OpenGL ES: iPhone and Andoid

CSCI 4239/5239
Advanced Computer Graphics
Spring 2018

Apple iOS Devices

- Supports OpenGL ES 1.1 or 2.0
  - Newer devices support 1.1 AND 2.0
- User interface is Objective C
  - Links to C and C++ code
- Develop with Xcode on Mac only
- Emulator for all devices
  - Slower than native devices
  - Almost perfect emulation

Getting iOS Tools

- Download Xcode from Apple

  - 4GB download

- Provides compiler, frameworks, etc

- Create project in Xcode

- Select target iPhone/iPad

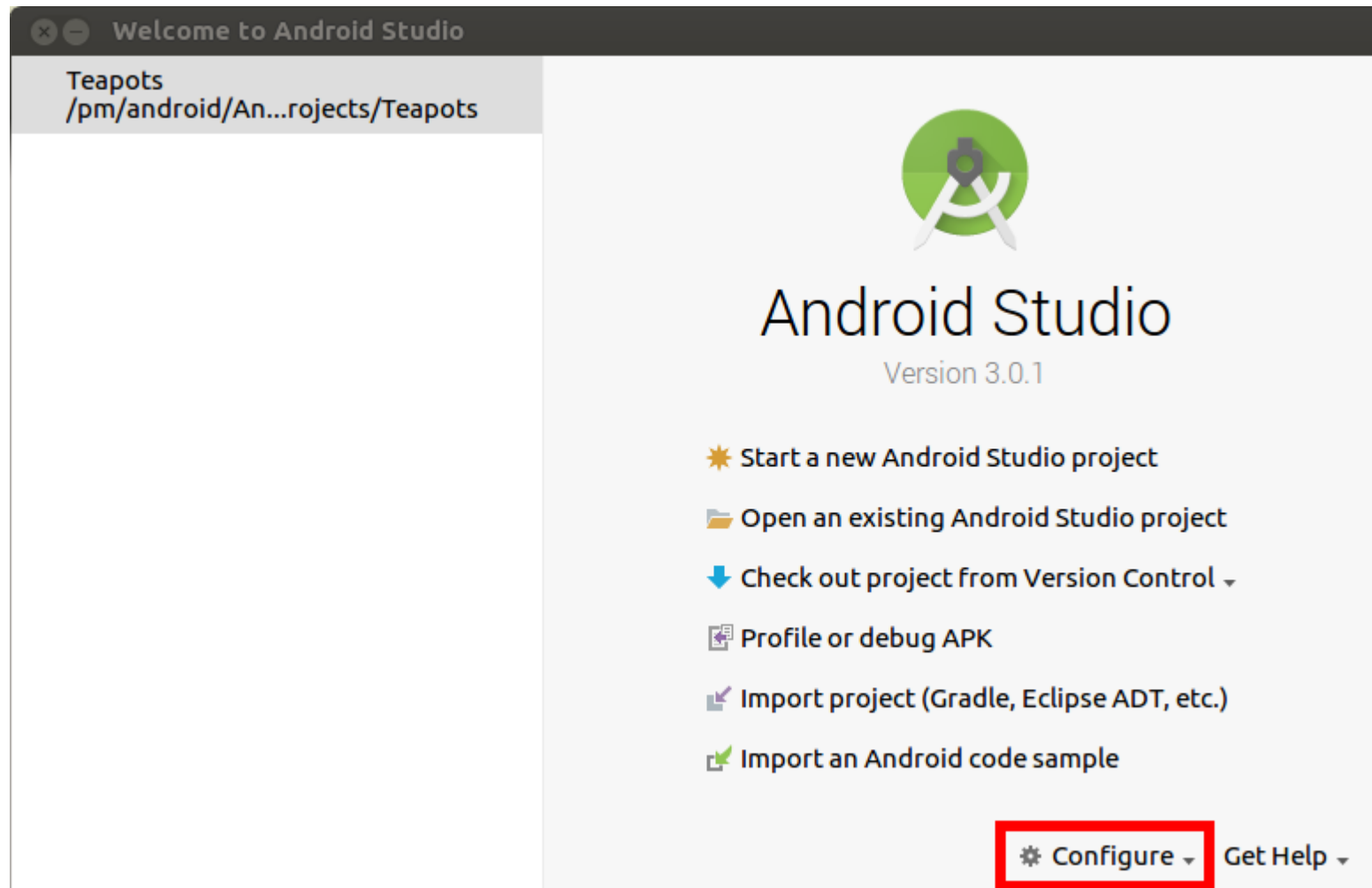- Emulator launched on run

- Get command line tools also

Android Devices

- Supports OpenGL ES 1.1 or 2.0
  - Newer devices support 1.1 AND 2.0
- User interface is Java
  - Link to C/C++ code with JNI
- Emulator for phones and tablets
  - Slower than native devices
  - OpenGL ES 2.0 emulator much improved

