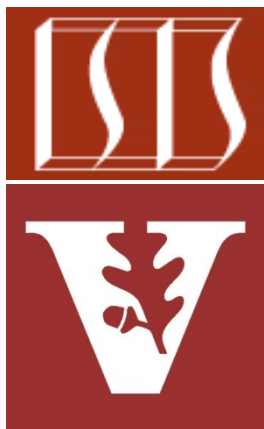


CS 5254: Concurrent Object-Oriented & Functional Programming: Course Overview (Part 3)

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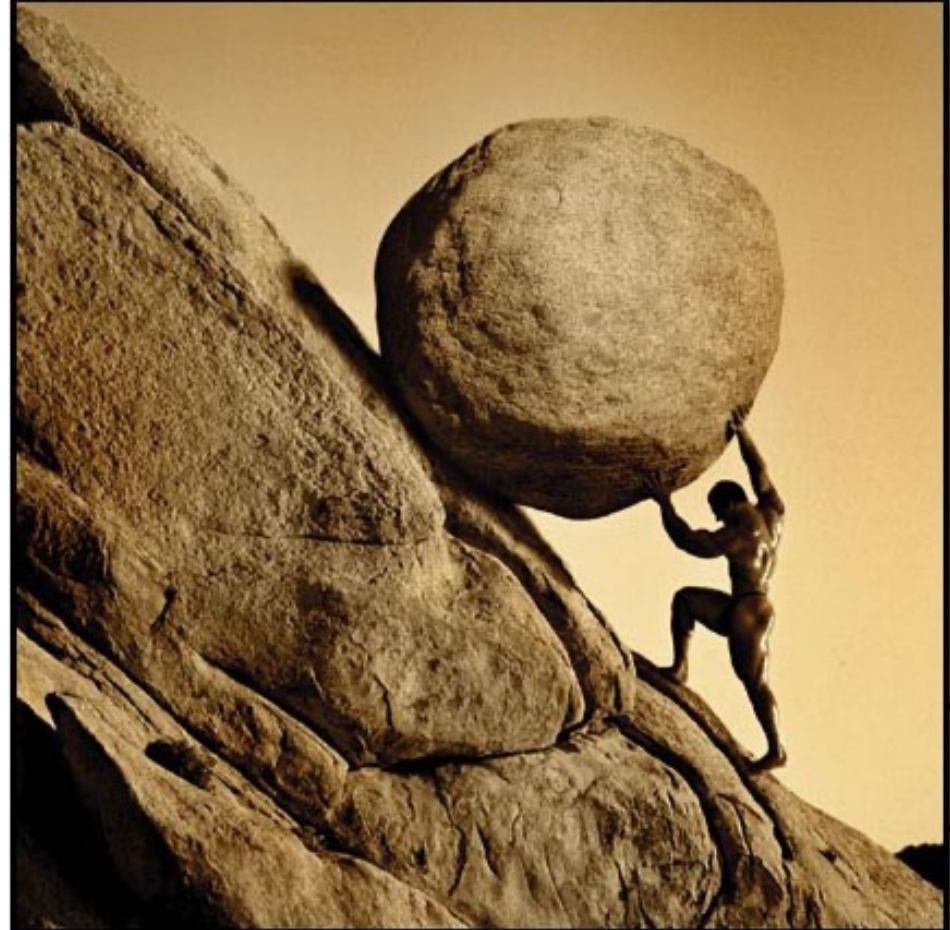
**Institute for Software
Integrated Systems**

**Vanderbilt University
Nashville, Tennessee, USA**



Learning Objectives in this Lesson

- Understand the course topics & logistics
 - Course philosophy
 - Course contents
 - Structure of the lecture material
 - Overview of the assignments & assessments
- Setting up Java & Android Studio
- Setting up GitLab et al.
- Accessing Java & Android source code



Setting Up the Android & Java IDE on Android Studio

Installing Java/Android Developer Tools

- To use Android, you need to install the latest release of Android Studio



See developer.android.com/studio

Installing Java/Android Developer Tools

- Installation steps



Installing Java/Android Developer Tools

- Installation steps
 - Download & install the latest version of Android Studio

New features in Android Studio Preview

On this page 

Current versions of Android Studio

Compatibility with Android Gradle plugin previews

Android Studio Giraffe | 2022.3.1

Use Live Edit to update composables in real time

[New UI preview](#)

New API support for Compose Animation Preview

Support for Grammatical Inflection API

Automatic per-app language support

...

