Foundations-Computer-Graphics-Steven-Gortler/dp/0262017350/>

And if you need to brush up on your C++:

Programming: Principles and Practice Using C++ (2nd Edition) (Bjarne Stroustrup)
<http://www.amazon.com/dp/0321992784/>

Grading / Assignments

Each week, you will have an assignment to complete by the beginning of next week's first class. Most of these assignments will involve implementing the concepts we learned that week as a simple game prototype. As part of the class, you will be expected to create a Github account if you don't already have one and submit your assignments via a git repository (we will go over how to do this during the first class).

You will also be expected to create a larger game by the end of the semester, which will serve as your final project. You may team up with another person for this project.

Your final course grade will be based on completion of weekly assignments (50%) and your final game project (50%).

Attendance Policy

Attendance will be taken every class. If you miss more than three classes, your final grade will be affected. Please keep in mind that we have a lot of material to cover in a fairly short time and missing even a single class will likely set you back!

Use of external code

For all of the assignments, including the final project, you will be expected to write all of the code yourself. Some example and helper code will be provided for you in class and online. If you wish to use other code, such as an open-source library or snippets of open-source code to implement features **NOT** covered in the class, you may do so, **but you must check in with me** beforehand and all open-source code used in your projects must be clearly marked and properly attributed.

Surprise C++ quiz!

What are games?

What are computer games?

What is game programming?

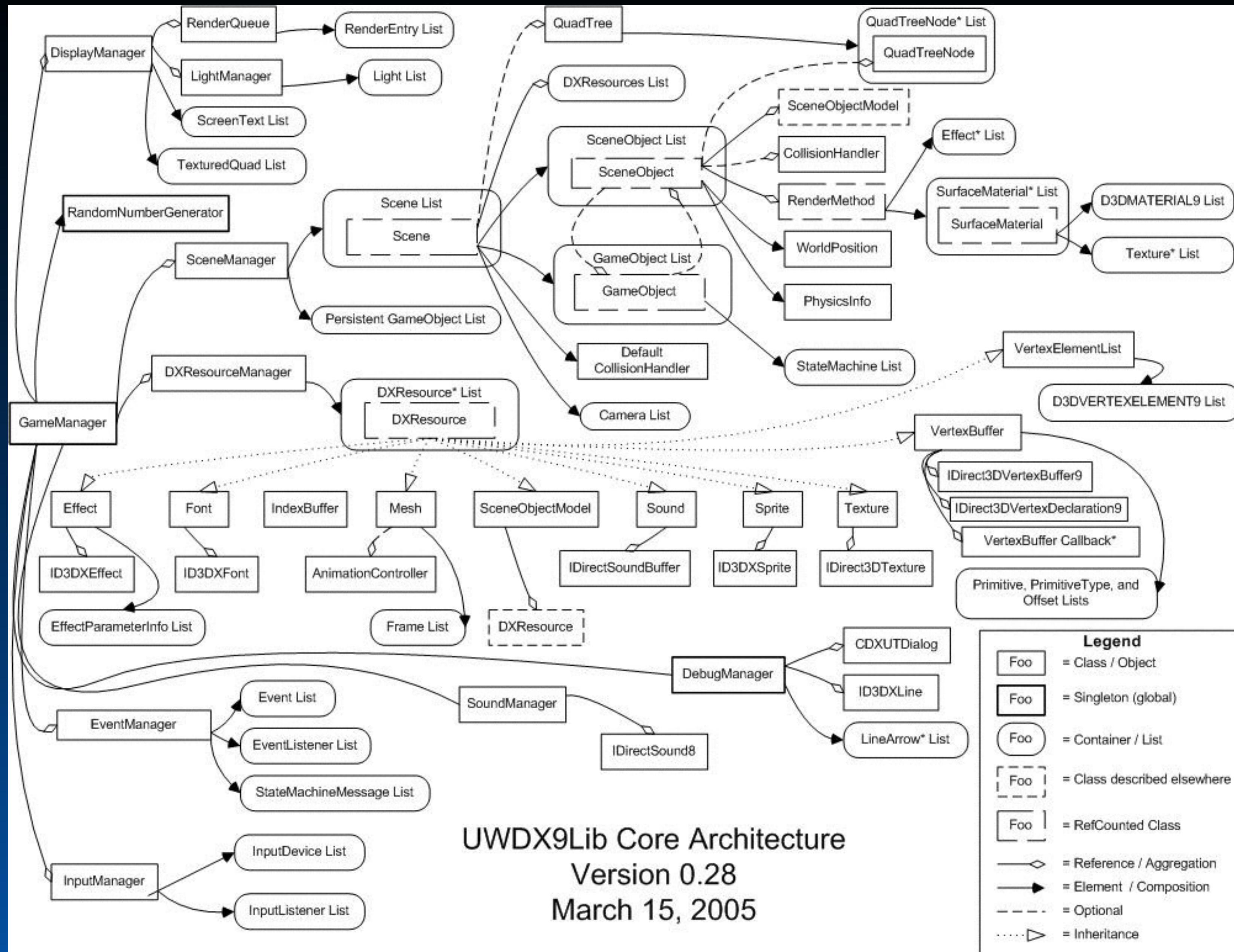
What are common
game components?

What are common game components?

