

# Version Control with Android Studio (Kotlin)



# What is Version Control?

- Version Control is a **system that helps developers track changes in their code and manage different versions of a project.**
- It allows you to
  - Save versions of your code.
  - Go back to previous versions.
  - Collaborate with others without overwriting each other's work.

# Why Do We Use Version Control?

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- Keep track of every change
- Roll back to an earlier version if something breaks
- Work with a team without overwriting each other's work
- Merge changes from different developers
- Keep code safely backed up online

# Methods of Version Control

- There are three main types
  - **Local Version Control**
    - Track changes only on your computer
    - Example -File history on your PC
  - **Centralized Version Control**
    - One central server stores all versions
  - **Distributed Version Control**
    - Git (most popular)

# What is Git?

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- Git is a free, open-source distributed version control system.
- It helps you track changes, collaborate, and manage source code history.



# What is GitHub?

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- GitHub is a platform to host Git repositories online.
- It helps with sharing code, collaboration, and version tracking.



## Other Git Hosting Services

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- GitHub
- GitLab
- Bitbucket



**GitHub**



**GitLab**

## Remote Repository

- A remote repository is the **online version of your project, usually hosted on platforms like GitHub.**
- It allows you to share your code and collaborate with others.
- Example  
<https://github.com/NIBMLectures/SampleApp1>



# Commit

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- A commit **saves a snapshot of your current code.**
- You add a message to explain what you changed.

# Push

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- A push **sends your local commits to the remote repository (GitHub).**
- This updates the online version of your project.
- You commit locally, then push to share.

# Pull

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- A pull fetches the latest changes from the remote repository to your local machine.
- Use this to get updates others made.
- **Always pull before starting new work!**

# Pull Request

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- **A Pull Request (PR) is a way to propose changes to a project in GitHub before those changes are merged into the main code.**

# Branch

- A branch is a **copy of your code used to make changes or test features without affecting the main code (usually called main or master).**
- You can merge it back after testing.

# Clone

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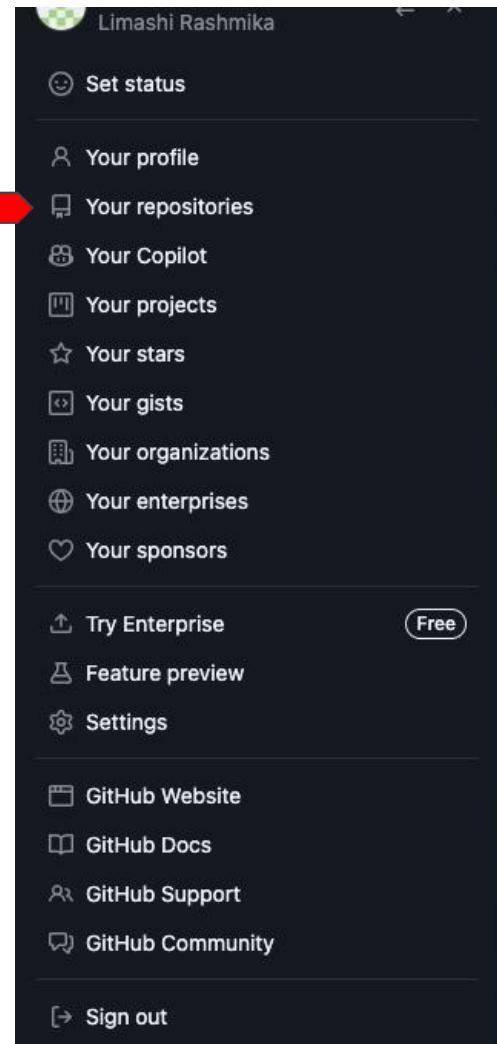
- To clone means to download a remote repository onto your computer.
- This gives you a local copy to work with.
- **First step when starting a new project from GitHub.**

# How to Create a Remote Repository on GitHub

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- Log in to your Github account (or sign up if you don't have one)
- **Select Your Repositories > New > Create a new repository**

# How to Create a Remote Repository on GitHub





# How to Create a Remote Repository on GitHub

## Create a new repository

A repository contains all project files, including the revision history. Already have a project repository elsewhere? [Import a repository](#).

Required fields are marked with an asterisk (\*).

Owner \*



NIBMLectures

Repository name \*



Great repository names are short and memorable. Need inspiration? How about [automatic-goggles](#) ?

Description (optional)



Public

Anyone on the internet can see this repository. You choose who can commit.



Private

You choose who can see and commit to this repository.

Initialize this repository with:



Add a README file

This is where you can write a long description for your project. [Learn more about READMEs](#).

Add .gitignore

.gitignore template: None

Choose which files not to track from a list of templates. [Learn more about ignoring files](#).

Choose a license

License: None

A license tells others what they can and can't do with your code. [Learn more about licenses](#).



You are creating a private repository in the NIBMLectures organization.