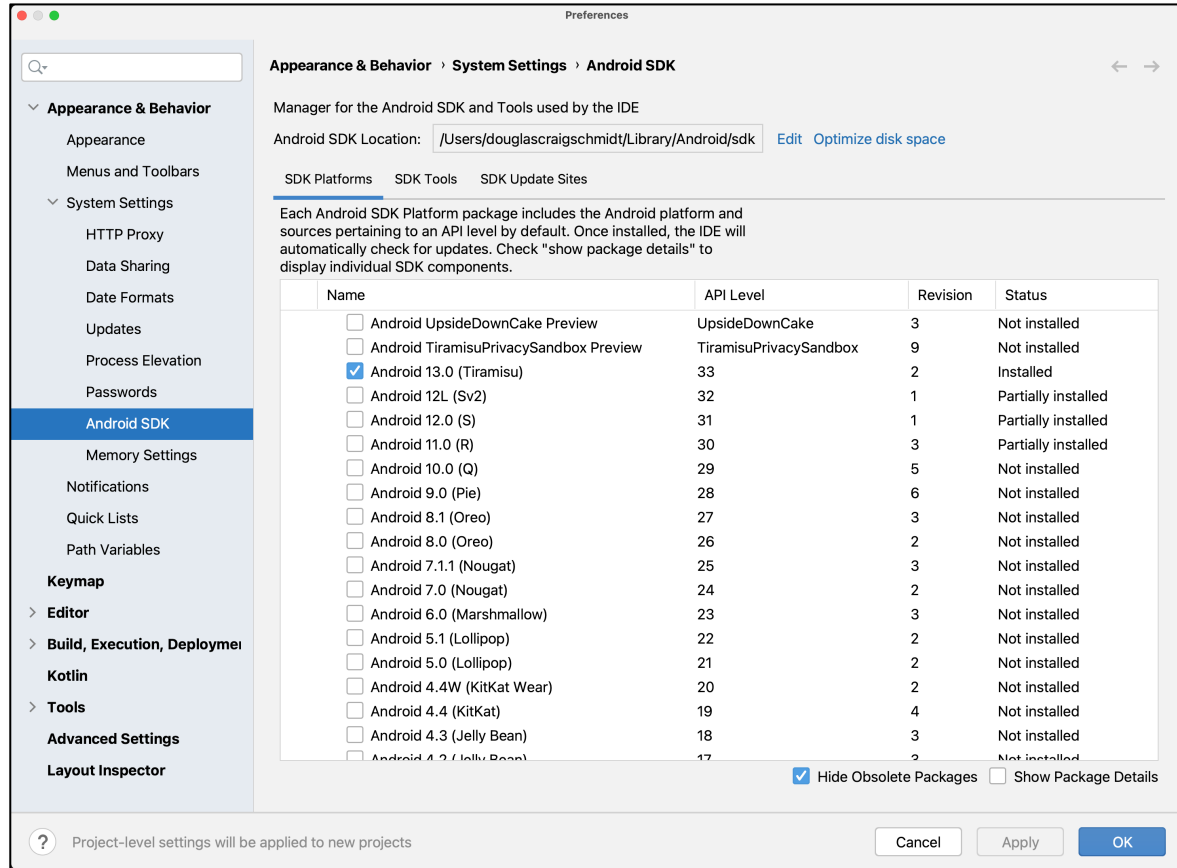
This page lists the new features introduced in Android Studio preview releases. The preview builds provide early access to the latest features and improvements in Android Studio. You can download these preview versions [here](#). If you encounter any problems using a preview version of Android Studio, please [let us know](#). Your bug reports help to make Android Studio better.

For the latest news on Android Studio preview releases, including a list of notable fixes in each preview release, see the [Release Updates](#) in the Android Studio blog.