- Graphics
- Input
- Sound
- Game Logic (Physics, AI)

Typical game structure.

```
while(gameIsRunning) {  
    ProcessInput();  
    UpdateGameWorld();  
    Render();  
}
```



Uwdx9Lib Core Architecture

Version 0.28

March 15, 2005

Our tools:

C++

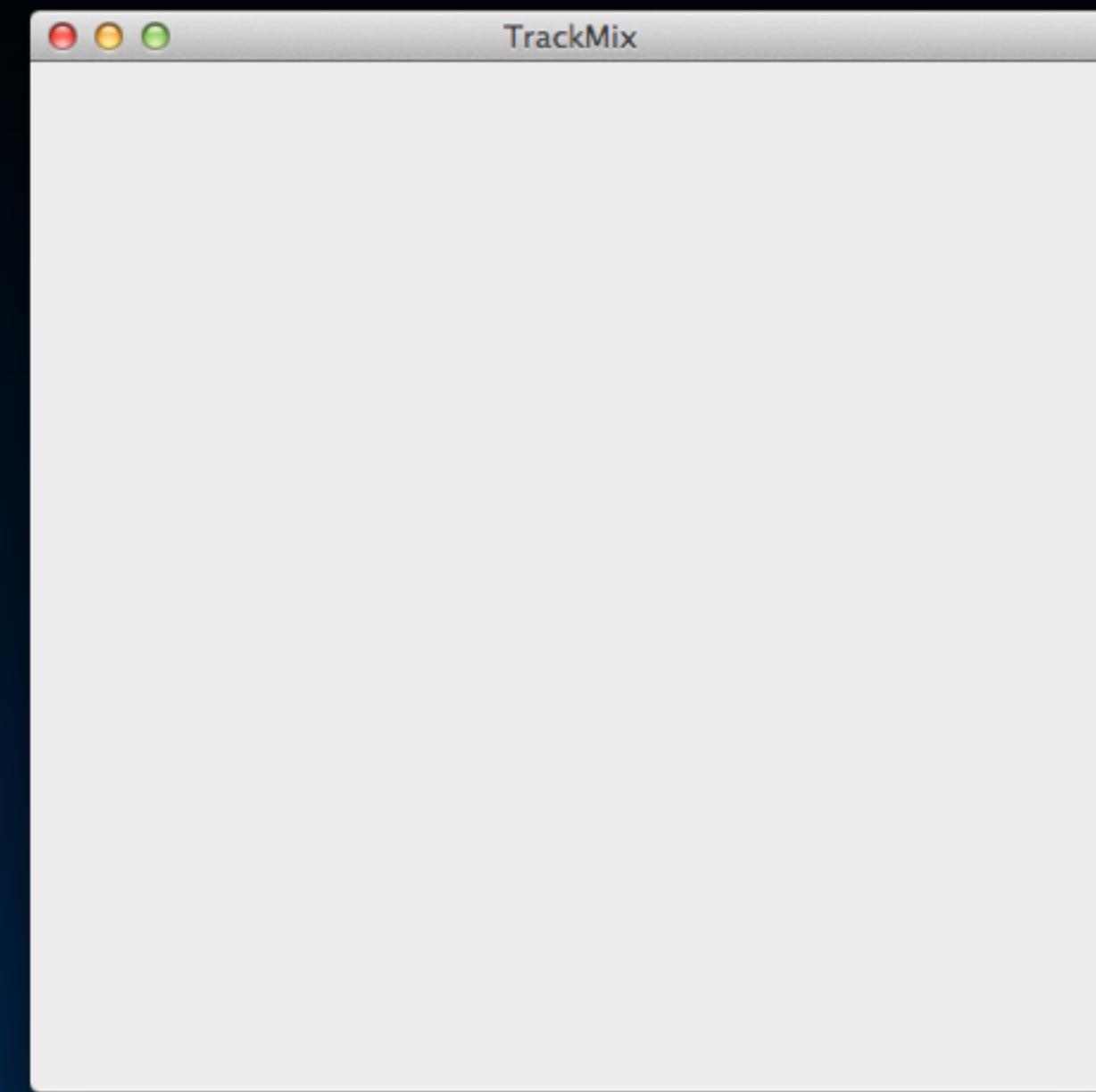
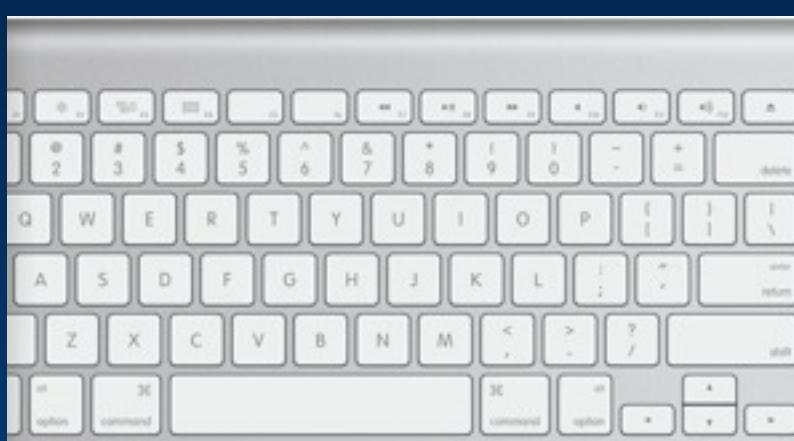
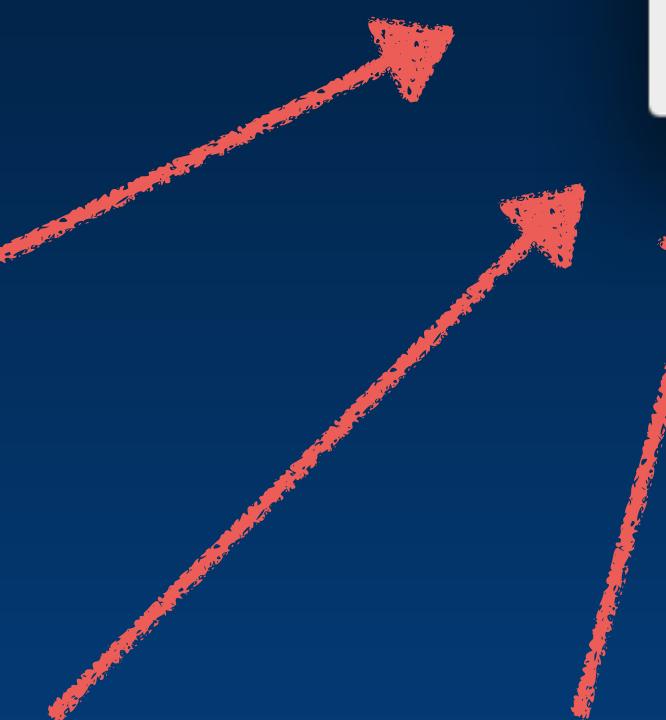
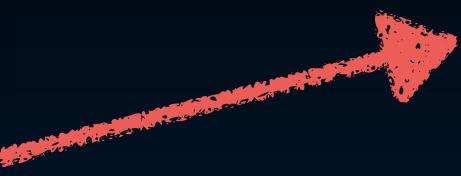
SDL (Input, Windowing, Sound)

