



# 尚硅谷技术课程系列之 Git

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## 第1章 Git 概述

Git 是一个免费的、开源的**分布式版本控制系统**，可以快速高效地处理从小型到大型的各种项目。

Git 易于学习，占地面积小，性能极快。它具有廉价的本地库，方便的暂存区域和多个工作流分支等特性。其性能优于 Subversion、CVS、Perforce 和 ClearCase 等版本控制工具。

### 1.1 何为版本控制

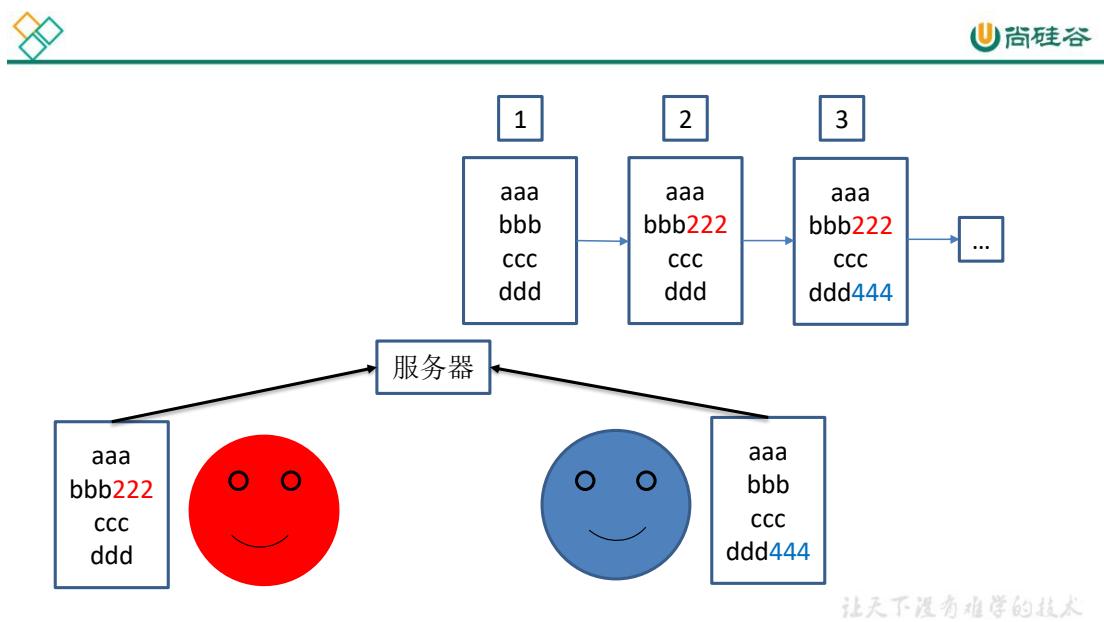
版本控制是一种记录文件内容变化，以便将来查阅特定版本修订情况的系统。

版本控制其实最重要的是可以记录文件修改历史记录，从而让用户能够查看历史版本，方便版本切换。

名称	修改日期
WORD XXX毕业论文.docx	2021/4/7 15:01
WORD XXX毕业论文改1.docx	2021/4/7 15:01
WORD XXX毕业论文改2.docx	2021/4/7 15:01
WORD XXX毕业论文完成版1.docx	2021/4/7 15:01
WORD XXX毕业论文完成版2.docx	2021/4/7 15:01
WORD XXX毕业论文最终版1.docx	2021/4/7 15:01
WORD XXX毕业论文最终版2.docx	2021/4/7 15:01
WORD XXX毕业论文最最终版1.docx	2021/4/7 15:01
WORD XXX毕业论文最最最终版1.docx	2021/4/7 15:01
WORD XXX毕业论文最最最终绝对不修改版1.docx	2021/4/7 15:01
WORD XXX毕业论文最最最终绝对不修改版2.docx	2021/4/7 15:01
WORD XXX毕业论文最最最终绝对不修改版修改就辍学版 .docx	2021/4/7 15:01
WORD XXX毕业论文最最最终绝对不修改版修改就辍学版2.docx	2021/4/7 15:01
WORD 给老师的一封信-辍学是怎么炼成的.docx	2021/4/7 15:01
WORD 遗书.docx	2021/4/7 15:01

### 1.2 为什么需要版本控制

个人开发过渡到团队协作。



### 1.3 版本控制工具

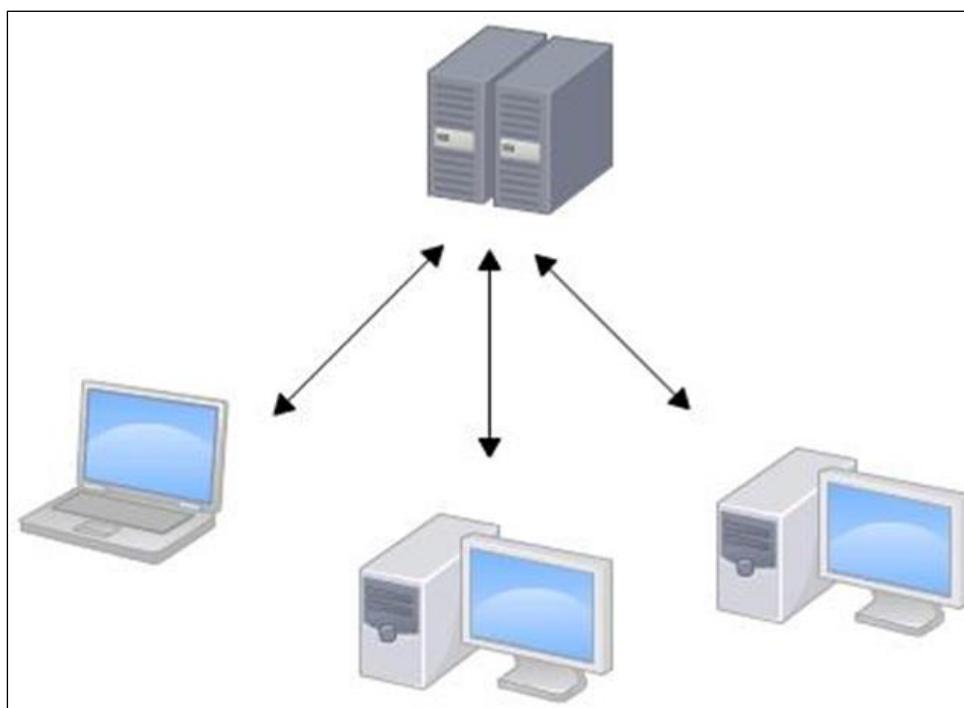
#### ➤ 集中式版本控制工具

CVS、**SVN(Subversion)**、VSS.....

集中化的版本控制系统诸如 CVS、SVN 等，都有一个单一的集中管理的服务器，保存所有文件的修订版本，而协同工作的人们都通过客户端连到这台服务器，取出最新的文件或者提交更新。多年以来，这已成为版本控制系统的标准做法。

这种做法带来了许多好处，每个人都可以在一定程度上看到项目中的其他人正在做些什么。而管理员也可以轻松掌控每个开发者的权限，并且管理一个集中化的版本控制系统，要远比在各个客户端上维护本地数据库来得轻松容易。

事分两面，有好有坏。这么做显而易见的缺点是中央服务器的单点故障。如果服务器宕机一小时，那么在一小时内，谁都无法提交更新，也就无法协同工作。



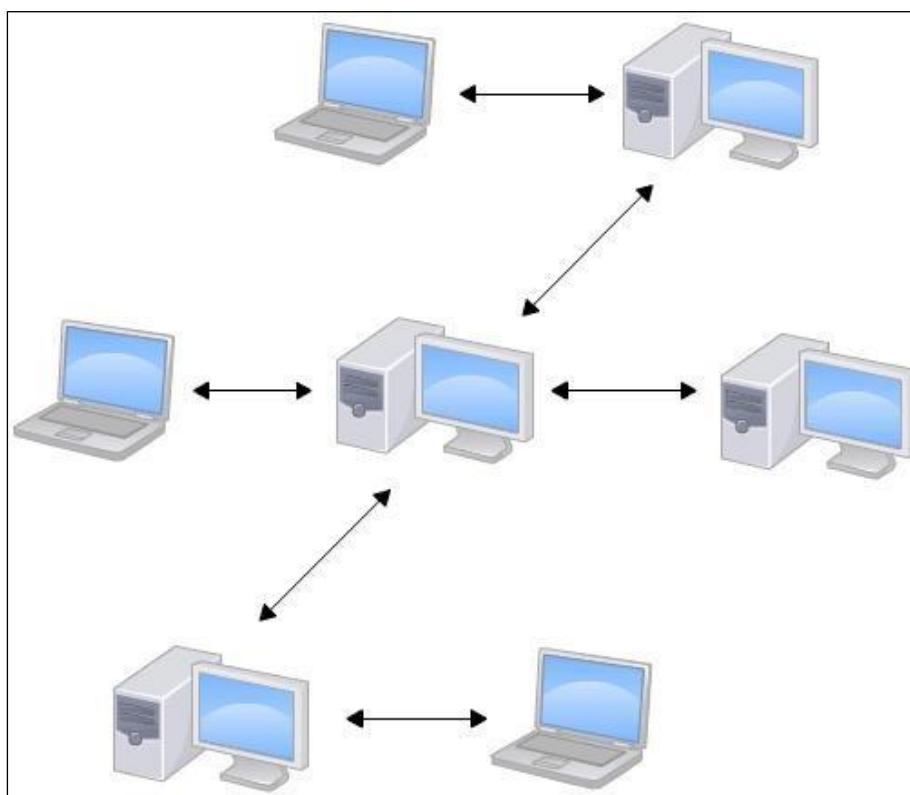
### ➤ 分布式版本控制工具

Git、Mercurial、Bazaar、Darcs.....

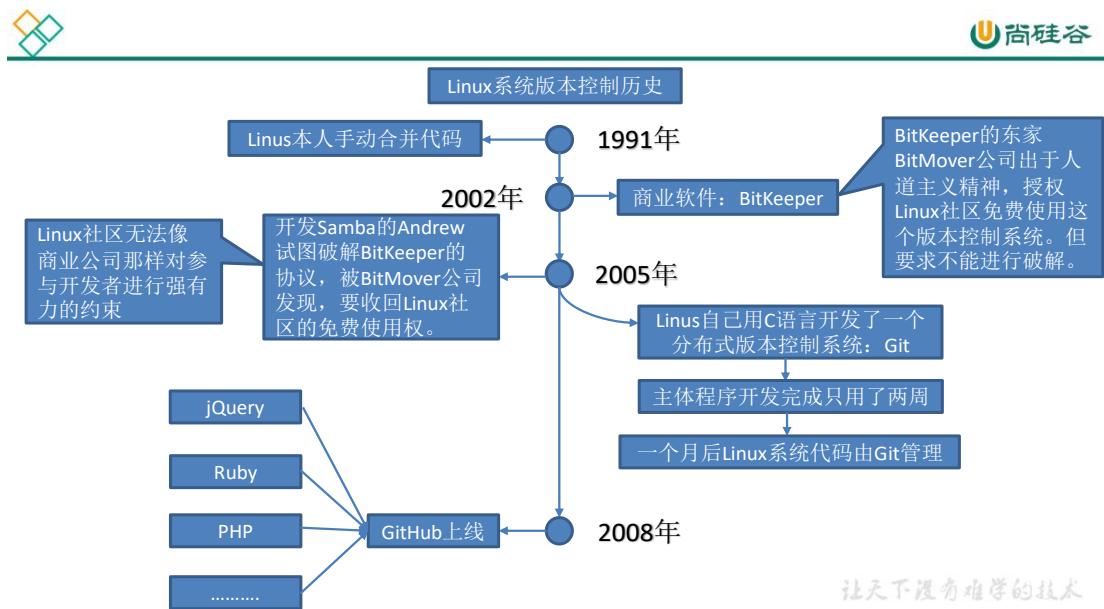
像 Git 这种分布式版本控制工具，客户端提取的不是最新版本的文件快照，而是把代码仓库完整地镜像下来（本地库）。这样任何一处协同工作用的文件发生故障，事后都可以用其他客户端的本地仓库进行恢复。因为每个客户端的每一次文件提取操作，实际上都是一次对整个文件仓库的完整备份。

分布式的版本控制系统出现之后，解决了集中式版本控制系统的缺陷：

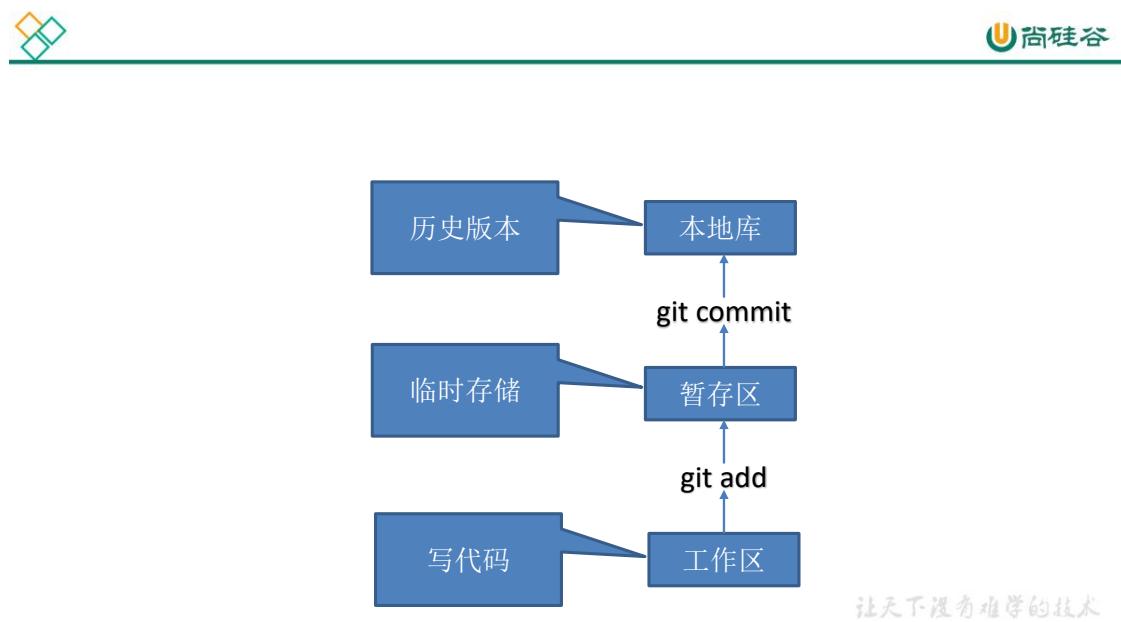
1. 服务器断网的情况下也可以进行开发（因为版本控制是在本地进行的）
2. 每个客户端保存的也都是整个完整的项目（包含历史记录，更加安全）



## 1.4 Git 简史



## 1.5 Git 工作机制



## 1.6 Git 和代码托管中心

代码托管中心是基于网络服务器的远程代码仓库，一般我们简单称为[远端库](#)。

- 局域网
  - ✓ GitLab
- 互联网
  - ✓ GitHub（外网）
  - ✓ Gitee 码云（国内网站）

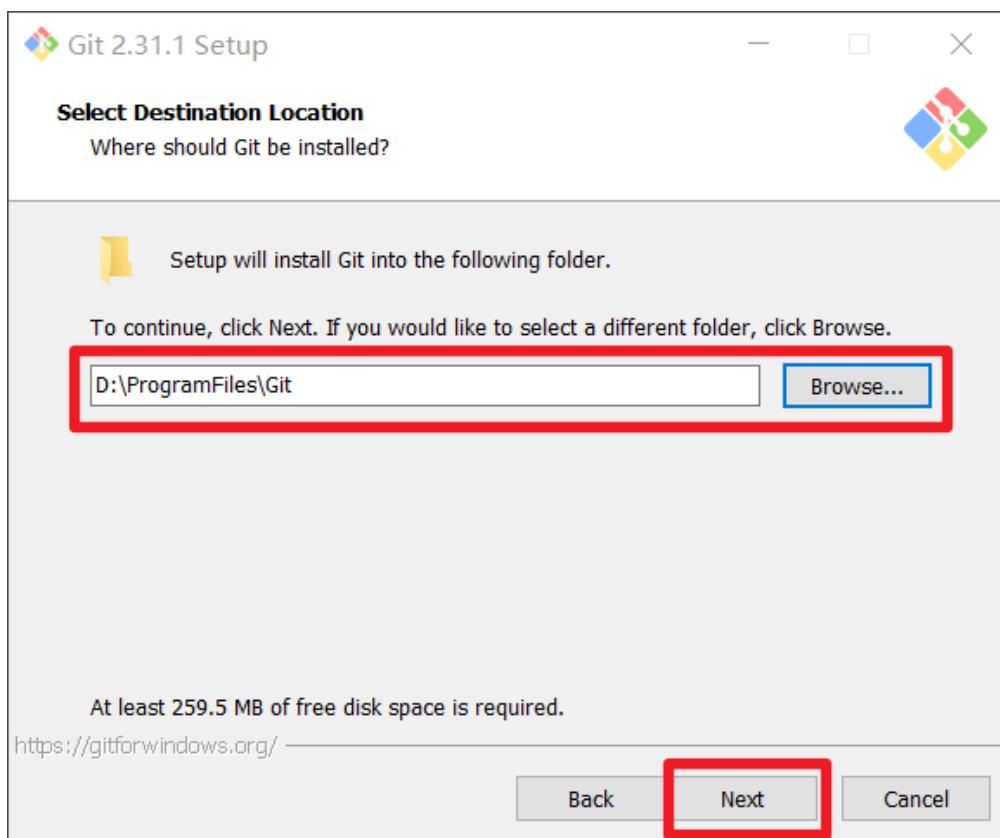
## 第2章 Git 安装

官网地址：<https://git-scm.com/>

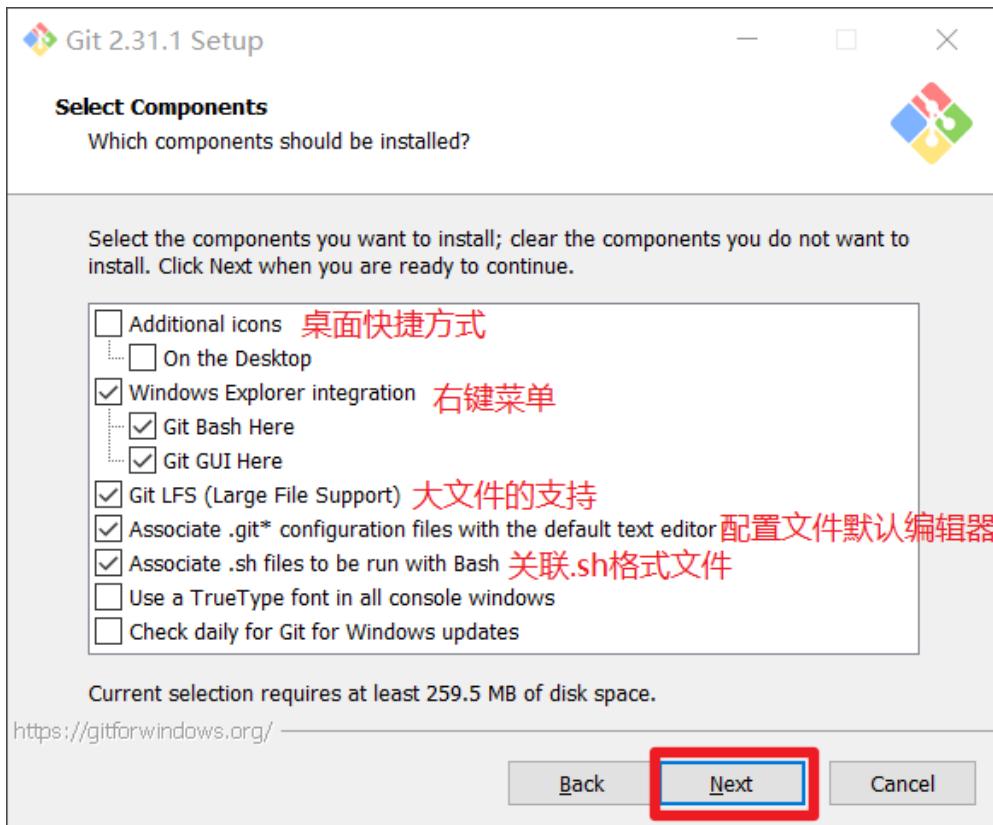
查看 GNU 协议，可以直接点击下一步。



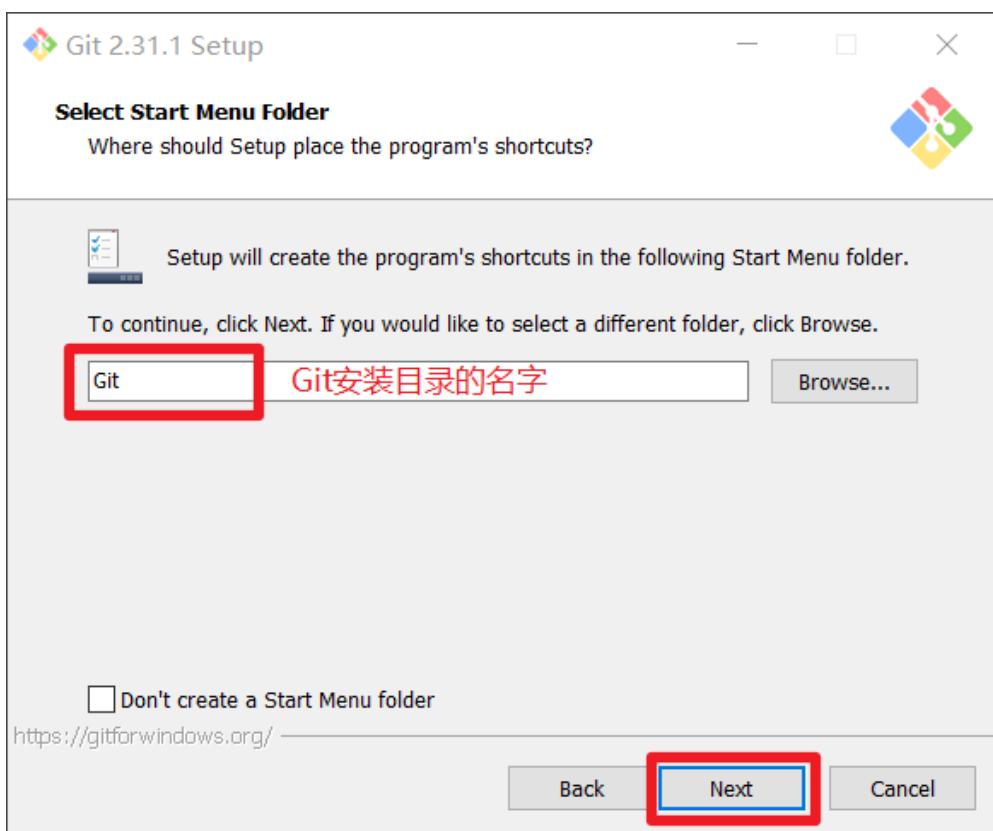
选择 Git 安装位置，要求是非中文并且没有空格的目录，然后下一步。



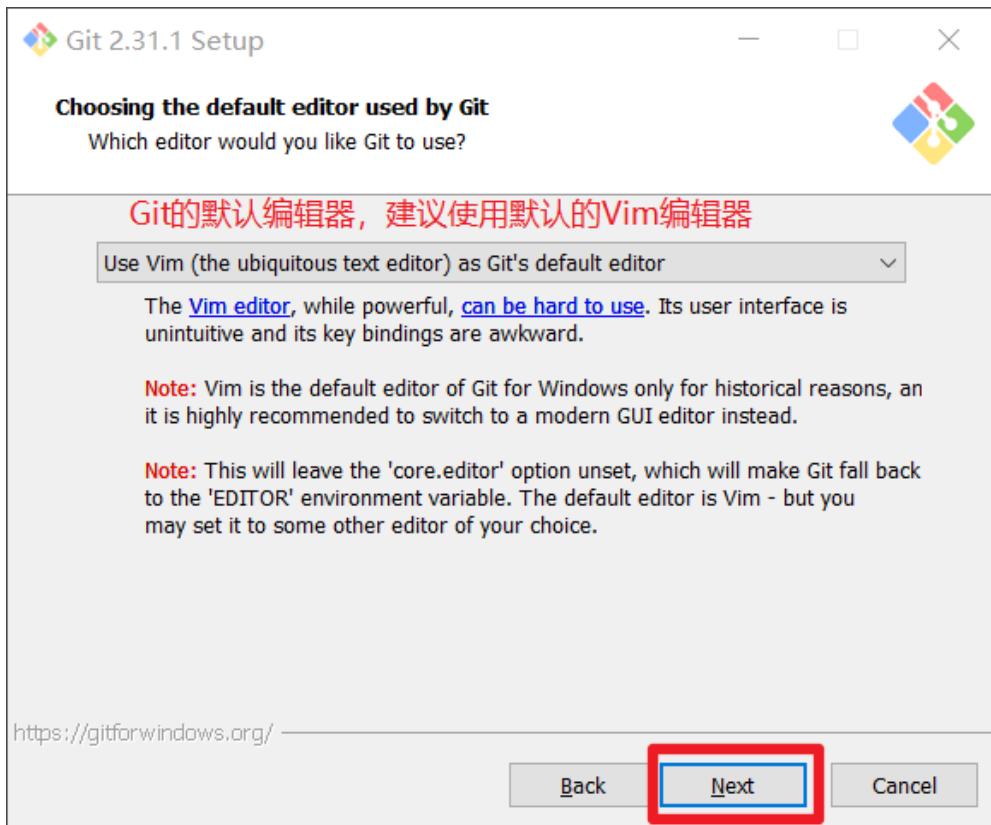
Git 选项配置，推荐默认设置，然后下一步。



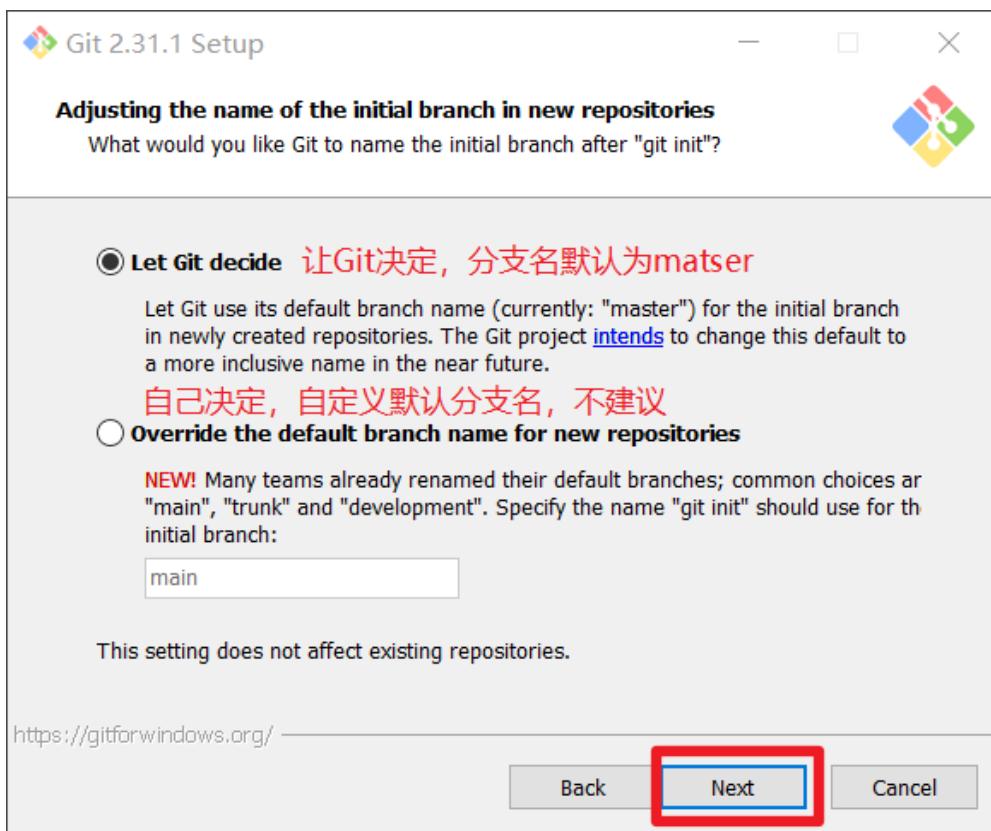
Git 安装目录名，不用修改，直接点击下一步。



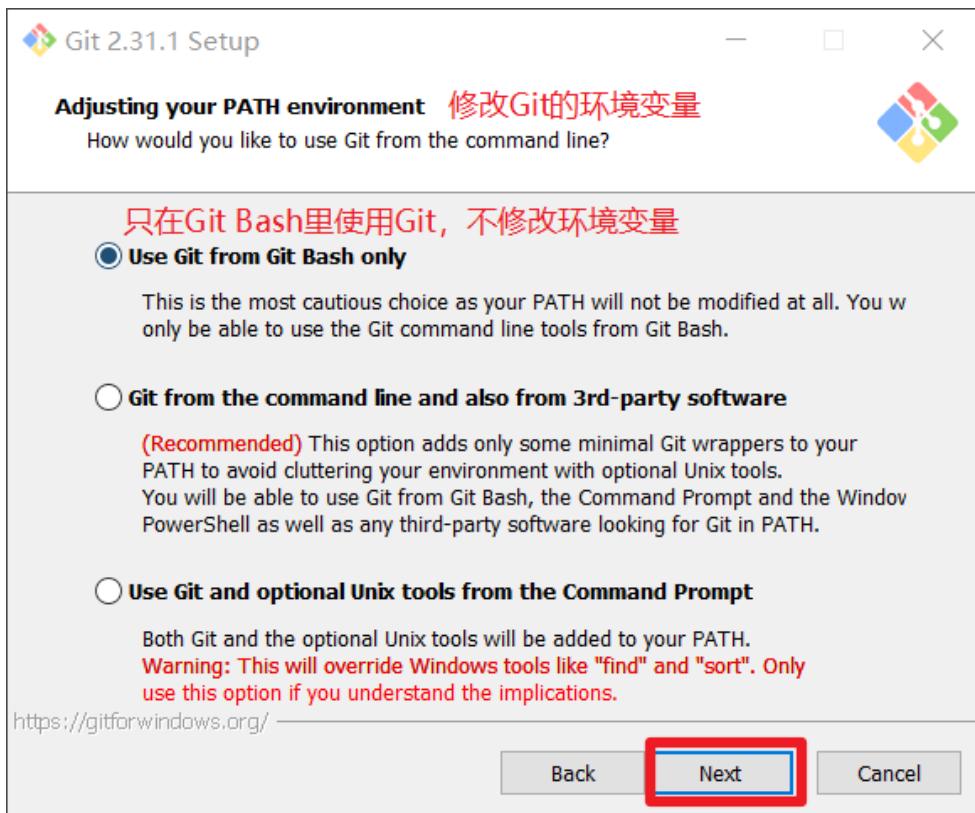
Git 的默认编辑器，建议使用默认的 Vim 编辑器，然后点击下一步。



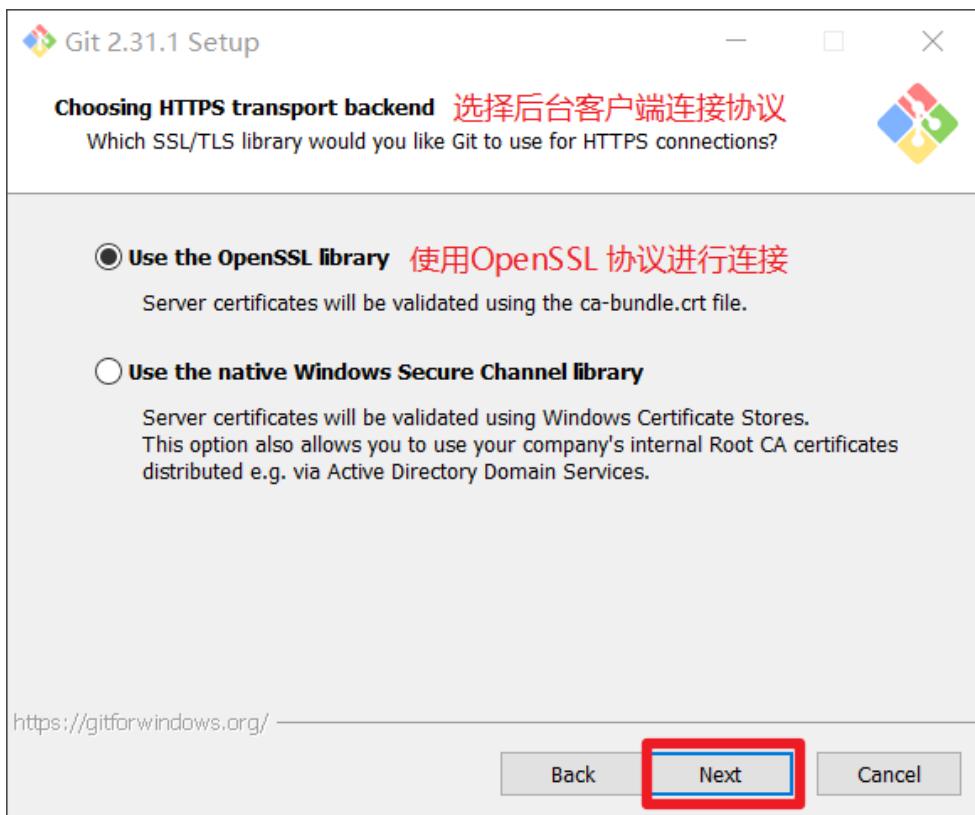
默认分支名设置，选择让 Git 决定，分支名默认为 master，下一步。



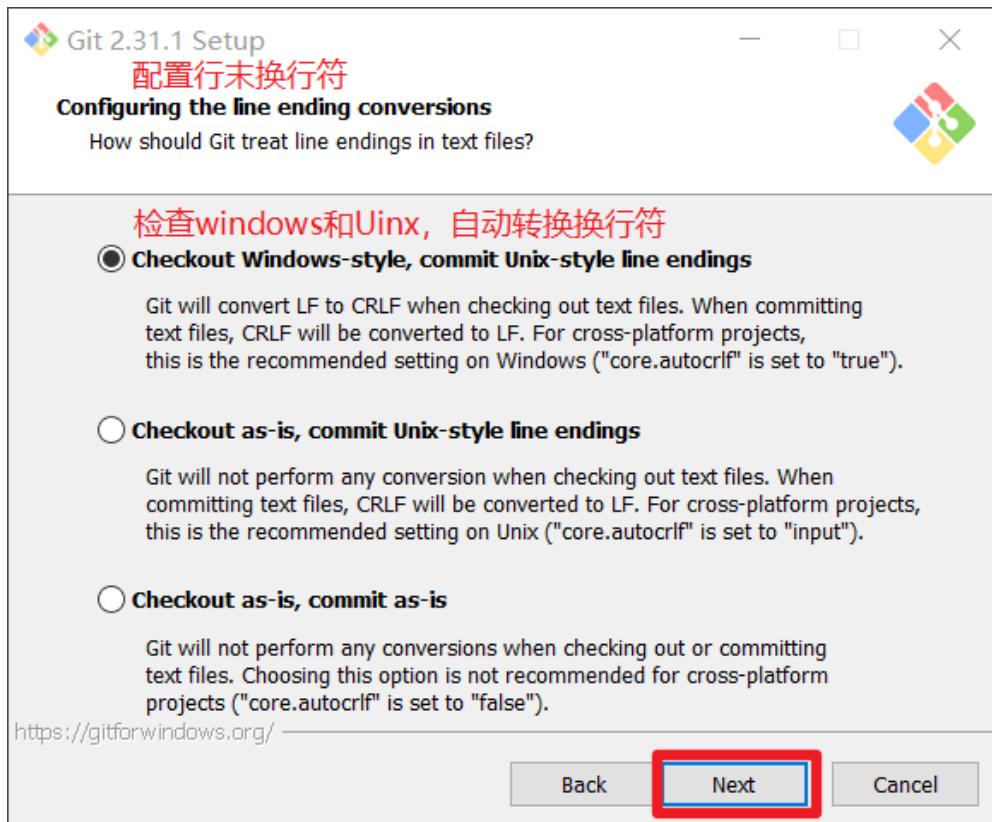
修改 Git 的环境变量，选第一个，不修改环境变量，只在 Git Bash 里使用 Git。