See developer.android.com/studio

Add Components to the SDK

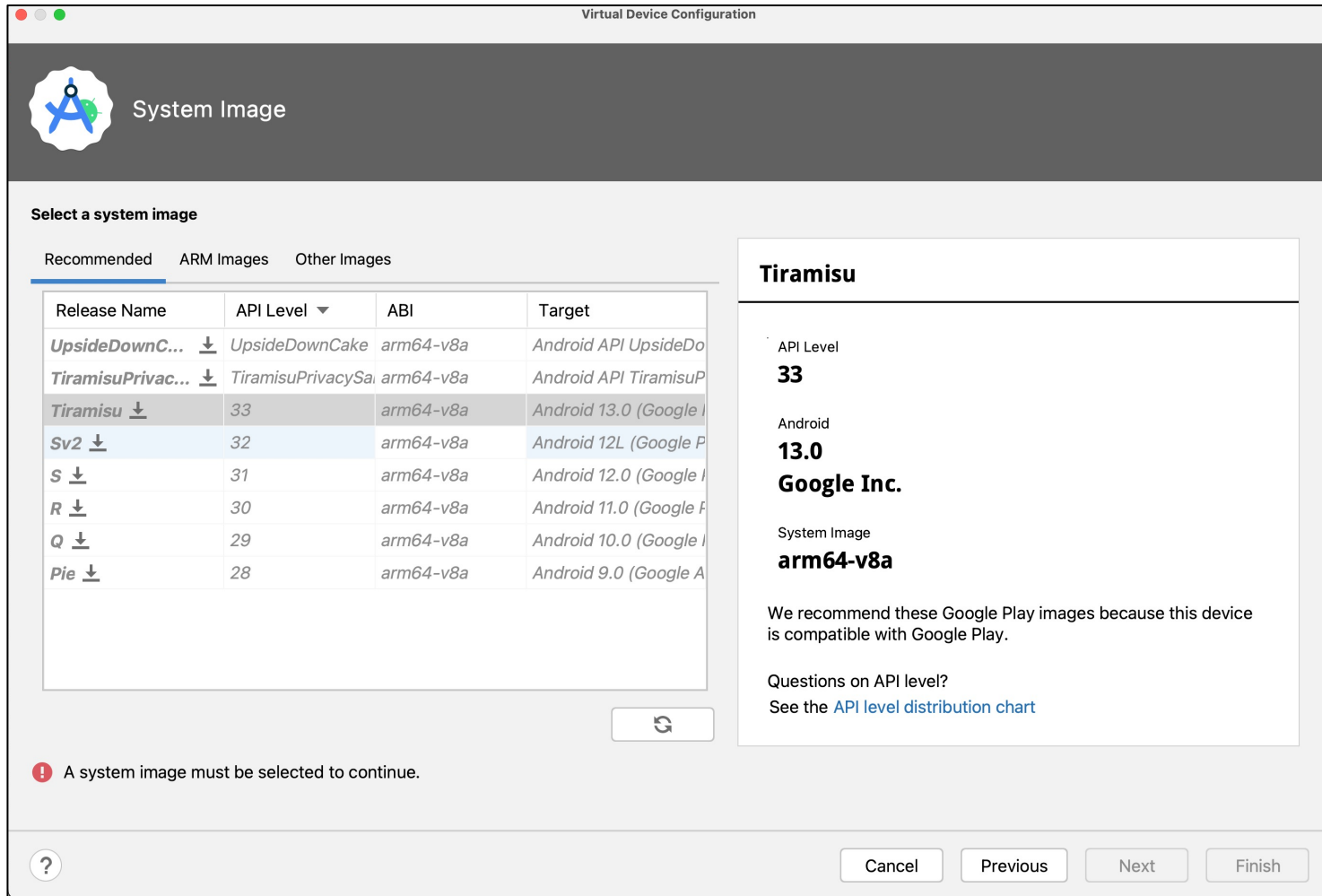
- Launch the Android Studio SDK Manager
 - Select "T" version of Android (13, API 33)



See developer.android.com/studio/intro/update.html

Add Components to the SDK

- Launch the Android Studio Virtual Device Manager
- Create an Android API 33 emulator



developer.android.com/tools/devices/managing-avds.html

Intel HAXM Virtualization Driver

• Requirements

- Intel virtualization extensions (VT, VT-x, vmx)
- AMD virtualization extensions (AMD-v, SVM) [only supported on Linux]
- Download an x86 emulator image

• Windows & Mac OSX

- `<sdk>/extras/intel/Hardware_Accelerated_Execution_Manager/IntelHAXM.exe/dmg`

• Linux

- Install KVM & pass the “-enable-kvm” flag to the emulator when starting

Configure hardware acceleration for the Android Emulator

On this page ▾

Configure graphics acceleration

Requirements

[Configure graphics acceleration in the AVD Manager](#)

Configure graphics acceleration from the command line

Enable Skia rendering for Android UI

Configure VM acceleration

General requirements

Restrictions

...