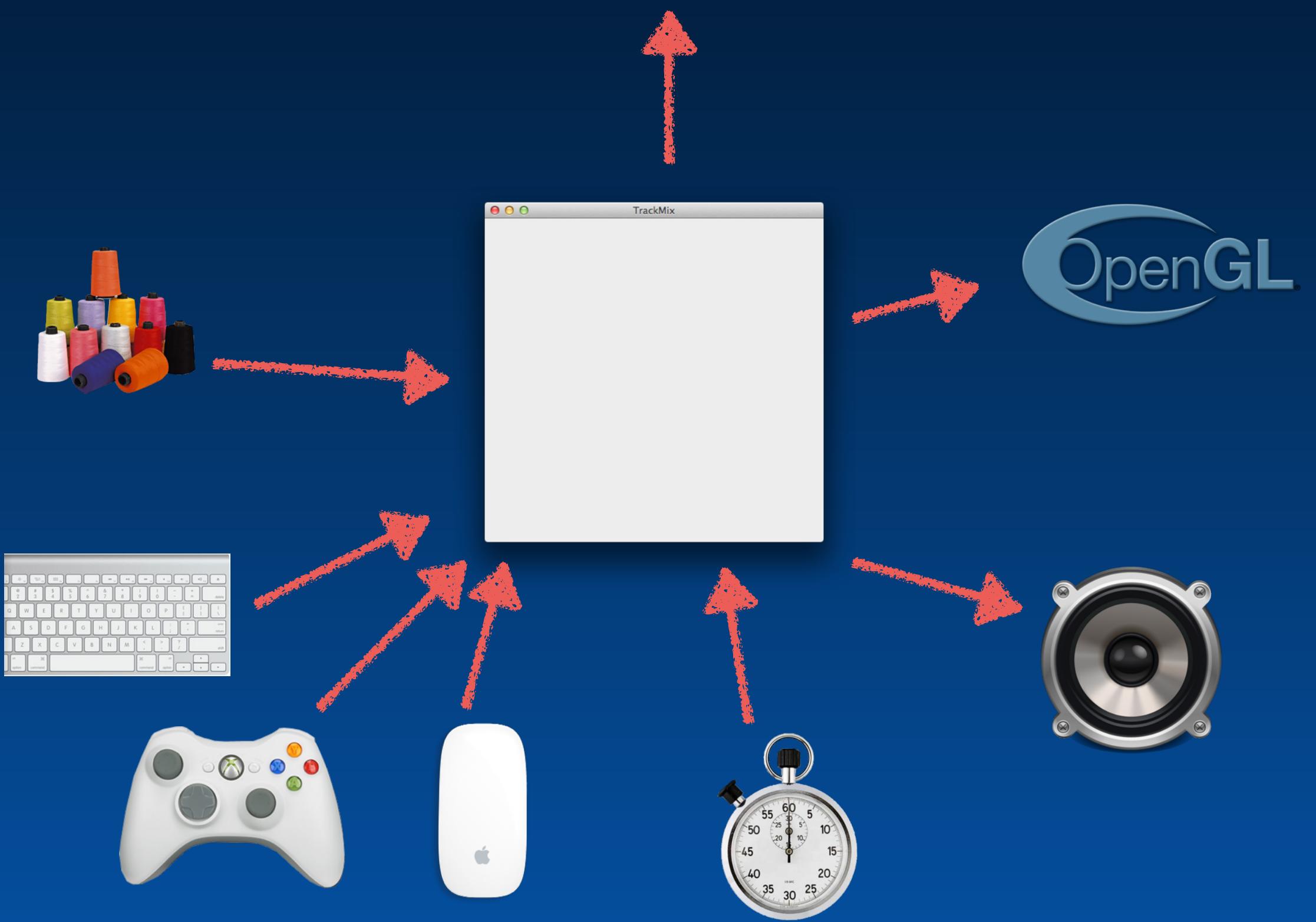
OpenGL (Graphics)

Why C++, SDL and OpenGL?