Create repository

## NOTE

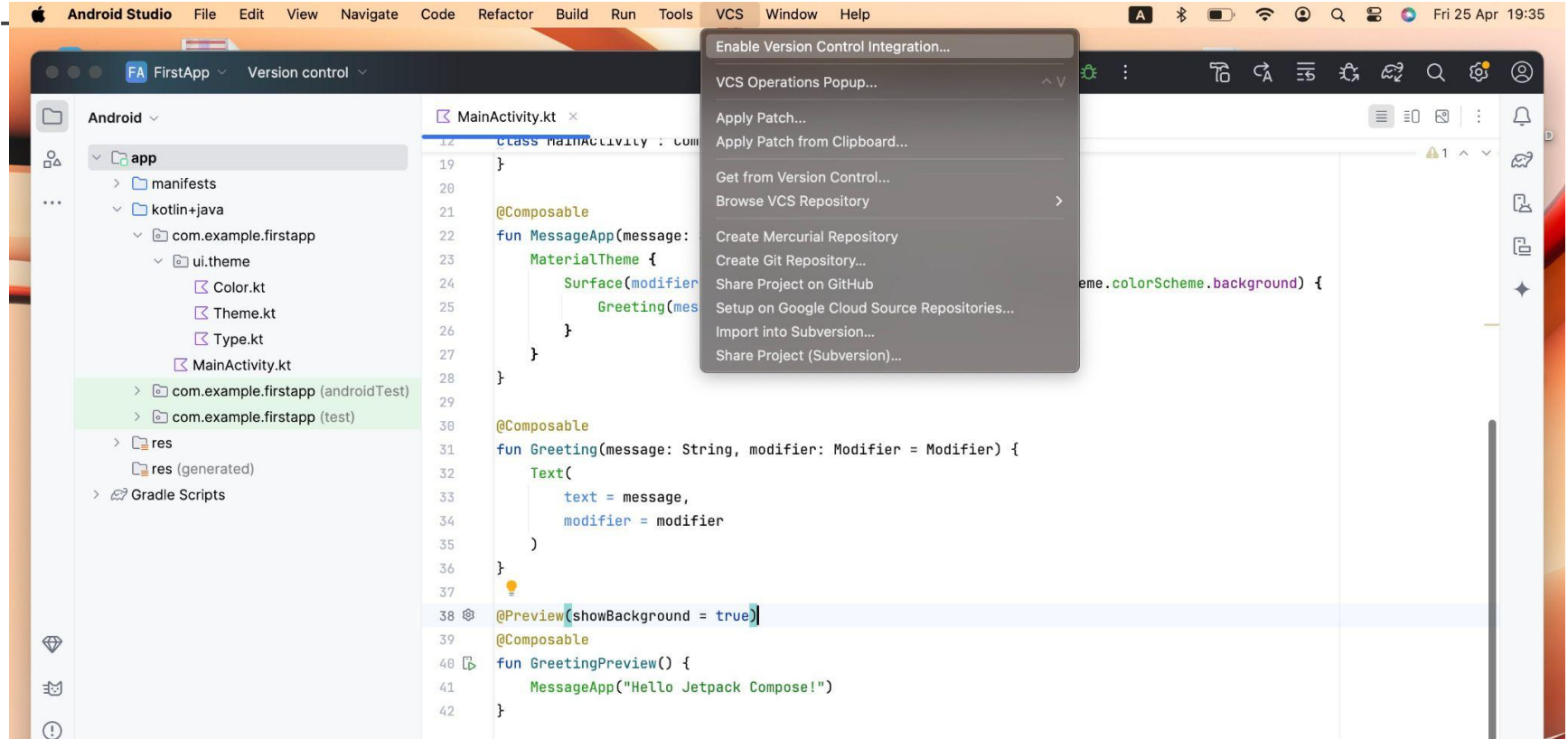
- Repository Name- Eg: MyKotlinApp
- Description (optional)- Short project description
- Visibility
  - Public (anyone can see it)
  - Private (only you/your team can see it)
- Check “Initialize this repository with a README” (optional)
- Then click Create repository

## How to Connect GitHub to Android Studio Kotlin Project

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- Open your Kotlin project in Android Studio
- Go to **VCS > Enable Version Control Integration**
- Choose **Git** and click OK
- Now your project is initialized with Git locally.

# How to Connect GitHub to Android Studio Kotlin Project



## NOTE

- There are two ways to connect a GitHub account to Android Studio
  - **Login with GitHub Account**
  - **Login with Personal Access Token (PAT)**

## Login with GitHub Account

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- This method uses **OAuth authorization**.
- The user logs in through a browser popup **using their GitHub username and password**.
- Android Studio is then granted access to the GitHub account.

## Login with Personal Access Token

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- GitHub has disabled password authentication for Git operations, so tokens are now required.
- Users generate a PAT from GitHub (with appropriate permissions like repo) and paste it into Android Studio.
- This token is used as a secure alternative to passwords when pushing, pulling, or cloning repositories.

## NOTE

- Both methods are valid, but using **Personal Access Tokens is more flexible and secure**, especially when working with private repositories or multiple GitHub accounts.



## What is a Personal Access Token?

- A Personal Access Token is **like a password you generate on GitHub to securely connect tools like Android Studio, Git CLI, or Postman to your GitHub account.**

## Why Do We Need PATs?

- GitHub no longer supports password-based authentication for Git operations (like push, pull) from the command line or tools like Android Studio.

## When Do You Use a PAT?

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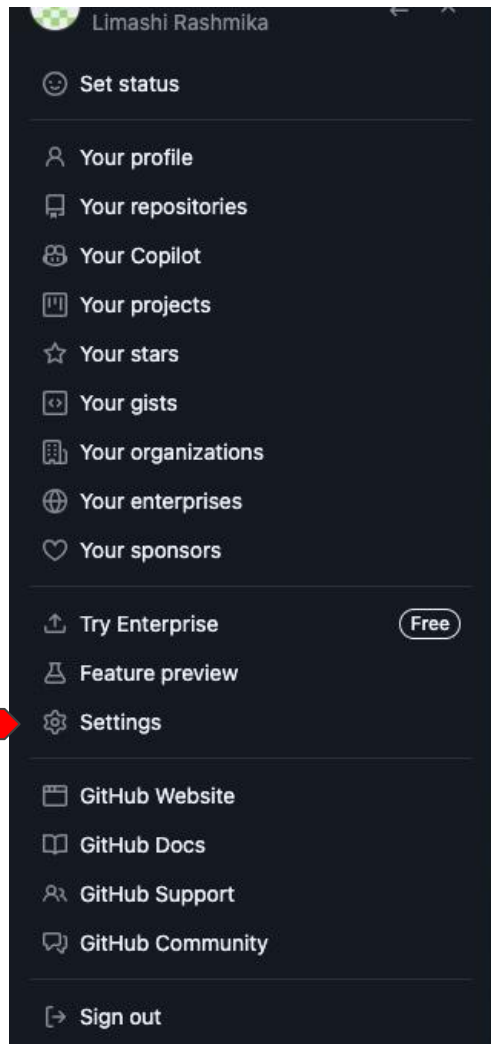
- Pushing code from Android Studio to GitHub
- Cloning private repos using HTTPS
- Using GitHub with third-party apps like Postman, CI/CD tools, etc.