The emulator runs best if it can use your machine's hardware, such as the CPU, GPU, and modem, rather than running as pure software. The ability to use your machine's hardware to improve performance is called *hardware acceleration*.

The emulator can use hardware acceleration to improve your experience in two main ways:

- Graphics acceleration for improved screen rendering
- Virtual machine (VM) acceleration for improved execution speed

Hardware acceleration is enabled by default on most machines. If it isn't enabled on your machine, this page describes how you can configure graphics and virtual machine (VM) acceleration to get higher performance from the emulator.

developer.android.com/studio/run/emulator-acceleration

Setting Up GitLab et al.

Setting Up GitLab et al.

The screenshot shows the GitLab dashboard homepage. At the top, there is a navigation bar with the GitLab logo, a search bar, and various utility icons. Below the navigation bar, a promotional banner for a "Free Trial of GitLab.com Gold" is visible. The main content area is titled "Welcome to GitLab" and includes the tagline "Code, test, and deploy together". There are four main action cards: "Create a project" (highlighted with a red border), "Create a group", "Explore public projects", and "Learn more about GitLab".

Free Trial of GitLab.com Gold
Try all GitLab has to offer for 30 days. No credit card required. [Start your trial](#)

Welcome to GitLab

Code, test, and deploy together

- Create a project**
Projects are where you store your code, access issues, wiki and other features of GitLab.
- Create a group**
Groups are the best way to manage projects and members.
- Explore public projects**
There are 1,385,678 public projects on this server. Public projects are an easy way to allow everyone to have read-only access.
- Learn more about GitLab**
Take a look at the documentation to discover all of GitLab's capabilities.

Setting Up GitLab et al.

New Project · GitLab

gitlab.com/projects/new

Projects Groups Activity Milestones Snippets

New project

A project is where you house your files (repository), plan your work (issues), and publish your documentation (wiki), among other things.

All features are enabled for blank projects, from templates, or when importing, but you can disable them afterward in the project settings.

To only use CI/CD features for an external repository, choose **CI/CD for external repo**.

Information about additional Pages templates and how to install them can be found in our [Pages getting started guide](#).

Tip: You can also create a project from the command line. [Show command](#)

Blank project Create from template Import project CI/CD for external repo

Project name
CS-5254-summer-2023

Project URL Project slug

Want to house several dependent projects under the same namespace? [Create a group](#).

Project description (optional)

Visibility Level ⓘ

Private
Project access must be granted explicitly to each user.

Public
The project can be accessed without any authentication.

Initialize repository with a README
Allows you to immediately clone this project's repository. Skip this if you plan to push up an existing repository.

Create project Cancel

Setting Up GitLab et al.

The screenshot shows the GitLab web interface. At the top, there's a navigation bar with the GitLab logo, 'Projects', 'Groups', 'Activity', 'Milestones', and 'Snippets'. A search bar is on the right. Below the navigation bar, a sidebar on the left lists project navigation options: Project, Details, Activity, Cycle Analytics, Issues (0), Merge Requests (0), CI / CD, Operations, Packages, Wiki, Snippets, and Settings. The main content area shows a project page for 'CS-5254-summer-2023' with Project ID: 13944228. A blue banner at the top of the project page states 'Project 'CS-5254-summer-2023' was successfully created.' Below this, there are buttons for 'New file', 'Add README', 'Add CHANGELOG', and 'Add CONTRIBUTING'. The page also includes 'Command line instructions' and 'Git global setup' sections with code snippets.

Lindsey Fox / CS-891-fall-2022

gitlab.com/lclfox/CS-891-fall-2022

GitLab Projects Groups Activity Milestones Snippets

Search or jump to...

CS-891-fall-2022

You won't be able to pull or push project code via SSH until you **add an SSH key** to your profile [Don't show again](#) [Remind later](#)

Lindsey Fox CS-5254-summer-2023 Details

Project 'CS-5254-summer-2023' was successfully created.