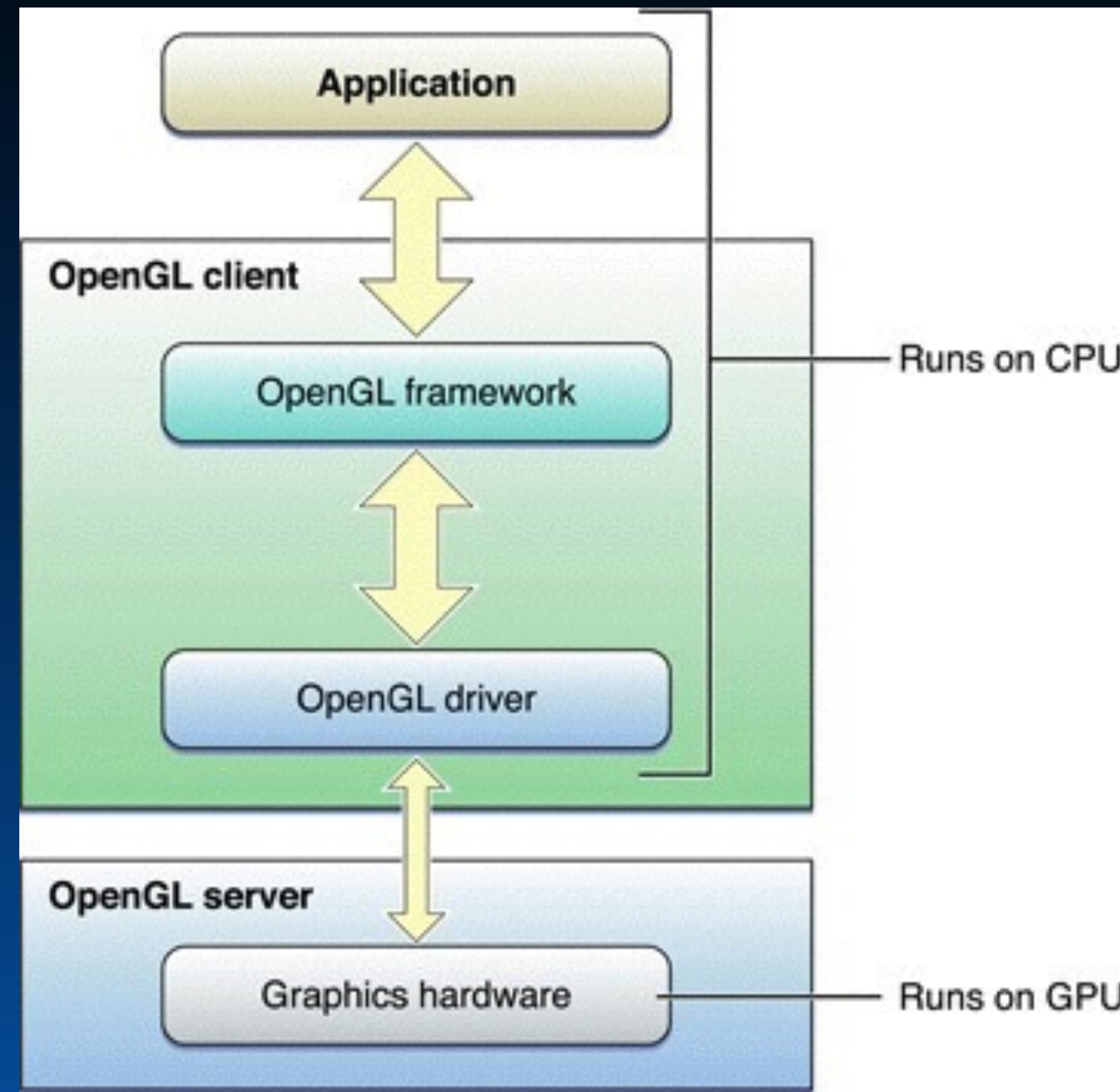
- Widely used for game development
- Fast and free
- Allows us to focus on general programming concepts
- Builds a low level understanding

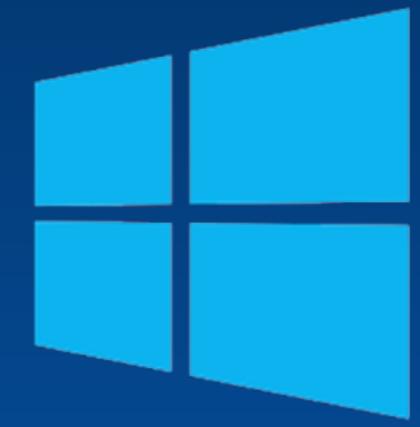
What is SDL?





What is OpenGL?





Setup your development environment.



Setup a Github account.

www.github.com

Install git if you don't have it



<http://git-scm.com/>

If you don't know how to use git,
follow this tutorial.

<https://try.github.io/>

Clone the class repository at

github.com/ivansafrin/CS3113

```
git clone https://github.com/ivansafrin/CS3113.git
```

Create a Github repository for this class

<https://help.github.com/articles/create-a-repo>

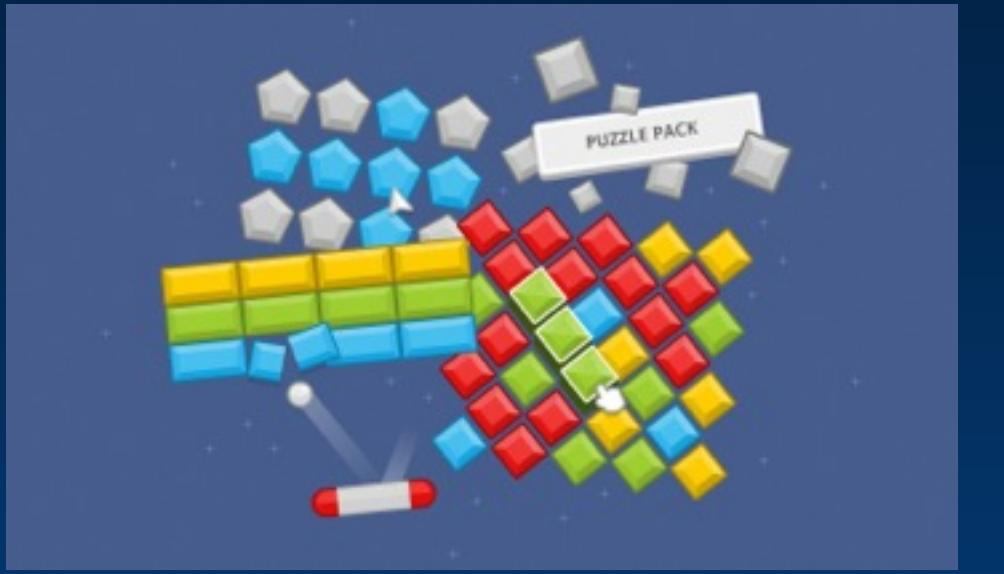
What's in the repo?