## How to Create a Personal Access Token on GitHub

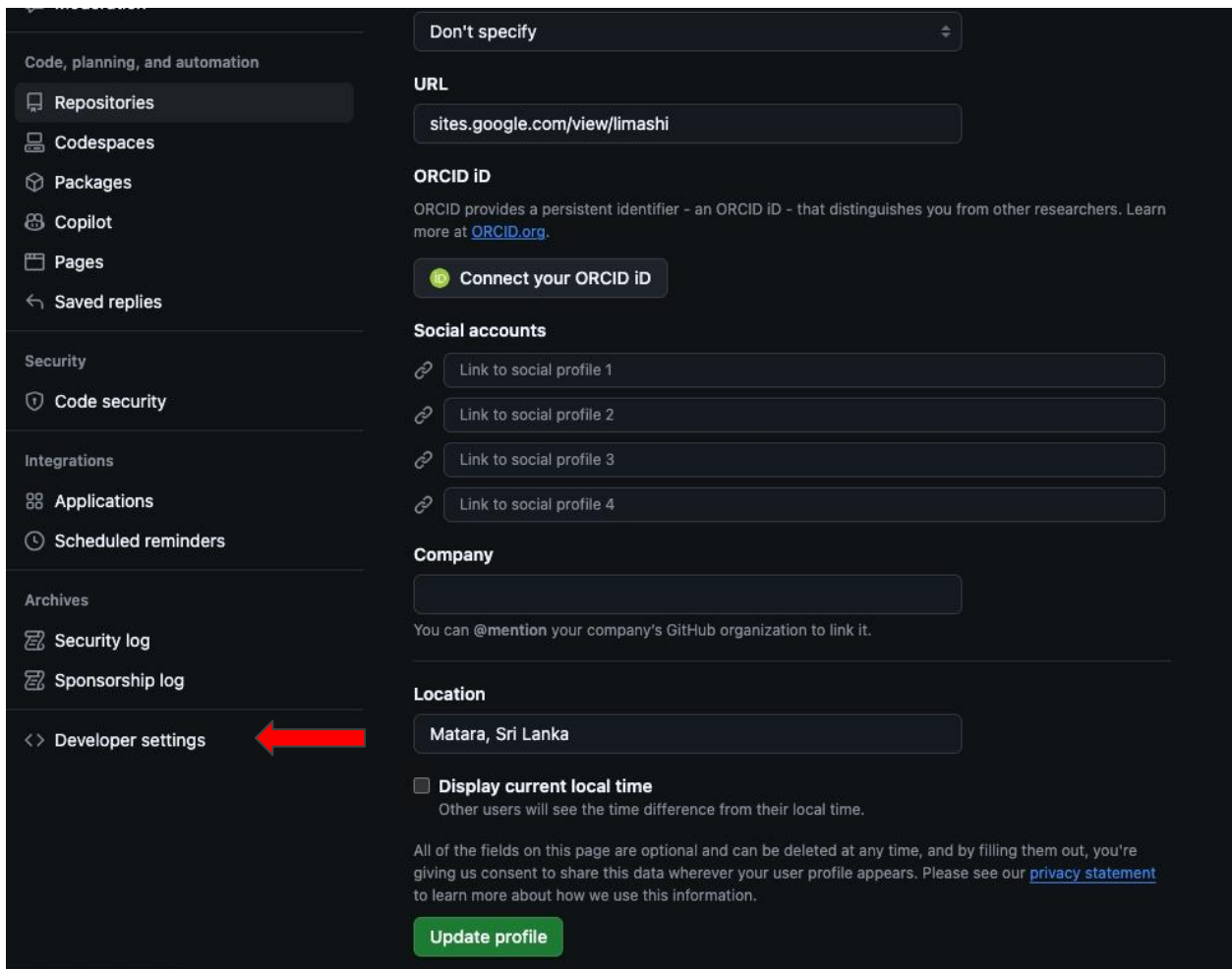
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- Login to your GitHub account
- Click your profile icon → Go to Settings
- Click Developer Settings
- Select Personal Access Tokens → Click **“Tokens (classic)”**

# How to Create a Personal Access Token on GitHub



# How to Create a Personal Access Token on GitHub



The screenshot shows the GitHub Developer settings page. On the left sidebar, the 'Developer settings' option is highlighted with a red arrow. The main content area displays various settings sections: 'Code, planning, and automation' (Repositories, Codespaces, Packages, Copilot, Pages, Saved replies), 'Security' (Code security), 'Integrations' (Applications, Scheduled reminders), 'Archives' (Security log, Sponsorship log), 'Don't specify' (dropdown), 'URL' (sites.google.com/view/limashi), 'ORCID iD' (Connect your ORCID iD button), 'Social accounts' (Link to social profile 1-4), 'Company' (text input), 'Location' (Matara, Sri Lanka), and 'Display current local time' (checkbox). A green 'Update profile' button is at the bottom.

Code, planning, and automation

- Repositories
- Codespaces
- Packages
- Copilot
- Pages
- Saved replies

Security

- Code security

Integrations

- Applications
- Scheduled reminders

Archives

- Security log
- Sponsorship log

<> Developer settings

Don't specify

URL

sites.google.com/view/limashi

ORCID iD

ORCID provides a persistent identifier - an ORCID iD - that distinguishes you from other researchers. Learn more at [ORCID.org](https://orcid.org).

Connect your ORCID iD

Social accounts

- Link to social profile 1
- Link to social profile 2
- Link to social profile 3
- Link to social profile 4

Company

You can @mention your company's GitHub organization to link it.