Android Tools

- Download Android Studio
  - https://developer.android.com/studio/

  - About 750MB ZIP file

- Unzip and find studio.sh or studio.exe
- Use Configure to download SDK, NDK
- Add Android tools to PATH
  - ..../SDK/tools
  - ..../SDK/platform-tools
  - ..../SDK/ndk-bundle

- Create AVDs

Initial SDK Configuration

Select and install SDK Tools
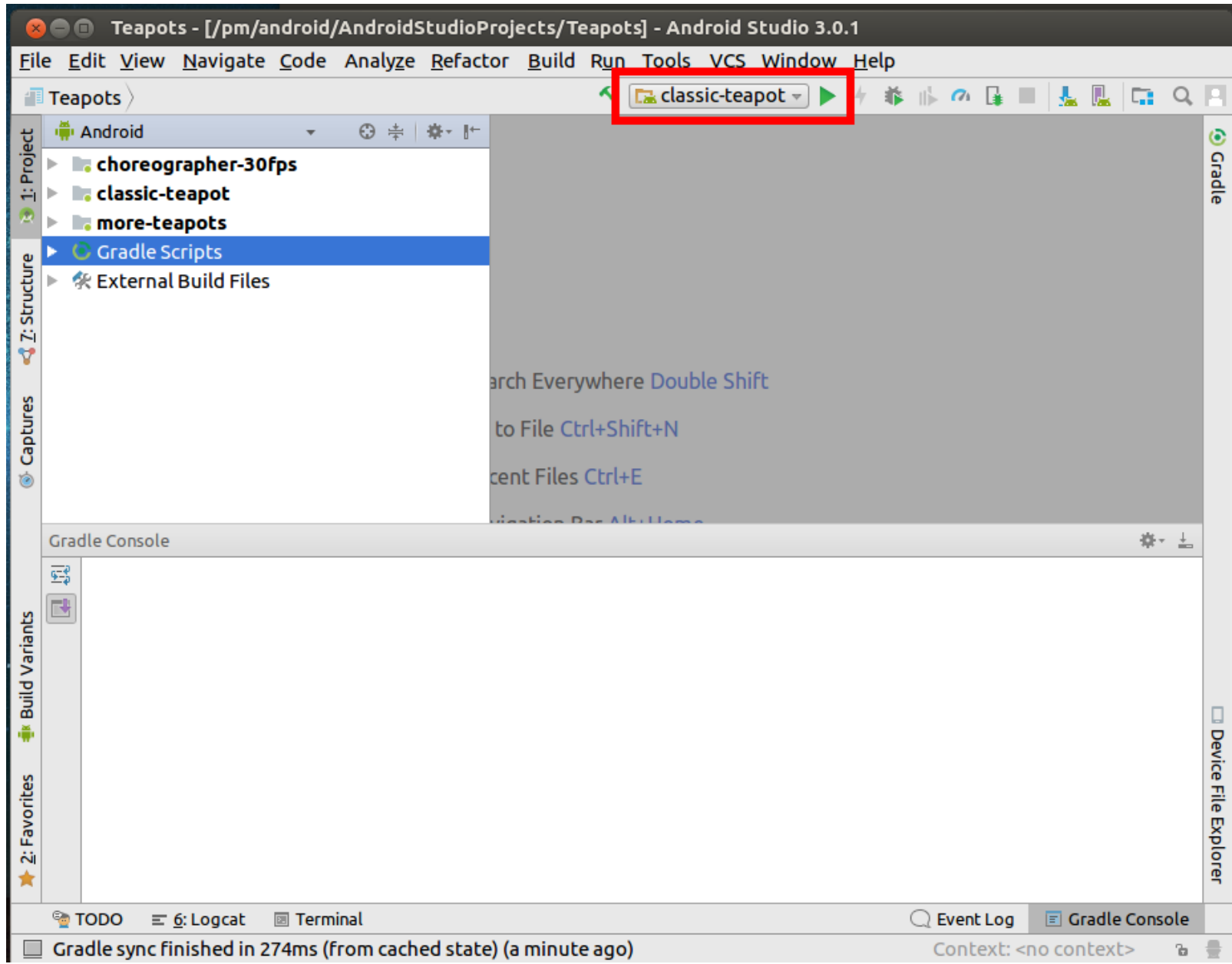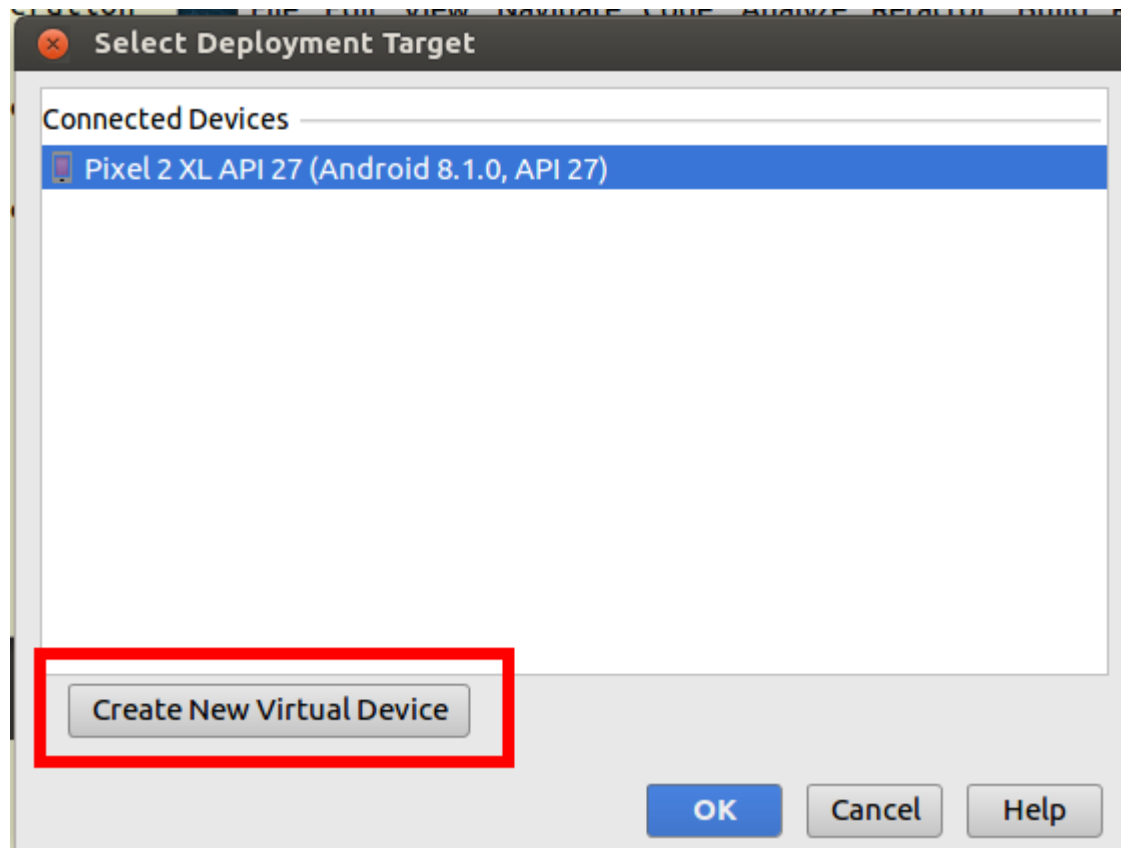
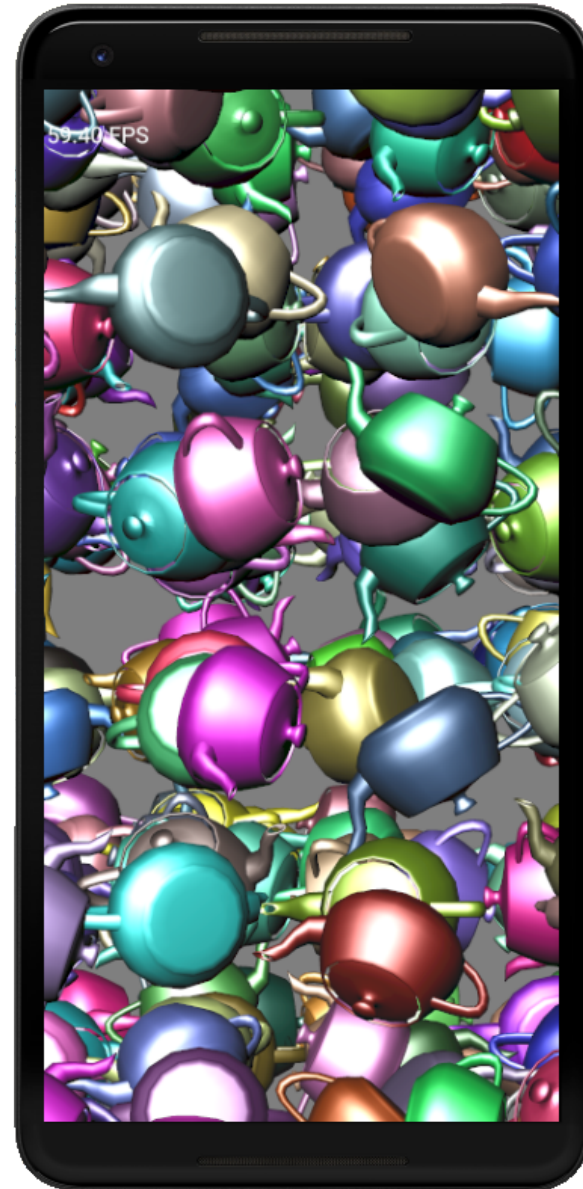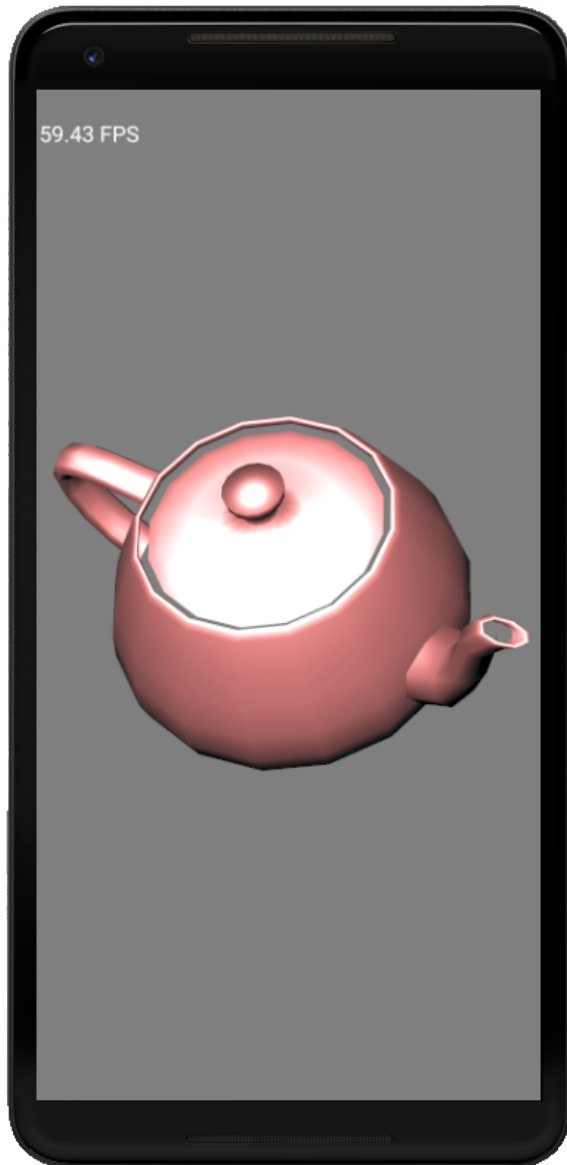# Import Code Example