Syllabus



Project templates
and helper code



CC0 Game Assets

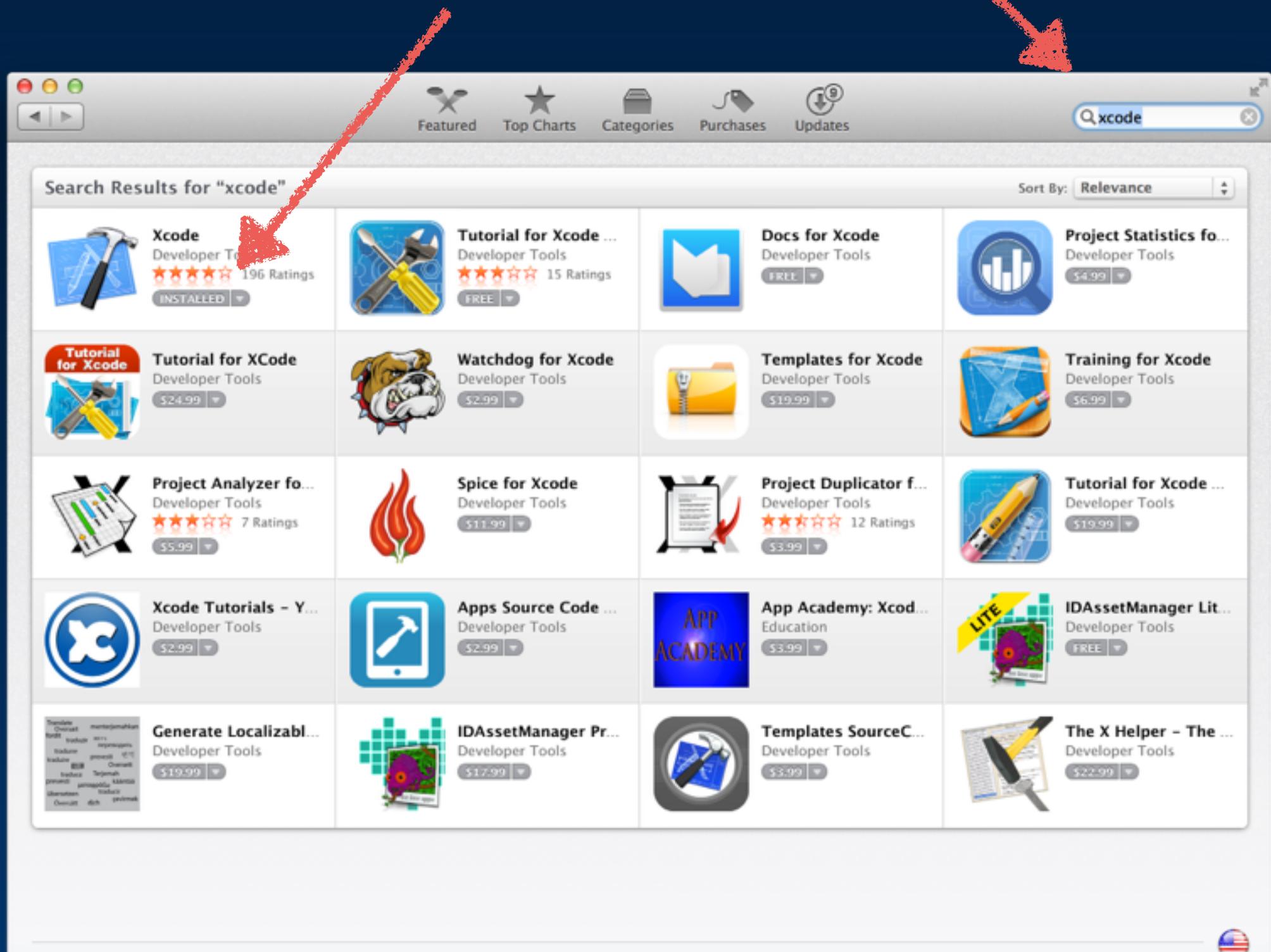


Class slides

Install Xcode if you are on
Mac or Visual Studio Express
if you are on Windows.

To install Xcode

Search for “Xcode” in the AppStore



Click “Install”