Location

Matara, Sri Lanka

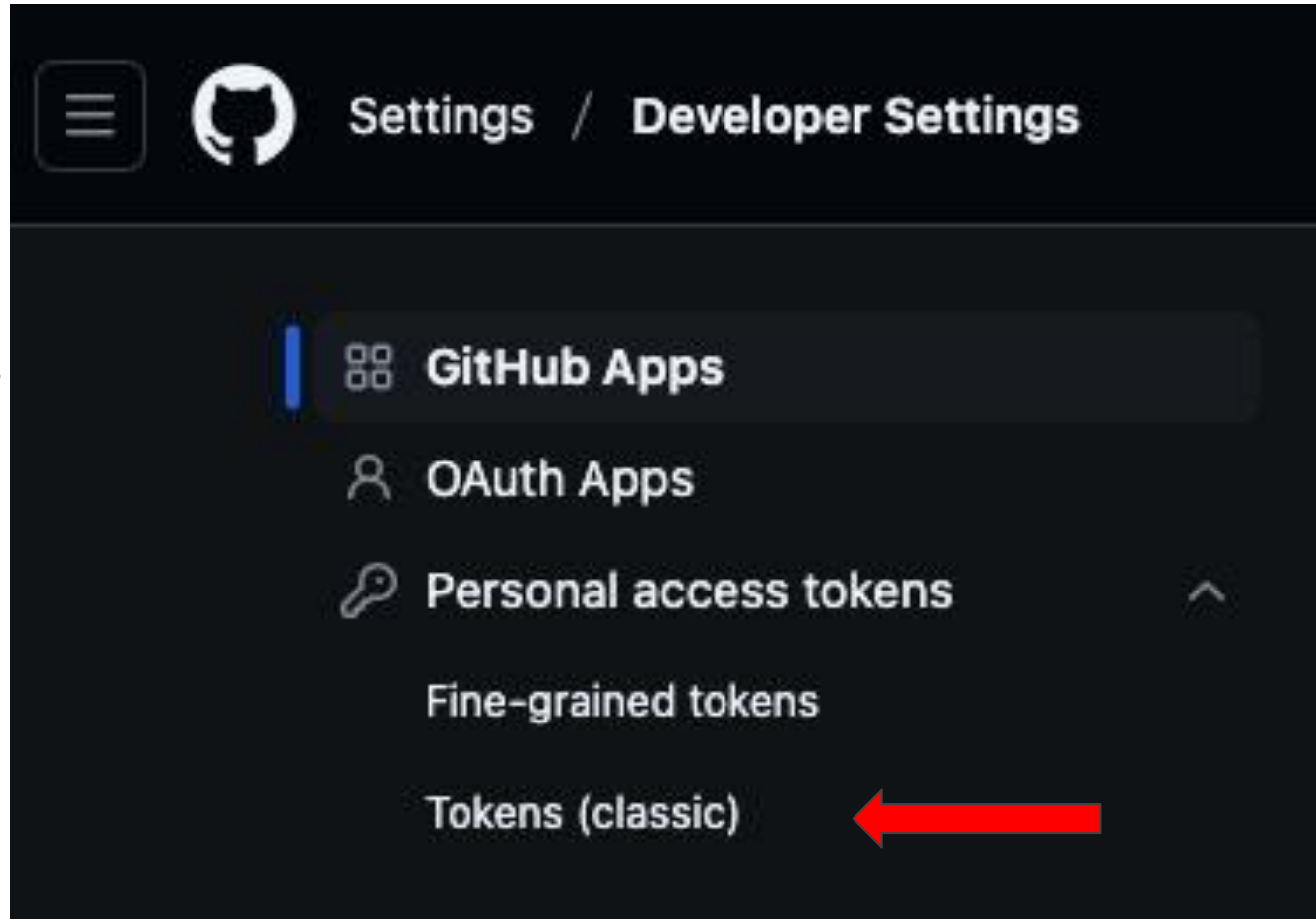
☐ Display current local time

Other users will see the time difference from their local time.

All of the fields on this page are optional and can be deleted at any time, and by filling them out, you're giving us consent to share this data wherever your user profile appears. Please see our [privacy statement](#) to learn more about how we use this information.

Update profile

# How to Create a Personal Access Token on GitHub



# How to Create a Personal Access Token on GitHub

## Personal access tokens (classic)

Generate new token ▾

Tokens you have generated that can be used to access the [GitHub API](#).

**NIBM\_JavaProject01** — *admin:enterprise, admin:gpg\_key, admin:ssh\_signing\_key, admin:public\_key, admin:repo\_hook, admin:ssh\_signing\_key, audit\_log, codespace, notifications, project, repo, user, workflow, write:discussion, write:packages*

Expired on Sun, Dec 1 2024.