CS-5254-summer-2023
Project ID: 13944228

[Add license](#)

The repository for this project is empty
You can create files directly in GitLab using one of the following options.

[New file](#) [Add README](#) [Add CHANGELOG](#) [Add CONTRIBUTING](#)

Command line instructions
You can also upload existing files from your computer using the instructions below.

Git global setup

```
git config --global user.name "Lindsey Fox"
git config --global user.email "lindsey.fox@vanderbilt.edu"
```

Create a new repository

```
git clone https://gitlab.com/lclfox/cs-891-fall-2019.git
cd cs-891-fall-2019
touch README.md
git add README.md
```

Setting Up GitLab et al.

Members · Lindsey Fox / CS-891- /

gitlab.com/lclfox/CS-891-fall-2022/-/project_members

GitLab Projects Groups Activity Milestones Snippets

Search or jump to...

Lindsey Fox > CS-891-fall-2022 > Members

Project members

You can invite a new member to **CS-5254-summer-2023** invite another group.

Invite member Invite group

GitLab member or Email address

Douglas Craig Schmidt

Choose a role permission

Maintainer

[Read more about role permissions](#)

Access expiration date

Expiration date

Add to project Import

Existing members and groups

Members of **CS-5254-summer-2023**

Find existing members by name Sort by Name, ascending

Lindsey Fox @lclfox **It's you** Given access 2 minutes ago Maintainer

Setting Up GitLab et al.

The screenshot shows the GitLab web interface. The browser address bar displays `gitlab.com/lclfox/CS-891-fall-2022/edit`. The left sidebar contains a navigation menu with the following items: Project, Issues (0), Merge Requests (0), CI / CD, Operations, Packages, Wiki, Snippets, Settings (selected), General (selected), Members, Integrations, Repository, CI / CD, Operations, Pages, and Audit Events. The main content area is titled "Lindsey Fox > CS-891-spring-2023 General Settings".

Naming, topics, avatar


Update your project name, topics, description and avatar. Collapse

Project name **Project ID**

Topics


Separate topics with commas.

Project description (optional)

Project avatar
 No file chosen
The maximum file size allowed is 200KB.

Visibility, project features, permissions

Choose visibility level, enable/disable project features (issues, repository, wiki, snippets) and set permissions. Collapse

Project visibility 

The project is accessible only by members of the project. Access must be granted explicitly to each user.

Issues

Setting Up GitLab et al.

2. Clone your GitLab repo

```
git clone git@gitlab.com:your-name/CS-5254-summer-2023.git
```

1. Create Your GitLab Repo

`www.gitlab.com`



**Working Folder
(Student's)**

**GitLab Repo
(Student's)**

```
cd CS-5254-summer-2023
```

3. Change Directory into Your Working Folder

See docs.gitlab.com/ee/ssh for info on setting up an SSH key for GitLab et al.

Setting Up GitLab et al.

4. Update from Read-Only GitHub Repo

```
git remote add skeletons
```

```
git@github.com:douglasraigschmidt/CS5254.git
```

5. Get Current Version

```
git pull skeletons main
```

**Working Folder
(Student's)**

Assignment1a
...

6. Do work!

**Local Repo
(Student's)**

Assignment1a
...

**GitLab Repo
(Student's)**

Assignment1a
...

**GitHub Repo
(Instructor's)**

Assignment1a
Assignment1b
Assignment2a
Assignment2b
...

```
git commit
```

7. Commit Changes

```
git push origin main
```

8. Send Changes to GitLab Repo

See item #13 at github.com/douglasraigschmidt/CS5254/wiki/CS-5254-FAQ

Accessing Java & Android Source Code

Accessing Java & Android Source Code

- Android source code is available
 - For browsing android.googlesource.com

android Git repositories

To clone one of these repositories, install `git`, and run:

```
| git clone https://android.googlesource.com/name
```

Name

accessories/manifest
device/asus/deb
device/asus/flo
device/asus/flo-kernel
device/asus/grouper
device/asus/tilapia
device/common
device/generic/armv7-a
device/generic/armv7-a-neon
device/generic/art
device/generic/common
device/generic/goldfish
device/generic/mini-emulator-armv7-a-neon
device/generic/mini-emulator-mips
device/generic/mini-emulator-x86

Accessing Java & Android Source Code

- Android source code is available
 - For browsing android.googlesource.com
 - For downloading source.android.com

The Android Source Code

Android is an open-source software stack created for a wide array of devices with different form factors. The primary purposes of Android are to create an open software platform available for carriers, OEMs, and developers to make their innovative ideas a reality and to introduce a successful, real-world product that improves the mobile experience for users. We also wanted to make sure there was no central point of failure, where one industry player could restrict or control the innovations of any other. The result is a full, production-quality consumer product with source code open for customization and porting.