Teapots NDK/OpenGL ES 2.0
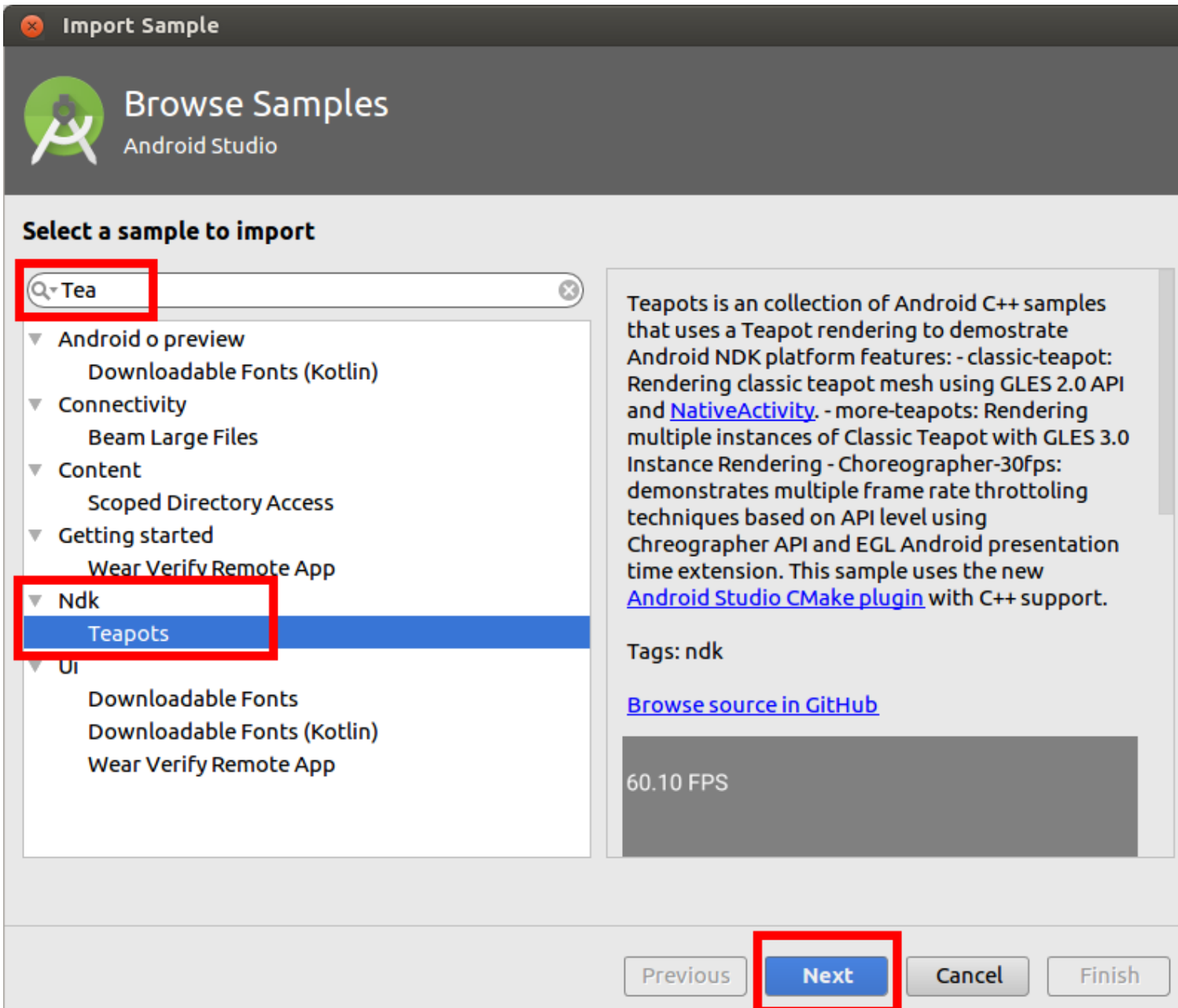
Select Target, Build and Run

Create Virtual Device using Wizard

teapot and more-teapots

Qt Creator

- Xcode lookalike IDE for Qt
- Allows builds for different platforms
  - Desktop
  - iOS
  - Android
- Cross compiles for hardware
- Many examples and tutorials
  - Cube OpenGL ES 2.0

Portable OpenGL ES Code

- Write the bulk of the code in C++
  - OpenGL ES 1.1 will run on all devices
  - OpenGL ES 2.0 will run on newer devices
- Write minimal code in interface language
  - Objective C – link to C/C++
  - Java – call C/C++ using JNI
- Build code using Qt

Assignment 6

- Create an application that displays a scene in 3D on the iPhone/iPad or Android
  - Build objects yourself
  - Explore advanced features such as lighting, textures, …
- Groups are permitted
  - Pair up with somebody ahead of the curve
  - Presentations are still individual
    - Volunteer if this is your thing