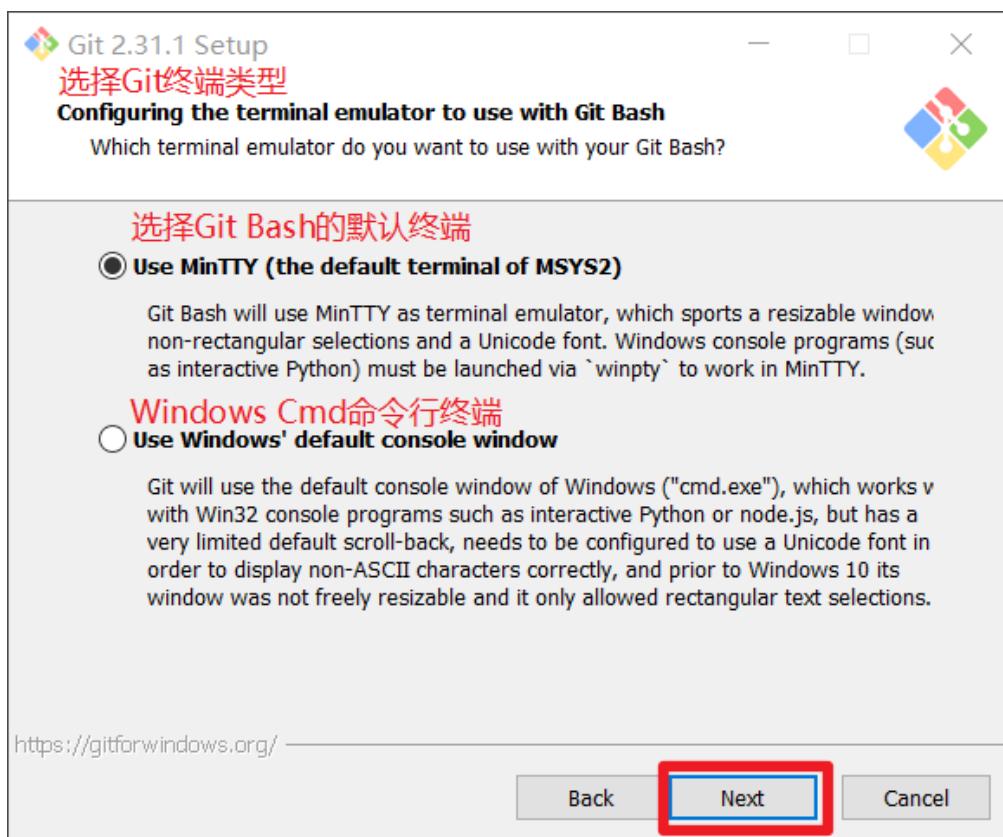
选择后台客户端连接协议，选默认值 OpenSSL，然后下一步。



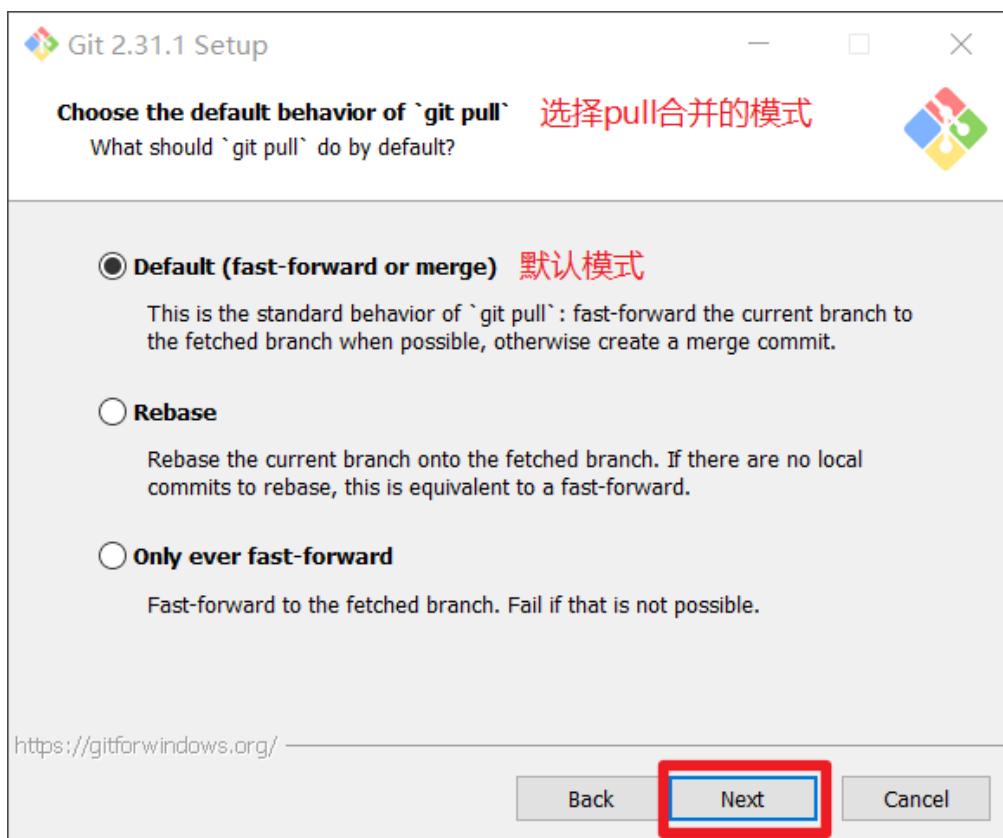
配置 Git 文件的行末换行符，Windows 使用 CRLF，Linux 使用 LF，选择第一个自动转换，然后继续下一步。



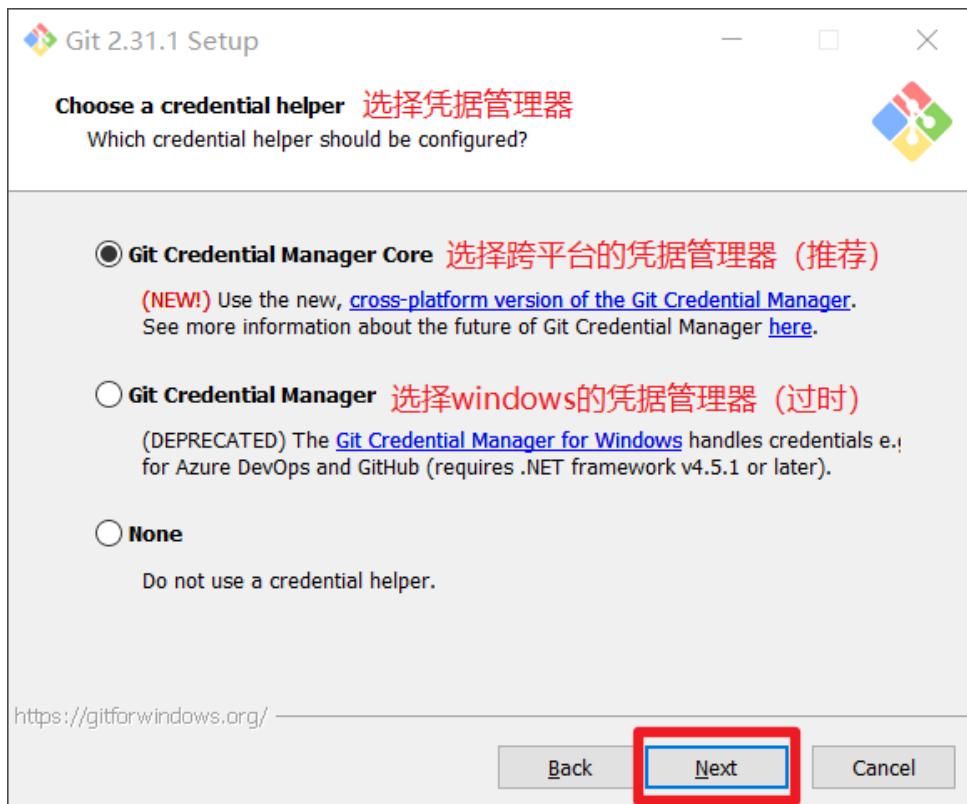
选择 Git 终端类型，选择默认的 Git Bash 终端，然后继续下一步。



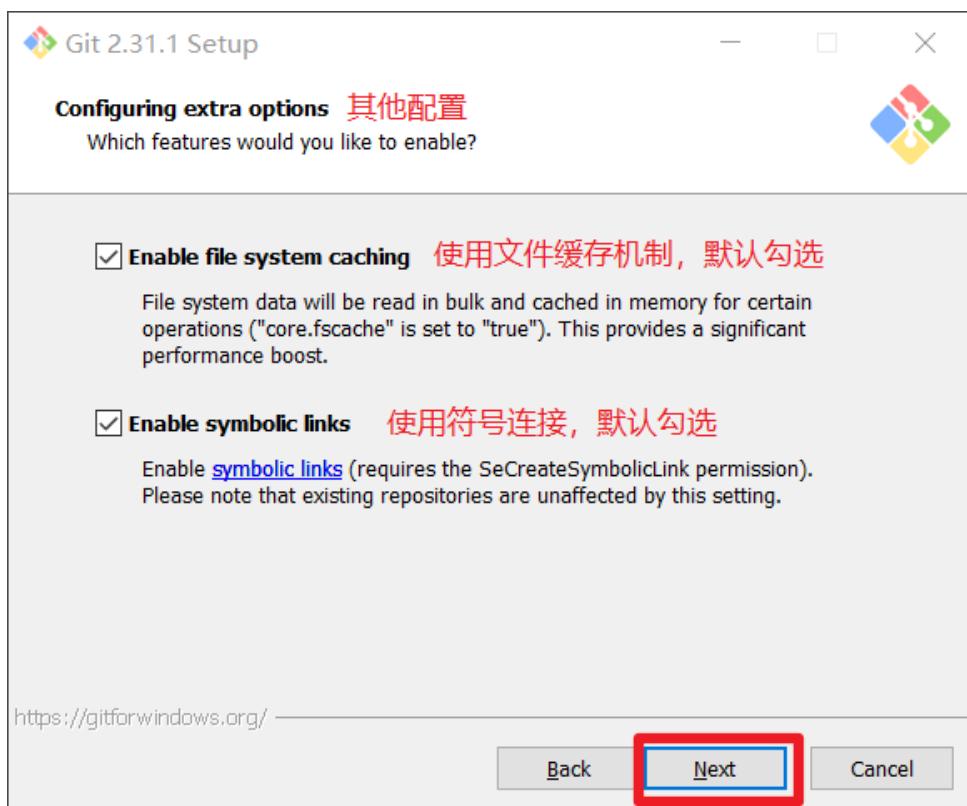
选择 Git pull 合并的模式，选择默认，然后下一步。



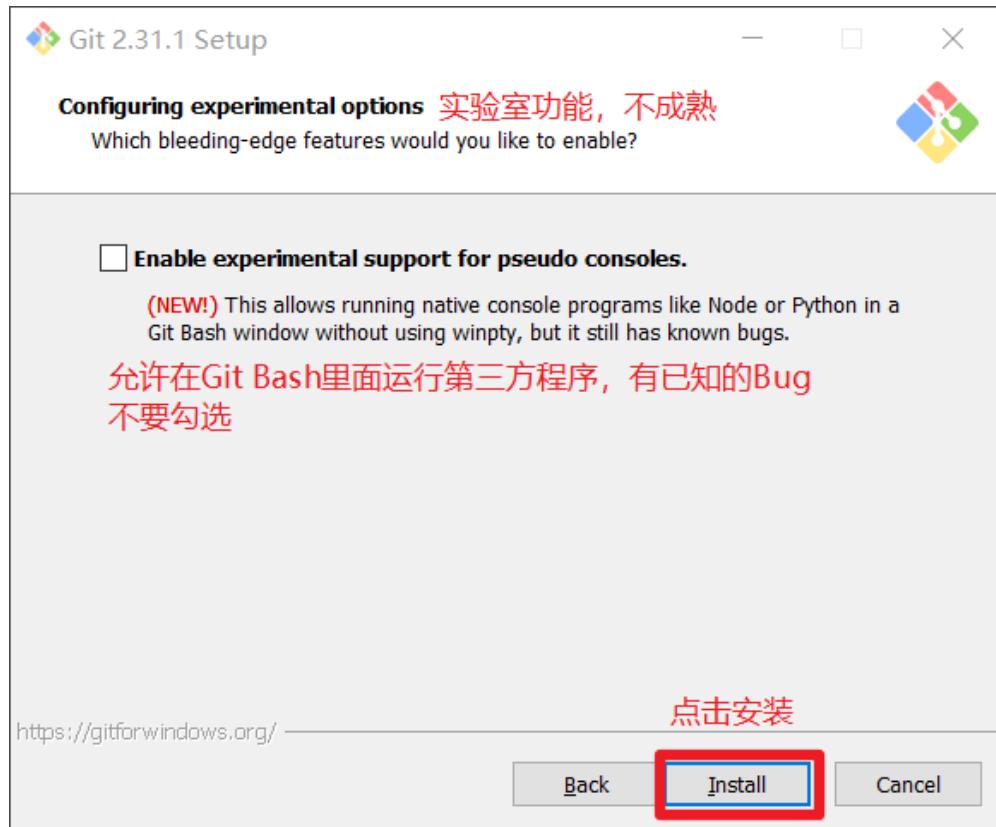
选择 Git 的凭据管理器，选择默认的跨平台的凭据管理器，然后下一步。



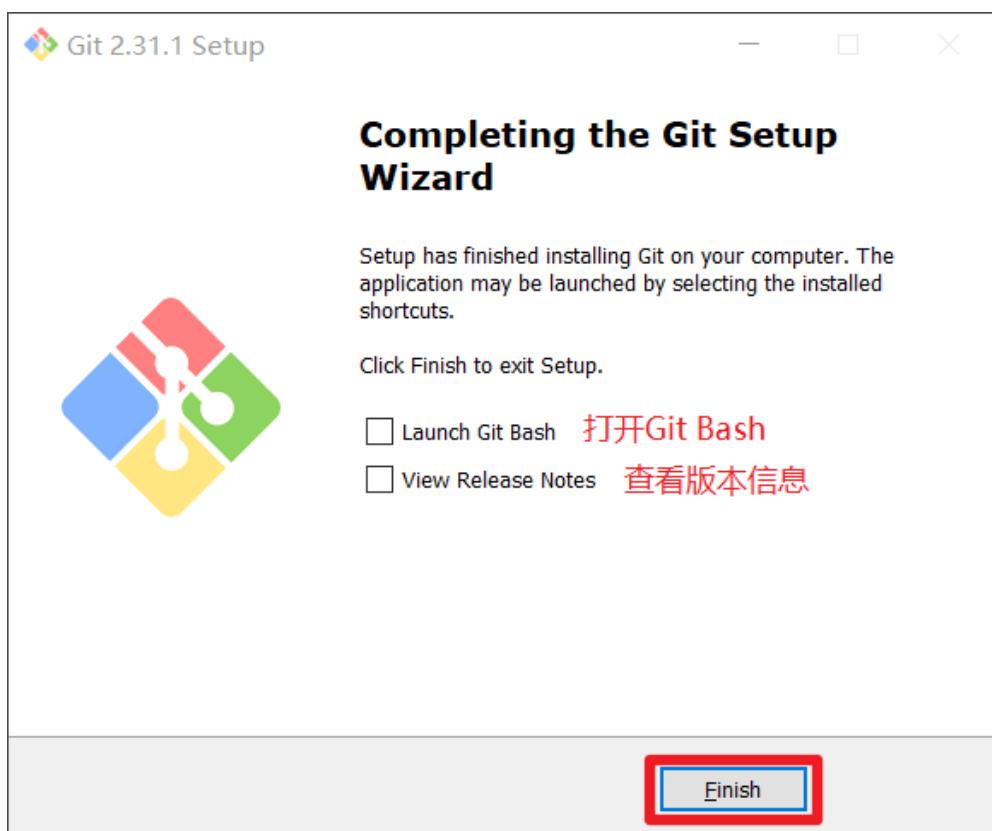
其他配置，选择默认设置，然后下一步。



实验室功能，技术还不成熟，有已知的 bug，不要勾选，然后点击右下角的 Install 按钮，开始安装 Git。



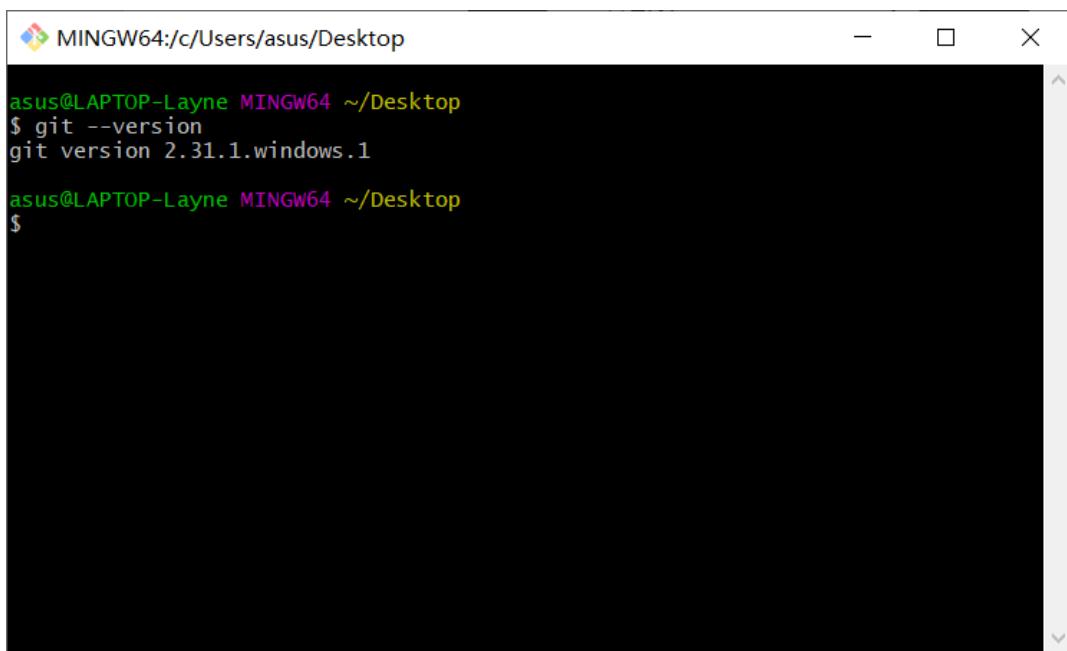
点击 Finish 按钮，Git 安装成功！



右键任意位置，在右键菜单里选择 Git Bash Here 即可打开 Git Bash 命令行终端。



在 Git Bash 终端里输入 git --version 查看 git 版本，如图所示，说明 Git 安装成功。



```
MINGW64:/c/Users/asus/Desktop
asus@LAPTOP-Layne MINGW64 ~/Desktop
$ git --version
git version 2.31.1.windows.1
asus@LAPTOP-Layne MINGW64 ~/Desktop
$
```

## 第 3 章 Git 常用命令

命令名称	作用
git config --global user.name 用户名	设置用户签名
git config --global user.email 邮箱	设置用户签名
git init	初始化本地库
git status	查看本地库状态
git add 文件名	添加到暂存区
git commit -m "日志信息" 文件名	提交到本地库
git reflog	查看历史记录
git reset --hard 版本号	版本穿梭

### 3.1 设置用户签名

#### 1) 基本语法

```
git config --global user.name 用户名
```

```
git config --global user.email 邮箱
```

#### 2) 案例实操

全局范围的签名设置：

```
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
```

```
$ git config --global user.name Layne
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ git config --global user.email Layne@atguigu.com
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ cat ~/.gitconfig
[user]
    name = Layne
    email = Layne@atguigu.com
```

说明：

签名的作用是区分不同操作者身份。用户的签名信息在每一个版本的提交信息中能够看到，以此确认本次提交是谁做的。**Git 首次安装必须设置一下用户签名，否则无法提交代码。**

**※注意：**这里设置用户签名和将来登录 GitHub（或其他代码托管中心）的账号没有任何关系。

## 3.2 初始化本地库

### 1) 基本语法

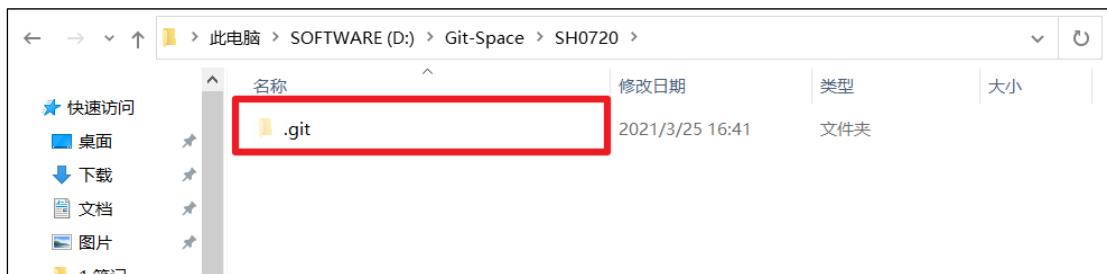
**git init**

### 2) 案例实操

```
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720
$ git init
Initialized empty Git repository in D:/Git-Space/SH0720/.git/

Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ ll -a
total 4
drwxr-xr-x 1 Layne 197609 0 11月 25 14:07 .
drwxr-xr-x 1 Layne 197609 0 11月 25 14:07 ../
drwxr-xr-x 1 Layne 197609 0 11月 25 14:07 .git/      (.git 初始化的效果，生成 git)
```

### 3) 结果查看



## 3.3 查看本地库状态

### 1) 基本语法



git status

## 2) 案例实操

### 3.3.1 首次查看（工作区没有任何文件）

```
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ git status
On branch master

No commits yet

nothing to commit (create/copy files and use "git add" to track)
```

### 3.3.2 新增文件（hello.txt）

```
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ vim hello.txt
hello git! hello atguigu!
```

### 3.3.3 再次查看（检测到未追踪的文件）

```
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ git status
On branch master

No commits yet

Untracked files:
  (use "git add <file>..." to include in what will be committed)

    hello.txt

nothing added to commit but untracked files present (use "git add"
to track)
```

## 3.4 添加暂存区

### 3.4.1 将工作区的文件添加到暂存区

#### 1) 基本语法

git add 文件名

#### 2) 案例实操

```
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ git add hello.txt
warning: LF will be replaced by CRLF in hello.txt.
The file will have its original line endings in your working
directory.
```

### 3.4.2 查看状态（检测到暂存区有新文件）

```
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ git status
On branch master

No commits yet

Changes to be committed:
  (use "git rm --cached <file>..." to unstage)

    new file:   hello.txt
```

## 3.5 提交本地库

### 3.5.1 将暂存区的文件提交到本地库

#### 1) 基本语法

git commit -m "日志信息" 文件名

#### 2) 案例实操

```
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ git commit -m "my first commit" hello.txt
warning: LF will be replaced by CRLF in hello.txt.
The file will have its original line endings in your working
directory.
[master (root-commit) 86366fa] my first commit
 1 file changed, 16 insertions(+)
 create mode 100644 hello.txt
```

### 3.5.2 查看状态（没有文件需要提交）

```
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ git status
On branch master
nothing to commit, working tree clean
```

### 3.6 修改文件 (hello.txt)

```
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ vim hello.txt
hello git! hello atguigu! 222222222222
hello git! hello atguigu!
```

#### 3.6.1 查看状态（检测到工作区有文件被修改）

```
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ git status
On branch master
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
    (use "git checkout -- <file>..." to discard changes in working
     directory)

        modified:   hello.txt

no changes added to commit (use "git add" and/or "git commit -a")
```

#### 3.6.2 将修改的文件再次添加暂存区

```
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ git add hello.txt
warning: LF will be replaced by CRLF in hello.txt.
The file will have its original line endings in your working
directory.
```

#### 3.6.3 查看状态（工作区的修改添加到了暂存区）

```
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ git status
On branch master
Changes to be committed:
  (use "git reset HEAD <file>..." to unstage)

        modified:   hello.txt
```

## 3.7 历史版本

### 3.7.1 查看历史版本

#### 1) 基本语法

`git reflog` 查看版本信息

`git log` 查看版本详细信息

#### 2) 案例实操

```
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ git reflog
087a1a7 (HEAD -> master) HEAD@{0}: commit: my third commit
ca8ded6 HEAD@{1}: commit: my second commit
86366fa HEAD@{2}: commit (initial): my first commit
```

### 3.7.2 版本穿梭

#### 1) 基本语法

`git reset --hard` 版本号

#### 2) 案例实操

```
--首先查看当前的历史记录，可以看到当前是在 087a1a7 这个版本
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ git reflog
087a1a7 (HEAD -> master) HEAD@{0}: commit: my third commit
ca8ded6 HEAD@{1}: commit: my second commit
86366fa HEAD@{2}: commit (initial): my first commit

--切换到 86366fa 版本，也就是我们第一次提交的版本
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ git reset --hard 86366fa
HEAD is now at 86366fa my first commit

--切换完毕之后再查看历史记录，当前成功切换到了 86366fa 版本
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ git reflog
86366fa (HEAD -> master) HEAD@{0}: reset: moving to 86366fa
087a1a7 HEAD@{1}: commit: my third commit
ca8ded6 HEAD@{2}: commit: my second commit
86366fa (HEAD -> master) HEAD@{3}: commit (initial): my first commit

--然后查看文件 hello.txt，发现文件内容已经变化
$ cat hello.txt
hello git! hello atguigu!
```

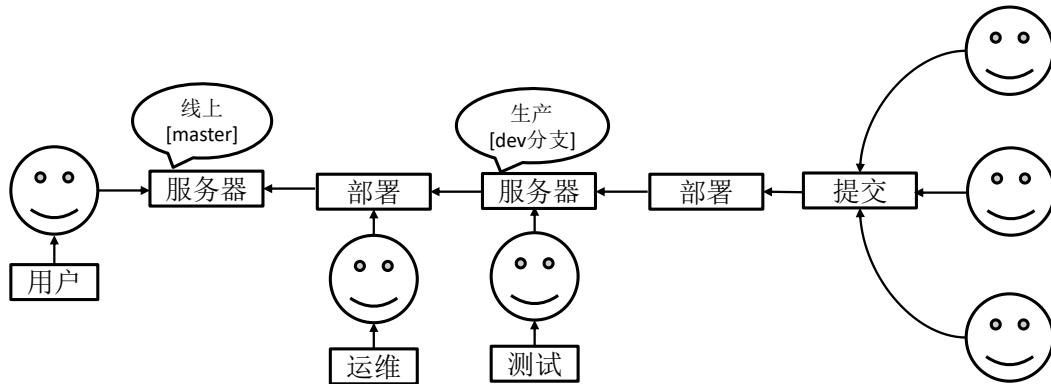
```
hello git! hello atguigu!
```

Git 切换版本，底层其实是移动的 HEAD 指针，具体原理如下图所示。



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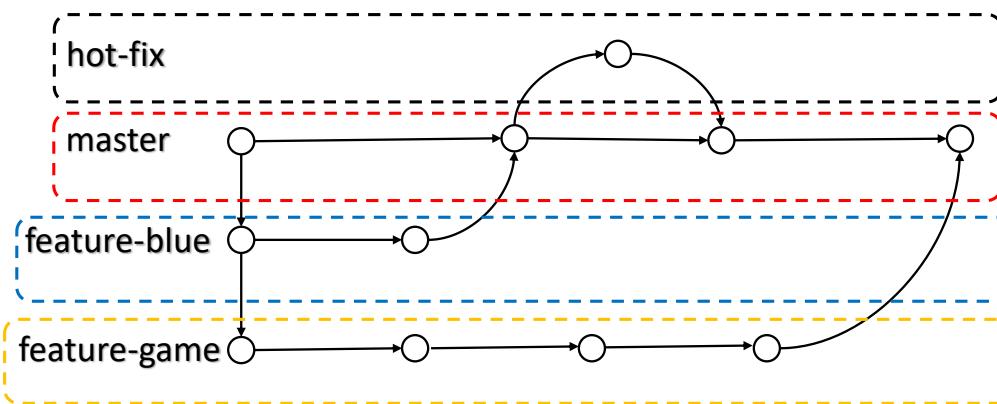
## 第 4 章 Git 分支操作



让天下没有难学的技术

### 4.1 什么是分支

在版本控制过程中，同时推进多个任务，为每个任务，我们就可以创建每个任务的单独分支。使用分支意味着程序员可以把自己的工作从开发主线上分离开来，开发自己分支的时候，不会影响主线分支的运行。对于初学者而言，分支可以简单理解为副本，一个分支就是一个单独的副本。（分支底层其实也是指针的引用）



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## 4.2 分支的好处

同时并行推进多个功能开发，提高开发效率。

各个分支在开发过程中，如果某一个分支开发失败，不会对其他分支有任何影响。失败的分支删除重新开始即可。

## 4.3 分支的操作

命令名称	作用
git branch 分支名	创建分支
git branch -v	查看分支
git checkout 分支名	切换分支
git merge 分支名	把指定的分支合并到当前分支上

### 4.3.1 查看分支

#### 1) 基本语法

**git branch -v**

#### 2) 案例实操

```
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ git branch -v
* master 087a1a7 my third commit (*代表当前所在的分区)
```

### 4.3.2 创建分支

#### 1) 基本语法

**git branch 分支名**

#### 2) 案例实操

```
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ git branch hot-fix
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ git branch -v
  hot-fix 087a1a7 my third commit (刚创建的新的分支，并将主分支 master 的内容复制了一份)
* master 087a1a7 my third commit
```

### 4.3.3 修改分支

```
--在 maste 分支上做修改
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ vim hello.txt
--添加暂存区
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
```



```
$ git add hello.txt
--提交本地库
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ git commit -m "my forth commit" hello.txt
[master f363b4c] my forth commit
 1 file changed, 1 insertion(+), 1 deletion(-)
--查看分支
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ git branch -v
  hot-fix 087a1a7 my third commit  (hot-fix 分支并未做任何改变)
* master   f363b4c my forth commit (当前 master 分支已更新为最新一次提交的版本)

--查看 master 分支上的文件内容
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ cat hello.txt
hello git! hello atguigu! 22222222222222
hello git! hello atguigu! 33333333333333
hello git! hello atguigu!
hello git! hello atguigu! master test
hello git! hello atguigu!
```

#### 4.3.4 切换分支

##### 1) 基本语法

git checkout 分支名

##### 2) 案例实操

```
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ git checkout hot-fix
Switched to branch 'hot-fix'
--发现当先分支已由 master 改为 hot-fix
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (hot-fix)
$ 
--查看 hot-fix 分支上的文件内容发现与 master 分支上的内容不同
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (hot-fix)
$ cat hello.txt
hello git! hello atguigu! 22222222222222
hello git! hello atguigu! 33333333333333
hello git! hello atguigu!
hello git! hello atguigu!
hello git! hello atguigu!
```



```
hello git! hello atguigu!
--在 hot-fix 分支上做修改
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (hot-fix)
$ cat hello.txt
hello git! hello atguigu! 22222222222222
hello git! hello atguigu! 33333333333333
hello git! hello atguigu!
--添加暂存区
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (hot-fix)
$ git add hello.txt
--提交本地库
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (hot-fix)
$ git commit -m "hot-fix commit" hello.txt
```

### 4.3.5 合并分支

#### 1) 基本语法

**git merge 分支名**

#### 2) 案例实操 在 master 分支上合并 hot-fix 分支

```
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ git merge hot-fix
Auto-merging hello.txt
CONFLICT (content): Merge conflict in hello.txt
Automatic merge failed; fix conflicts and then commit the result.
```

### 4.3.6 产生冲突

冲突产生的表现：后面状态为 MERGING

```
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master|MERGING)
```

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```
$ cat hello.txt
hello git! hello atguigu! 22222222222222
hello git! hello atguigu! 33333333333333
hello git! hello atguigu!
<<<<< HEAD
hello git! hello atguigu! master test
hello git! hello atguigu!
=====
hello git! hello atguigu!
hello git! hello atguigu! hot-fix test
>>>>> hot-fix
```

冲突产生的原因：

合并分支时，两个分支在同一个文件的同一个位置有两套完全不同的修改。Git 无法替我们决定使用哪一个。必须人为决定新代码内容。

查看状态（检测到有文件有两处修改）

```
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master|MERGING)
$ git status
On branch master
You have unmerged paths.
  (fix conflicts and run "git commit")
  (use "git merge --abort" to abort the merge)

Unmerged paths:
  (use "git add <file>..." to mark resolution)

    both modified:  hello.txt

no changes added to commit (use "git add" and/or "git commit -a")
```

### 4.3.7 解决冲突

1) 编辑有冲突的文件，删除特殊符号，决定要使用的内容

特殊符号：`<<<<< HEAD` 当前分支的代码 `=====` 合并过来的代码 `>>>>> hot-fix`

```
hello git! hello atguigu! 22222222222222
hello git! hello atguigu! 33333333333333
hello git! hello atguigu!
```

```
hello git! hello atguigu!
hello git! hello atguigu! master test
hello git! hello atguigu! hot-fix test
```

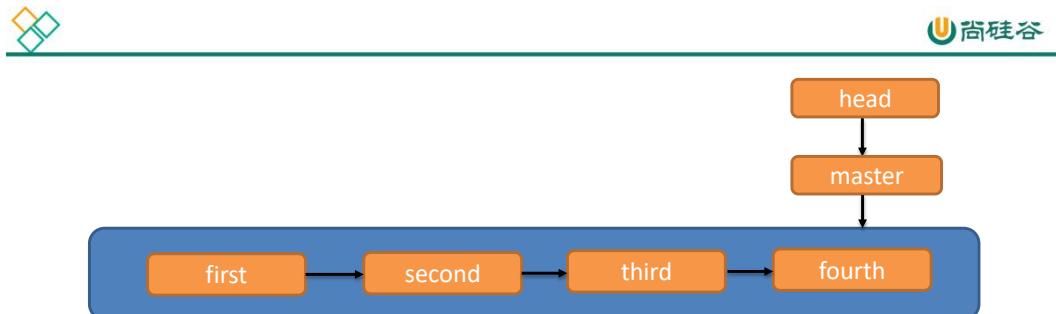
## 2) 添加到暂存区