### Generate new token

Fine-grained, repo-scoped

### Generate new token (classic)

For general use

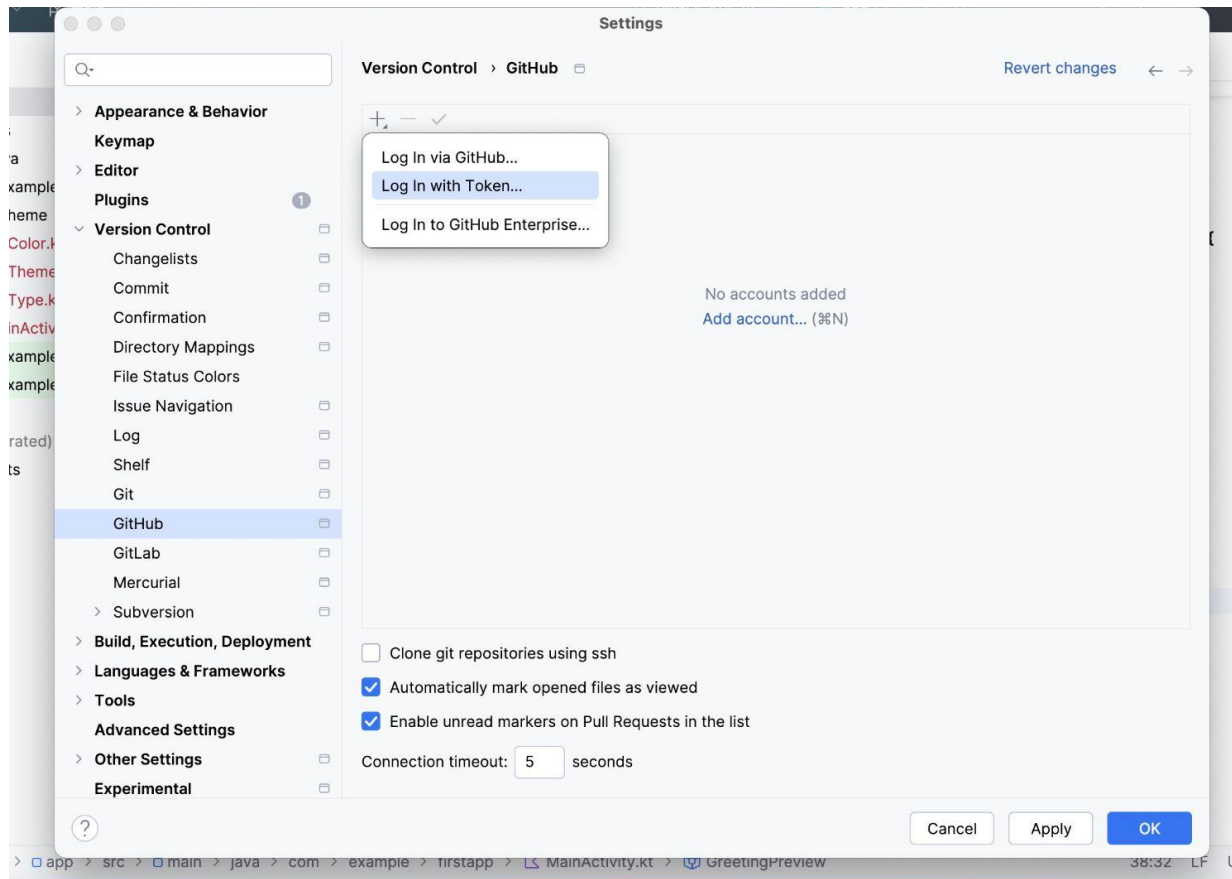


## Sign In to GitHub

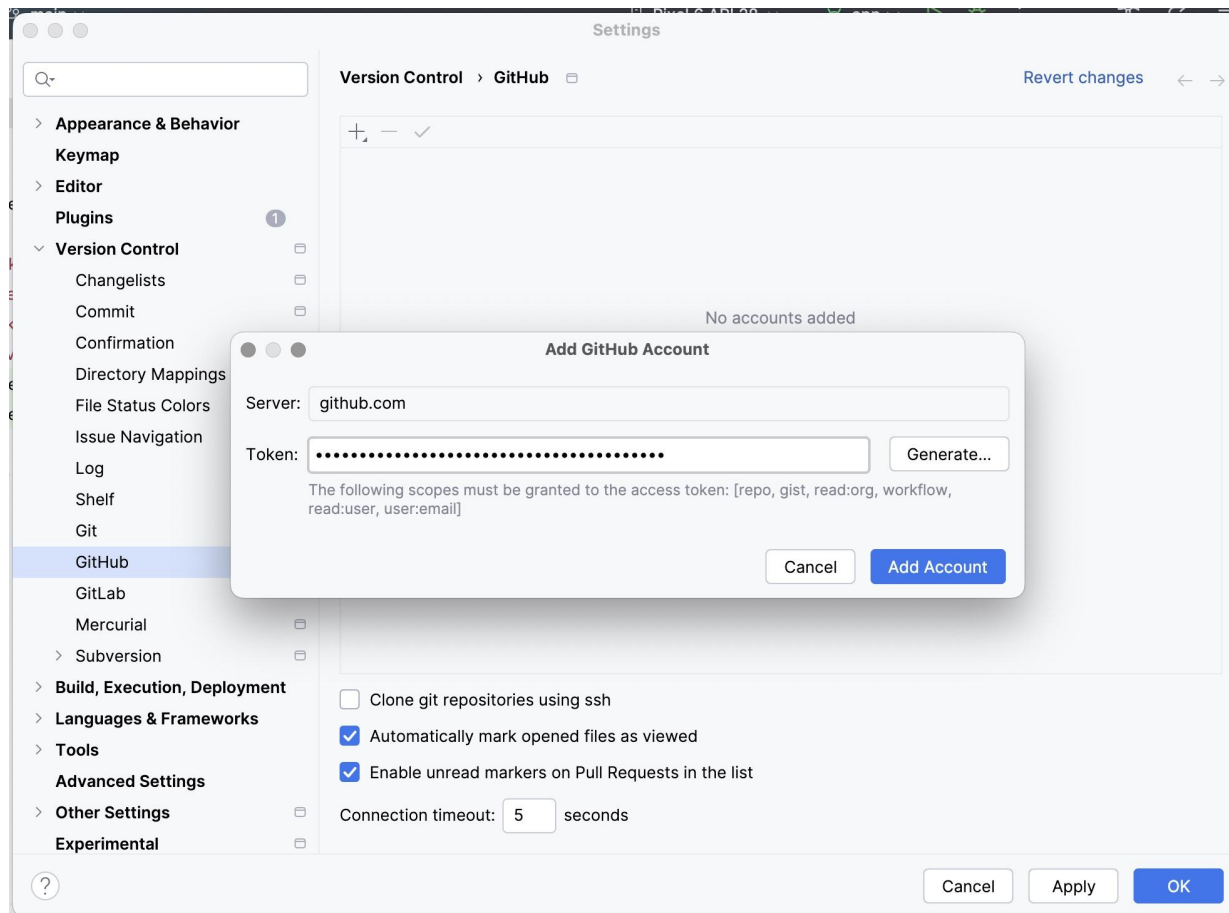
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- Go to **File > Settings**
- Navigate to **Version Control > GitHub**
- Click “**+**” to add an account
- Choose “**Log in with GitHub**” or use a **Personal Access Token (PAT)**
- Authorize and complete the login