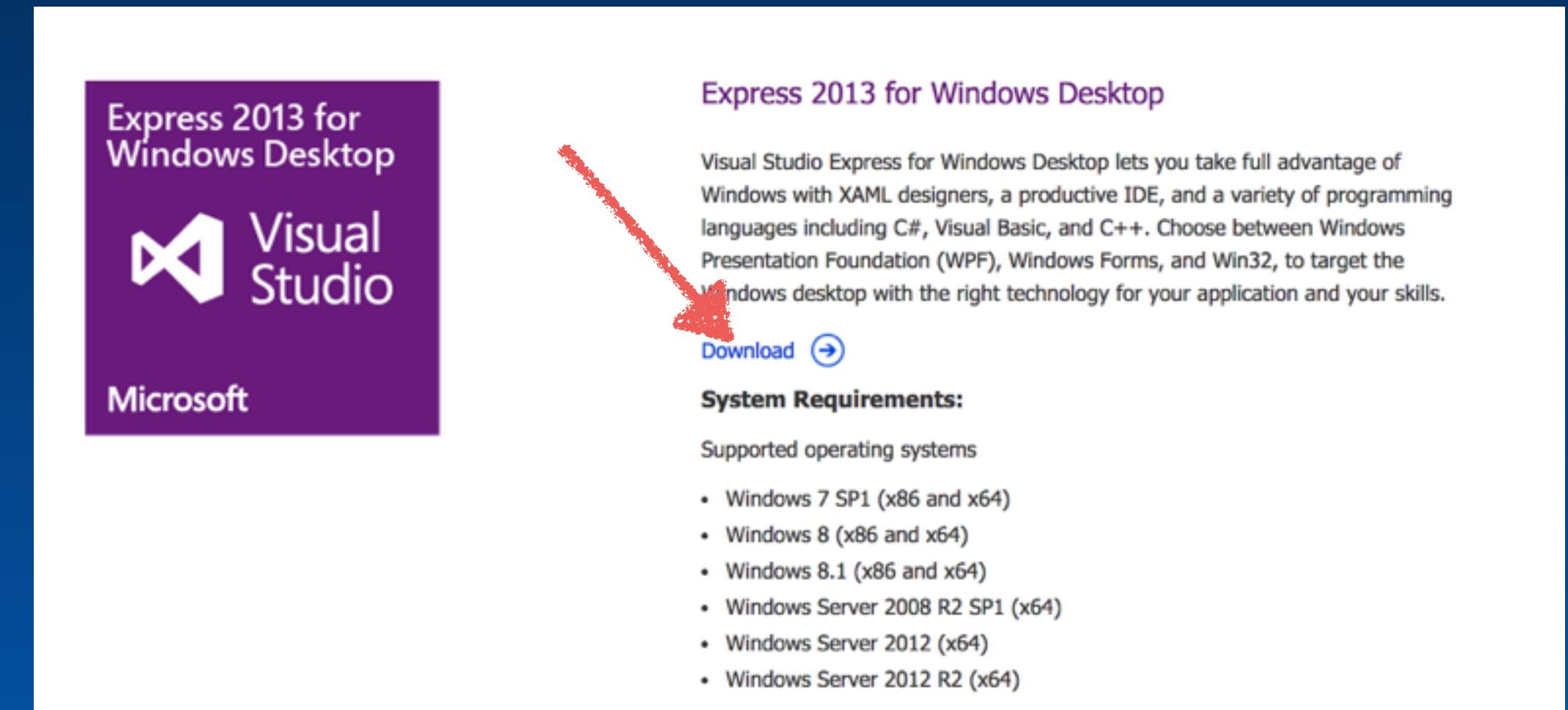
To install Visual Studio Express

Go to

<http://www.visualstudio.com/en-us/products/visual-studio-express-vs.aspx>

Download Express 2013
for Windows Desktop

Make sure it says “For
Windows Desktop”!



The screenshot shows a web page for downloading Visual Studio Express 2013. At the top left is a purple button labeled "Express 2013 for Windows Desktop" with the Microsoft logo. To the right of the button is a description of the product: "Visual Studio Express for Windows Desktop lets you take full advantage of Windows with XAML designers, a productive IDE, and a variety of programming languages including C#, Visual Basic, and C++. Choose between Windows Presentation Foundation (WPF), Windows Forms, and Win32, to target the Windows desktop with the right technology for your application and your skills." Below the description is a red arrow pointing to a blue "Download" button. Further down, there is a section titled "System Requirements:" with a list of supported operating systems.

Express 2013 for Windows Desktop

Visual Studio Express for Windows Desktop lets you take full advantage of Windows with XAML designers, a productive IDE, and a variety of programming languages including C#, Visual Basic, and C++. Choose between Windows Presentation Foundation (WPF), Windows Forms, and Win32, to target the Windows desktop with the right technology for your application and your skills.

Download →

System Requirements:

Supported operating systems

- Windows 7 SP1 (x86 and x64)
- Windows 8 (x86 and x64)
- Windows 8.1 (x86 and x64)
- Windows Server 2008 R2 SP1 (x64)
- Windows Server 2012 (x64)
- Windows Server 2012 R2 (x64)

Download SDL2

Download

<https://www.libsdl.org/download-2.0.php>

Go to

Development Libraries:

Windows:

- [SDL2-devel-2.0.3-VC.zip \(Visual C++ 32/64-bit\)](#)
- [SDL2-devel-2.0.3-mingw.tar.gz \(MinGW 32/64-bit\)](#)

Mac OS X:

- [SDL2-2.0.3.dmg \(Intel 10.5+\)](#)

Linux:

Please contact your distribution maintainer for updates.

iOS & Android:

Projects for these platforms are included with the [source](#).

Download SDL2_image

Go to

https://www.libsdl.org/projects/SDL_image/

Download

Development Libraries:

Windows

- [SDL2_image-devel-2.0.0-VC.zip](#) (Visual C++ 32/64-bit)
- [SDL2_image-devel-2.0.0-mingw.tar.gz](#) (MinGW 32/64-bit)

Mac OS X

- [SDL2_image-2.0.0.dmg](#) (Intel 10.5+)