```
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master|MERGING)
$ git add hello.txt
```

## 3) 执行提交 (注意: 此时使用 git commit 命令时**不能带文件名**)

```
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master|MERGING)
$ git commit -m "merge hot-fix"
[master 69ff88d] merge hot-fix
--发现后面 MERGING 消失, 变为正常
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$
```

## 4.4 创建分支和切换分支图解



让天下没有难学的技术

master、hot-fix 其实都是指向具体版本记录的指针。当前所在的分支，其实是由 HEAD 决定的。所以创建分支的本质就是多创建一个指针。

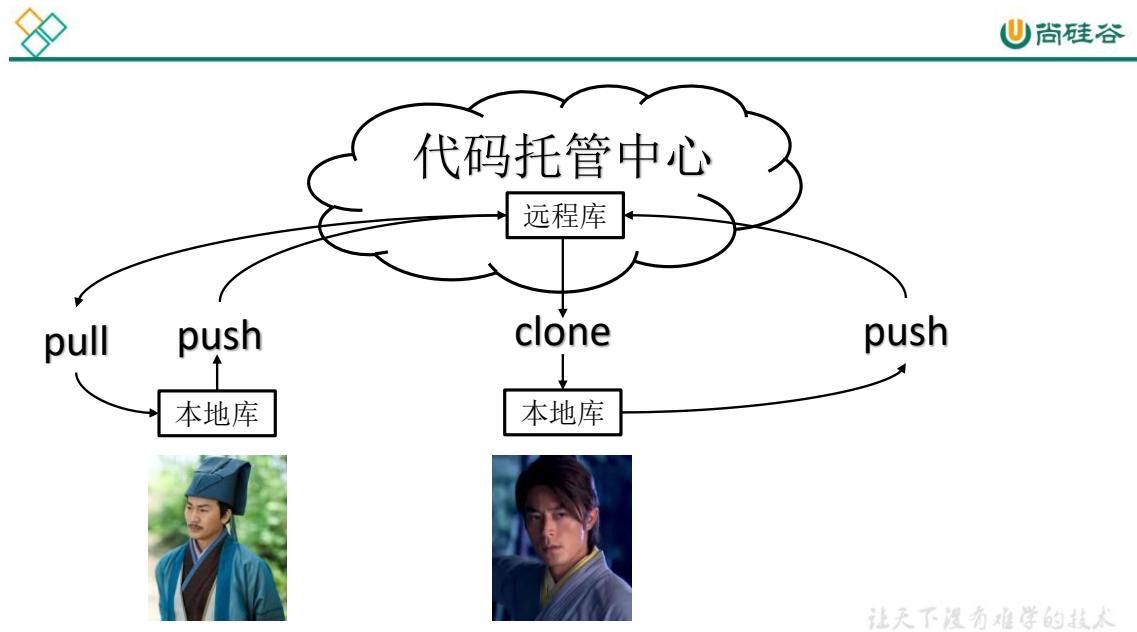
HEAD 如果指向 master，那么我们现在就在 master 分支上。

HEAD 如果执行 hotfix，那么我们现在就在 hotfix 分支上。

所以切换分支的本质就是移动 HEAD 指针。

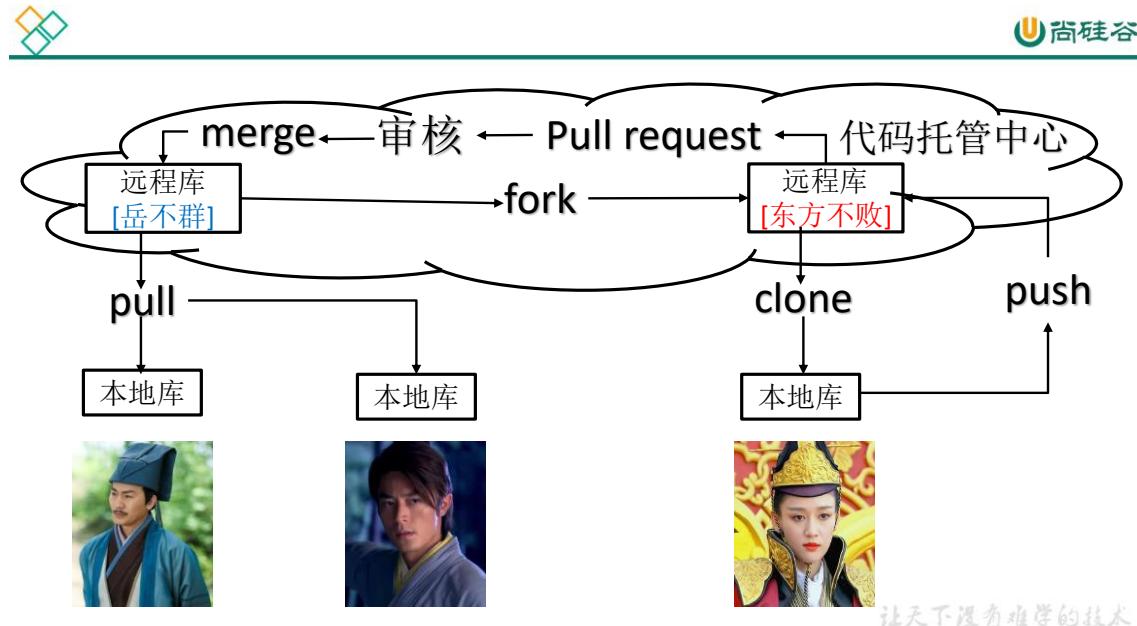
## 第 5 章 Git 团队协作机制

### 5.1 团队内协作



让天下没有难学的技术

### 5.2 跨团队协作



让天下没有难学的技术

## 第 6 章 GitHub 操作

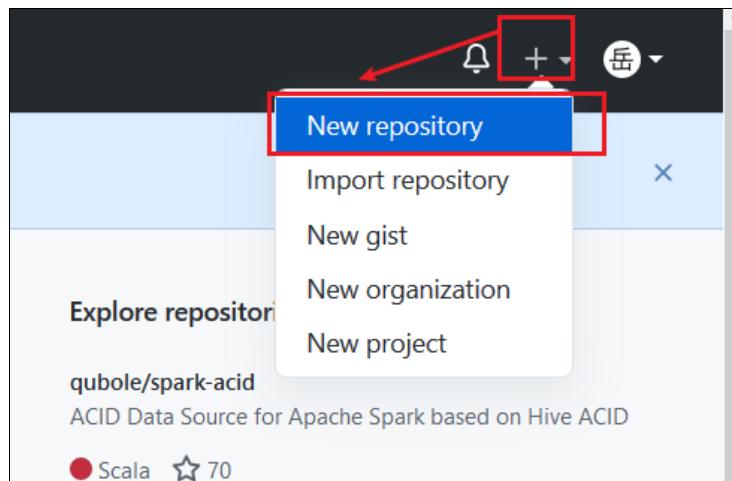
GitHub 网址: <https://github.com/>

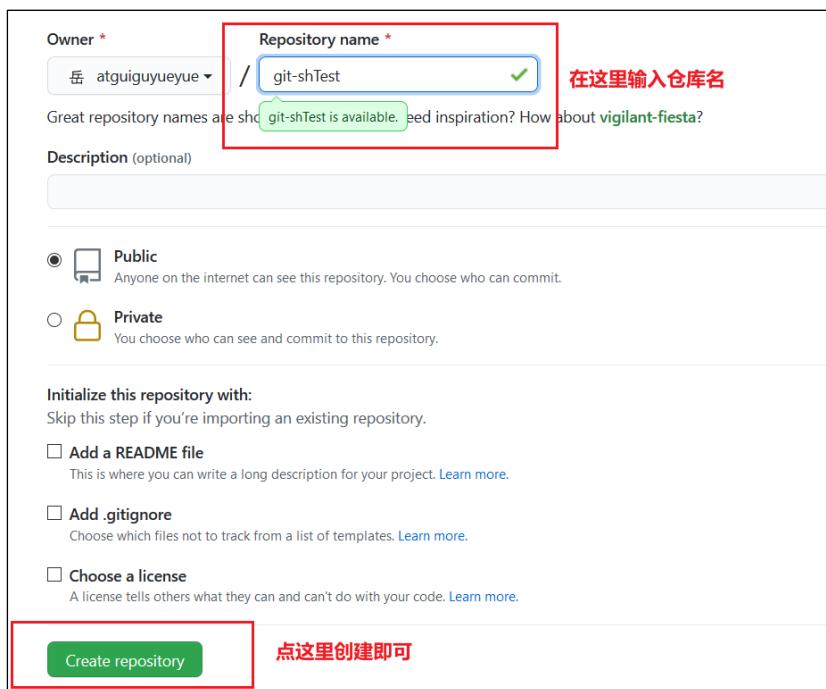
Ps:全球最大同性交友网站，技术宅男的天堂，新世界的大门，你还在等什么？

账号	姓名	验证邮箱
atguiguyueyue	岳不群	atguiguyueyue@aliyun.com
atguigulinghuchong	令狐冲	atguigulinghuchong@163.com
atguigudongfang1	东方不败	atguigudongfang@163.com

注:此三个账号为讲师使用账号，同学请自行注册，然后三个同学为一组进行团队协作！

### 6.1 创建远程仓库





## 6.2 远程仓库操作

命令名称	作用
git remote -v	查看当前所有远程地址别名
git remote add 别名 远程地址	起别名
git push 别名 分支	推送本地分支上的内容到远程仓库
git clone 远程地址	将远程仓库的内容克隆到本地
git pull 远程库地址别名 远程分支名	将远程仓库对于分支最新内容拉下来后与当前本地分支直接合并

### 6.2.1 创建远程仓库别名

#### 1) 基本语法

git remote -v 查看当前所有远程地址别名

git remote add 别名 远程地址

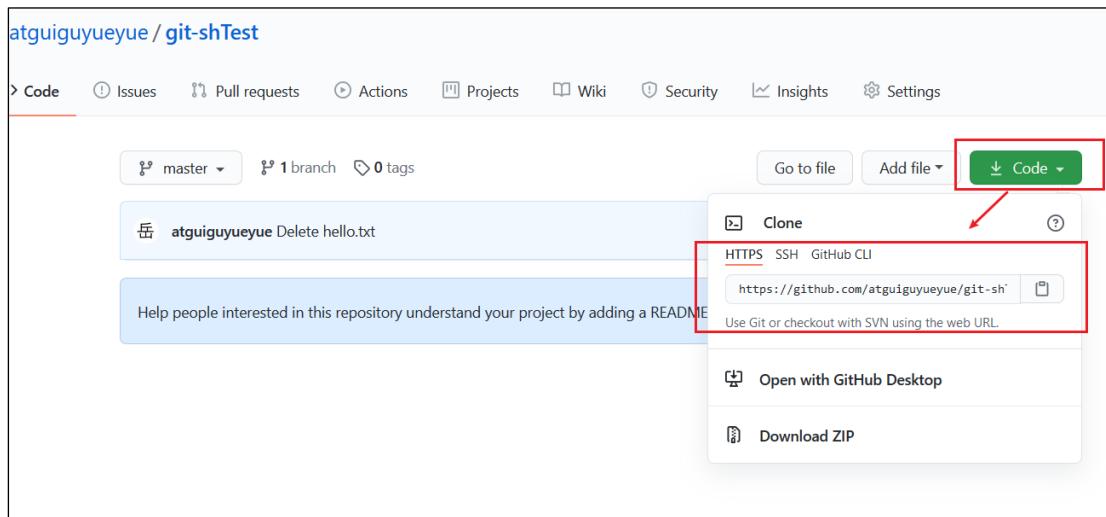
#### 2) 案例实操

```
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ git remote -v
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ git remote add ori https://github.com/atguiguyueyue/git-shTest.git

Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ git remote -v
ori      https://github.com/atguiguyueyue/git-shTest.git (fetch)
ori      https://github.com/atguiguyueyue/git-shTest.git (push)
```

<https://github.com/atguiguyueyue/git-shTest.git>

这个地址在创建完远程仓库后生成的连接，如图所示红框中



The screenshot shows the GitHub repository page for 'atguiguyueyue / git-shTest'. At the top, there are tabs for Code, Issues, Pull requests, Actions, Projects, Wiki, Security, Insights, and Settings. The 'Code' tab is selected. Below the tabs, it shows 'master' branch, '1 branch', and '0 tags'. On the right, there's a 'Code' dropdown menu with options: 'Go to file', 'Add file', and a redboxed 'Code' button. A 'Clone' section is open, showing 'HTTPS' selected, the URL 'https://github.com/atguiguyueyue/git-shTest', and a note 'Use Git or checkout with SVN using the web URL.' There are also links for 'Open with GitHub Desktop' and 'Download ZIP'.

## 6.2.2 推送本地分支到远程仓库

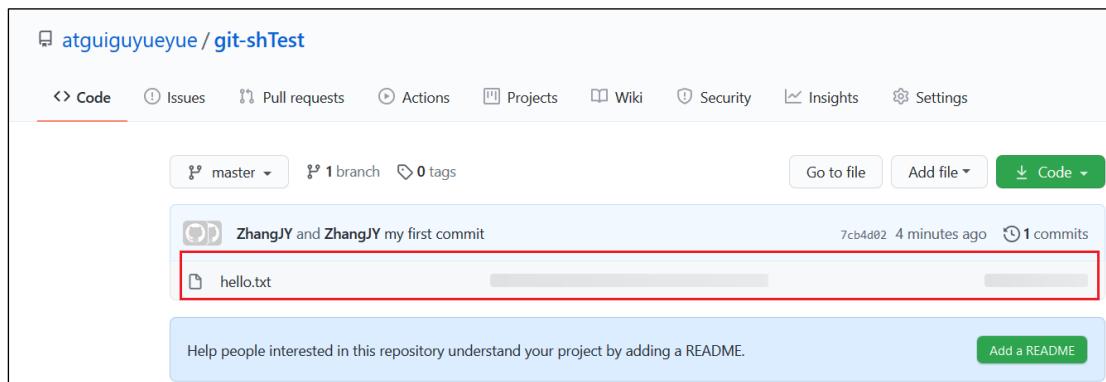
### 1) 基本语法

**git push 别名 分支**

### 2) 案例实操

```
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ git push ori master
Logon failed, use ctrl+c to cancel basic credential prompt.
Username for 'https://github.com': atguiguyueyue
Counting objects: 3, done.
Delta compression using up to 12 threads.
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 276 bytes | 276.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0)
To https://github.com/atguiguyueyue/git-shTest.git
 * [new branch]      master -> master
```

此时发现已将我们 master 分支上的内容推送到 GitHub 创建的远程仓库。



The screenshot shows the GitHub repository page for 'atguiguyueyue / git-shTest'. It has the same navigation bar as the previous screenshot. The 'Code' tab is selected. Below the tabs, it shows 'master' branch, '1 branch', and '0 tags'. A commit history is displayed: 'ZhangJY and ZhangJY my first commit' made 4 minutes ago with 1 commit. The commit message is 'hello.txt'. At the bottom, there's a link 'Add a README'.

### 6.2.3 克隆远程仓库到本地

#### 1) 基本语法

git clone 远程地址

#### 2) 案例实操

```
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/pro-linghuchong
$ git clone https://github.com/atguiguyueyue/git-shTest.git
Cloning into 'git-shTest'...
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Compressing objects: 100% (2/2), done.
remote: Total 3 (delta 0), reused 3 (delta 0), pack-reused 0
Unpacking objects: 100% (3/3), done.
```

<https://github.com/atguiguyueyue/git-shTest.git>

这个地址为远程仓库地址，克隆结果：初始化本地仓库

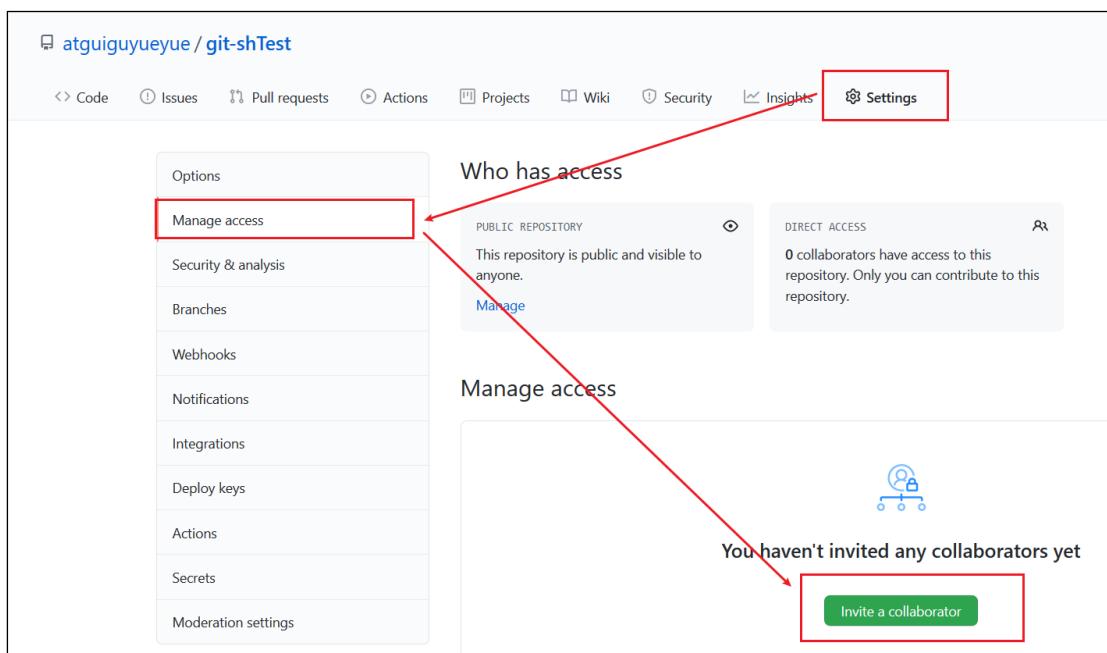


```
--创建远程仓库别名
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/pro-linghuchong/git-shTest
(master)
$ git remote -v
origin https://github.com/atguiguyueyue/git-shTest.git (fetch)
origin https://github.com/atguiguyueyue/git-shTest.git (push)
```

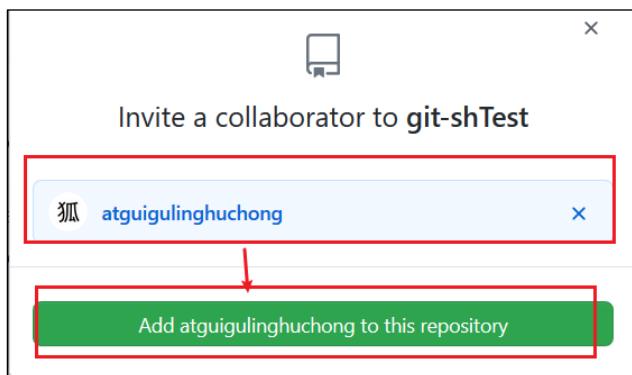
小结：clone 会做如下操作。1、拉取代码。2、初始化本地仓库。3、创建别名

### 6.2.4 邀请加入团队

#### 1) 选择邀请合作者

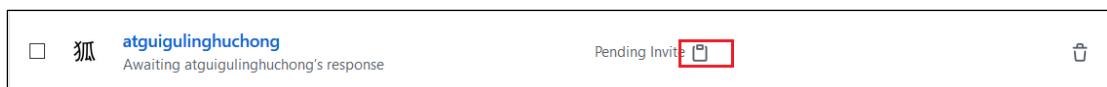


## 2) 填入想要合作的人

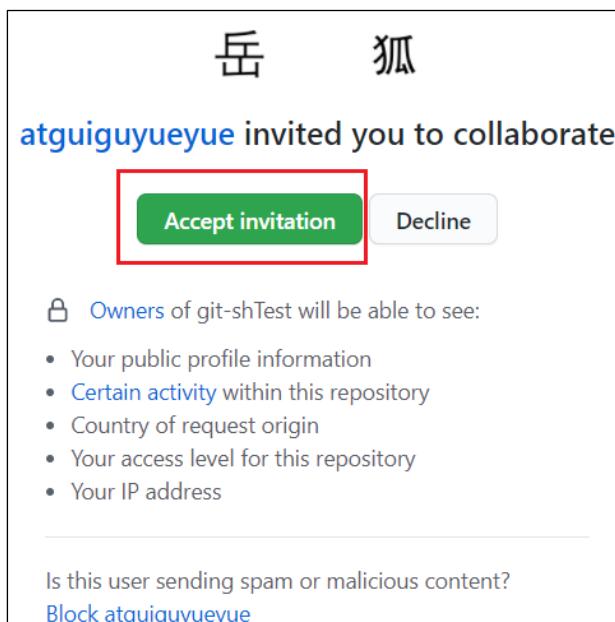


## 3 ) 复制地址并通过微信钉钉等方式发送给该用户，复制内容如下：

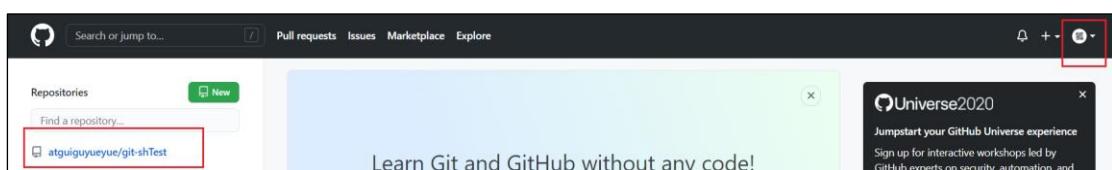
<https://github.com/atguiguyueyue/git-shTest/invitations>



## 4) 在 atguigulinghuchong 这个账号中的地址栏复制收到邀请的链接，点击接受邀请。



5) 成功之后可以在 atguigulinghuchong 这个账号上看到 git-Test 的远程仓库。



6) 令狐冲可以修改内容并 push 到远程仓库。

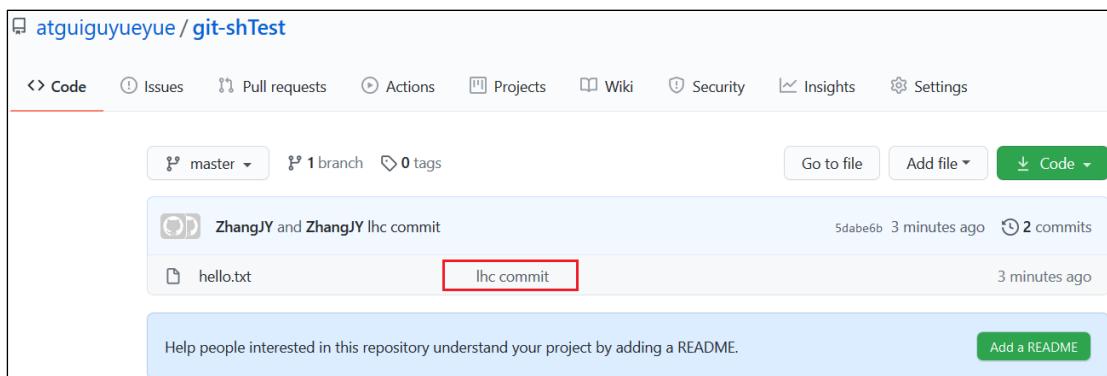
```
--编辑 clone 下来的文件
Layne@LAPTOP-Layne  MINGW64  /d/Git-Space/pro-linghuchong/git-shTest
(master)
$ vim hello.txt

Layne@LAPTOP-Layne  MINGW64  /d/Git-Space/pro-linghuchong/git-shTest
(master)
$ cat hello.txt
hello git! hello atguigu! 222222222222
hello git! hello atguigu! 33333333333333
hello git! hello atguigu!
hello git! hello atguigu!
hello git! hello atguigu!
hello git! hello atguigu! 我是最帅的，比岳不群还帅
hello git! hello atguigu!
hello git! hello atguigu! master test
hello git! hello atguigu! hot-fix test
--将编辑好的文件添加到暂存区
```

Layne@LAPTOP-Layne MINGW64 /d/Git-Space/pro-linghuchong/git-shTest

```
(master)
$ git add hello.txt
--将暂存区的文件上传到本地库
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/pro-linghuchong/git-shTest
(master)
$ git commit -m "lhc commit" hello.txt
[master 5dabe6b] lhc commit
 1 file changed, 1 insertion(+), 1 deletion(-)
--将本地库的内容 push 到远程仓库
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/pro-linghuchong/git-shTest
(master)
$ git push origin master
Logon failed, use ctrl+c to cancel basic credential prompt.
Username for 'https://github.com': atguigulinghuchong
Counting objects: 3, done.
Delta compression using up to 12 threads.
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 309 bytes | 309.00 KiB/s, done.
Total 3 (delta 1), reused 0 (delta 0)
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To https://github.com/atguiguyueyue/git-shTest.git
 7cb4d02..5dabe6b master -> master
```

7) 回到 atguiguyueyue 的 GitHub 远程仓库中可以看到，最后一次是 lhc 提交的。



atguiguyueyue / git-shTest

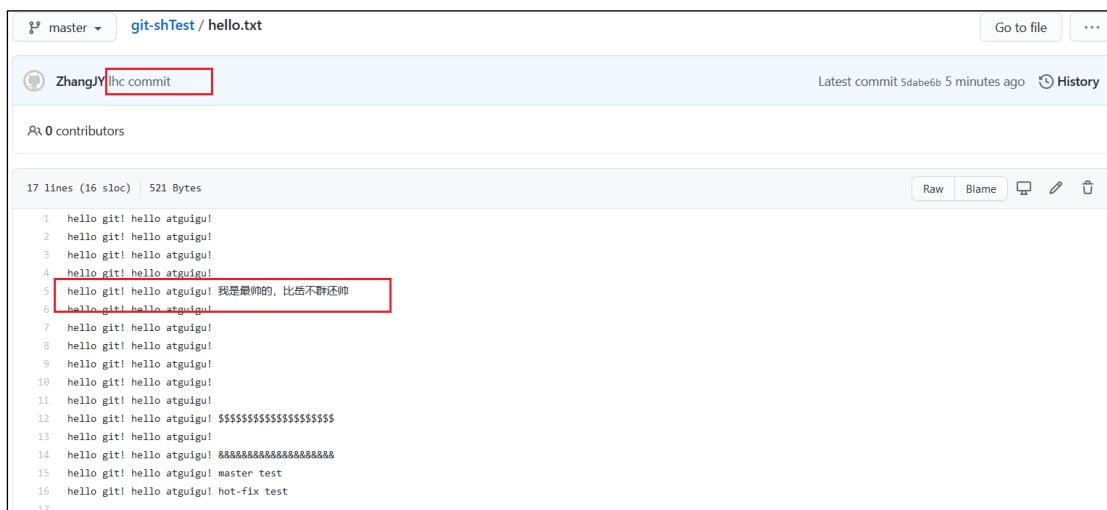
Code Issues Pull requests Actions Projects Wiki Security Insights Settings

master 1 branch 0 tags Go to file Add file Code

ZhangJY and ZhangJY lhc commit 5dabe6b 3 minutes ago 2 commits

hello.txt lhc commit 3 minutes ago

Add a README



git-shTest / hello.txt

ZhangJY lhc commit Latest commit 5dabe6b 5 minutes ago History

0 contributors

17 lines (16 sloc) 521 Bytes

Raw Blame