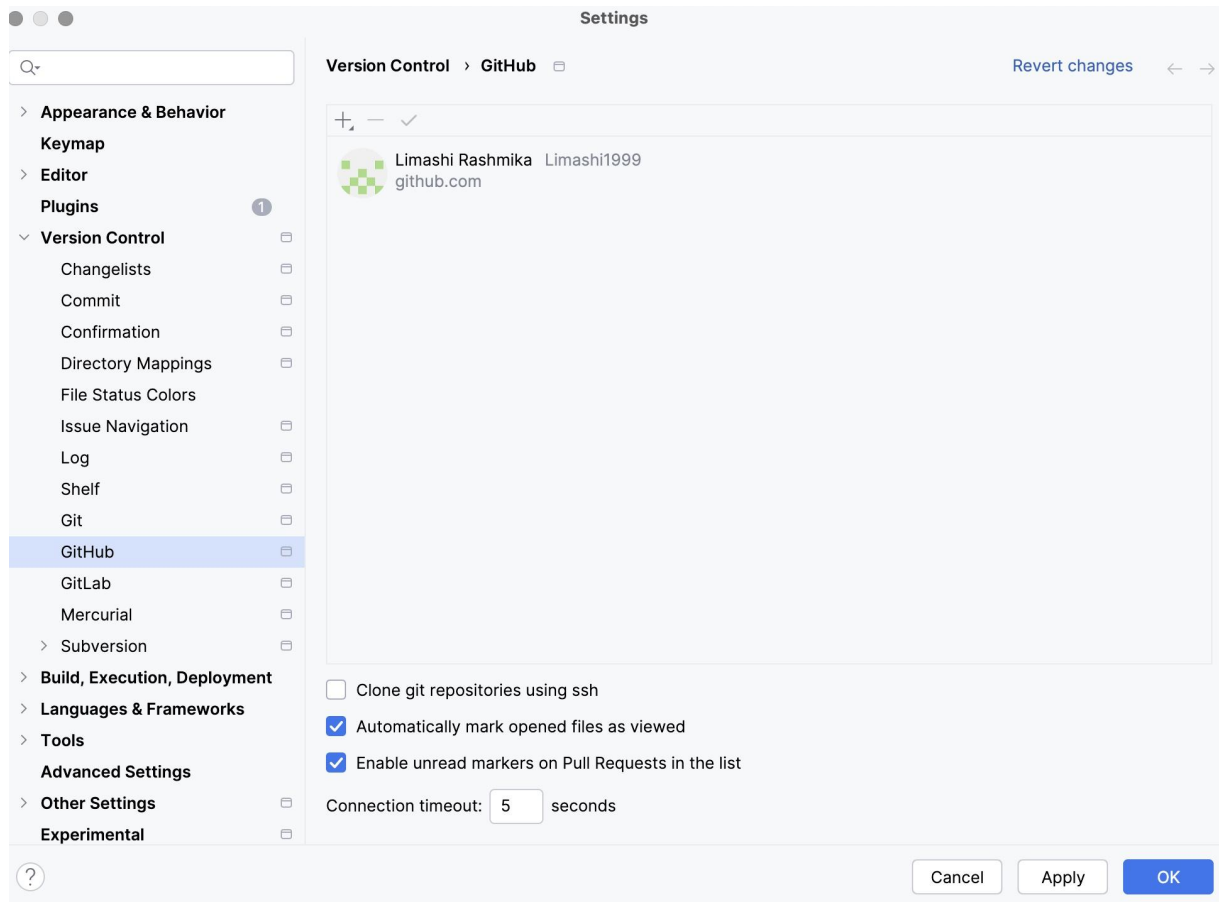
# Sign In to GitHub



# Sign In to GitHub



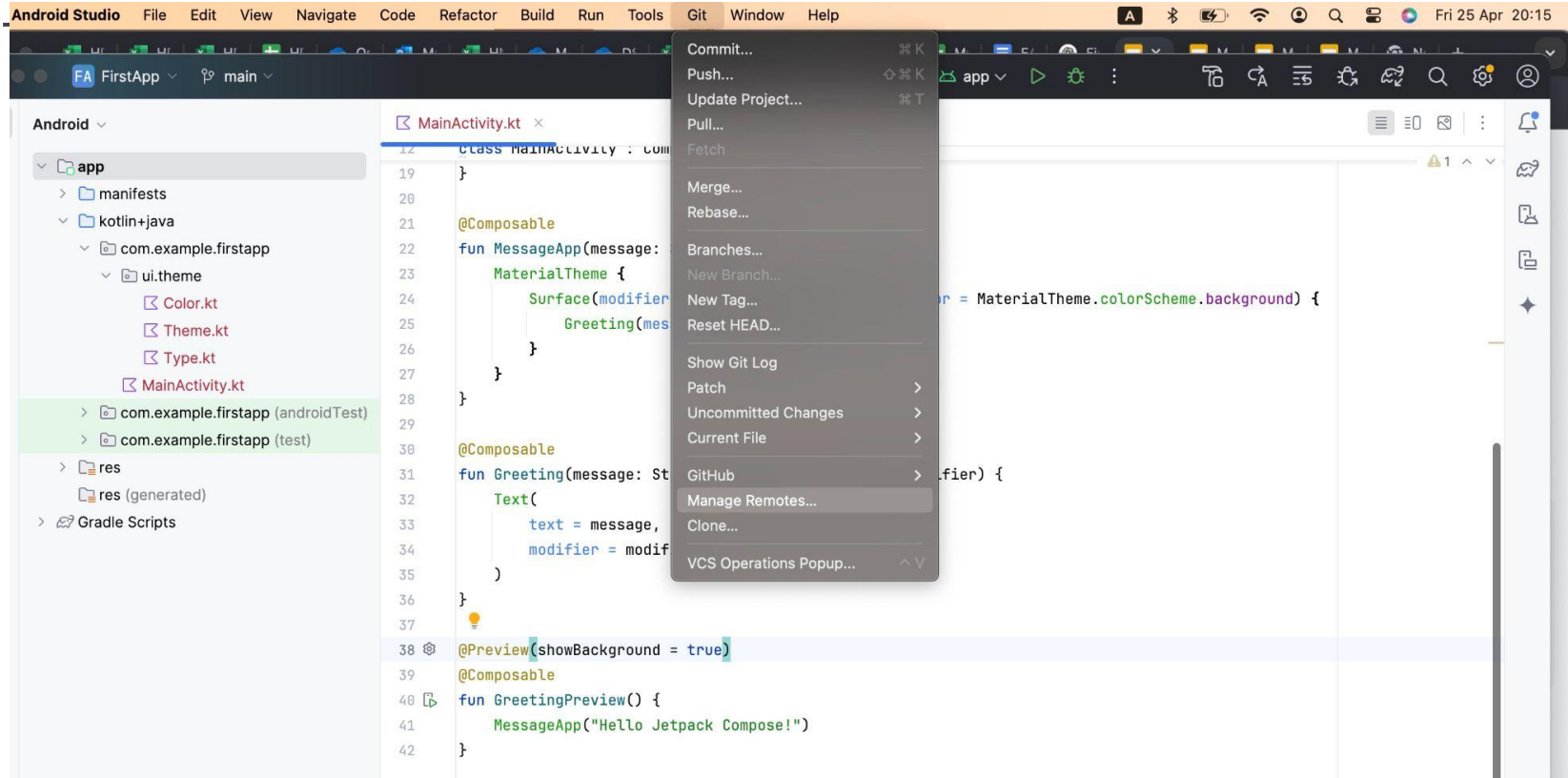
# Sign In to GitHub



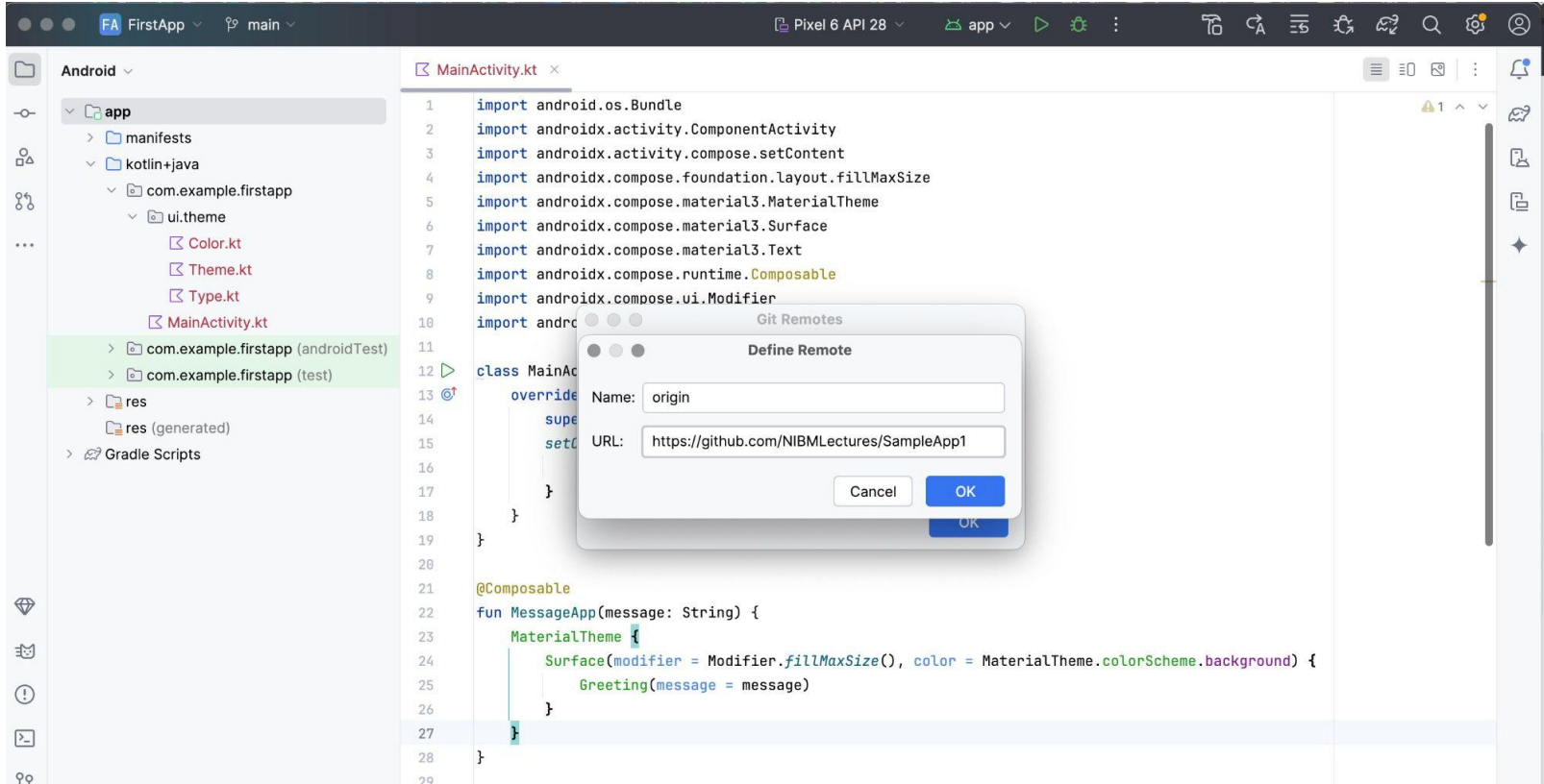
## Connect Android Studio Project to Remote GitHub Repository