Linux

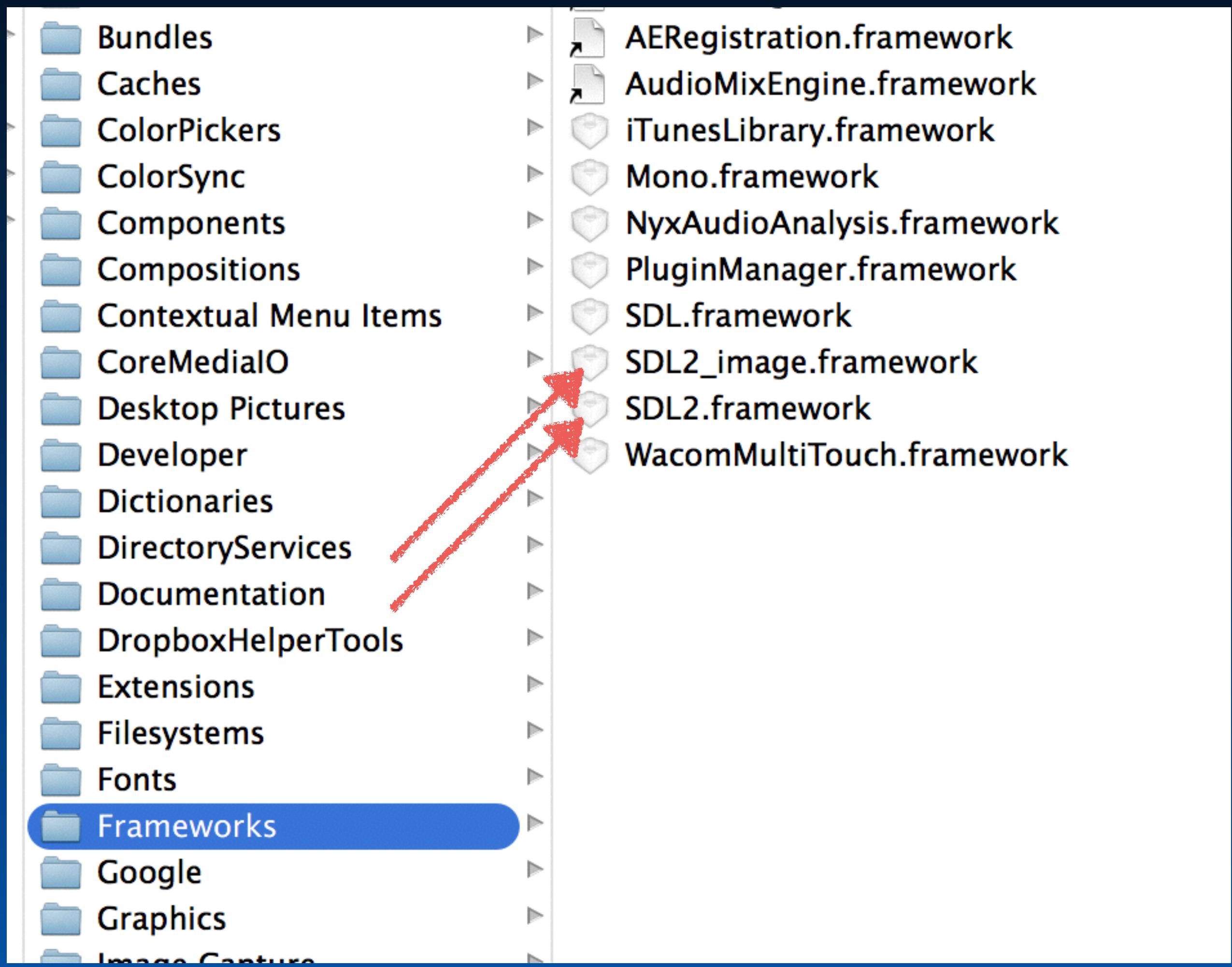
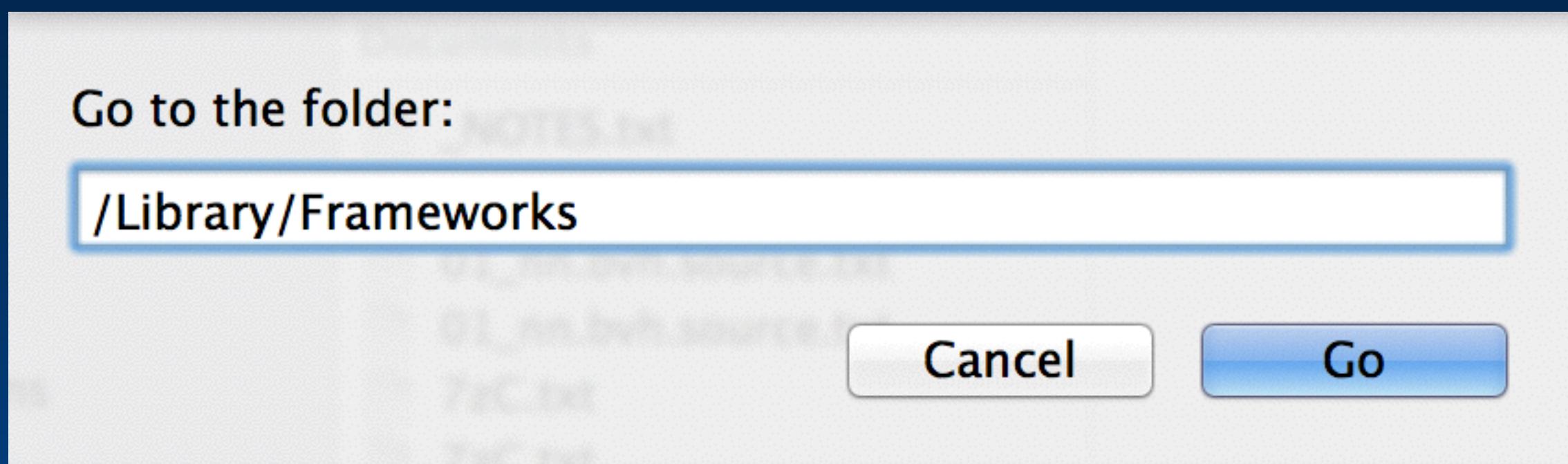
Please contact your distribution maintainer for updates.

iOS & Android

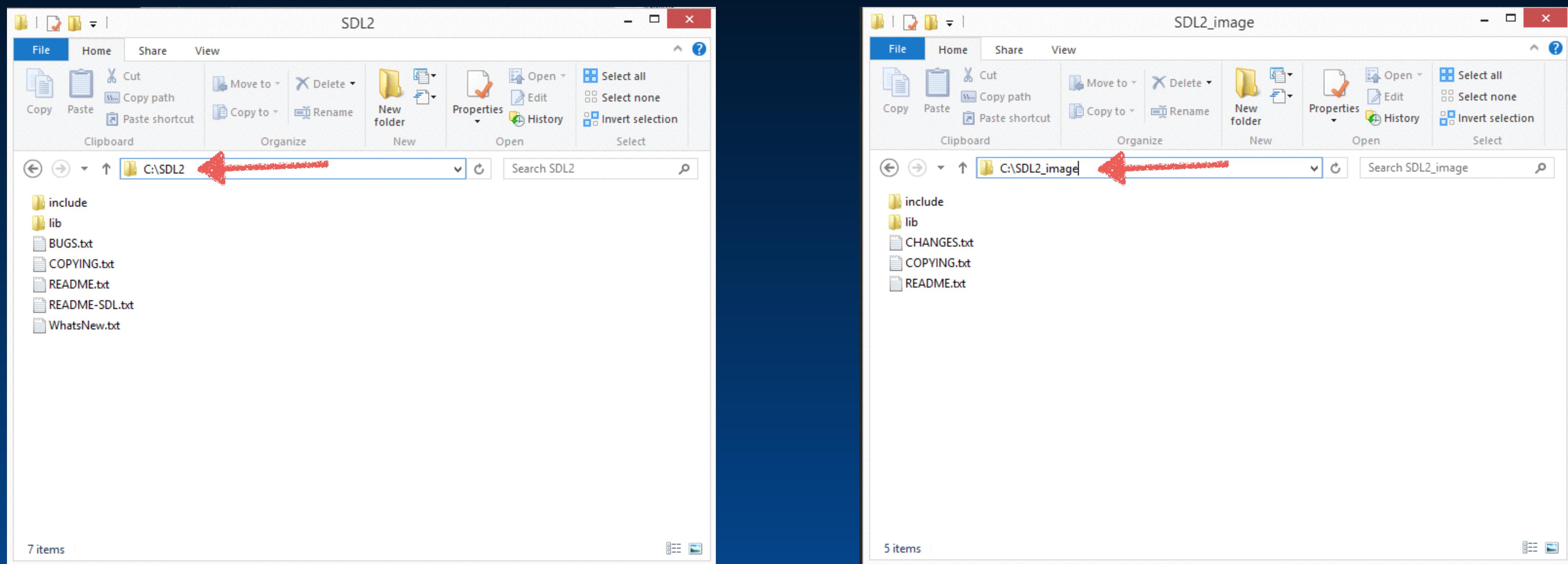
Projects for these platforms are included with the [source](#).