```
1 hello git! hello atguigu!
2 hello git! hello atguigu!
3 hello git! hello atguigu!
4 hello git! hello atguigu!
5 hello git! hello atguigu! 我是最帅的，比岳不群还帅
6 hello git! hello atguigu!
7 hello git! hello atguigu!
8 hello git! hello atguigu!
9 hello git! hello atguigu!
10 hello git! hello atguigu!
11 hello git! hello atguigu!
12 hello git! hello atguigu!$$$$$$$$$$$$$$$$$$$$$$
13 hello git! hello atguigu!
14 hello git! hello atguigu! &&&&&&&&&&&&&&&
15 hello git! hello atguigu! master test
16 hello git! hello atguigu! hot-fix test
17
```

## 6.2.5 拉取远程库内容

### 1) 基本语法

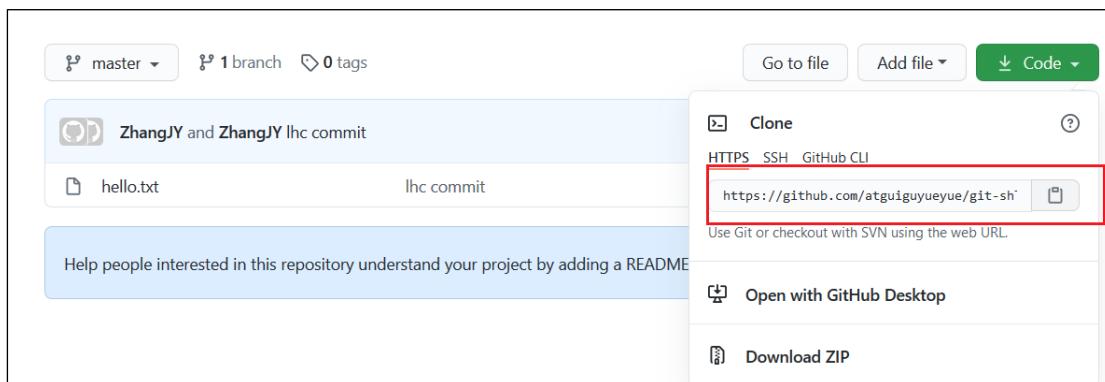
```
git pull 远程库地址别名 远程分支名
```

### 2) 案例实操

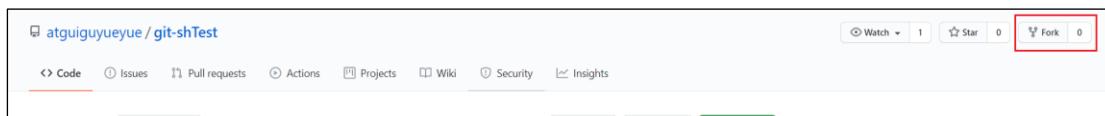
```
--将远程仓库对于分支最新内容拉下来后与当前本地分支直接合并
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ git pull ori master
remote: Enumerating objects: 5, done.
remote: Counting objects: 100% (5/5), done.
remote: Compressing objects: 100% (1/1), done.
remote: Total 3 (delta 1), reused 3 (delta 1), pack-reused 0
Unpacking objects: 100% (3/3), done.
From https://github.com/atguiguyueyue/git-shTest
 * branch            master      -> FETCH_HEAD
   7cb4d02..5dabe6b  master      -> ori/master
Updating 7cb4d02..5dabe6b
Fast-forward
 hello.txt | 2 +-  
 1 file changed, 1 insertion(+), 1 deletion(-)
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)
$ cat hello.txt
hello git! hello atguigu! 22222222222222
hello git! hello atguigu! 33333333333333
hello git! hello atguigu!
hello git! hello atguigu!
hello git! hello atguigu! 我是最帅的，比岳不群还帅
hello git! hello atguigu!
hello git! hello atguigu! master test
hello git! hello atguigu! hot-fix test
```

## 6.3 跨团队协作

### 1) 将远程仓库的地址复制发给邀请跨团队协作的人，比如东方不败。



2) 在东方不败的 GitHub 账号里的地址栏复制收到的链接，然后点击 Fork 将项目叉到自己的本地仓库。



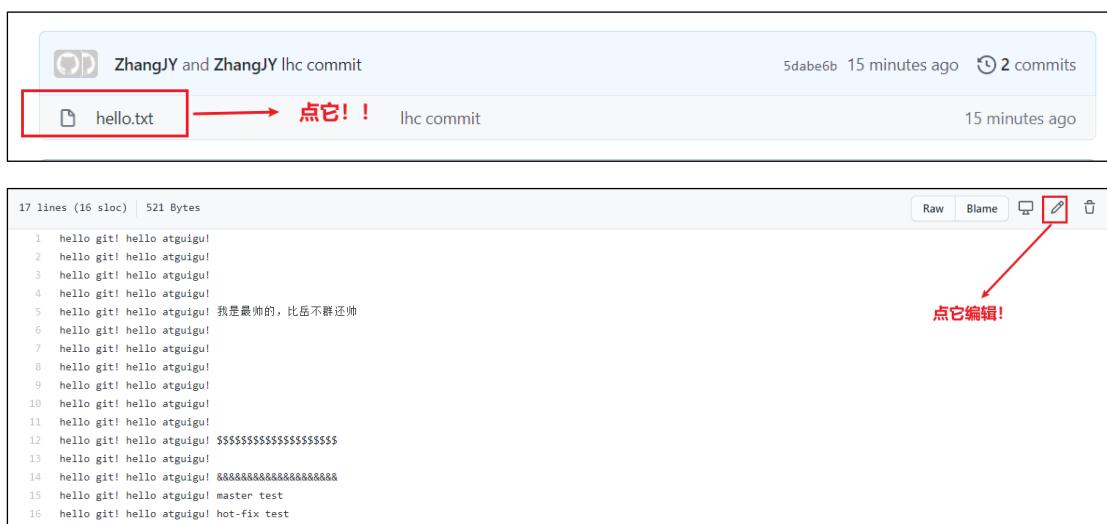
叉入中...



叉成功后可以看到当前仓库信息。



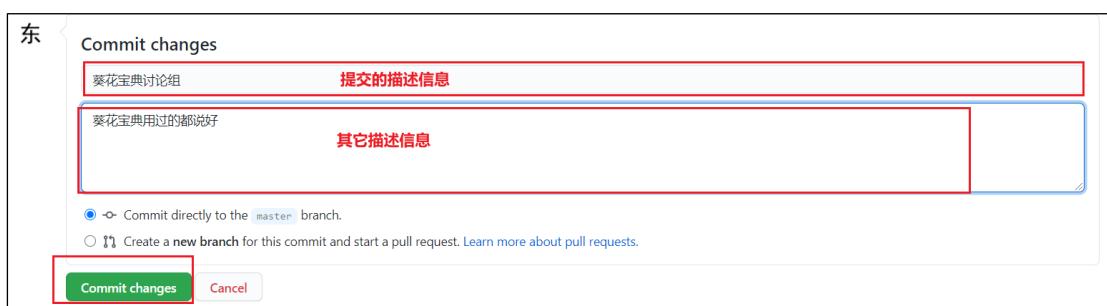
3) 东方不败就可以在线编辑叉取过来的文件。



ZhangJY and ZhangJY lhc commit  
5dabe6b 15 minutes ago 2 commits  
hello.txt → 点它!! lhc commit 15 minutes ago

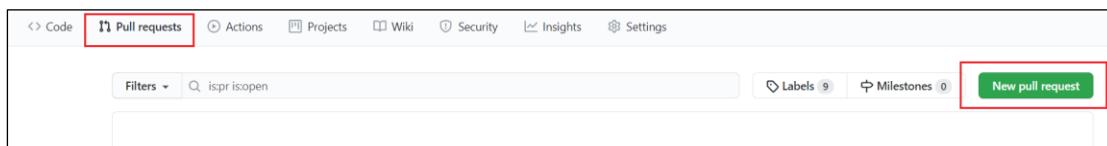
17 lines (16 sloc) | 521 Bytes  
Raw Blame ⌂ ⌂  
1 hello git! hello atguigu!  
2 hello git! hello atguigu!  
3 hello git! hello atguigu!  
4 hello git! hello atguigu!  
5 hello git! hello atguigu! 我是最帅的，比岳不群还帅  
6 hello git! hello atguigu!  
7 hello git! hello atguigu!  
8 hello git! hello atguigu!  
9 hello git! hello atguigu!  
10 hello git! hello atguigu!  
11 hello git! hello atguigu!  
12 hello git! hello atguigu! \$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$  
13 hello git! hello atguigu!  
14 hello git! hello atguigu! &&&&&&&&&&&&&  
15 hello git! hello atguigu! master test  
16 hello git! hello atguigu! hot-fix test

4) 编辑完毕后，填写描述信息并点击左下角绿色按钮提交。



东 Commit changes  
葵花宝典讨论组 提交的描述信息  
葵花宝典用过的都说好 其它描述信息  
● Commit directly to the master branch.  
○ Create a new branch for this commit and start a pull request. Learn more about pull requests.  
Commit changes Cancel

5) 接下来点击上方的 Pull 请求，并创建一个新的请求。





Discuss and review the changes in this comparison with others. [Learn about pull requests](#)

[Create pull request](#)

- 1 commit    1 file changed    0 comments    1 contributor

Commits on Nov 25, 2020

东 莫花宝典讨论组 ... Verified fe72fec

Showing 1 changed file with 1 addition and 1 deletion.

Unified Split

hello.txt

Line	Text
14	hello git! hello atguigu!
15	hello git! hello atguigu! master test
16	hello git! hello atguigu! hot-fix test
17	+ 莫花宝典就在这，老岳岳，你就放心练吧！！

# 东

## 葵花宝典讨论组

Write Preview

H B I ━ ↔ ⌂ ━ ━ ☑ @ ⌂ ⌂ ↵

葵花宝典用过的都说好

Attach files by dragging & dropping, selecting or pasting them.

Allow edits by maintainers ?

Create pull request ▾

6) 回到岳岳 GitHub 账号可以看到有一个 Pull request 请求。

The screenshot shows a GitHub repository interface. The top navigation bar includes links for Code, Issues, Pull requests (which is highlighted with a red box), Actions, Projects, Wiki, Security, Insights, and Settings. Below the navigation bar, there are two summary sections: one for pull requests (1 Open, 0 Closed) and another for issues (0 Open). A single pull request is listed, titled '【讨论】 菊花宝典讨论组', with a note indicating it was opened 1 minute ago by the user 'atguiguudongfang1'.

进入到聊天室，可以讨论代码相关内容。



葵花宝典讨论组 #1

atguigudongfang1 wants to merge 1 commit into atguiguyueyue:master from atguigudongfang1:master

Conversation 0 Commits 1 Checks 0 Files changed 1

atguigudongfang1 commented 5 minutes ago

First-time contributor

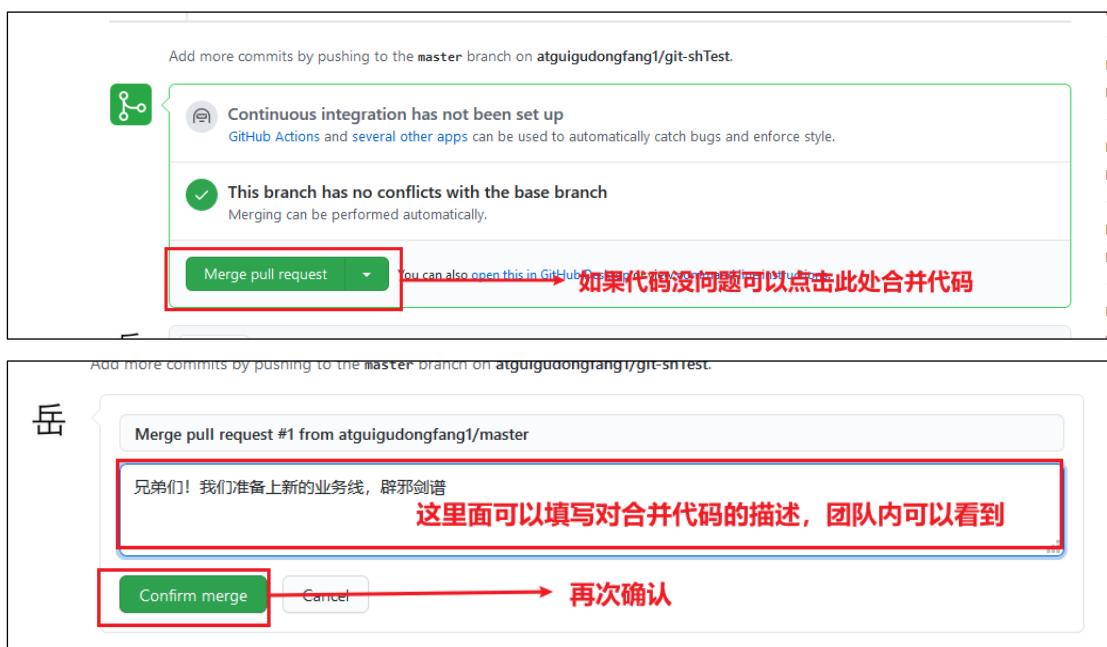
葵花宝典用过的都说好

东 葵花宝典讨论组 ...

Add more commits by pushing to the master branch on atguigudongfang1/git-shTest.

点击此处可以查看对方发送过来的代码

7) 如果代码没有问题, 可以点击 Merge pull request 合并代码。



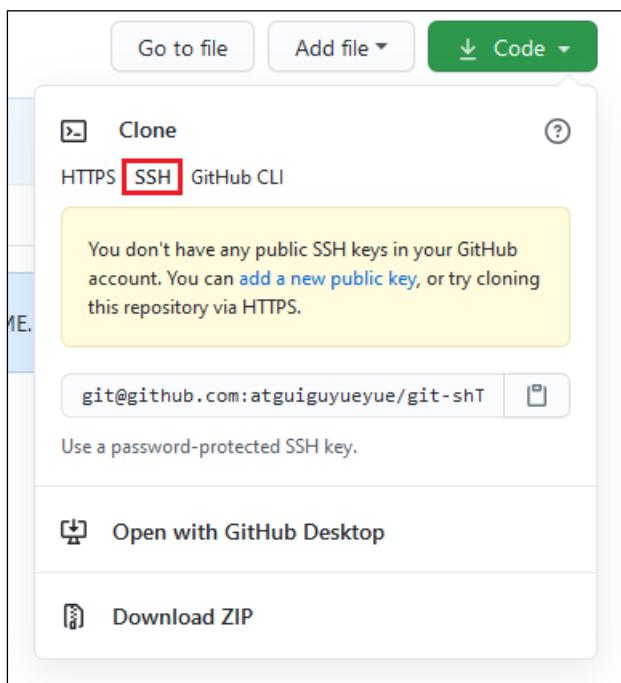
The image contains two screenshots of GitHub's pull request merge interface.

The top screenshot shows a pull request from "atguigudongfang1/git-shTest" to "master". It includes a note about continuous integration not being set up and a message stating the branch has no conflicts with the base branch. A red box highlights the "Merge pull request" button, with a red arrow pointing to it and the text "如果代码没问题可以点击此处合并代码" (If the code is fine, click here to merge the code).

The bottom screenshot shows a merge pull request from "atguigudongfang1/master" to "master" by user "岳". It includes a message from the user: "兄弟们！我们准备上新的业务线，辟邪剑谱" (Brothers! We are preparing to launch a new business line, Bixie Jianpu). A red box highlights the "Confirm merge" button, with a red arrow pointing to it and the text "再次确认" (Confirm again).

## 6.4 SSH 免密登录

我们可以看到远程仓库中还有一个 SSH 的地址，因此我们也可以使用 SSH 进行访问。



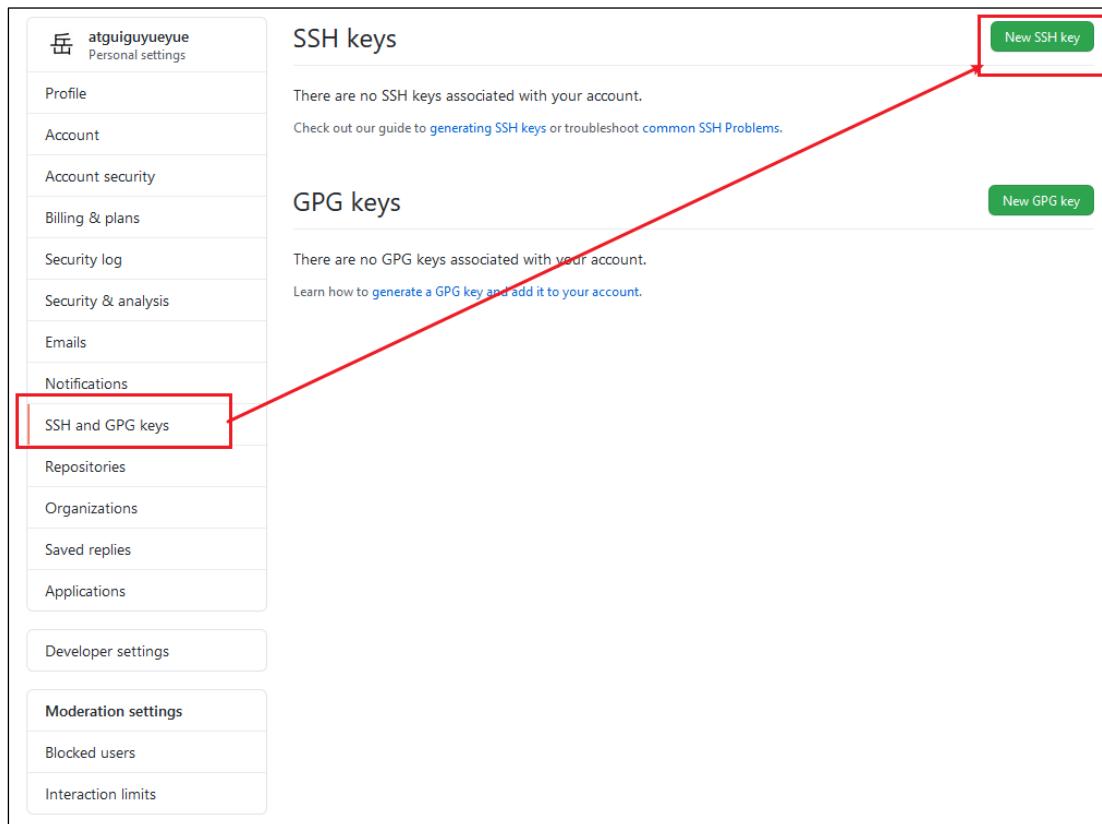
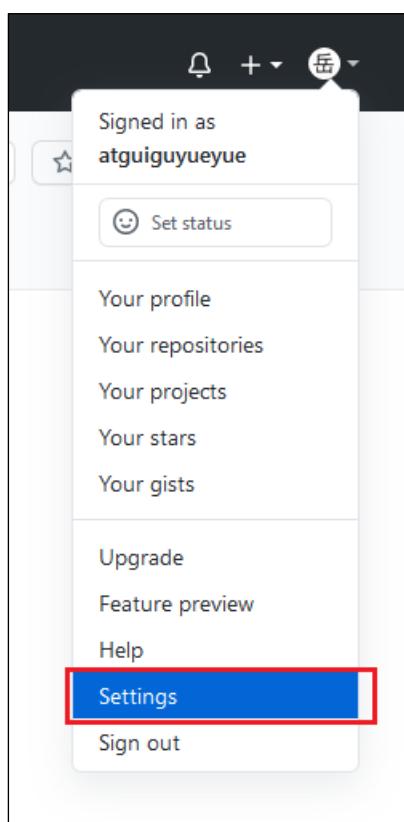
具体操作如下：

```
--进入当前用户的家目录  
Layne@LAPTOP-Layne MINGW64 /d/Git-Space/SH0720 (master)  
$ cd  
--删除.ssh 目录  
Layne@LAPTOP-Layne MINGW64 ~  
$ rm -rf .ssh  
removed '.ssh/known_hosts'
```



```
removed directory '.ssh'
--运行命令生成.ssh秘钥目录[注意：这里-C这个参数是大写的C]
Layne@LAPTOP-Layne MINGW64 ~
$ ssh-keygen -t rsa -C atguiguyueyue@aliyun.com
Generating public/private rsa key pair.
Enter file in which to save the key (/c/Users/Layne/.ssh/id_rsa):
Created directory '/c/Users/Layne/.ssh'.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /c/Users/Layne/.ssh/id_rsa.
Your public key has been saved in /c/Users/Layne/.ssh/id_rsa.pub.
The key fingerprint is:
SHA256:7CPfRLITKcYDhaqpEDeok7Atvwh2reRmpxxOC6dkY44
atguiguyueyue@aliyun.com
The key's randomart image is:
+---[RSA 2048]---+
| .. |
| .. |
| . . |
| + + o . . |
| oO . = S . |
| X . . + = |
| +@ * . . = . |
| X.&o+. o = |
| Eo+Oo . . |
+---[SHA256]---+
--进入.ssh目录查看文件列表
Layne@LAPTOP-Layne MINGW64 ~
$ cd .ssh
Layne@LAPTOP-Layne MINGW64 ~/ssh
$ ll -a
total 21
drwxr-xr-x 1 Layne 197609 0 11月 25 19:27 .
drwxr-xr-x 1 Layne 197609 0 11月 25 19:27 ..
-rw-r--r-- 1 Layne 197609 1679 11月 25 19:27 id_rsa
-rw-r--r-- 1 Layne 197609 406 11月 25 19:27 id_rsa.pub
--查看id_rsa.pub文件内容
Layne@LAPTOP-Layne MINGW64 ~/ssh
$ cat id_rsa.pub
ssh-rsa
AAAAB3NzaC1yc2EAAAQABAAQDRXRsk9Ohtg1AXLltsuNRAGBsx3ypE1O1Rkdzpm
11woa6y6G621Zri3XtCH0F7GQvnMvQtPISJFXXWo+jFHZmqYQa/6kOIMv2sszcoj2Qtwl
1GXTPn/4T2h/cHjSHfc+ks8OYP7OWOOefpOCbYY/7DWYrl89k7nQ1fd+A1FV/vQmcsa1L
P5ihqjpjms2CoUUen8kZHbjwHBAHQHWRE+Vc371MG/dwINvCi8n7ibI86o2k0dW0+8SL+
svPV/Y0G9m+RAqgec8b9U6DcSSAMH5uq4UWfnAcUNagb/aJQLytrH0pLa8nMv3XdSGNNNo
AGBFew2+K81XrmkP27FrLI6lDef atguiguyueyue@aliyun.com
```

复制 id\_rsa.pub 文件内容，登录 GitHub，点击用户头像→Settings→SSH and GPG keys



岳 atguiguyueyue Personal settings

Profile

Account

Account security

Billing & plans

Security log

Security & analysis

Emails

Notifications

**SSH and GPG keys**

Repositories

Organizations

Saved replies

Applications

Developer settings

Moderation settings

Blocked users

Interaction limits

**SSH keys**

There are no SSH keys associated with your account.

Check out our guide to [generating SSH keys](#) or troubleshoot [common SSH Problems](#).

**New SSH key**

**GPG keys**

There are no GPG keys associated with your account.

Learn how to [generate a GPG key](#) and add it to your account.

**New GPG key**

SSH keys / Add new

Title  
SH200720 **这里面可以随意取个名字**

Key

```
ssh-rsa AAAAB3NzaC1yc2EAAAQABAAQDRXRsk9Ohtg1AXLtsuNRAGBsx3ypE1O1RkdzpmI1woa6y6G62lZri3XtCH0F7GQvnMvQtPISJFXXWo+jFHZmqYQa/6kOIMv2sszcoj2QtwIIGXTPn/4T2h/cHjSHfc+ks8OYP7OWOOefpOCbYY/7DWYrl89k7nQldf+A1FV/vQmcsa1LP5ihqjpjms2CoUUen8kZHbjwHBAHQHWRE+Vc371MG/dwlINvCi8n7ibI86o2k0dW0+8SL+svPV/Y0G9m+RAqgec8b9U6DcSSAMH5uq4UWfnAcUNagb/aJQLytrH0pLa8nMv3XdSGNNNoAGBFeW2+K81XrmkP27FrLI6IDef atguiguyueyue@aliyun.com
```

**将生成的id\_rsa.pub文件内容复制到这里**

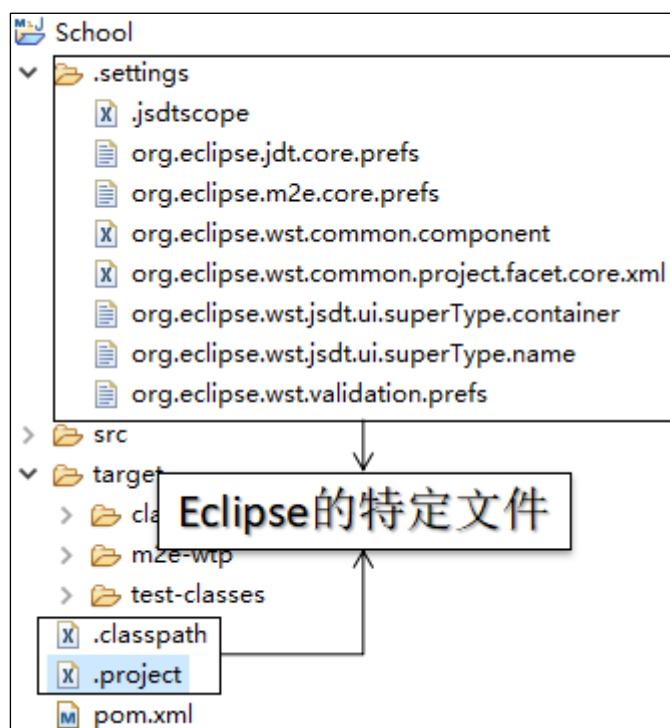
Add SSH key

接下来再往远程仓库 push 东西的时候使用 SSH 连接就不需要登录了。

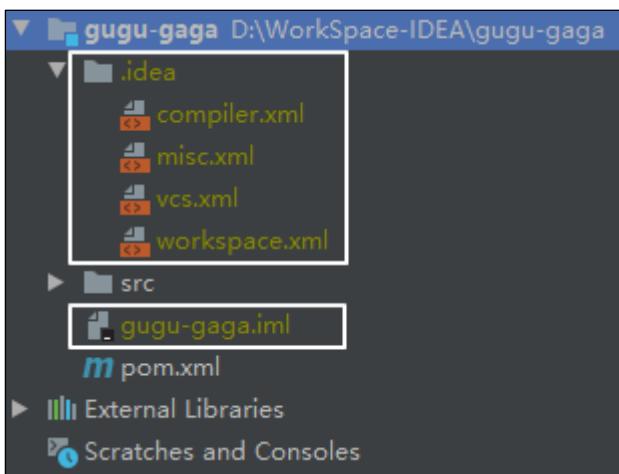
## 第 7 章 IDEA 集成 Git

### 7.1 配置 Git 忽略文件

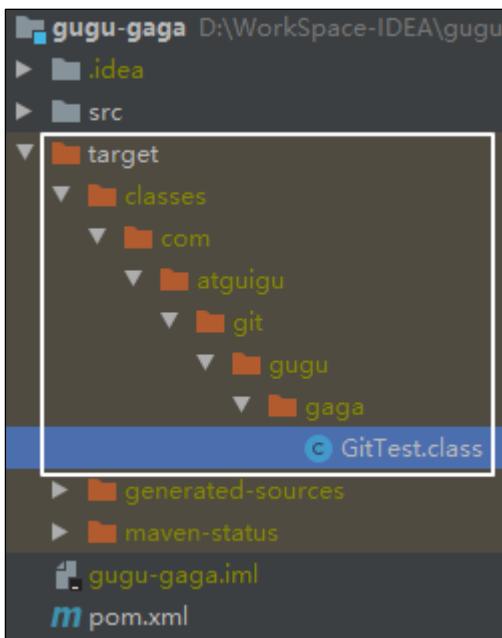
#### 1) Eclipse 特定文件



#### 2) IDEA 特定文件



### 3) Maven 工程的 target 目录



#### 问题 1:为什么要忽略他们?

答：与项目实际功能无关，不参与服务器上部署运行。把它们忽略掉能够屏蔽 IDE 工具之间的差异。

#### 问题 2：怎么忽略？

1) 创建忽略规则文件 xxxx.ignore (前缀名随便起，建议是 git.ignore)

这个文件的存放位置原则上在哪里都可以，为了便于让 ~/.gitconfig 文件引用，建议也放在用户家目录下

git.ignore 文件模版内容如下：

```
# Compiled class file  
*.class
```

```
# Log file
*.log

# BlueJ files
*.ctxt

# Mobile Tools for Java (J2ME)
.mtj.tmp/

# Package Files #
*.jar
*.war
*.nar
*.ear
*.zip
*.tar.gz
*.rar

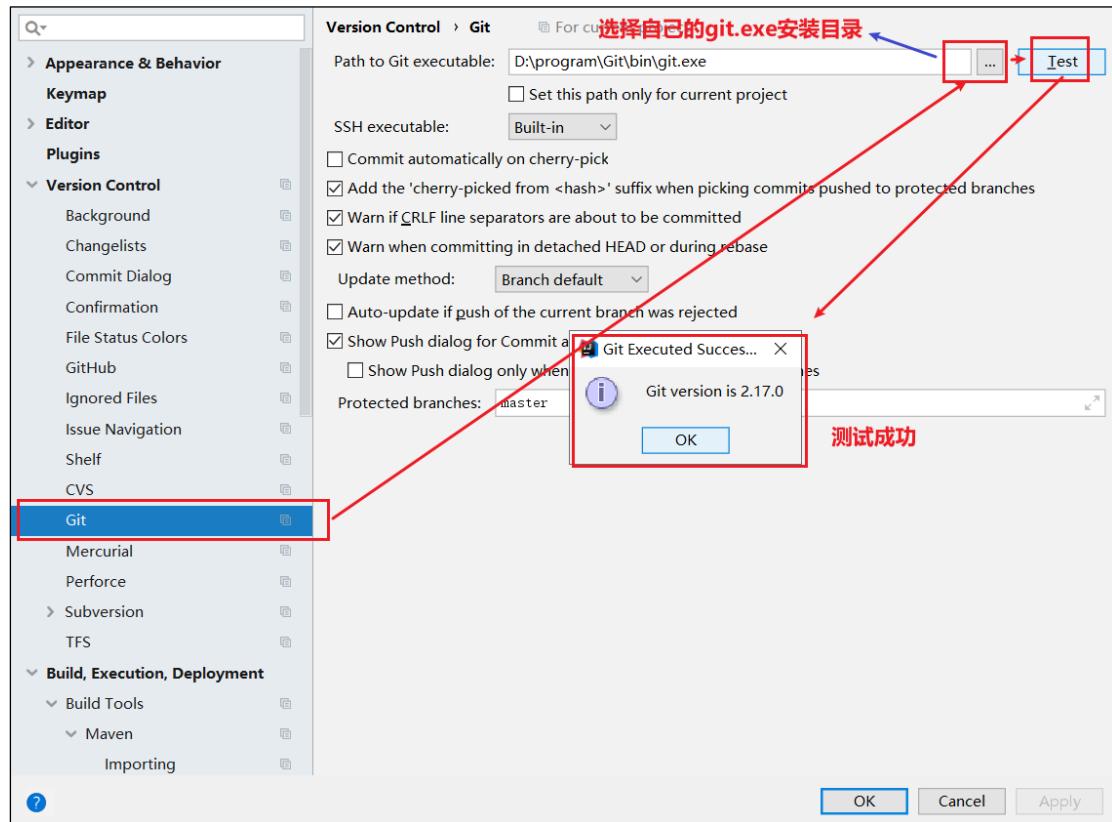
#           virtual      machine      crash      logs,      see
http://www.java.com/en/download/help/error_hotspot.xml
hs_err_pid*

.classpath
.project
.settings
.target
.idea
*.iml
```

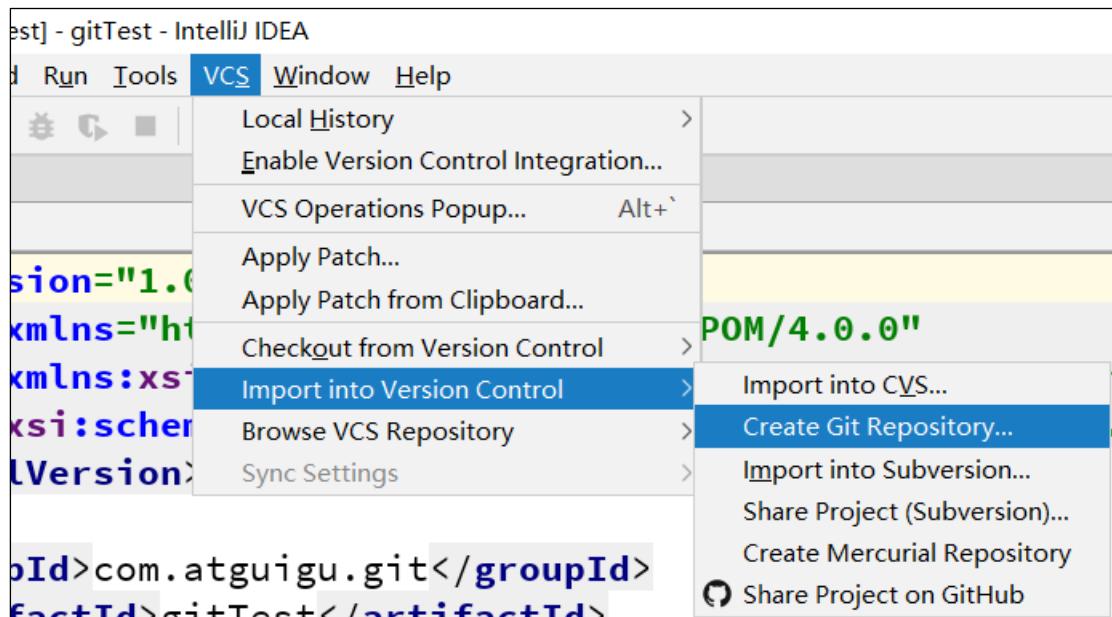
2) 在.gitconfig 文件中引用忽略配置文件（此文件在 Windows 的家目录中）