- Open Your Project in Android Studio
- Go to **VCS > Git > Remotes...**
- Click the “+” (Add) button.
- Enter the remote name (e.g., origin) and **repository URL**  
(<https://github.com/NIBMLectures/SampleApp1>)
- Click OK

# Connect Android Studio Project to Remote GitHub Repository



# Connect Android Studio Project to Remote GitHub Repository



# What is a Branching Strategy?

- Branching Strategy is a plan for how your team will use Git branches to develop, test, and release code.



# Why Use Branching?

- Develop new features without breaking the main code
- Test or fix bugs separately
- Collaborate safely

# Common Branching Strategies

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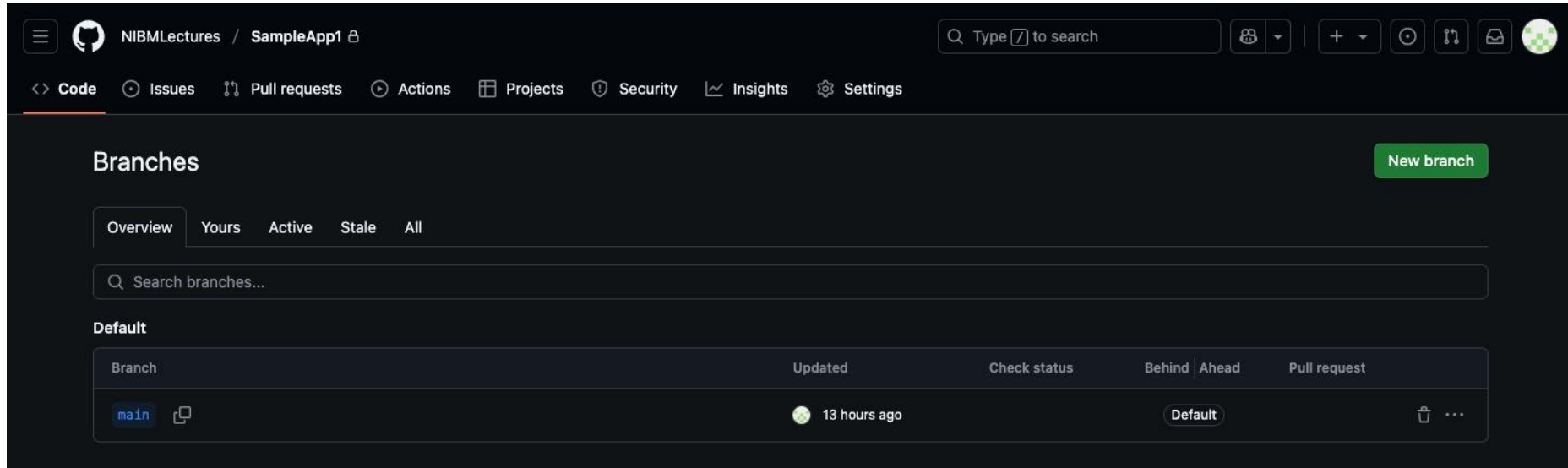
- **Main / Master** - Stable, production-ready version
- **Feature Branch** - For new features. Merged when complete
- **Development Branch** - Where integration happens before production
- **Hotfix Branch** - For urgent bug fixes in production
- **Release Branch** - Prepare for a new release (testing, polishing)

## Create Branches in a GitHub Repository

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- Go to your repository on GitHub
- Click the branch dropdown (next to the default branch, e.g., main)
- Type a new branch name.
- Click Create branch: [your-branch-name] from main

# Create Branches in a GitHub Repository






The screenshot shows the GitHub interface for a repository named 'SampleApp1' under the user 'NIBMLectures'. The 'Branches' tab is selected, displaying a list of branches. The 'main' branch is the default branch, updated 13 hours ago. A 'New branch' button is located in the top right corner of the branches section.