Governance Philosophy

Android was originated by a group of companies known as the Open Handset Alliance, led by Google. Today, many companies – both original members of the OHA and others – have invested heavily in Android. These companies have allocated significant engineering resources to improve Android and bring Android devices to market.

The companies that have invested in Android have done so on its merits because we believe an open platform is necessary. Android is intentionally and explicitly an open-source – as opposed to a free software – effort; a group of organizations with shared needs has pooled resources to collaborate on a single implementation of a shared product. The Android philosophy is pragmatic, first and foremost. The objective is a shared product that each contributor can tailor and customize.

Uncontrolled customization can, of course, lead to incompatible implementations. To prevent this, the Android Open Source Project also maintains the [Android Compatibility Program](#), which spells out what it means to be "Android compatible" and what is required of device builders to achieve that status. Anyone can (and will!) use the Android source code for any purpose, and we welcome all legitimate uses. However, in order to take part in the shared ecosystem of applications we are building around Android, device builders must participate in the Android Compatibility Program.

The Android Open Source Project is led by Google, who maintains and further develops Android. Although Android consists of multiple subprojects, this is strictly a project management technique. We view and manage Android as a single, holistic software product, not a "distribution", specification, or collection of replaceable parts. Our intent is that device builders port Android to a device; they don't implement a specification or curate a distribution.

Accessing Java & Android Source Code

- Java source code is available
 - For browsing zgrepcode.com



The screenshot shows the Java.net website interface. At the top left is the Java logo and the text "Java.net The Source for Java Technology Collaboration". On the right, there are links for "Login", "Register", and "Help". A navigation menu for "JDK 8" is visible, containing links for "Downloads", "Feedback Forum", "OpenJDK", and "Planet JDK". The main content area is titled "JDK 8 Project" with the subtitle "Building the next generation of the JDK platform". Below this, there are three columns of text: "JDK 8 snapshot builds" with a list of links including "Download 8u40 early access snapshot builds", "Source code (instructions)", "Official Java SE 8 Reference Implementations", and "Early Access Build Test Results (instructions)"; "We Want Contributions!" with a paragraph about contributing to the platform; and "Feedback" with instructions on where to report issues and how to provide version information.

JDK 8 Project
Building the next generation of the JDK platform

JDK 8 snapshot builds

- [Download 8u40 early access snapshot builds](#)
- [Source code \(instructions\)](#)
- [Official Java SE 8 Reference Implementations](#)
- [Early Access Build Test Results \(instructions\)](#)

We Want Contributions!

Frustrated with a bug that never got fixed? Have a great idea for improving the Java SE platform? See [how to contribute](#) for information on making contributions to the platform.

Feedback

Please use the [Project Feedback](#) forum if you have suggestions for or encounter issues using JDK 8.

If you find bugs in a release, please submit them using the usual [Java SE bug reporting channels](#), not with the Issue tracker accompanying this project. Be sure to include complete version information from the output of the `java -version` command.

Accessing Java & Android Source Code

- Java source code is available
 - For browsing zgrepcode.com
 - For downloading openjdk.org

OpenJDK



What is this? The place to collaborate on an open-source implementation of the [Java Platform, Standard Edition](#), and related projects.



Download and install the latest open-source JDK. Oracle's free, GPL-licensed, production-ready OpenJDK JDK 20 binaries for Linux, macOS, and Windows are available at jdk.java.net/20; Oracle's commercially-licensed JDK 20 binaries, based on the same code, are [here](#).



Learn about the key active Projects in the Community including [Amber](#) (high-productivity language features), [Loom](#) (lightweight concurrency), [Panama](#) (foreign functions and foreign data), [Valhalla](#) (primitive types and specialized generics), and, of course, [the next version of Java and the JDK](#).

If you want to learn how to use the Java that's available today, head over to [dev.java](#).

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