```
[user]
    name = Layne
    email = Layne@atguigu.com
[core]
    excludesfile = C:/Users/asus/.gitignore
注意: 这里要使用“正斜线 (/)”, 不要使用“反斜线 (\)”
```

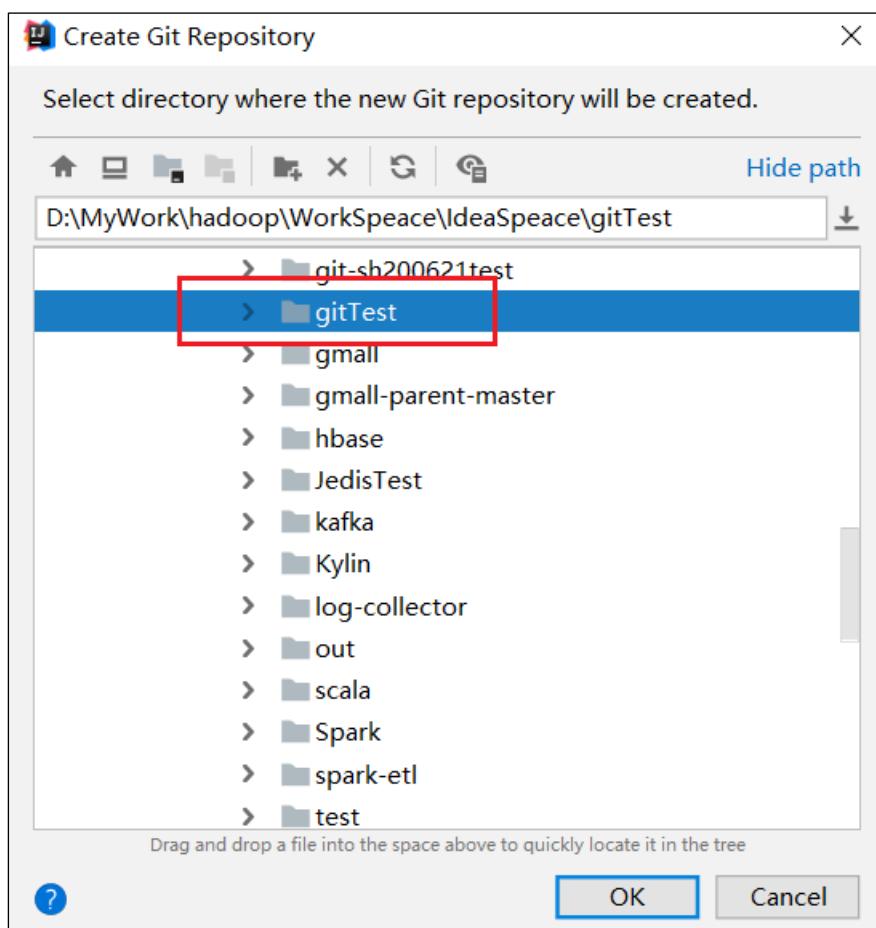
## 7.2 定位 Git 程序



## 7.3 初始化本地库

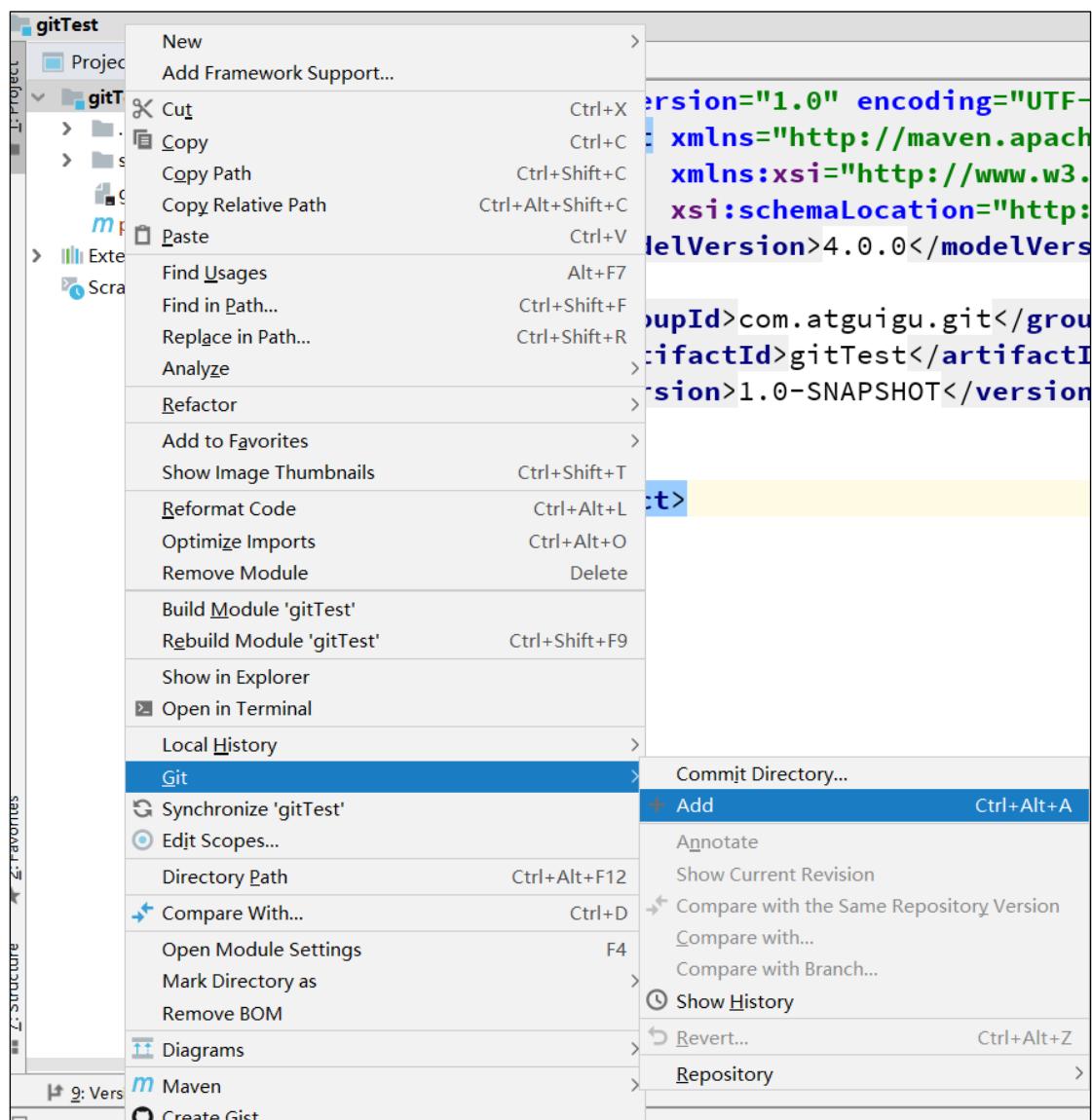


选择要创建 Git 本地仓库的工程。

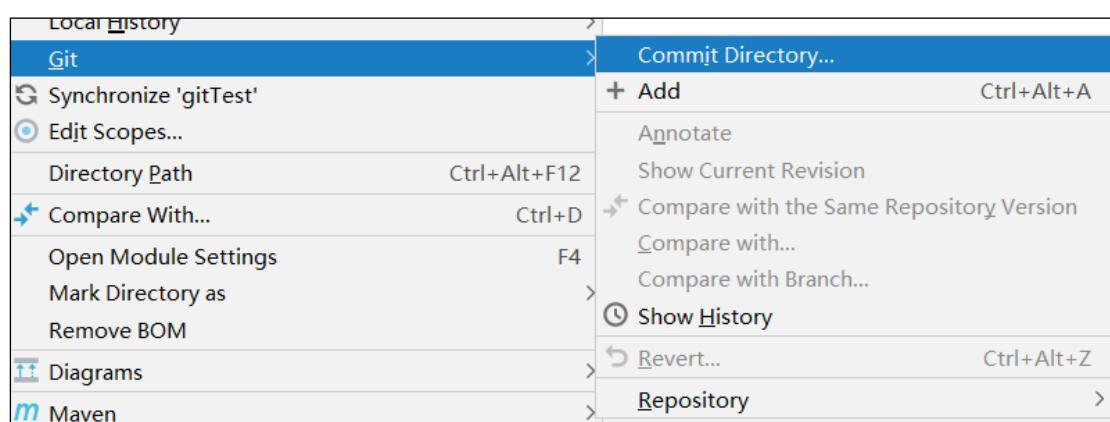


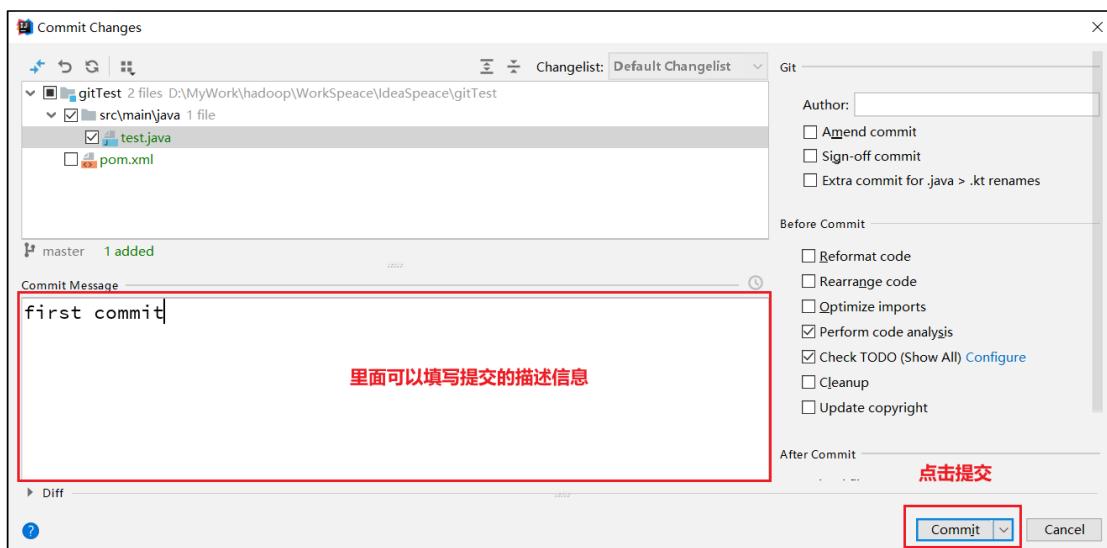
## 7.4 添加到暂存区

右键点击项目选择 Git -> Add 将项目添加到暂存区。



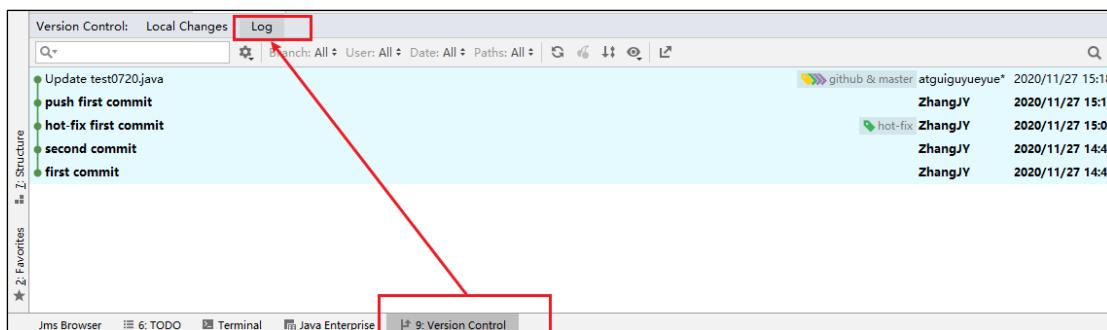
## 7.5 提交到本地库



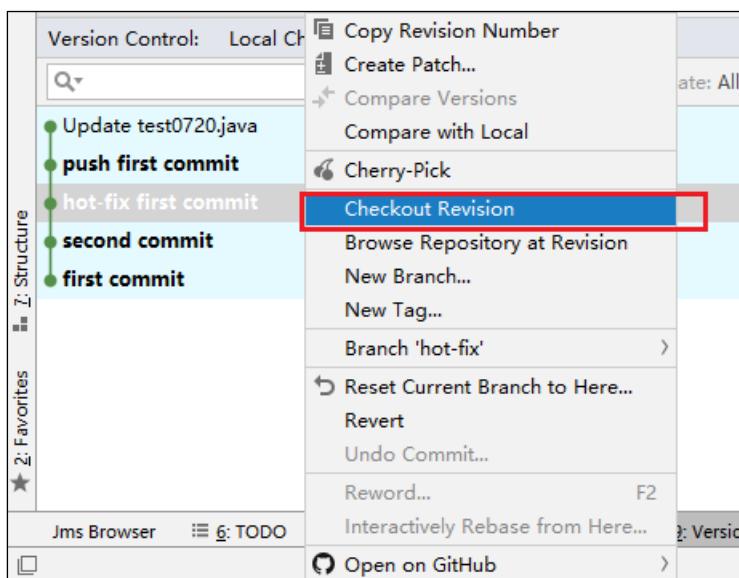


## 7.6 切换版本

在 IDEA 的左下角, 点击 Version Control, 然后点击 Log 查看版本

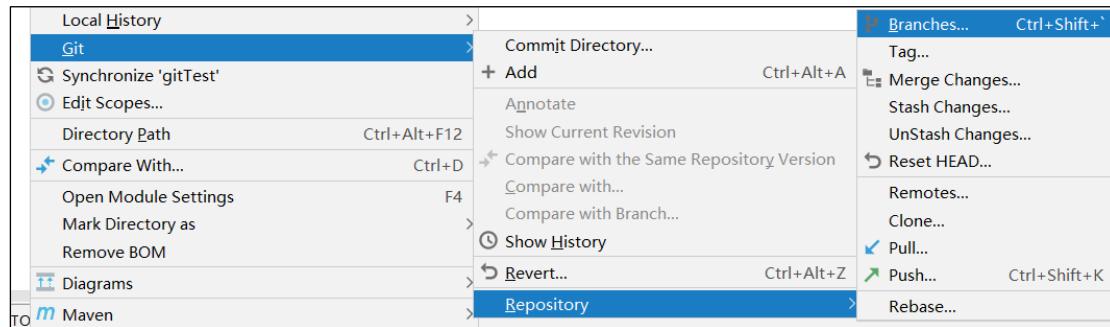


右键选择要切换的版本, 然后在菜单里点击 Checkout Revision。

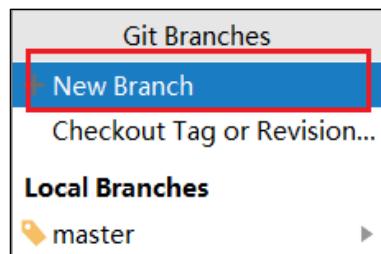


## 7.7 创建分支

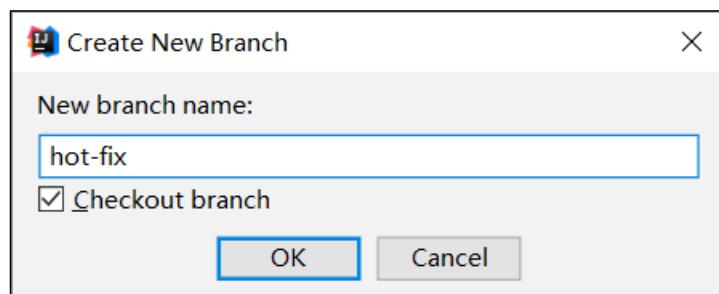
选择 Git，在 Repository 里面，点击 Branches 按钮。



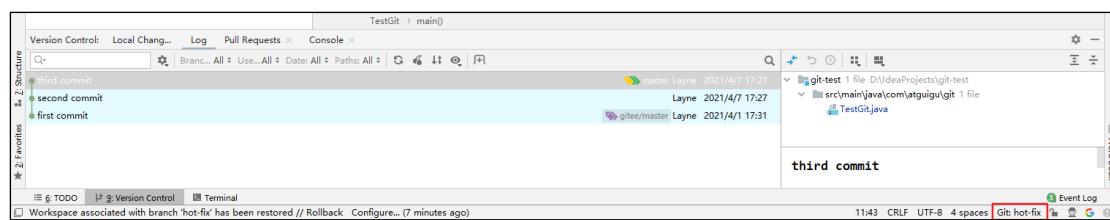
在弹出的 Git Branches 框里，点击 New Branch 按钮。



填写分支名称，创建 hot-fix 分支。

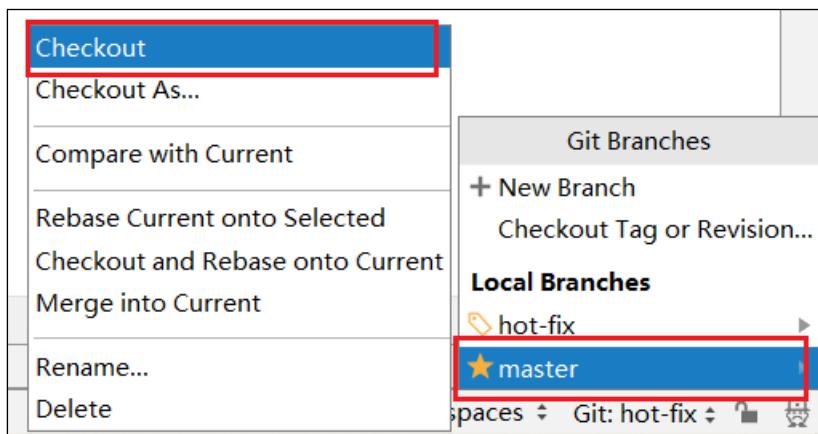


然后再 IDEA 的右下角看到 hot-fix，说明分支创建成功，并且当前已经切换成 hot-fix 分支

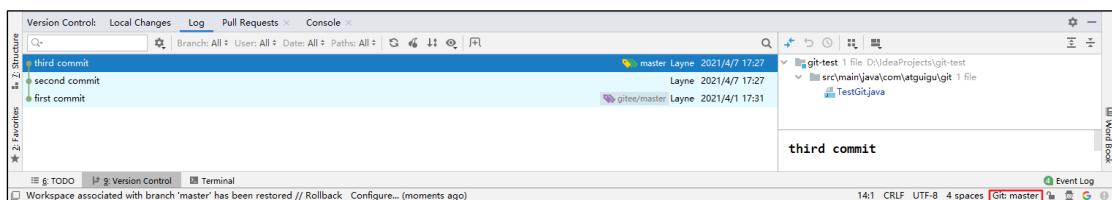


## 7.8 切换分支

在 IDEA 窗口的右下角，切换到 master 分支。

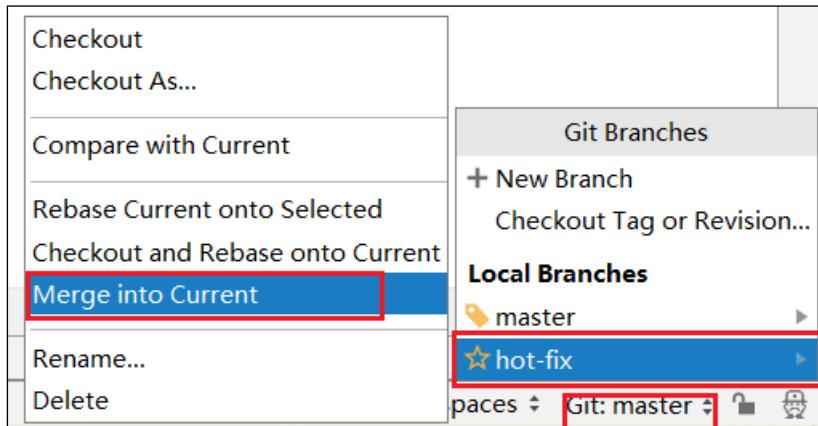


然后在 IDEA 窗口的右下角看到了 master，说明 master 分支切换成功。

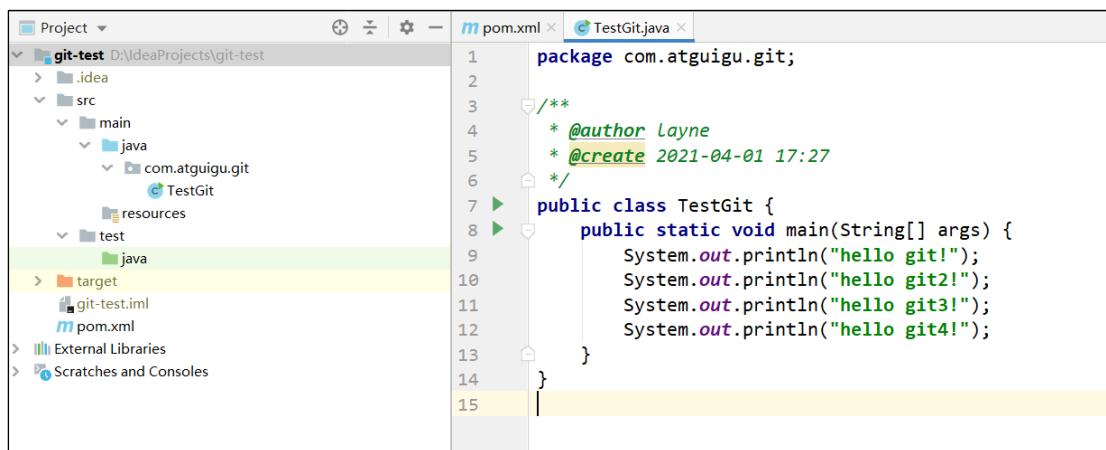


## 7.9 合并分支

在 IDEA 窗口的右下角，将 hot-fix 分支合并到当前 master 分支。



如果代码没有冲突，分支直接合并成功，分支合并成功以后，代码自动提交，无需手动提交本地库。

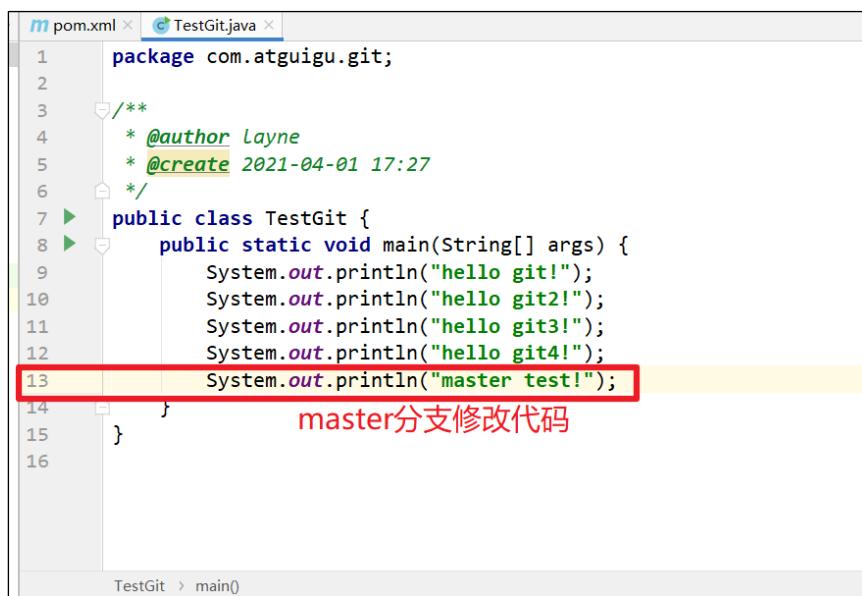


Project D:\ideaProjects\git-test  
git-test .idea  
src  
  main  
    java  
      com.atguigu.git  
        TestGit  
      resources  
    test  
      java  
      target  
      git-test.iml  
      pom.xml  
External Libraries  
Scratches and Consoles

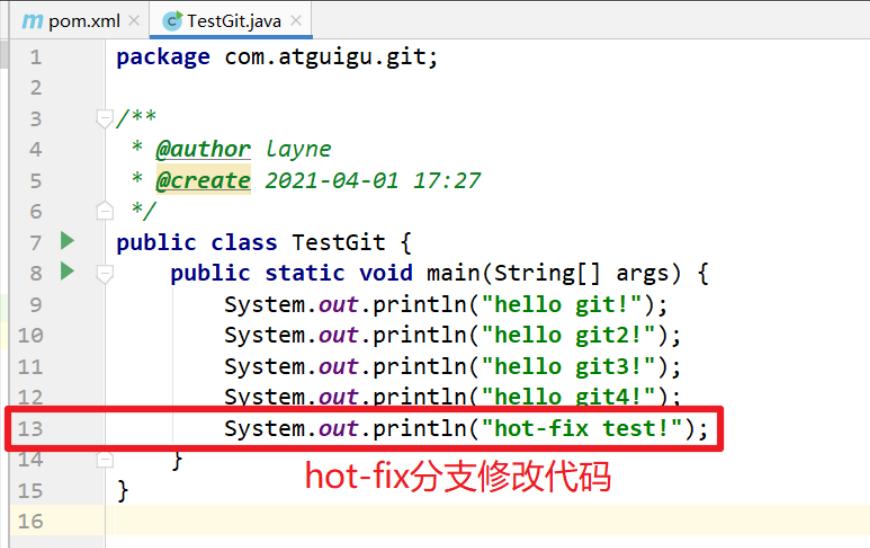
```
1 package com.atguigu.git;
2
3 /**
4  * @author Layne
5  * @create 2021-04-01 17:27
6 */
7 public class TestGit {
8     public static void main(String[] args) {
9         System.out.println("hello git!");
10        System.out.println("hello git2!");
11        System.out.println("hello git3!");
12        System.out.println("hello git4!");
13    }
14 }
15
```

## 7.10 解决冲突

如图所示，如果 master 分支和 hot-fix 分支都修改了代码，在合并分支的时候就会发生冲突。



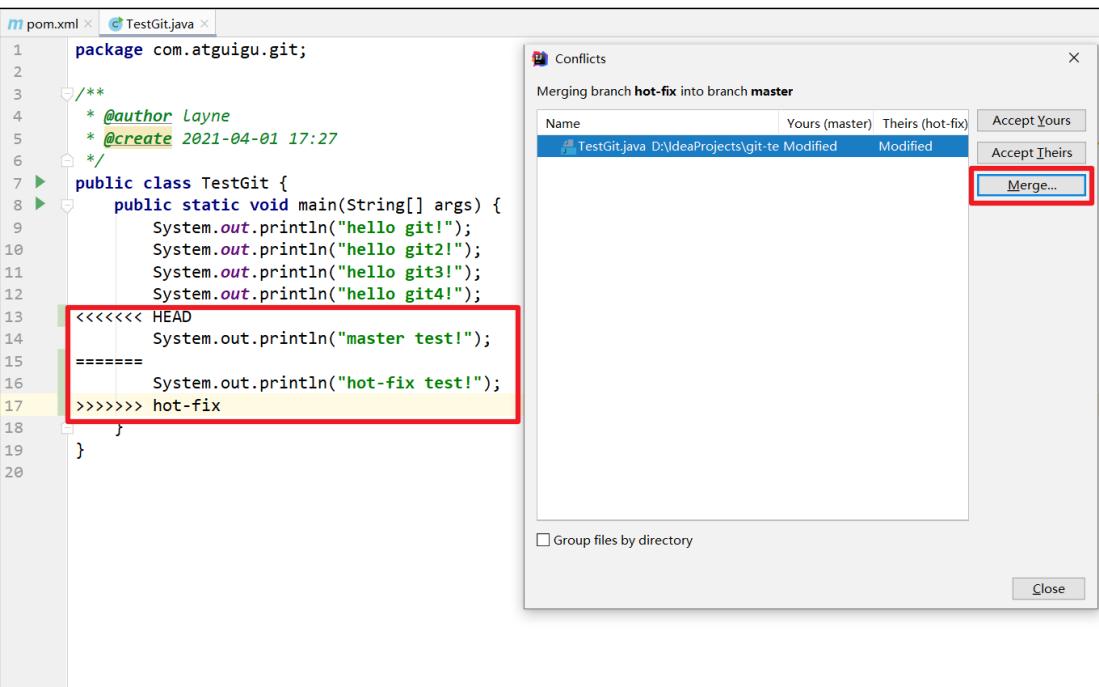
```
1 package com.atguigu.git;
2
3 /**
4  * @author Layne
5  * @create 2021-04-01 17:27
6 */
7 public class TestGit {
8     public static void main(String[] args) {
9         System.out.println("hello git!");
10        System.out.println("hello git2!");
11        System.out.println("hello git3!");
12        System.out.println("hello git4!");
13        System.out.println("master test!"); // master分支修改代码
14    }
15 }
```



IDEA code editor showing the `TestGit.java` file. Line 13 contains the code `System.out.println("hot-fix test!");`, which is highlighted with a red box. The text "hot-fix分支修改代码" is overlaid on the code editor area.

```
pom.xml x TestGit.java x
1 package com.atguigu.git;
2
3 /**
4 * @author Layne
5 * @create 2021-04-01 17:27
6 */
7 public class TestGit {
8     public static void main(String[] args) {
9         System.out.println("hello git!");
10        System.out.println("hello git2!");
11        System.out.println("hello git3!");
12        System.out.println("hello git4!");
13        System.out.println("hot-fix test!");
14    }
15 }
16
```

我们现在站在 master 分支上合并 hot-fix 分支，就会发生代码冲突。



IDEA Conflicts dialog showing the merge process between the `hot-fix` branch and the `master` branch. The `TestGit.java` file has a conflict in line 13. The `Merge...` button is highlighted with a red box.

Conflicts

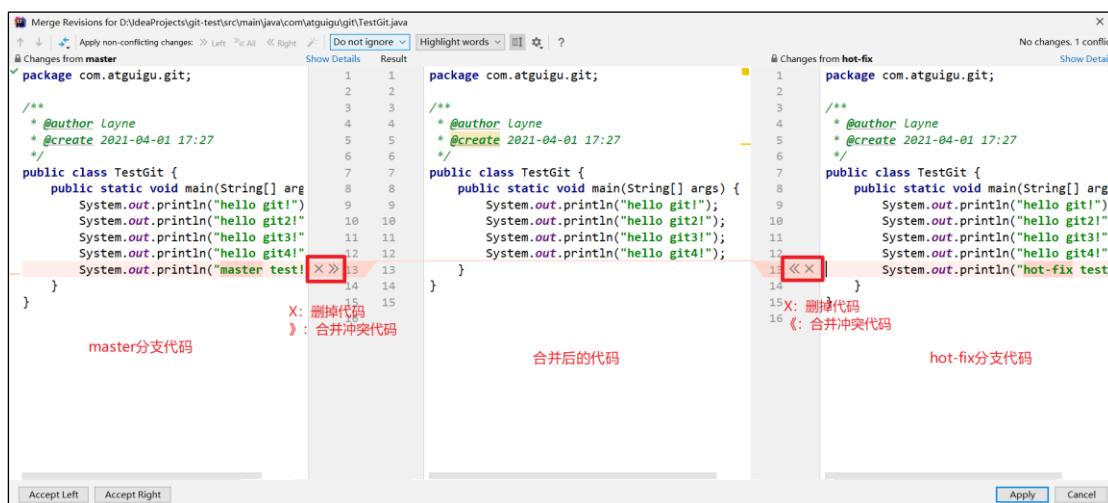
Merging branch `hot-fix` into branch `master`

Name	Yours (master)	Theirs (hot-fix)	Action
<code>TestGit.java</code>	D:\IdeaProjects\git-te	Modified	<input type="button" value="Accept Yours"/> <input type="button" value="Accept Theirs"/> <input type="button" value="Merge..."/>

Group files by directory  Close

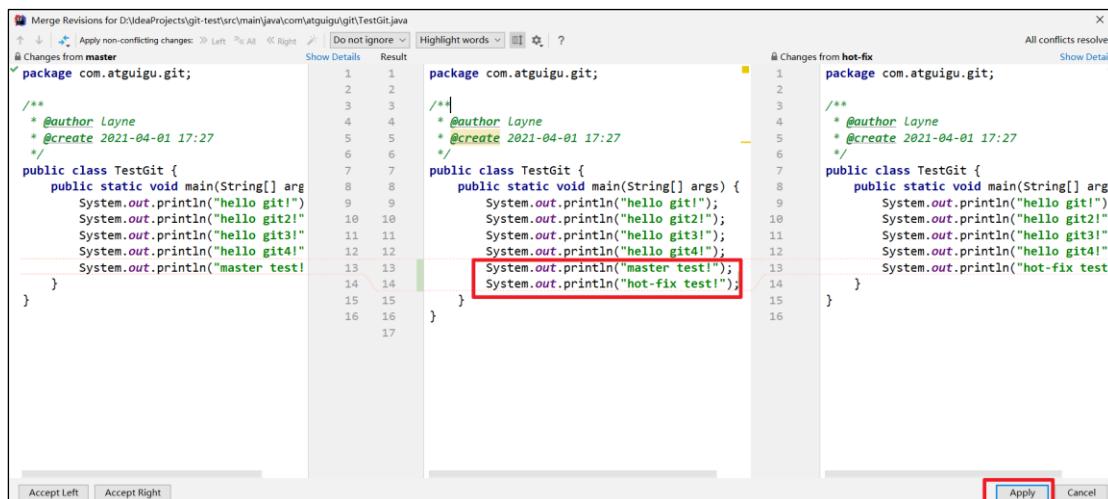
```
pom.xml x TestGit.java x
1 package com.atguigu.git;
2
3 /**
4 * @author Layne
5 * @create 2021-04-01 17:27
6 */
7 public class TestGit {
8     public static void main(String[] args) {
9         System.out.println("hello git!");
10        System.out.println("hello git2!");
11        System.out.println("hello git3!");
12        System.out.println("hello git4!");
13        <<<<< HEAD
14        System.out.println("master test!");
15        =====
16        System.out.println("hot-fix test!");
17        >>>> hot-fix
18    }
19
20 }
```

点击 Conflicts 框里的 Merge 按钮，进行手动合并代码。



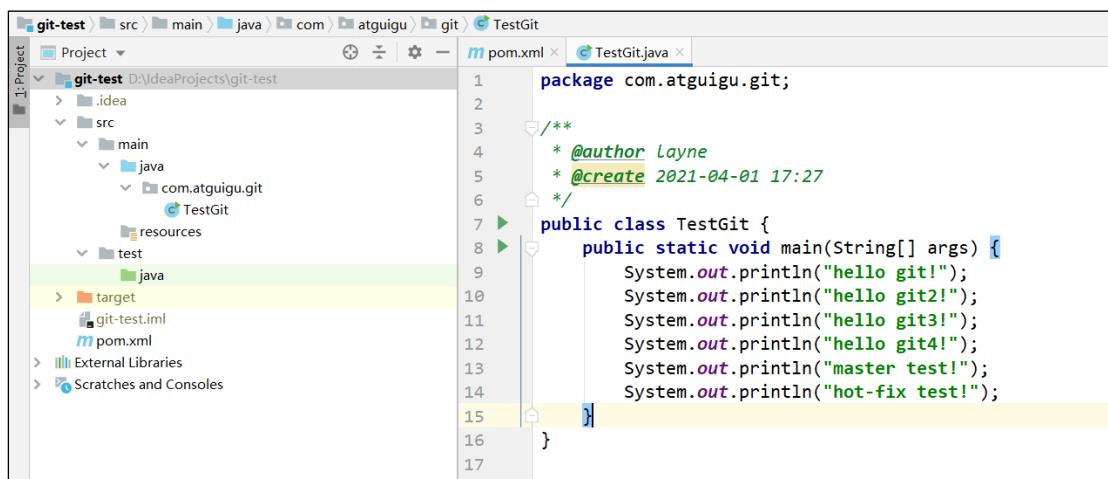
The screenshot shows the IntelliJ IDEA 'Merge Revisions' dialog for the file `TestGit.java`. It displays three panes: 'Changes from master' (left), 'Changes from hot-fix' (right), and 'Result' (center). In the Result pane, line 13 contains a conflict marker (`<>`) indicating a merge conflict. A tooltip 'X: 删掉代码' (Delete code) points to the left side of the marker, and another tooltip '》: 合并冲突代码' (Conflict code) points to the right side. Below the Result pane, the text '合并后的代码' (Merged code) is displayed.

手动合并完代码以后，点击右下角的 Apply 按钮。



The screenshot shows the IntelliJ IDEA 'Merge Revisions' dialog after manual conflict resolution. The 'Result' pane now shows the merged code, where the conflict at line 13 has been resolved. The 'Apply' button is highlighted in red at the bottom right of the dialog.

代码冲突解决，自动提交本地库。



The screenshot shows the IntelliJ IDEA Project Structure for the `git-test` project. The `TestGit.java` file is open in the editor. The code now includes the additional print statement from the `hot-fix` branch, demonstrating that the merge was successful. The code block is as follows:

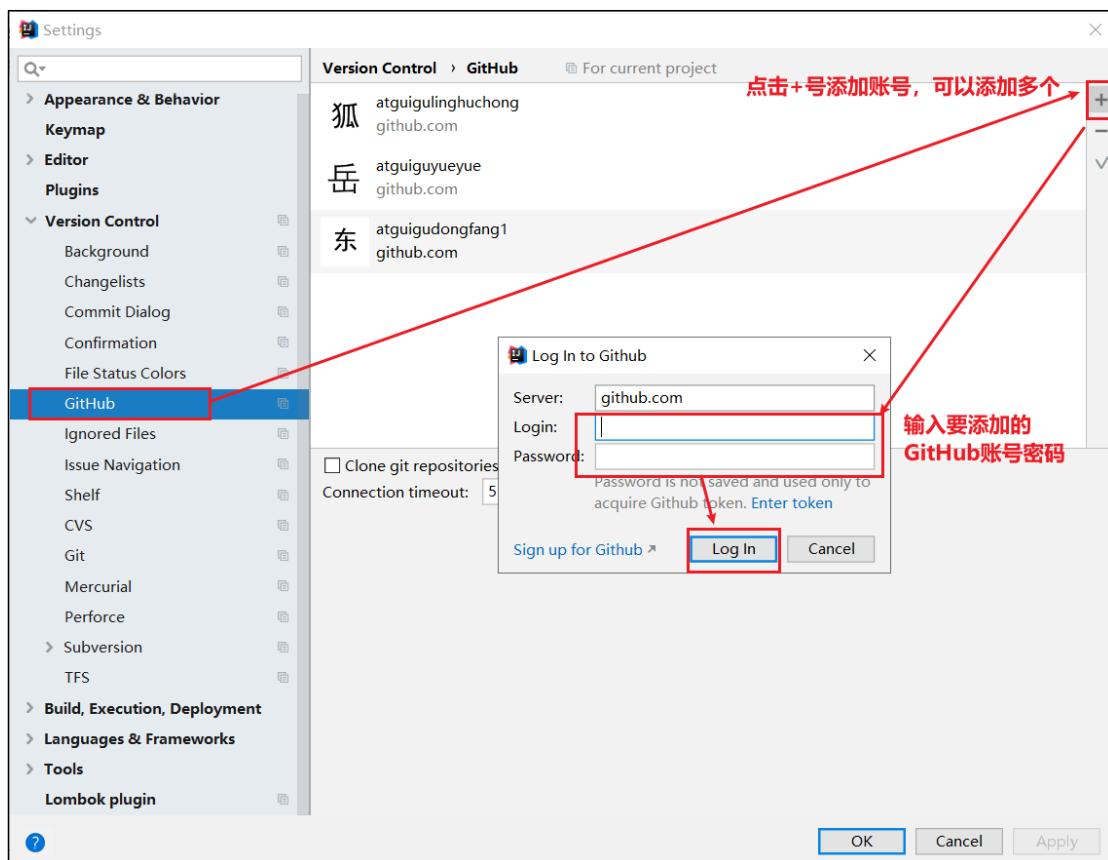
```

1 package com.atguigu.git;
2
3 /**
4 * @author Layne
5 * @create 2021-04-01 17:27
6 */
7 public class TestGit {
8     public static void main(String[] args) {
9         System.out.println("hello git!");
10        System.out.println("hello git2!");
11        System.out.println("hello git3!");
12        System.out.println("hello git4!");
13        System.out.println("master test!");
14        System.out.println("hot-fix test!");
15    }
16 }