**Branches** New branch

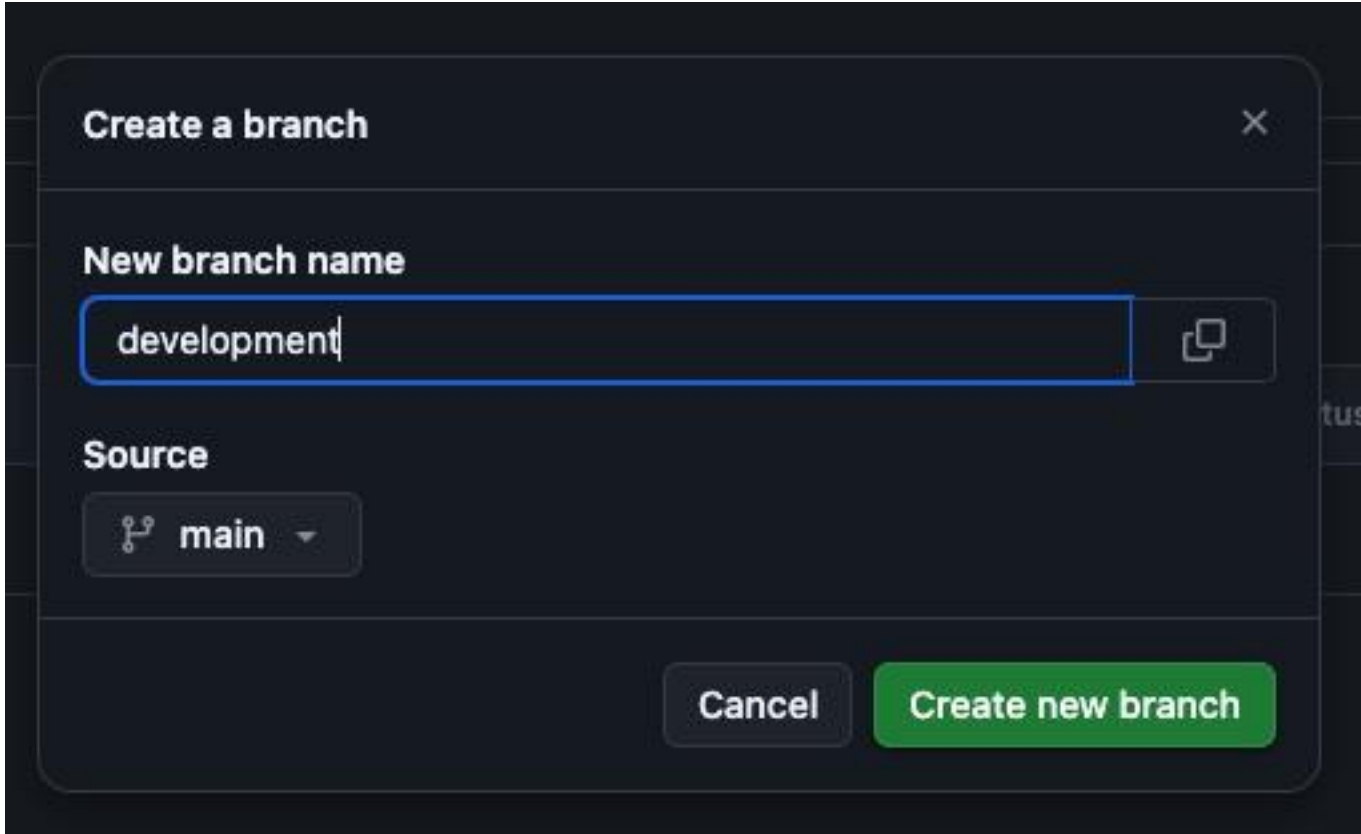
Overview **Yours** Active Stale All

Search branches...

**Default**

Branch	Updated	Check status	Behind   Ahead	Pull request
main 	 13 hours ago		Default	 ...

# Create Branches in a GitHub Repository



The image shows a dark-themed modal window titled "Create a branch" with a close button (X) in the top right corner. Below the title, there is a section labeled "New branch name" containing a text input field with the word "development" and a copy icon to its right. Underneath this is a section labeled "Source" with a button that shows a branch icon, the text "main", and a dropdown arrow. At the bottom of the modal are two buttons: a "Cancel" button and a green "Create new branch" button.

Create a branch

New branch name

development

Source

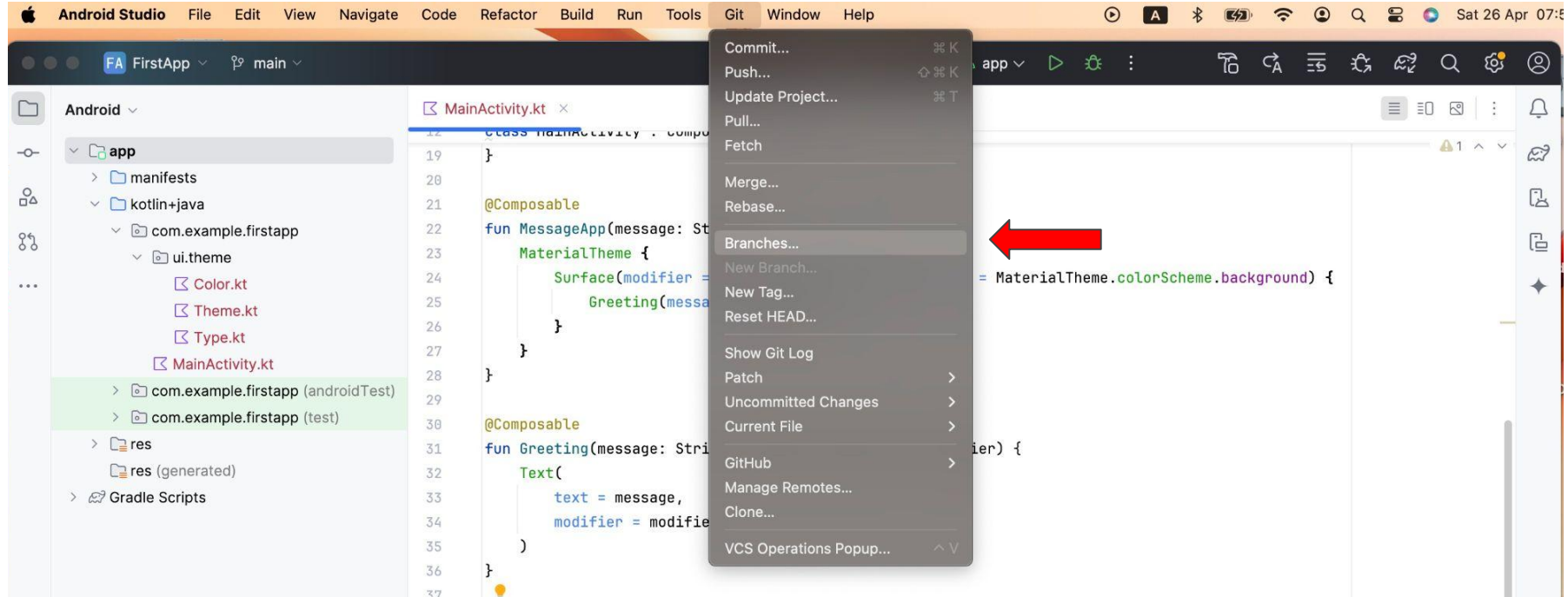
main

Cancel Create new branch

## Create a Branch in Android Studio (and Push to GitHub)

- In Android Studio, go to Git > Branches
- Click New Branch
- Enter a branch name (e.g., feature-login) and click Create
- After doing some changes, commit your changes
- Then go to Git > Push to push the branch to GitHub

# Create a Branch in Android Studio (and Push to GitHub)



# End