Install SDL and SDL_image

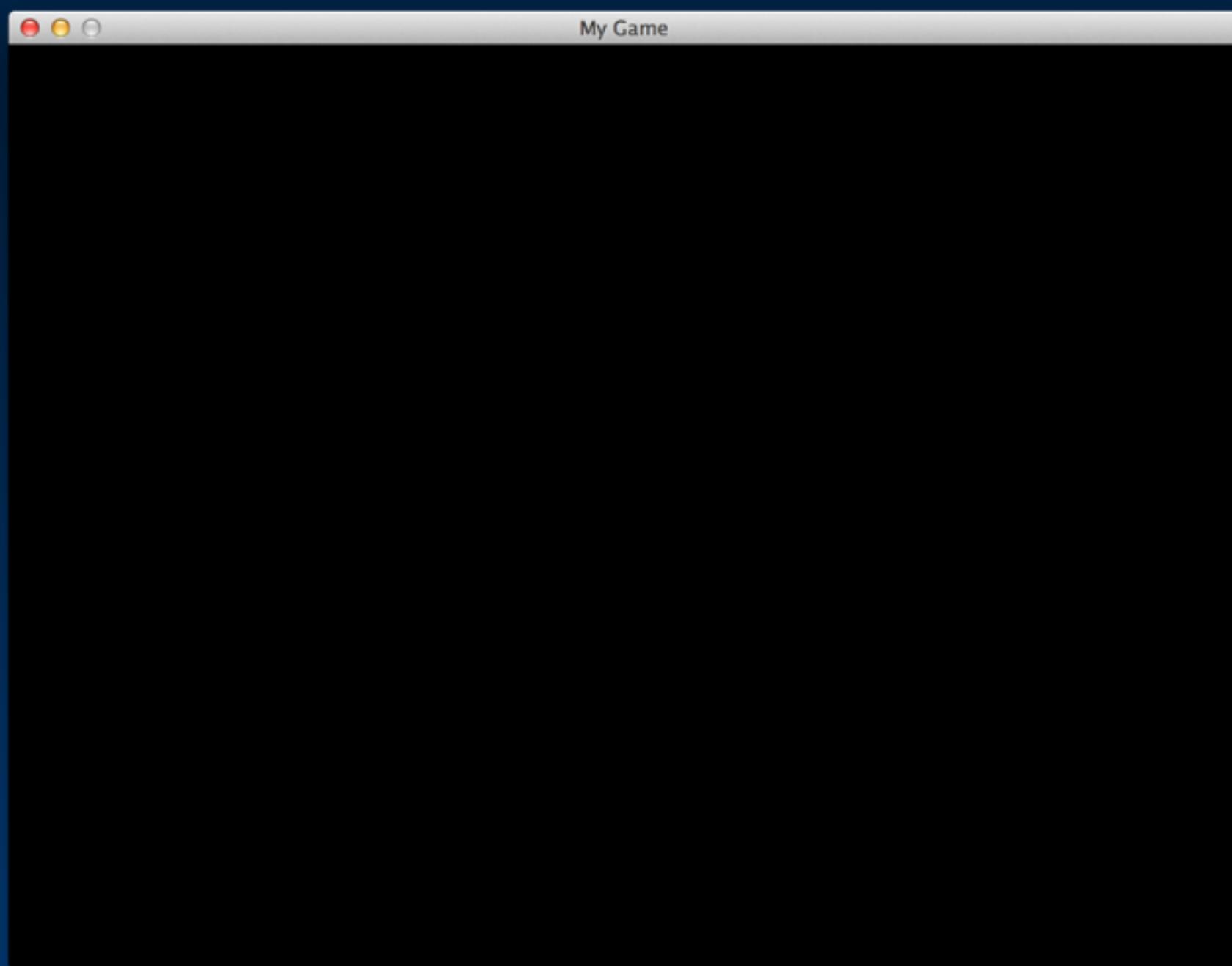
On Mac



On Windows



Build and run the template project
from the class git repository.



SDL boilerplate code.

```
#include <SDL.h>
#include <SDL_opengl.h>
#include <SDL_image.h>

SDL_Window* displayWindow;

int main(int argc, char *argv[])
{
    SDL_Init(SDL_INIT_VIDEO);
    displayWindow = SDL_CreateWindow("My Game", SDL_WINDOWPOS_CENTERED, SDL_WINDOWPOS_CENTERED, 800, 600, SDL_WINDOW_OPENGL);
    SDL_GLContext context = SDL_GL_CreateContext(displayWindow);
    SDL_GL_MakeCurrent(displayWindow, context);

    bool done = false;

    SDL_Event event;

    while (!done) {
        while (SDL_PollEvent(&event)) {
            if (event.type == SDL_QUIT || event.type == SDL_WINDOWEVENT_CLOSE) {
                done = true;
            }
        }
        SDL_GL_SwapWindow(displayWindow);
    }

    SDL_Quit();
    return 0;
}
```

Home assignments:

- Set up a github account if you don't have one
- Install git if not installed and learn how to use it
- Clone the class repository
- Setup your own repository for this class
- Setup Xcode or Visual Studio and install SDL
- Make sure the template project in the class repository builds and runs

Please email me if you run into any issues:

is1296@nyu.edu