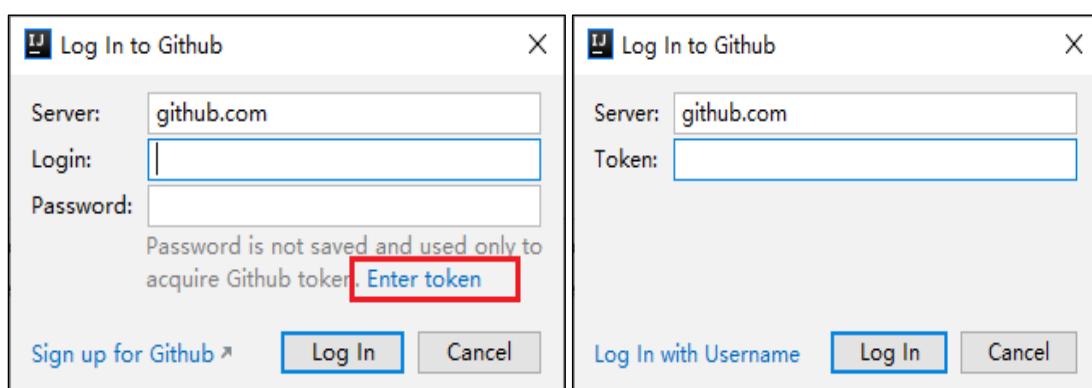
```

## 第 8 章 IDEA 集成 GitHub

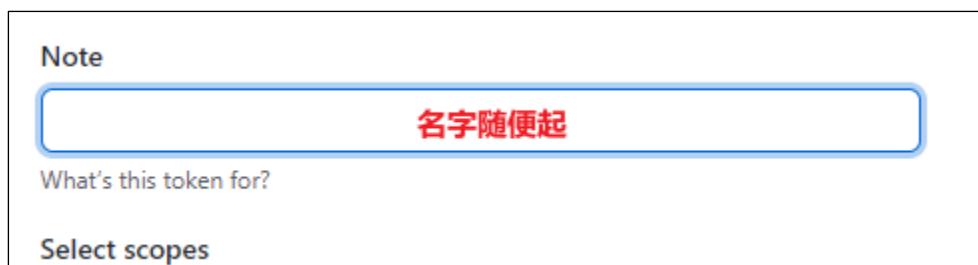
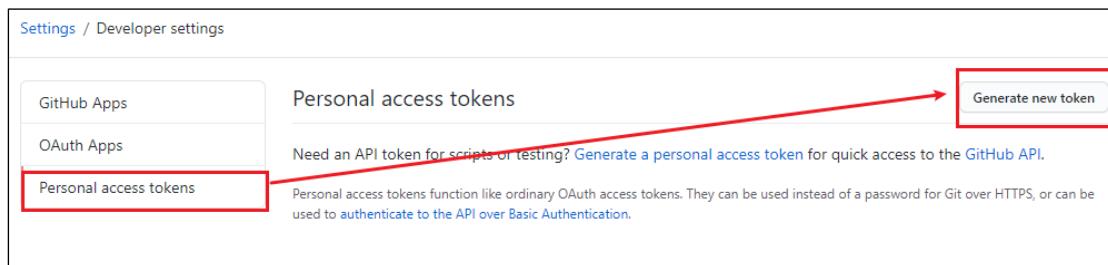
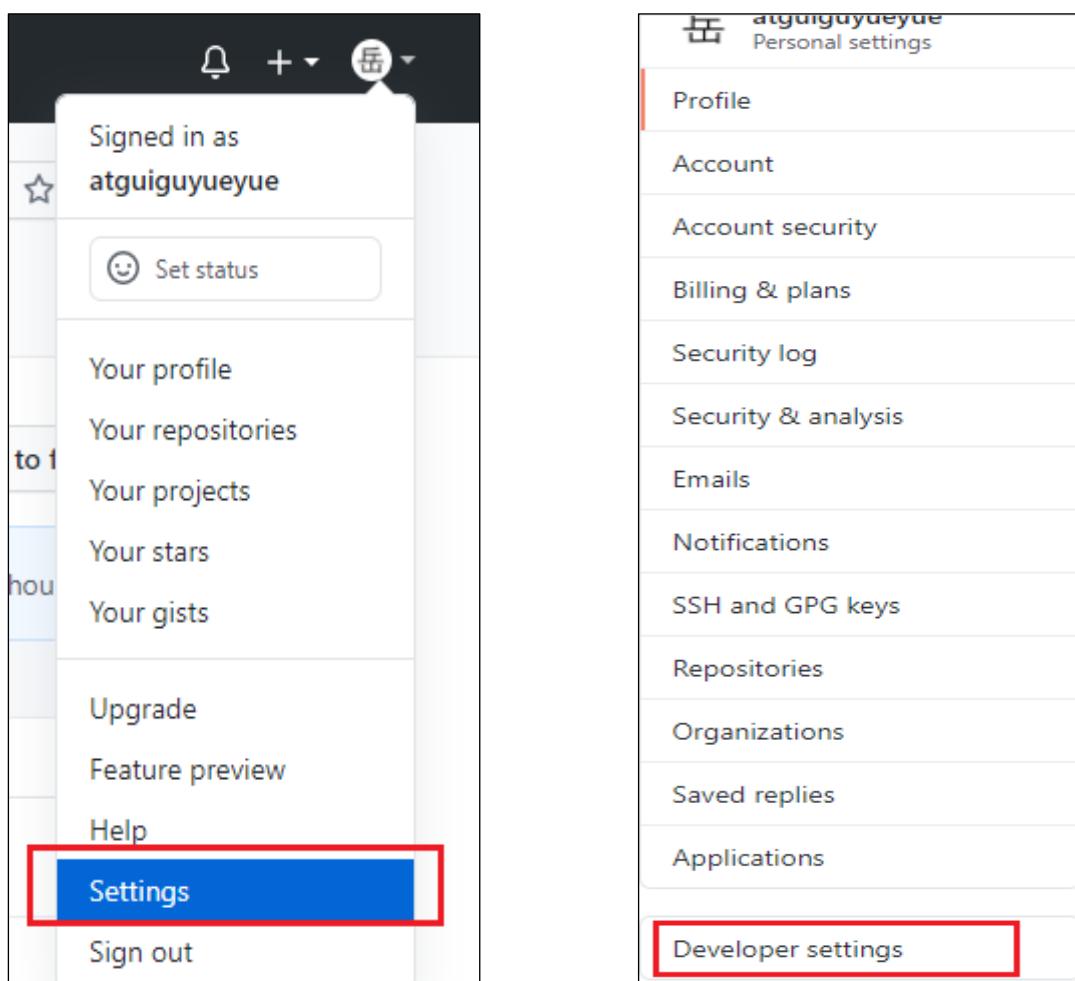
### 8.1 设置 GitHub 账号



如果出现 401 等情况连接不上的，是因为网络原因，可以使用以下方式连接：



然后去 GitHub 账户上设置 token。



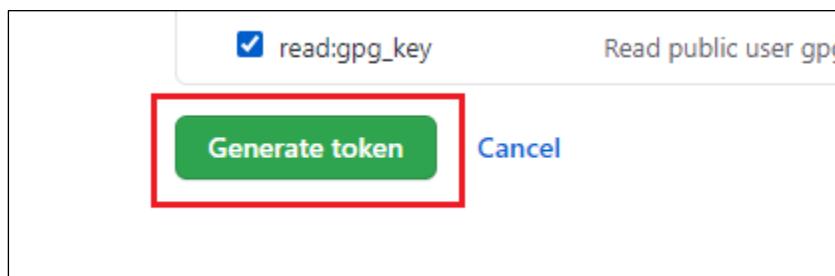
Select scopes

Scopes define the access for personal tokens. Read more about OAuth scopes.

学习环境权限作用域拉满

<input checked="" type="checkbox"/> repo	Full control of private repositories
<input type="checkbox"/> repo:status	Access commit status
<input type="checkbox"/> repo_deployment	Access deployment status
<input type="checkbox"/> public_repo	Access public repositories
<input type="checkbox"/> repo:invite	Access repository invitations
<input type="checkbox"/> security_events	Read and write security events
<input checked="" type="checkbox"/> workflow	Update github action workflows
<input checked="" type="checkbox"/> write:packages	Upload packages to github package registry
<input type="checkbox"/> read:packages	Download packages from github package registry
<input checked="" type="checkbox"/> delete:packages	Delete packages from github package registry
<input checked="" type="checkbox"/> admin:org	Full control of orgs and teams, read and write org projects
<input type="checkbox"/> write:org	Read and write org and team membership, read and write org projects
<input type="checkbox"/> read:org	Read org and team membership, read org projects
<input checked="" type="checkbox"/> admin:public_key	Full control of user public keys
<input type="checkbox"/> write:public_key	Write user public keys
<input type="checkbox"/> read:public_key	Read user public keys

点击生成 token。



复制红框中的字符串到 idea 中。

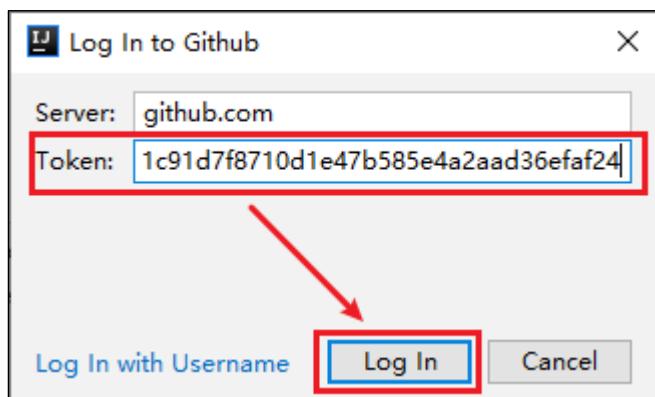
Personal access tokens

Tokens you have generated that can be used to access the GitHub API.

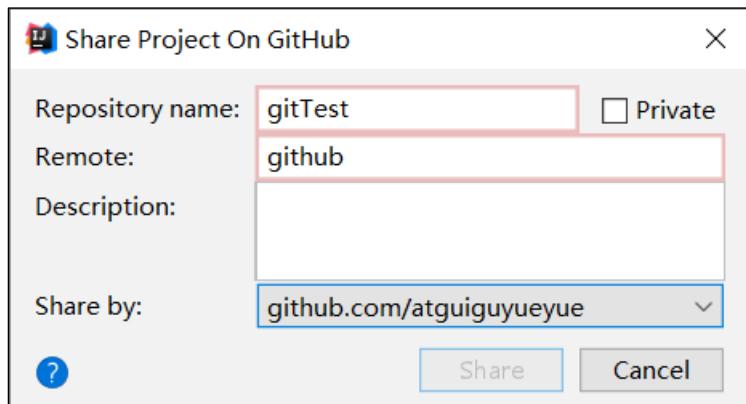
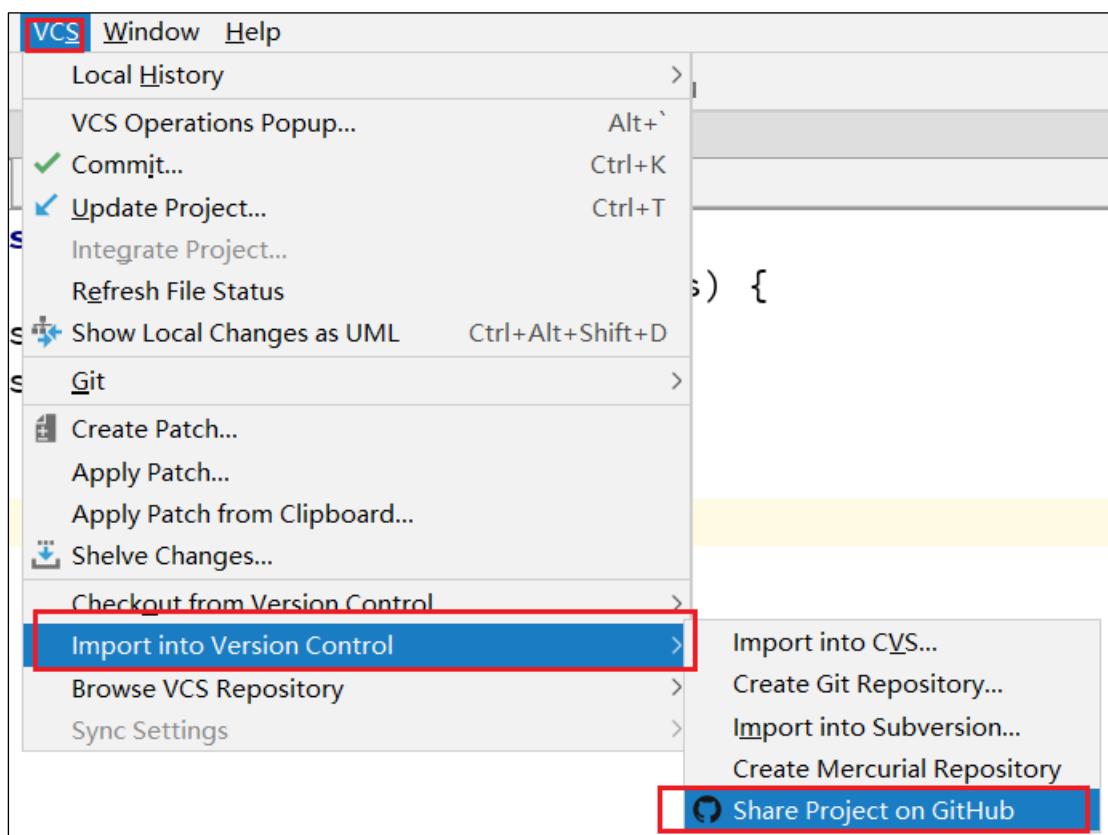
Make sure to copy your new personal access token now. You won't be able to see it again!

<input checked="" type="checkbox"/> c0dfc1c91d7f8710d1e47b585e4a2aad36efaf24		
--	---	---

点击登录。

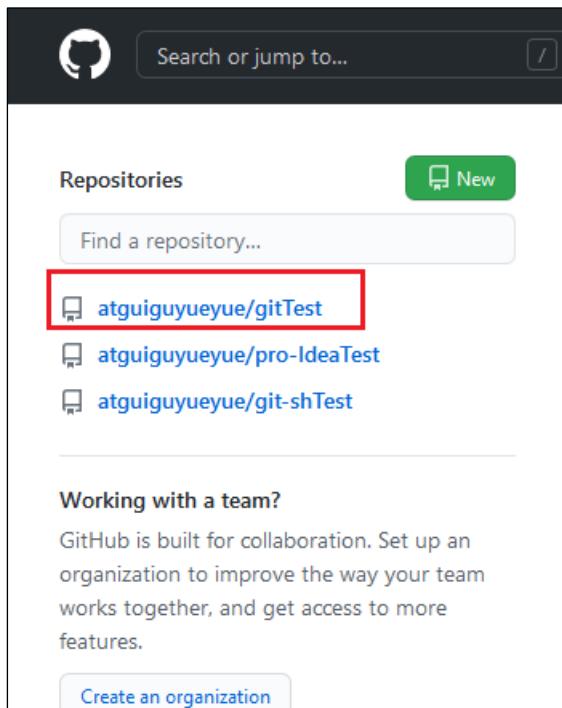


## 8.2 分享工程到 GitHub



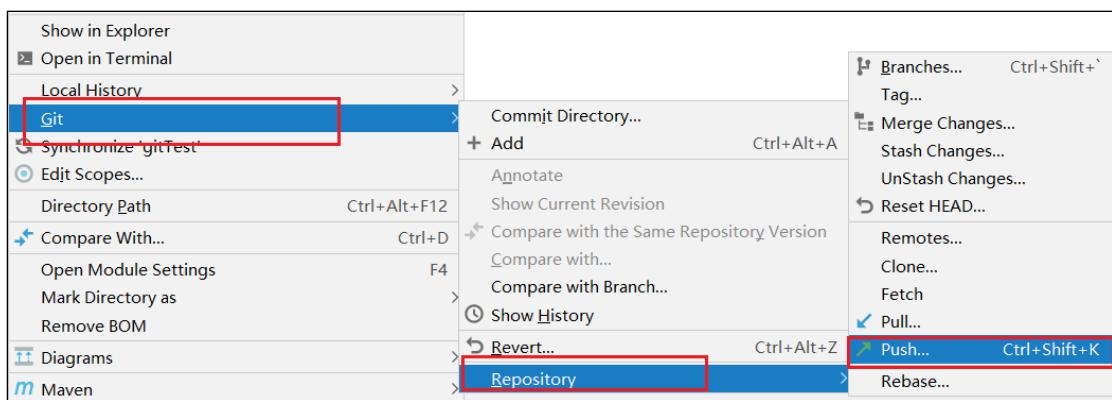


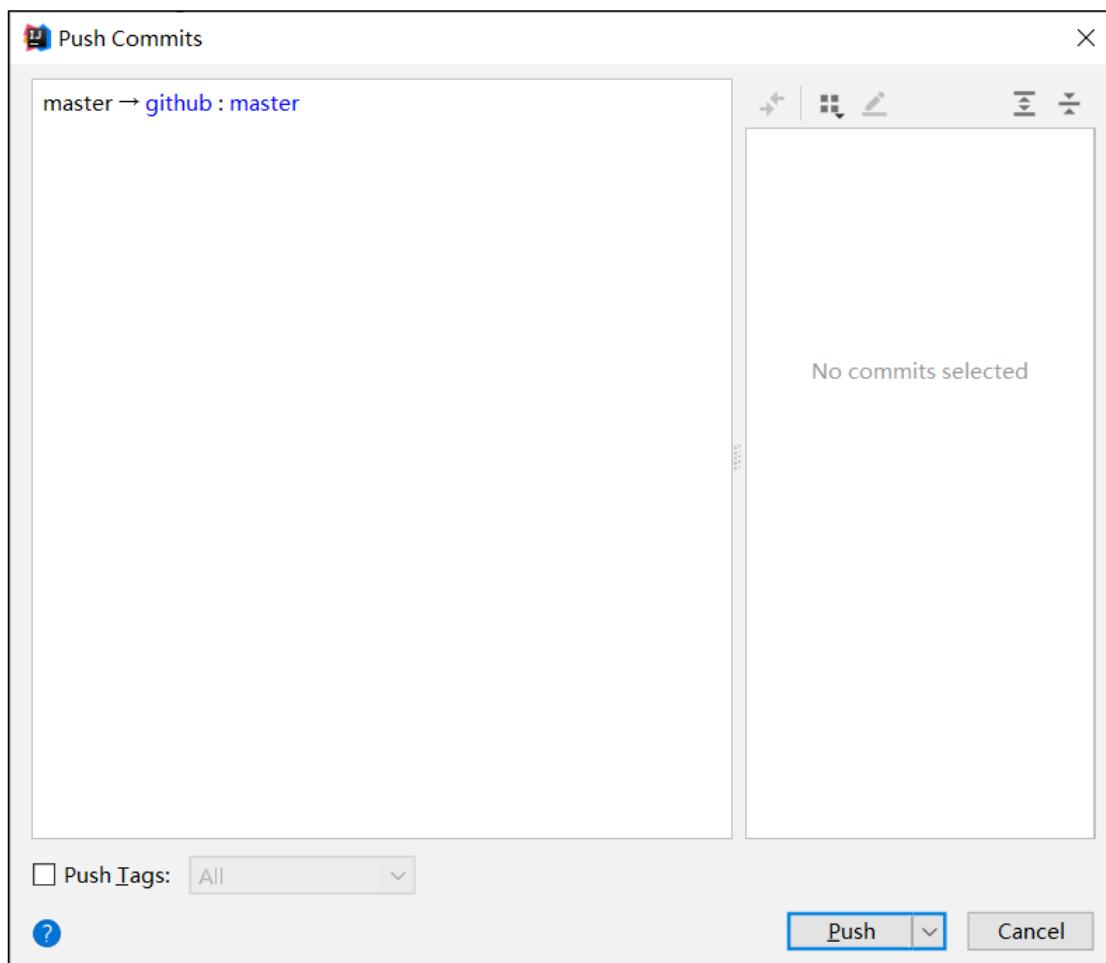
来到 GitHub 中发现已经帮我们创建好了 gitTest 的远程仓库。

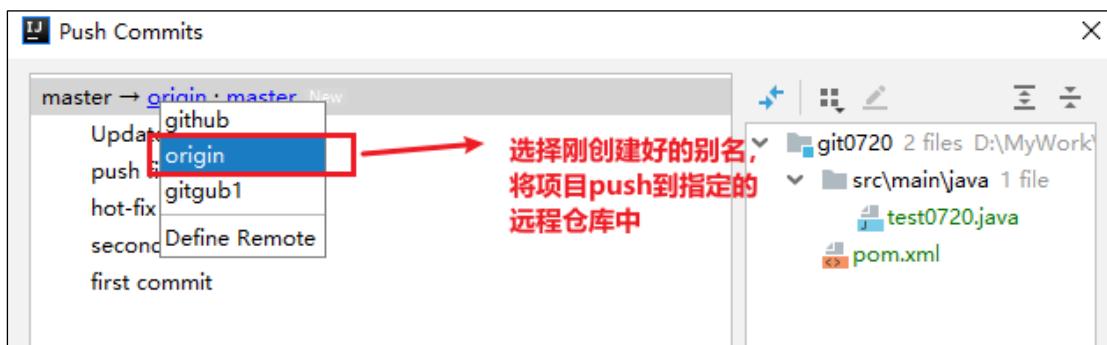


### 8.3 push 推送本地库到远端库

右键点击项目，可以将当前分支的内容 push 到 GitHub 的远程仓库中。



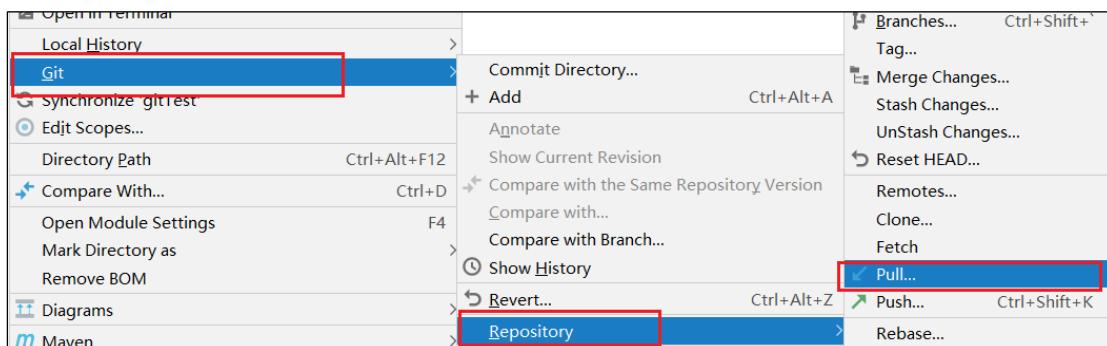


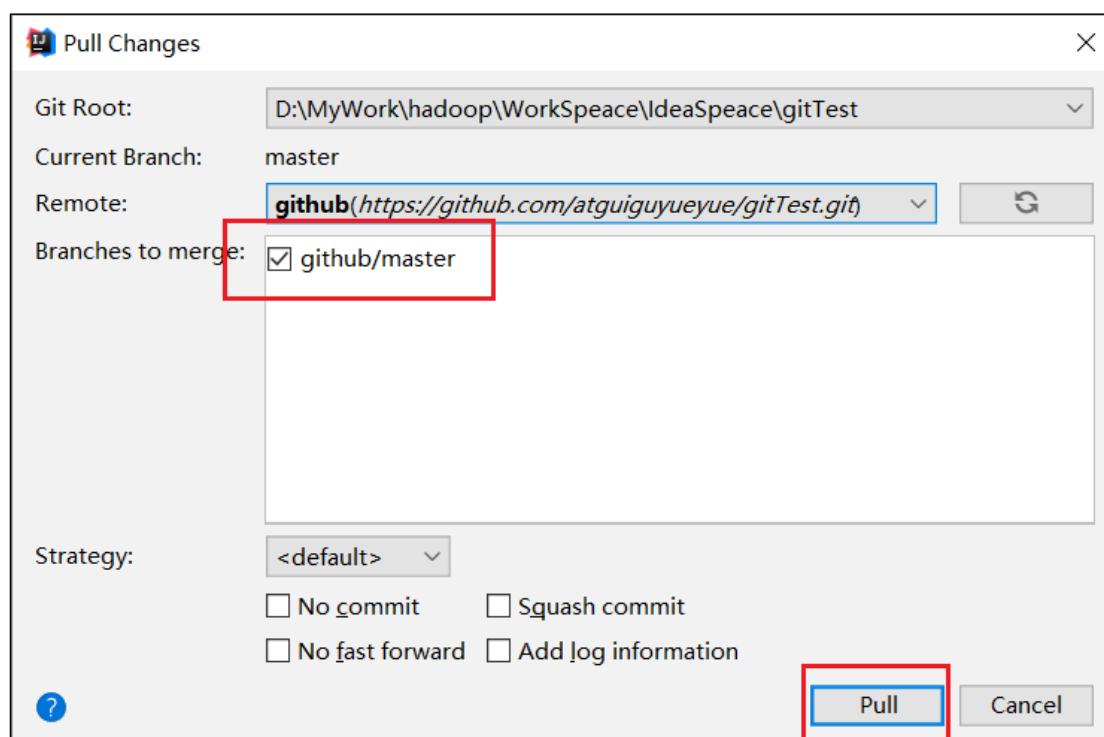


注意: push 是将本地库代码推送到远程库, 如果本地库代码跟远程库代码版本不一致, push 的操作是会被拒绝的。也就是说, 要想 push 成功, 一定要保证本地库的版本要比远程库的版本高! 因此一个成熟的程序员在动手改本地代码之前, 一定会先检查下远程库跟本地代码的区别! 如果本地的代码版本已经落后, 切记要先 pull 拉取一下远程库的代码, 将本地代码更新到最新以后, 然后再修改, 提交, 推送!

## 8.4 pull 拉取远程库到本地库

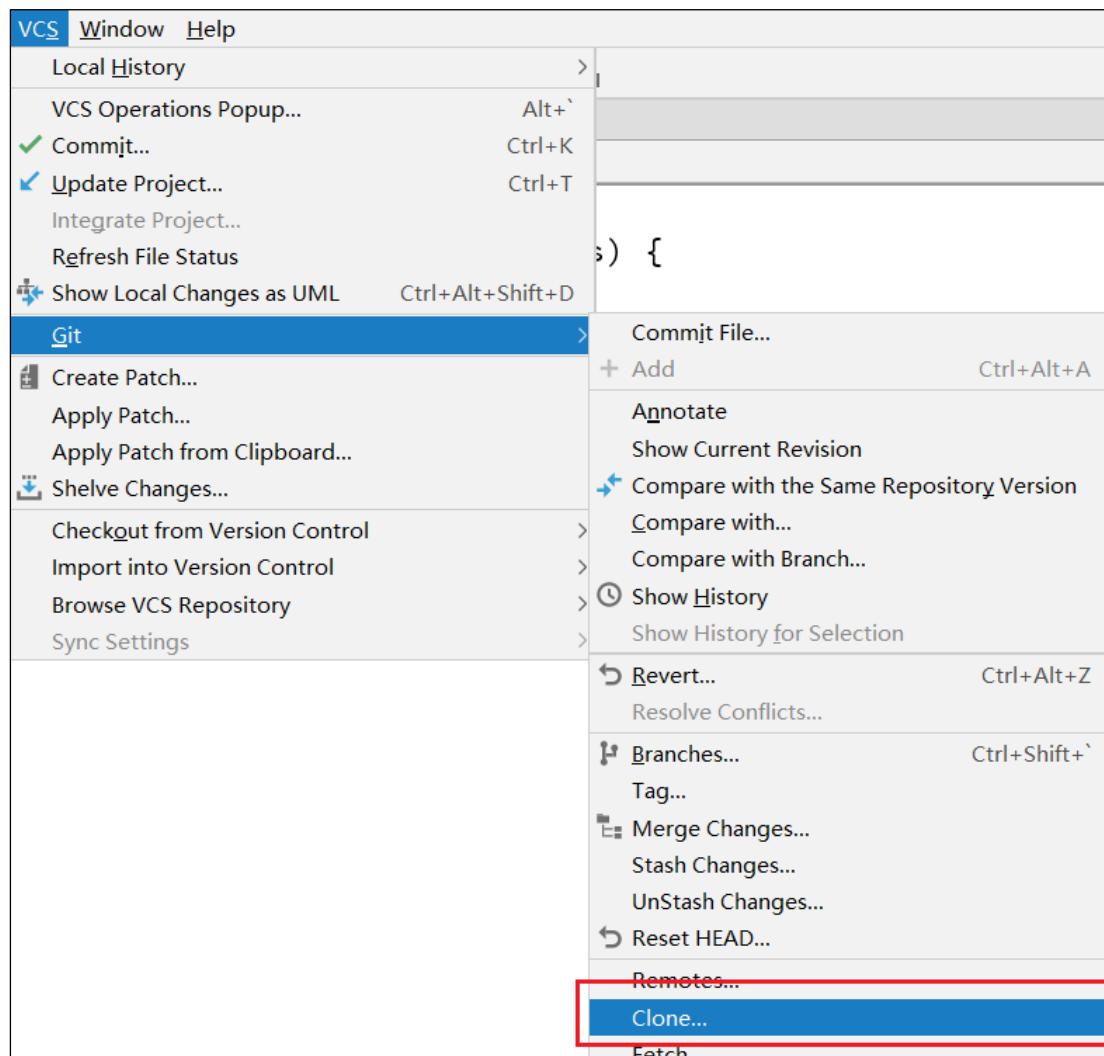
右键点击项目, 可以将远程仓库的内容 pull 到本地仓库。



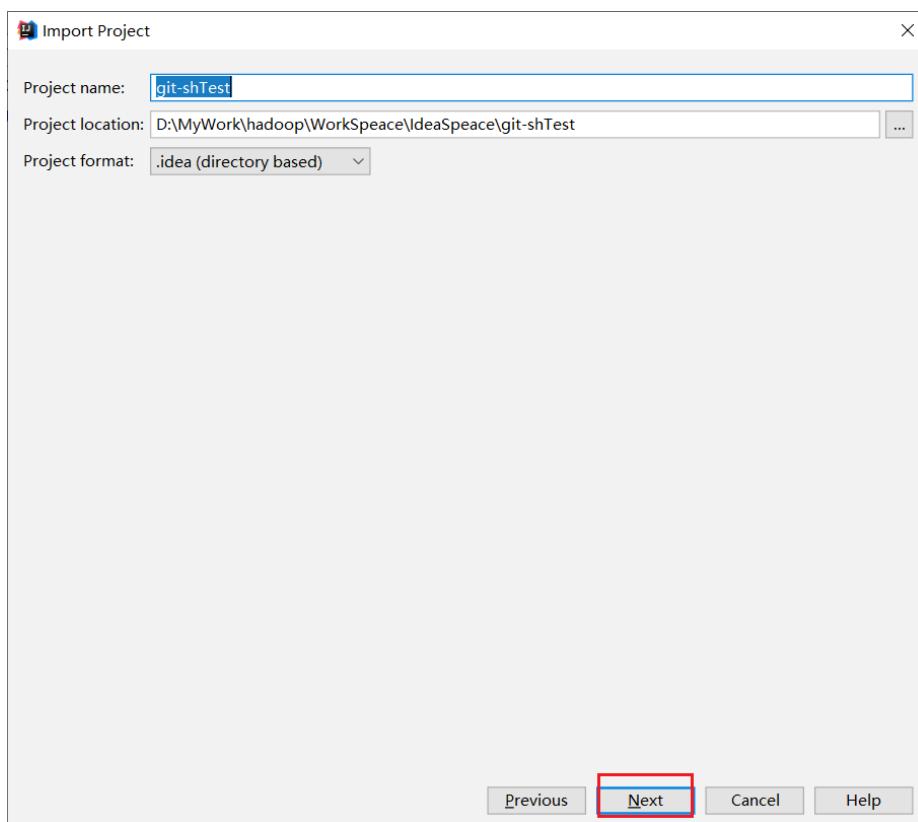
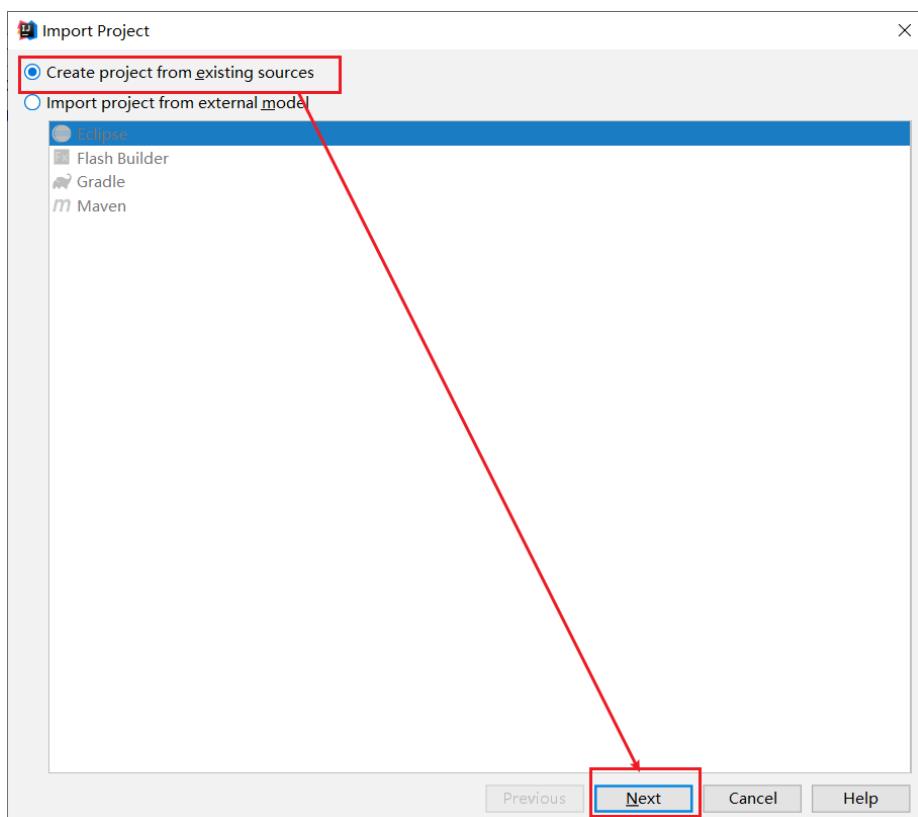


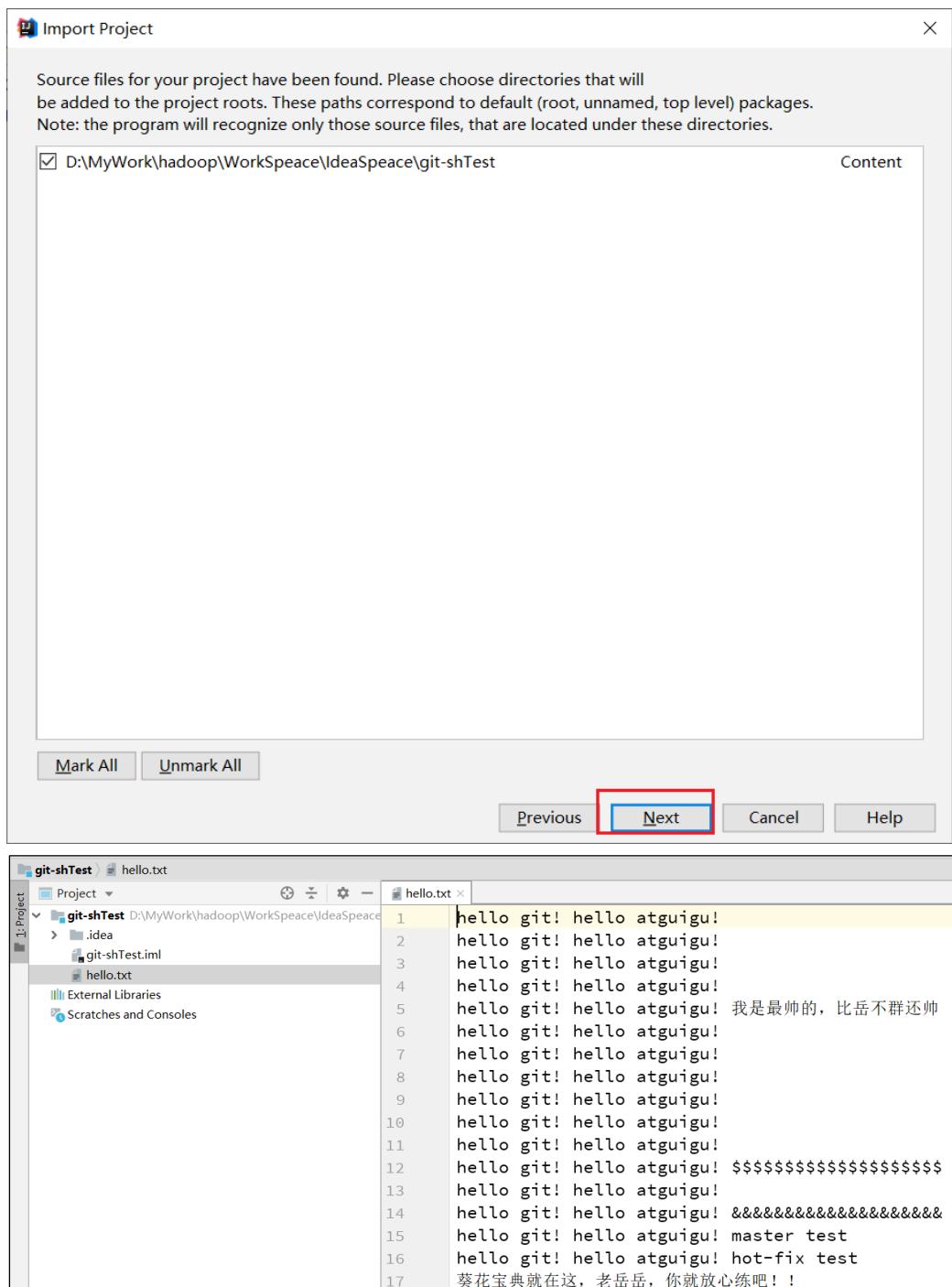
注意：pull 是拉取远端仓库代码到本地，如果远程库代码和本地库代码不一致，会自动合并，如果自动合并失败，还会涉及到手动解决冲突的问题。

## 8.5 clone 克隆远端库到本地



为 clone 下来的项目创建一个工程，然后点击 Next。





## 第 9 章 国内代码托管中心-码云

### 9.1 简介

众所周知, GitHub 服务器在国外, 使用 GitHub 作为项目托管网站, 如果网速不好的话, 严重影响使用体验, 甚至会出现登录不上的情况。针对这个情况, 大家也可以使用国内的项目托管网站-码云。



码云是开源中国推出的基于 Git 的代码托管服务中心，网址是 <https://gitee.com/>，使用方式跟 GitHub 一样，而且它还是一个中文网站，如果你英文不是很好它是最好的选择。

## 9.2 码云帐号注册和登录

进入码云官网地址：<https://gitee.com/>，点击注册 Gitee



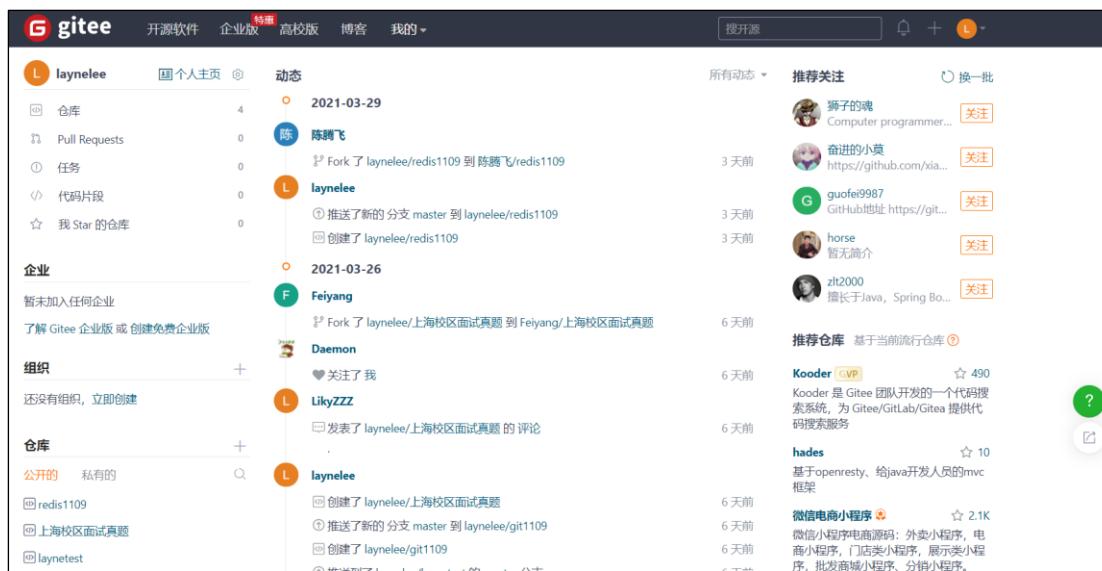
输入个人信息，进行注册即可。



帐号注册成功以后，直接登录。



登录以后，就可以看到码云官网首页了。



### 9.3 码云创建远程库

点击首页右上角的加号，选择下面的新建仓库



The screenshot shows the Gitee homepage for user 'laynelee'. On the left, there's a sidebar with sections for仓库 (4), Pull Requests (0), 任务 (0), 代码片段 (0), and 我 Star 的仓库 (0). The main area shows activity feed with posts from '陈腾飞' and 'laynelee' dated 2021-03-29, and 'Feiyang' dated 2021-03-26. A modal window titled '新建仓库' (Create New Repository) is open in the top right corner, with the '公开' (Public) radio button selected. Other options include '私有' (Private) and '内部' (Internal).

填写仓库名称，路径和选择是否开源（共开库或私有库）

This screenshot shows the 'Create New Repository' form. The '仓库名称' (Repository Name) field contains 'git-test' and has a green checkmark. The '归属' (Owner) dropdown is set to 'laynelee'. The '路径' (Path) field contains 'git-test' and also has a green checkmark. The '是否开源' (Open Source) section shows '公开' (Public) selected, while '私有' (Private) is unselected. Below this, a note says '任何人都可以访问该仓库的代码和其他任何形式的资源' (Anyone can access the code and other resources of this repository). At the bottom, there are dropdowns for '选择语言' (Select Language), '添加 .gitignore' (Add .gitignore), and '添加开源许可证' (Add Open Source License), along with a checkbox for '使用Readme文件初始化这个仓库' (Initialize this repository with a Readme file).

最后根据需求选择分支模型，然后点击创建按钮。



远程库创建好以后，就可以看到 HTTPS 和 SSH 的链接。

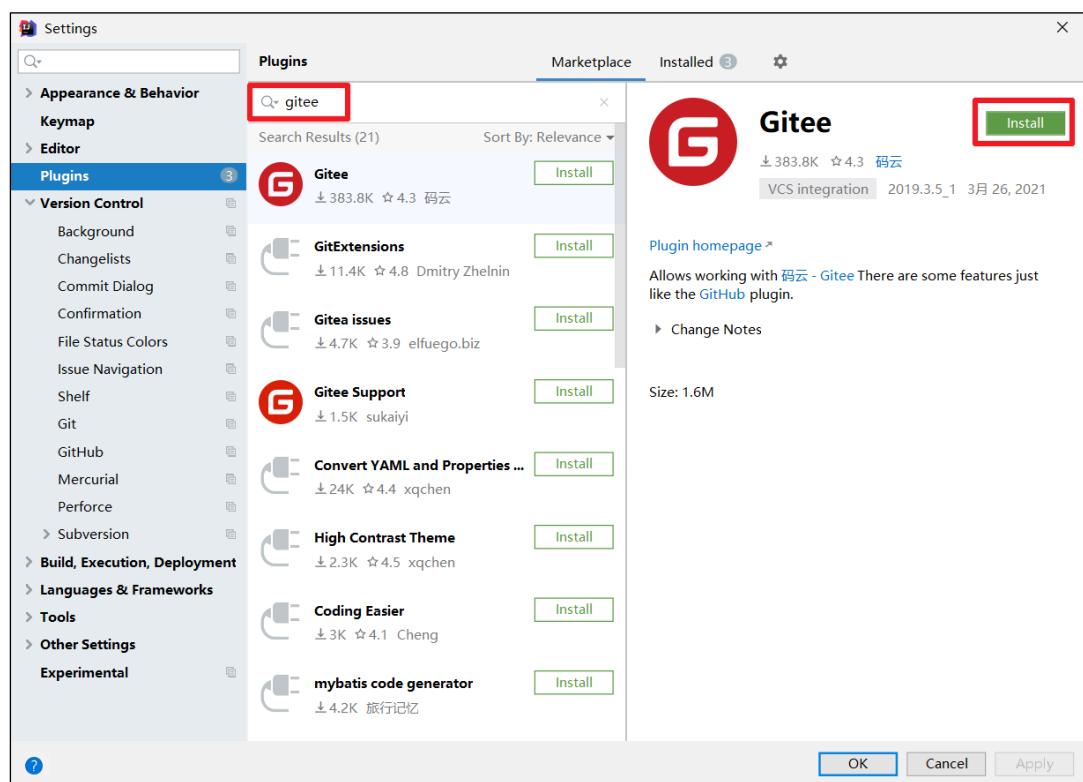


## 9.4 IDEA 集成码云

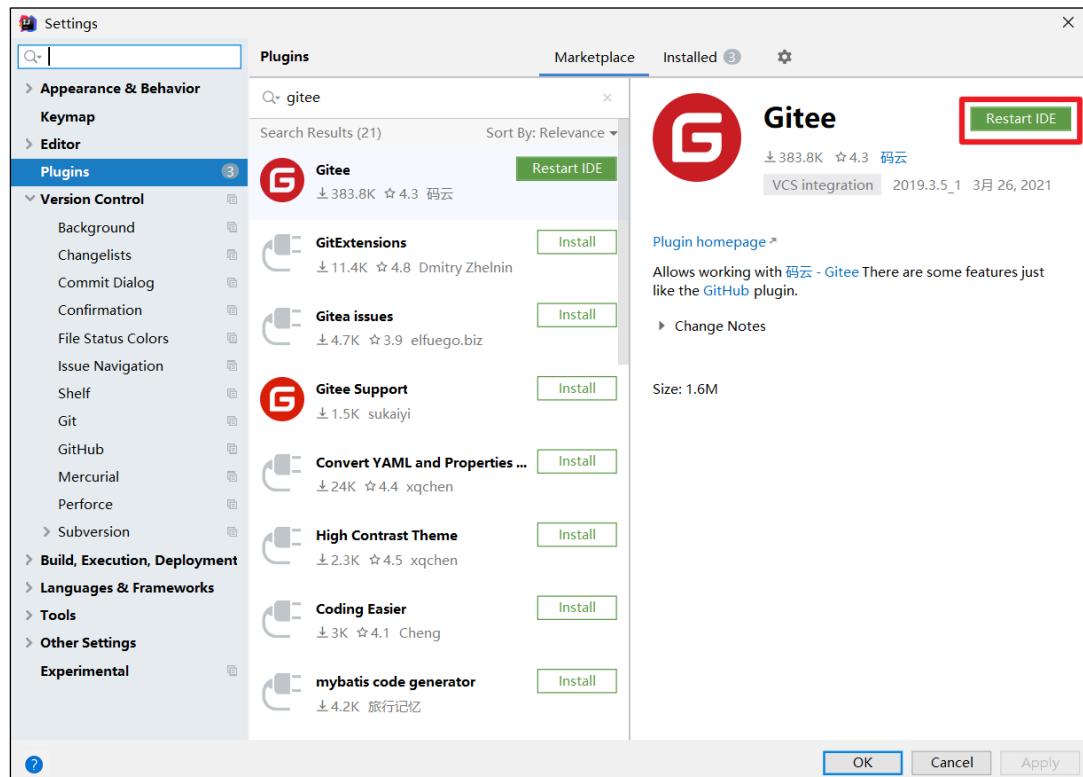
### 9.4.1 IDEA 安装码云插件

Idea 默认不带码云插件，我们第一步要安装 Gitee 插件。

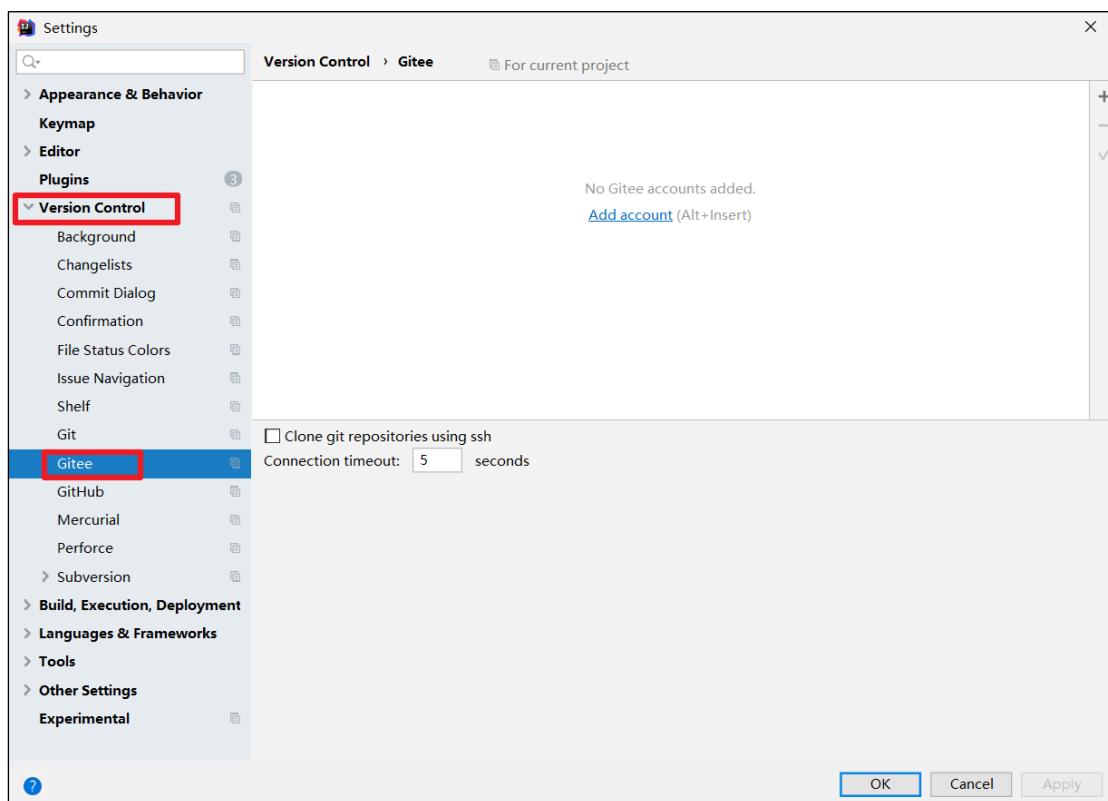
如图所示，在 Idea 插件商店搜索 Gitee，然后点击右侧的 Install 按钮。



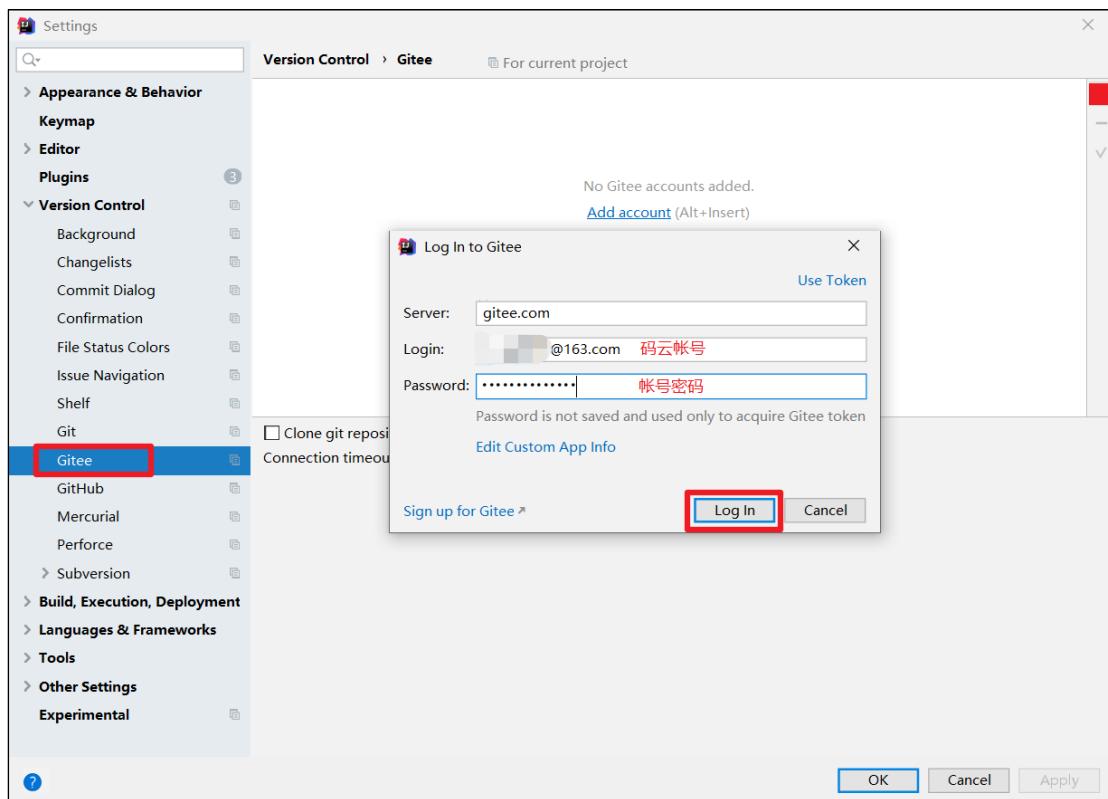
Idea 链接码云和链接 GitHub 几乎一样，安装成功后，重启 Idea。



Idea 重启以后在 Version Control 设置里面看到 Gitee，说明码云插件安装成功。



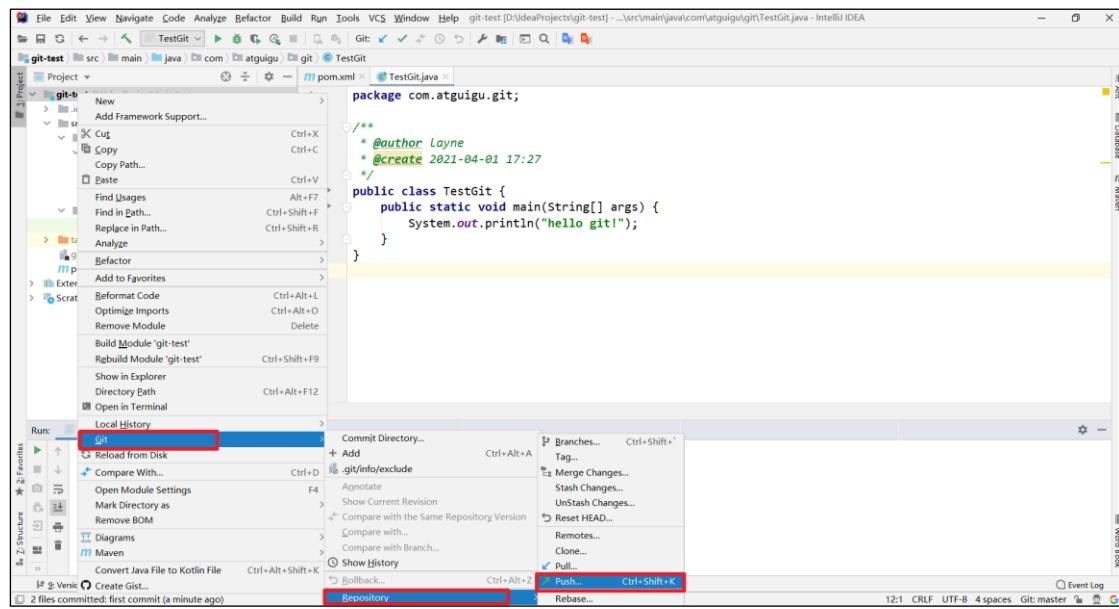
然后在码云插件里面添加码云帐号，我们就可以用 Idea 连接码云了。



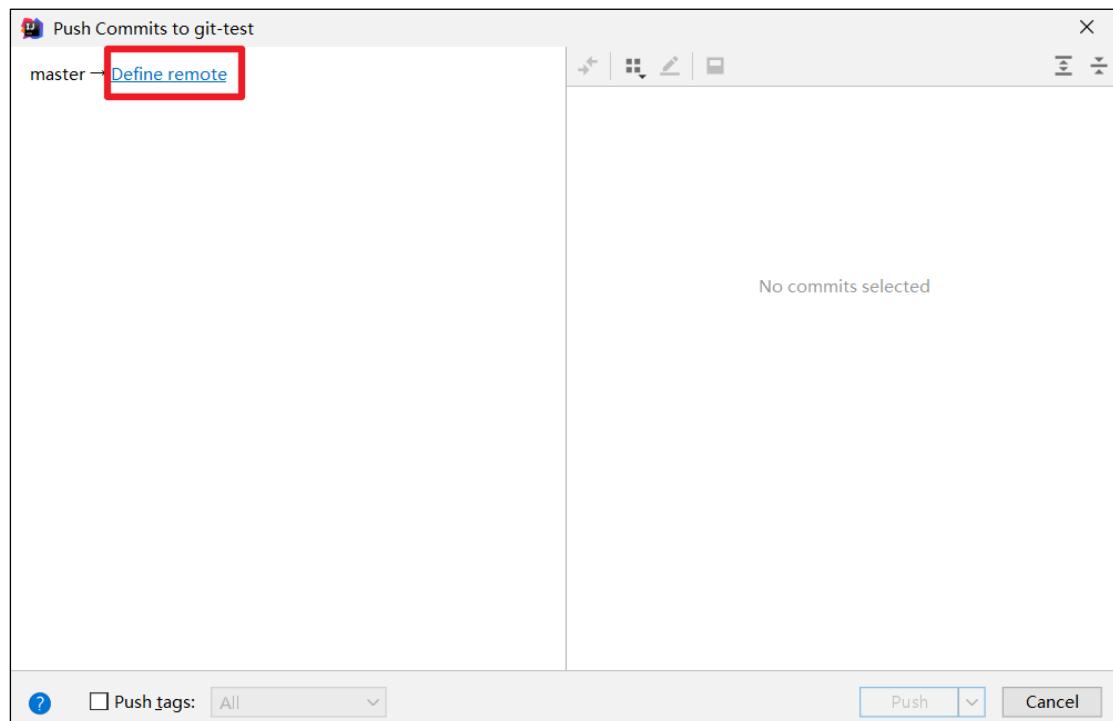
## 9.4.2 IDEA 连接码云

Idea 连接码云和连接 GitHub 几乎一样，首先在 Idea 里面创建一个工程，初始化 git 工程，然后将代码添加到暂存区，提交到本地库，这些步骤上面已经讲过，此处不再赘述。

### ➤ 将本地代码 push 到码云远程库

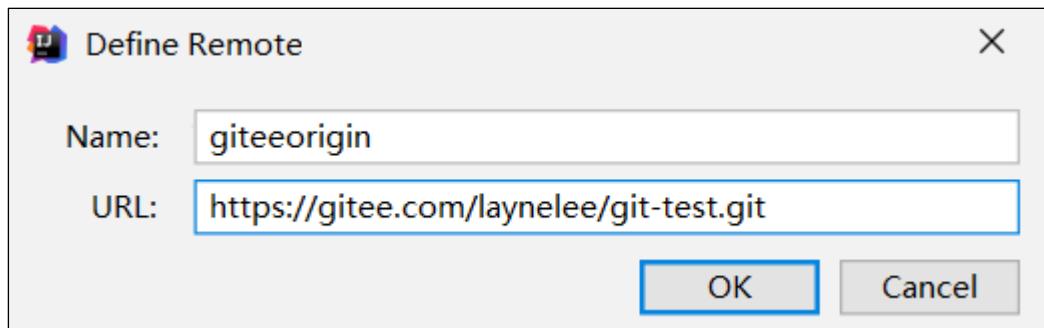


自定义远程库链接。

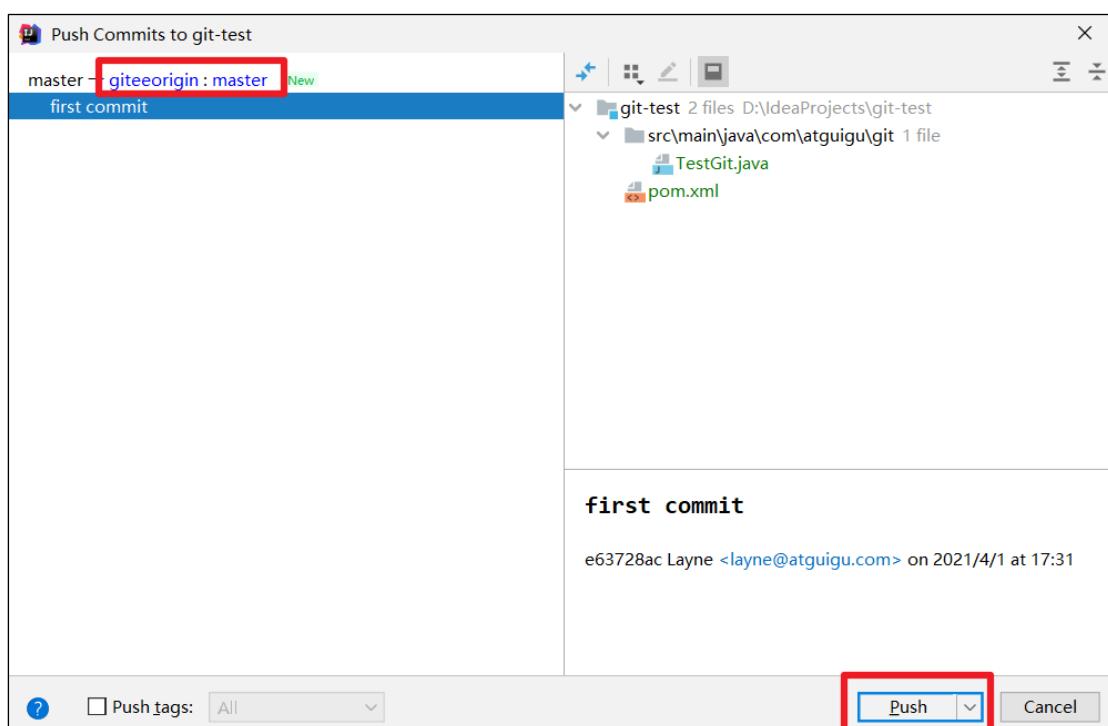


给远程库链接定义个 name，然后再 URL 里面填入码云远程库的 HTTPS 链接即可。码

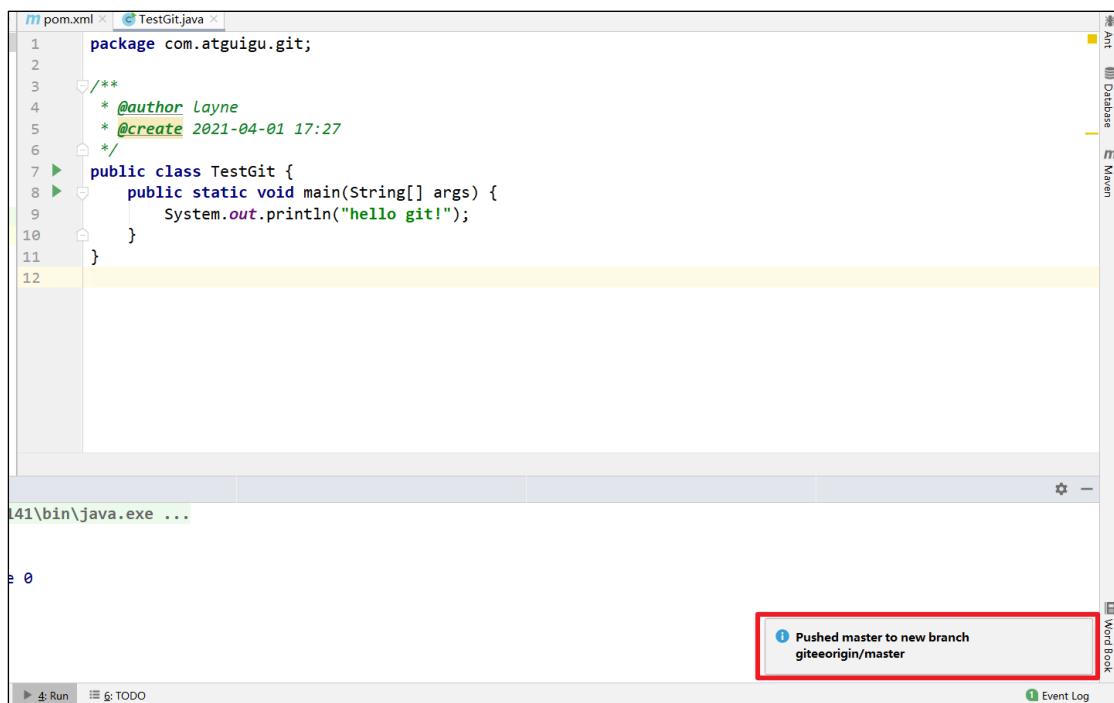
云服务器在国内，用 HTTPS 链接即可，没必要用 SSH 免密链接。



然后选择定义好的远程链接，点击 Push 即可。

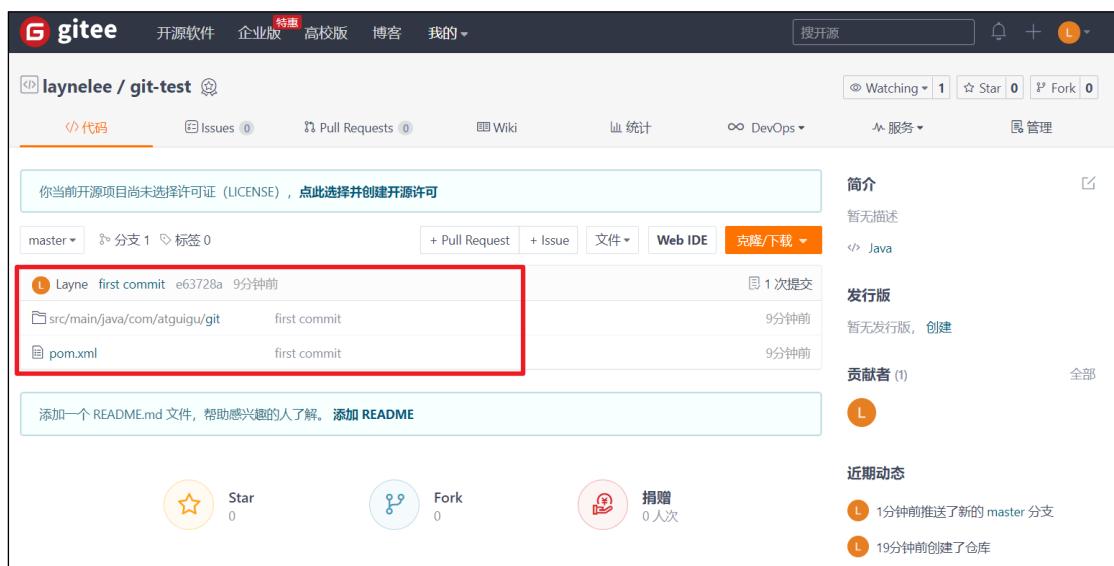


看到提示就说明 Push 远程库成功。



The screenshot shows an IDE (IntelliJ IDEA) interface. In the top-left, there are two tabs: 'pom.xml' and 'TestGit.java'. The code editor displays a Java class 'TestGit' with a main method that prints 'hello git!'. Below the code editor is a terminal window showing the command '141\bin\java.exe ...'. At the bottom right of the screen, a red-bordered notification box contains the text: 'Pushed master to new branch giteeorigin/master'.

去码云远程库查看代码。



The screenshot shows a Gitee project page for 'laynelee / git-test'. The 'Code' tab is selected. The commit history shows three commits from 'Layne': 'first commit' (e63728a, 9 minutes ago), 'src/main/java/com/atguigu/git' (first commit, 9 minutes ago), and 'pom.xml' (first commit, 9 minutes ago). The commit from 'src/main/java/com/atguigu/git' is highlighted with a red box. On the right side of the page, there are sections for '简介' (Introduction), '发行版' (Release), '贡献者' (Contributors), and '近期动态' (Recent Activity).

只要码云远程库链接定义好以后，对码云远程库进行 pull 和 clone 的操作和 Github 一致，此处不再赘述。

## 9.5 码云复制 GitHub 项目

码云提供了直接复制 GitHub 项目的功能，方便我们做项目的迁移和下载。

具体操作如下：



将 GitHub 的远程库 HTTPS 链接复制过来，点击创建按钮即可。



如果 GitHub 项目更新了以后，在码云项目端可以手动重新同步，进行更新！



This screenshot shows a Gitee repository page for 'laynelee / layne-test2'. The GitHub URL 'https://github.com/atguiguyueyue/layne-test2.git' is highlighted with a red box. The page displays basic repository information: master branch, 2222 commits, 0 issues, 0 pull requests, 0 wiki pages, 0 statistics, 0 DevOps, 0 services, and 0 management. It also shows a file named 'hello.txt' with a commit by 'Layne' made 7 days ago. A note at the top says '你当前开源项目尚未选择许可证 (LICENSE) , 点此选择并创建开源许可'. On the right, there's a brief introduction, a release section, contributor stats, and recent activity.

This screenshot shows the same Gitee repository page after a forced sync. The GitHub URL is no longer highlighted. The repository details remain the same, but the commit history now includes a commit from 'atguiguyueyue' made 6 minutes ago. The 'hello.txt' file has a different commit ID ('333333333'). The rest of the interface is identical to the first screenshot.

This screenshot shows a confirmation dialog box titled '确定同步?' (Confirm Sync?). It contains a warning message: '同步操作将从 https://github.com/atguiguyueyue/layne-test2.git 强制同步, Gitee 的仓库将被覆盖, 且无法恢复!!!' (Sync operation will force sync from https://github.com/atguiguyueyue/layne-test2.git, the Gitee repository will be overwritten, and it cannot be recovered!!!). Below this, it says '确定后同步将在后台操作, 完成时将刷新页面, 请耐心等待.' (Sync will be performed in the background, please wait for the page to refresh when it's done). A note at the bottom states '你正在尝试导入来自 github.com 的仓库, 可能因网络原因存在导入缓慢问题.' (You are trying to import a repository from github.com, there may be slow import issues due to network reasons). At the bottom, there are two buttons: '取消' (Cancel) and a large red-bordered '确定' (Confirm) button.



## 第 10 章 自建代码托管平台-GitLab

### 10.1 GitLab 简介

GitLab 是由 GitLabInc. 开发，使用 MIT 许可证的基于网络的 Git 仓库管理工具，且具有 wiki 和 issue 跟踪功能。使用 Git 作为代码管理工具，并在此基础上搭建起来的 web 服务。

GitLab 由乌克兰程序员 DmitriyZaporozhets 和 ValerySizov 开发，它使用 Ruby 语言写成。后来，一些部分用 Go 语言重写。截止 2018 年 5 月，该公司约有 290 名团队成员，以及 2000 多名开源贡献者。GitLab 被 IBM, Sony, JülichResearchCenter, NASA, Alibaba, Invincea, O'ReillyMedia, Leibniz-Rechenzentrum(LRZ), CERN, SpaceX 等组织使用。

### 10.2 GitLab 官网地址

官网地址: <https://about.gitlab.com/>

安装说明: <https://about.gitlab.com/installation/>

### 10.3 GitLab 安装

#### 10.3.1 服务器准备

准备一个系统为 CentOS7 以上版本的服务器，要求内存 4G，磁盘 50G。

关闭防火墙，并且配置好主机名和 IP，保证服务器可以上网。

此教程使用虚拟机：主机名：gitlab-server IP 地址：192.168.6.200

#### 10.3.2 安装包准备

Yum 在线安装 gitlab-ce 时，需要下载几百 M 的安装文件，非常耗时，所以最好提前把所需 RPM 包下载到本地，然后使用离线 rpm 的方式安装。

下载地址：

```
https://packages.gitlab.com/gitlab/gitlab-ce/packages/el/7/gitlab-ce-13.10.2-ce.0.el7.x86_64.rpm
```

注：资料里提供了此 rpm 包，直接将此包上传到服务器/opt/module 目录下即可。

#### 10.3.3 编写安装脚本

安装 gitlab 步骤比较繁琐，因此我们可以参考官网编写 gitlab 的安装脚本。

```
[root@gitlab-server module]# vim gitlab-install.sh
sudo rpm -ivh /opt/module/gitlab-ce-13.10.2-ce.0.el7.x86_64.rpm

sudo yum install -y curl policycoreutils-python openssh-server cronie
```

```
sudo lokkit -s http -s ssh
sudo yum install -y postfix
sudo service postfix start
sudo chkconfig postfix on
curl https://packages.gitlab.com/install/repositories/gitlab/gitlab-ce/script.rpm.sh | sudo bash
sudo EXTERNAL_URL="http://gitlab.example.com" yum -y install gitlab-ce
```

给脚本增加执行权限

```
[root@gitlab-server module]# chmod +x gitlab-install.sh
[root@gitlab-server module]# ll
总用量 403104
-rw-r--r--. 1 root root 412774002 4月 7 15:47 gitlab-ce-13.10.2-ce.0.el7.x86_64.rpm
-rwxr-xr-x. 1 root root 416 4月 7 15:49 gitlab-install.sh
```

然后执行该脚本，开始安装 gitlab-ce。注意一定要保证服务器可以上网。

```
[root@gitlab-server module]# ./gitlab-install.sh
警告: /opt/module/gitlab-ce-13.10.2-ce.0.el7.x86_64.rpm: 头 v4
RSA/SHA1 Signature, 密钥 ID f27eab47: NOKEY
准备中...
[100%]
正在升级/安装...
1:gitlab-ce-13.10.2-ce.0.el7
##### [100%]
. . . . .
```

### 10.3.4 初始化 GitLab 服务

执行以下命令初始化 GitLab 服务，过程大概需要几分钟，耐心等待...

```
[root@gitlab-server module]# gitlab-ctl reconfigure
.
.
.
Running handlers:
Running handlers complete
Chef Client finished, 425/608 resources updated in 03 minutes 08
seconds
gitlab Reconfigured!
```

### 10.3.5 启动 GitLab 服务

执行以下命令启动 GitLab 服务，如需停止，执行 gitlab-ctl stop

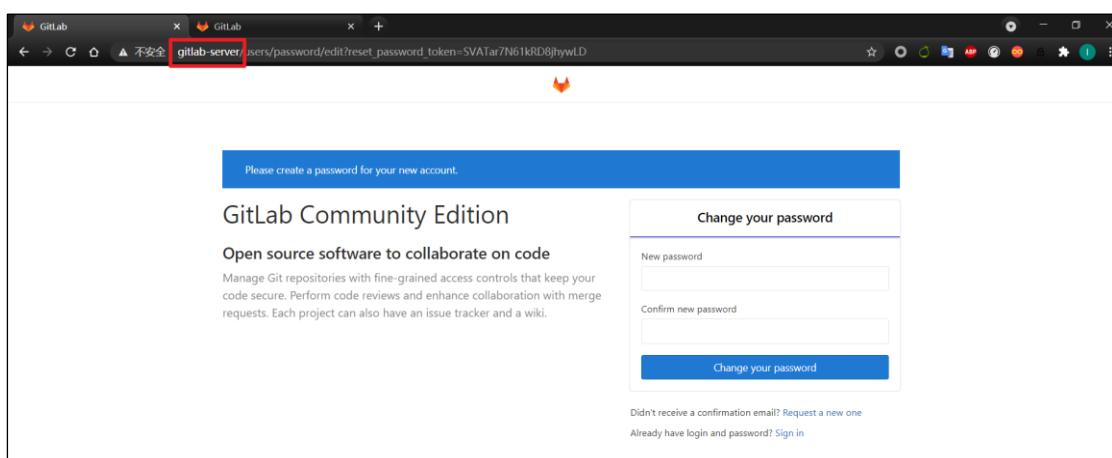
```
[root@gitlab-server module]# gitlab-ctl start
ok: run: alertmanager: (pid 6812) 134s
ok: run: gitaly: (pid 6740) 135s
ok: run: gitlab-monitor: (pid 6765) 135s
```

```
ok: run: gitlab-workhorse: (pid 6722) 136s
ok: run: logrotate: (pid 5994) 197s
ok: run: nginx: (pid 5930) 203s
ok: run: node-exporter: (pid 6234) 185s
ok: run: postgres-exporter: (pid 6834) 133s
ok: run: postgresql: (pid 5456) 257s
ok: run: prometheus: (pid 6777) 134s
ok: run: redis: (pid 5327) 263s
ok: run: redis-exporter: (pid 6391) 173s
ok: run: sidekiq: (pid 5797) 215s
ok: run: unicorn: (pid 5728) 221s
```

### 10.3.6 使用浏览器访问 GitLab

使用主机名或者 IP 地址即可访问 GitLab 服务。需要提前配一下 windows 的 hosts 文件。

192.168.6.100	hadoop100
192.168.6.101	hadoop101
192.168.6.102	hadoop102
192.168.6.103	hadoop103
192.168.6.104	hadoop104
192.168.6.105	hadoop105
192.168.6.106	hadoop106
192.168.6.107	hadoop107
192.168.6.108	hadoop108
192.168.6.109	hadoop109
192.168.6.200	gitlab-server





Please create a password for your new account.

GitLab Community Edition

Open source software to collaborate on code

Manage Git repositories with fine-grained access controls that keep your code secure. Perform code reviews and enhance collaboration with merge requests. Each project can also have an issue tracker and a wiki.

Change your password

New password

Confirm new password

Change your password

Didn't receive a confirmation email? Request a new one

Already have login and password? Sign in

首次登陆之前，需要修改下 GitLab 提供的 root 账户的密码，要求 8 位以上，包含大小写子母和特殊符号。因此我们修改密码为 **Atguigu.123456**

然后使用修改后的密码登录 GitLab。

Sign in - GitLab

Sign in | Register

Username or email

root

默认帐号: root

Password

.....

修改的帐号密码

Remember me

Forgot your password?

Sign in

Didn't receive a confirmation email? Request a new one.

GitLab 登录成功。

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 a great way to organize projects and people.

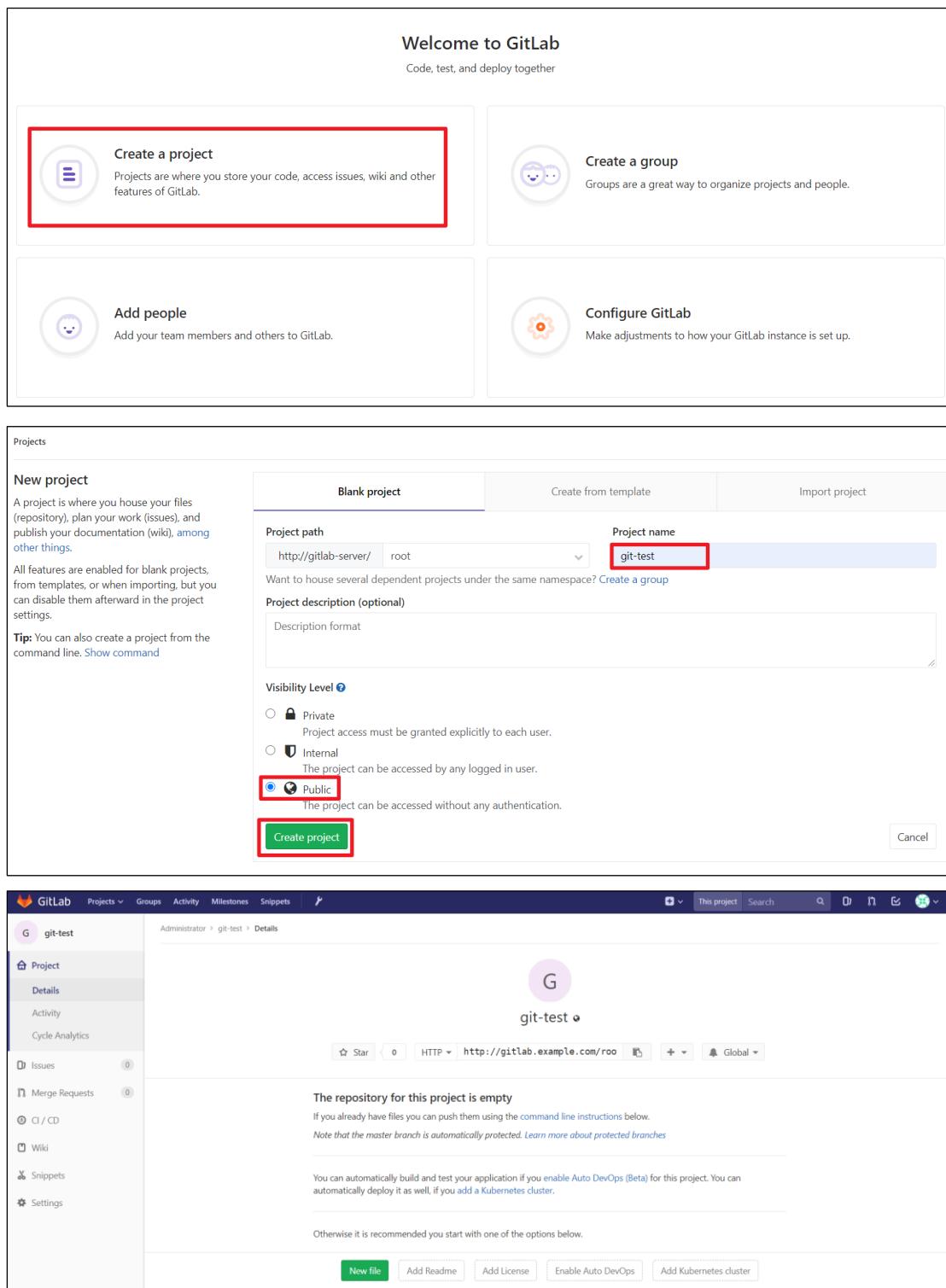
Add people

Add your team members and others to GitLab.

Configure GitLab

Make adjustments to how your GitLab instance is set up.

### 10.3.7 GitLab 创建远端库



The image consists of three vertically stacked screenshots of the GitLab interface.

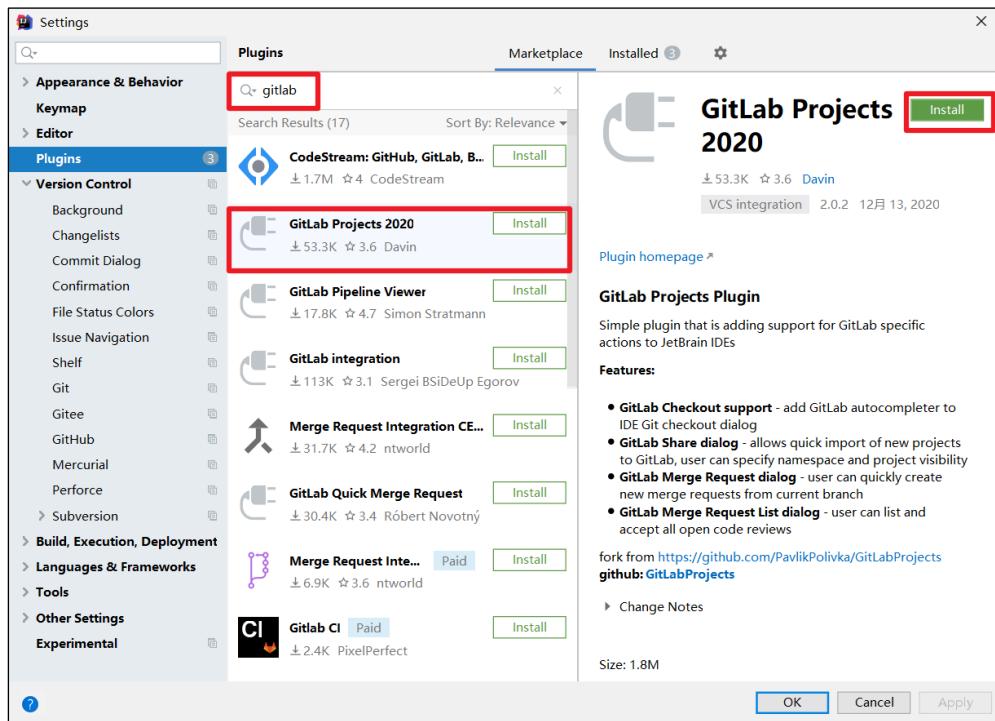
**Screenshot 1: Welcome to GitLab**  
This screenshot shows the main landing page of GitLab with four main sections: "Create a project", "Create a group", "Add people", and "Configure GitLab". The "Create a project" section is highlighted with a red box.

**Screenshot 2: New project creation dialog**  
This screenshot shows the "New project" dialog. It includes fields for "Project path" (set to "http://gitlab-server/ root"), "Project name" (set to "git-test" and highlighted with a red box), "Project description (optional)", "Visibility Level" (with "Public" selected and highlighted with a red box), and a "Create project" button (highlighted with a green box).

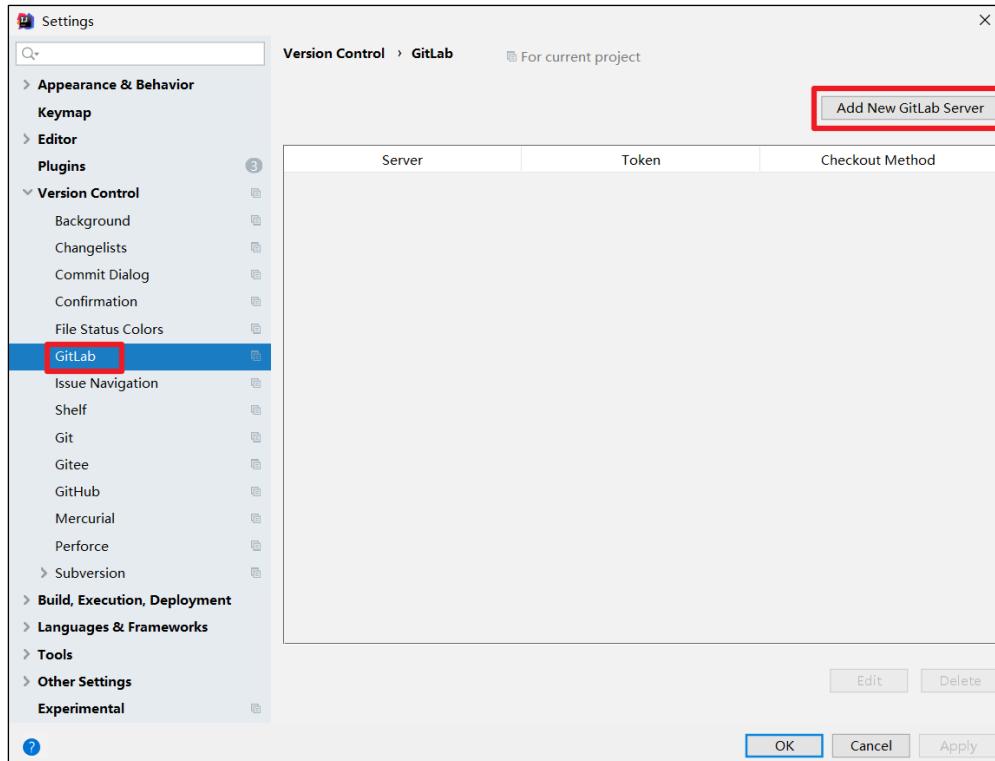
**Screenshot 3: Project details page**  
This screenshot shows the "git-test" project details page. The sidebar lists project components like Issues, Merge Requests, CI / CD, Wiki, Snippets, and Settings. The main area displays the project's URL ("http://gitlab.example.com/root/git-test") and a message stating "The repository for this project is empty". It also includes sections for "Auto DevOps" and "Kubernetes cluster".

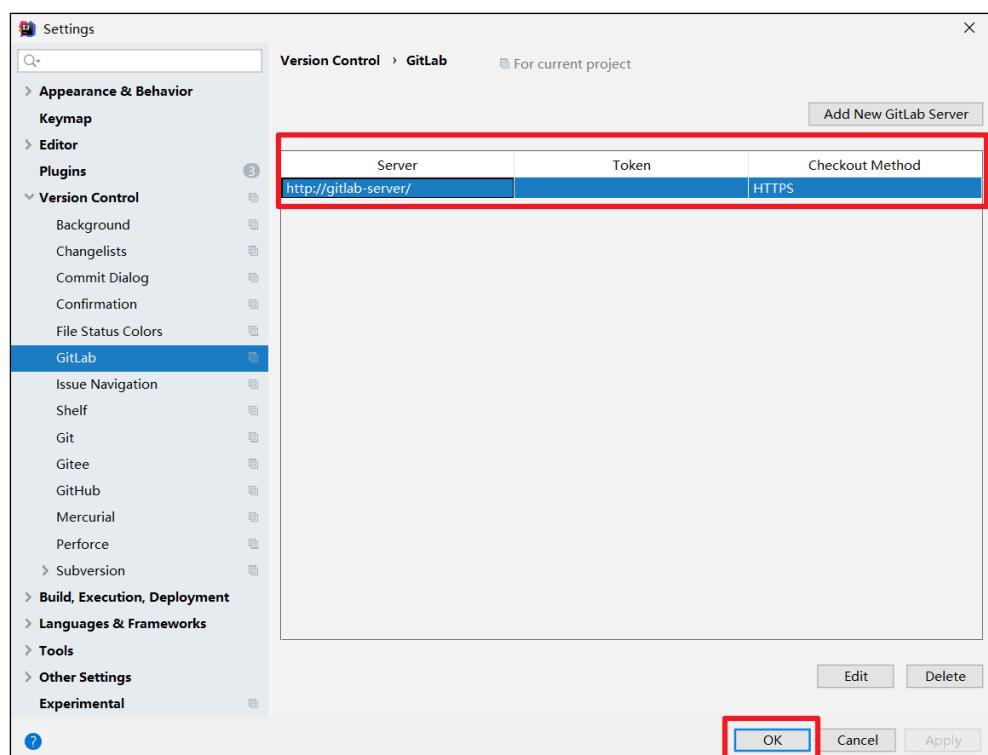
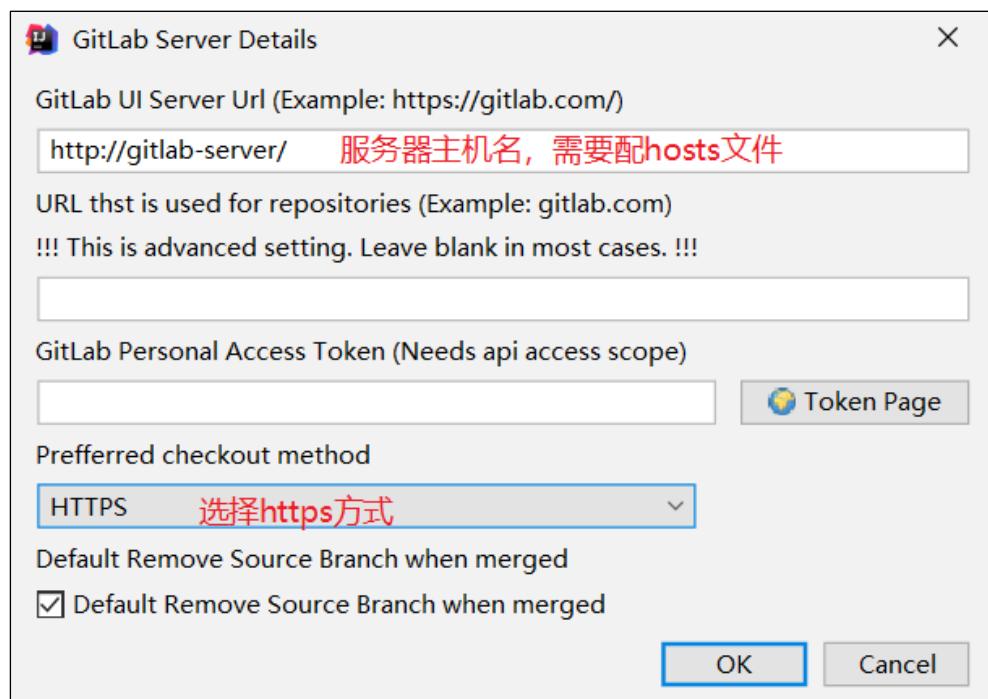
### 10.3.8 IDEA 集成 GitLab

- 1) 安装 GitLab 插件

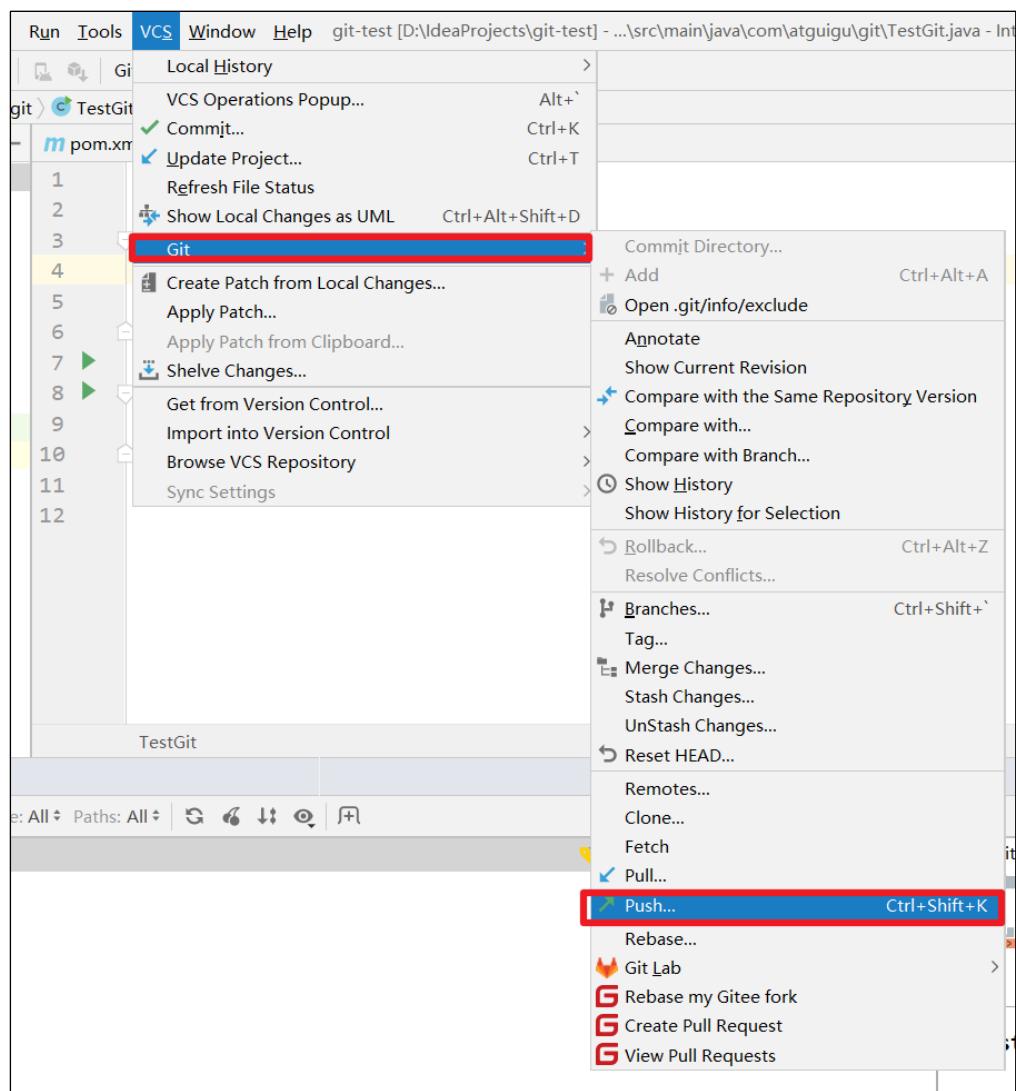


➤ 2) 设置 GitLab 插件

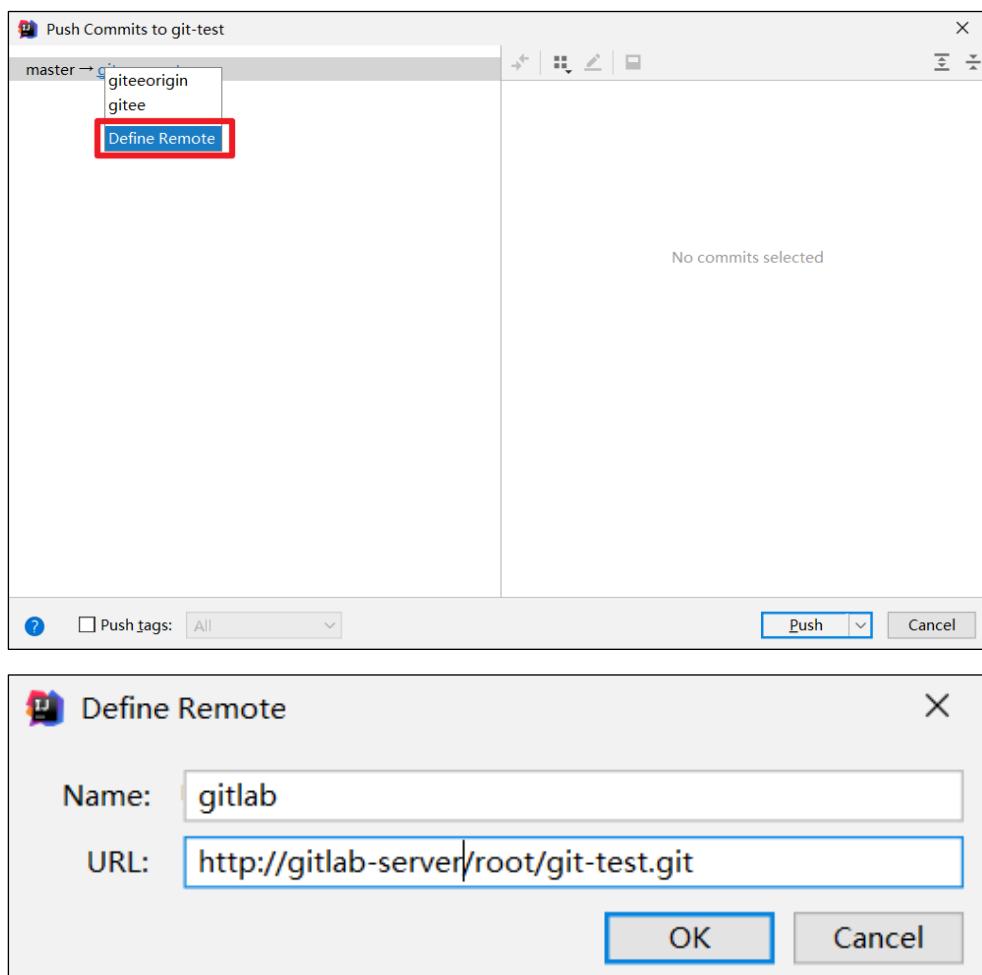




➤ 3) push 本地代码到 GitLab 远程库



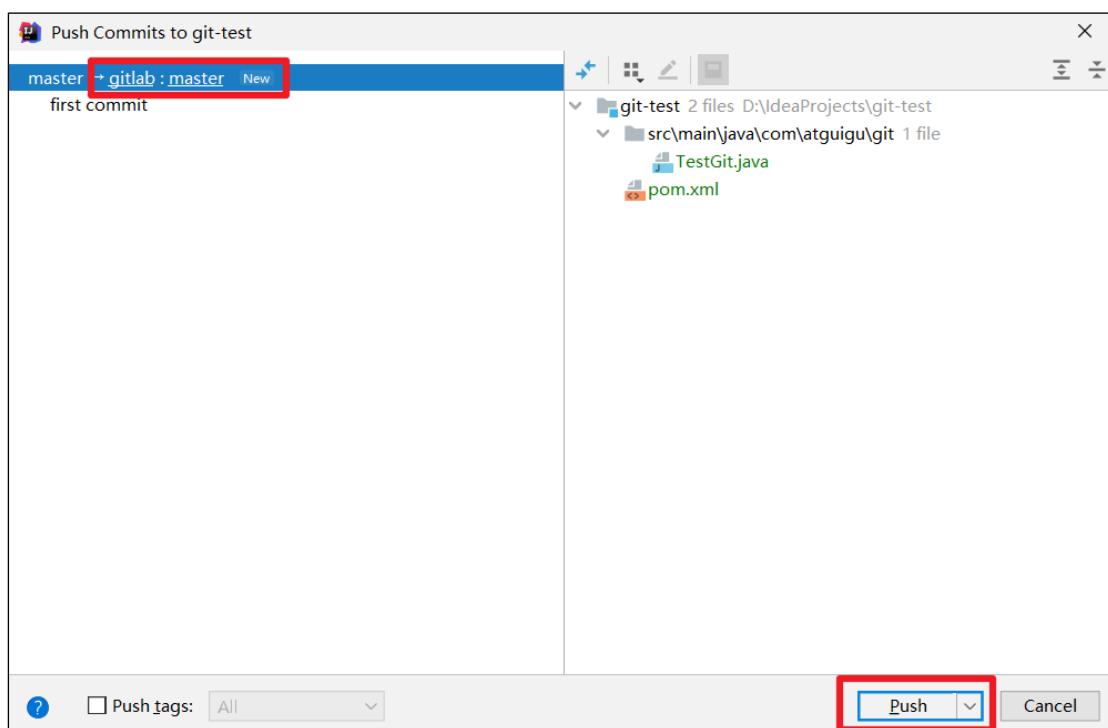
自定义远程连接



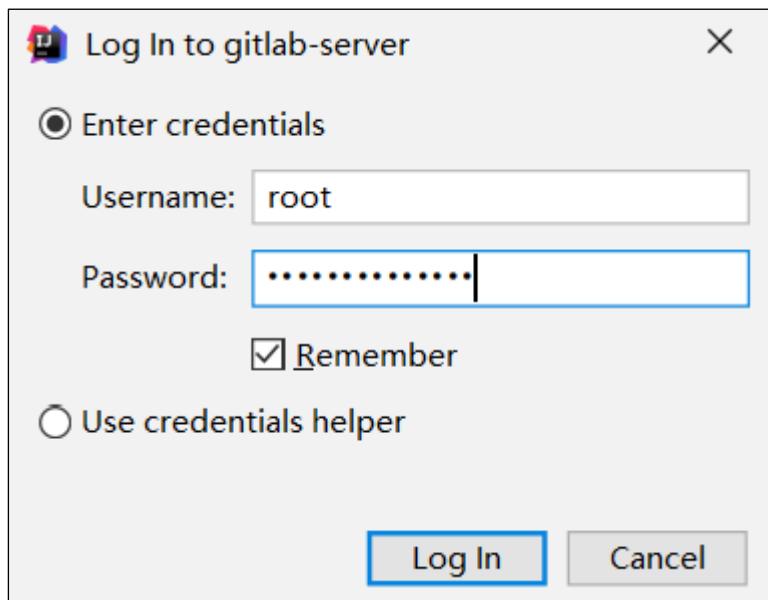
注意：gitlab 网页上复制过来的连接是：<http://gitlab.example.com/root/git-test.git>,

需要手动修改为：<http://gitlab-server/root/git-test.git>

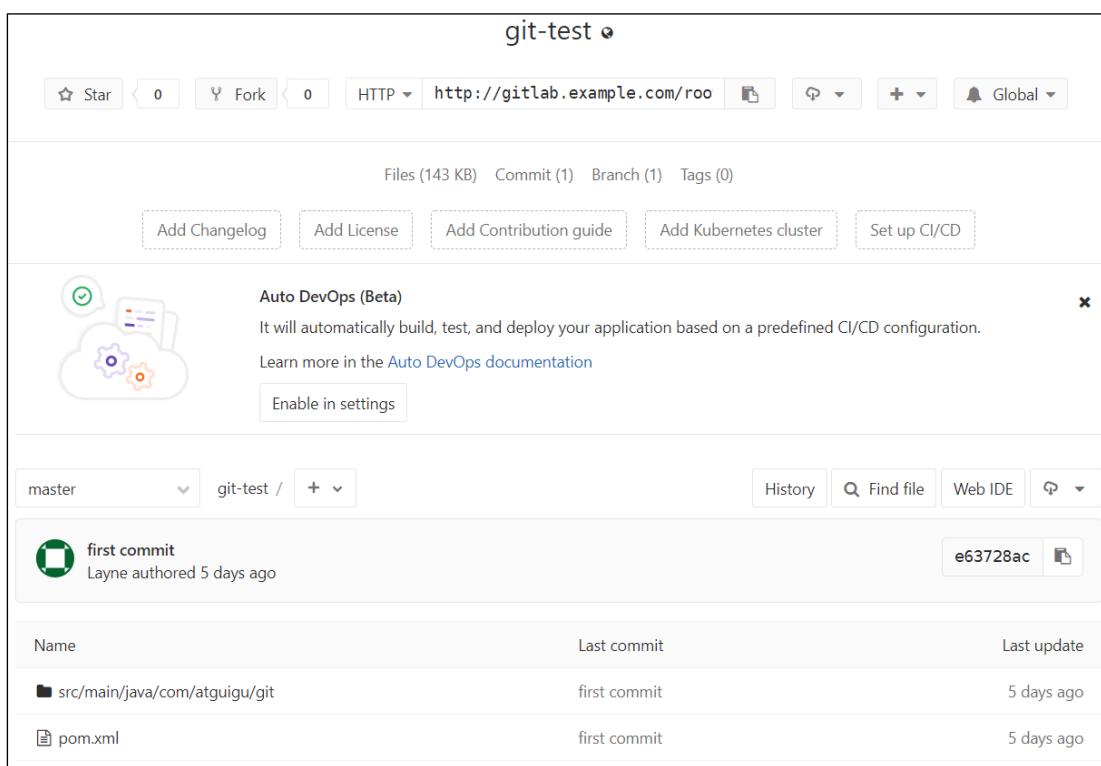
选择 gitlab 远程连接，进行 push。



首次向连接 gitlab，需要登录帐号和密码，用 root 帐号和我们修改的密码登录即可。



代码 Push 成功。



The screenshot shows a GitLab repository named 'git-test'. At the top, there are buttons for 'Star' (0), 'Fork' (0), and 'Global' notifications. The URL is listed as <http://gitlab.example.com/roo/git-test>. Below the header, there are links for 'Files (143 KB)', 'Commit (1)', 'Branch (1)', and 'Tags (0)'. A horizontal bar contains buttons for 'Add Changelog', 'Add License', 'Add Contribution guide', 'Add Kubernetes cluster', and 'Set up CI/CD'. A modal window titled 'Auto DevOps (Beta)' explains that it will automatically build, test, and deploy your application based on a predefined CI/CD configuration. It includes a 'Learn more in the Auto DevOps documentation' link and a 'Enable in settings' button. The main content area shows a commit history starting with 'first commit' by Layne, authored 5 days ago. The commit hash is e63728ac. Below the commit, a table lists files with their last commit and update times:

Name	Last commit	Last update
src/main/java/com/atguigu/git	first commit	5 days ago
pom.xml	first commit	5 days ago

只要 GitLab 的远程库连接定义好以后，对 GitLab 远程库进行 pull 和 clone 的操作和 Github 和码云一致，此处不再赘述。