

哈尔滨工业大学计算机科学与技术学院  
2023年秋季学期《开源软件开发实践》

## Lab 1 : Git实战

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# 1 实验要求

该实验的目标是首先获得使用开源阅读和分析现有开源项目的能力,并在此能力的基础上,发展参考开源参与开源项目的技能,最终提高编程能力。

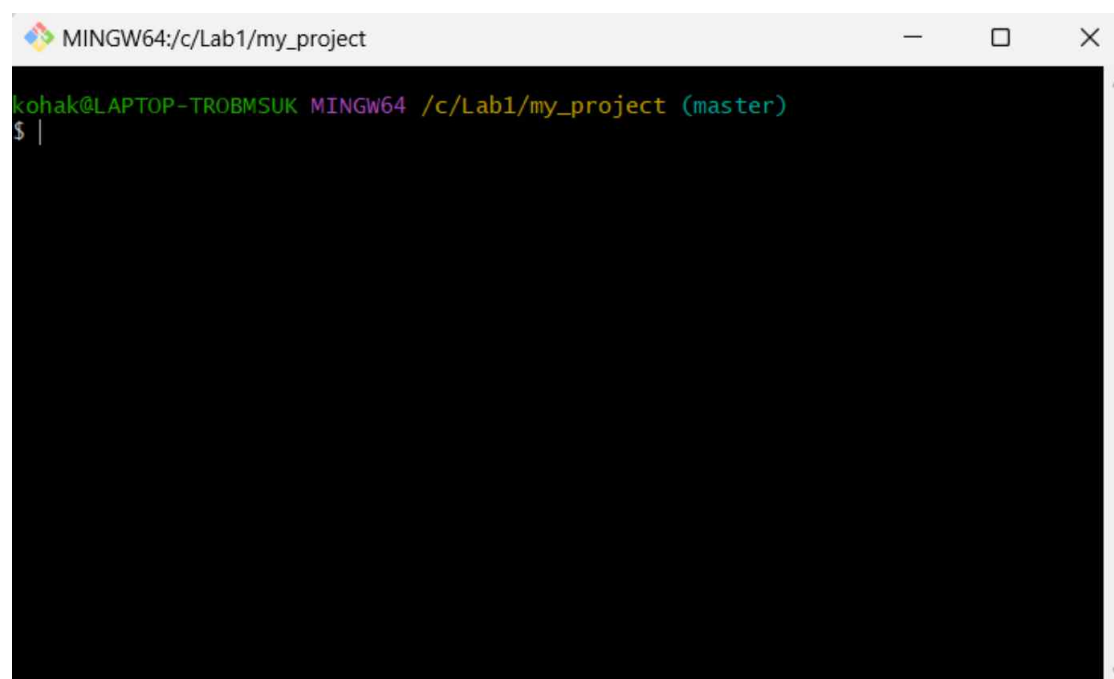
在阅读和分析现有开源项目的步骤中,可以下载、编译、分发和执行软件,并可以识别软件向外部用户提供的功能和服务。此外,编辑器可以用于分析开源软件项目的内部代码组织和体系结构,并构建内部代码。

在开源项目参与阶段,您将能够识别开源软件开发的意识形态、每项活动背后的原则、基本操作流程和技术、支持、获得开源技能、了解开源文化,并有能力参与开源项目。

在编程能力增强的最后阶段,可以评估现有代码的质量,并发现质量缺陷问题。此外,所获得的编程语言和工具可以用于解决缺陷问题和实现新功能。

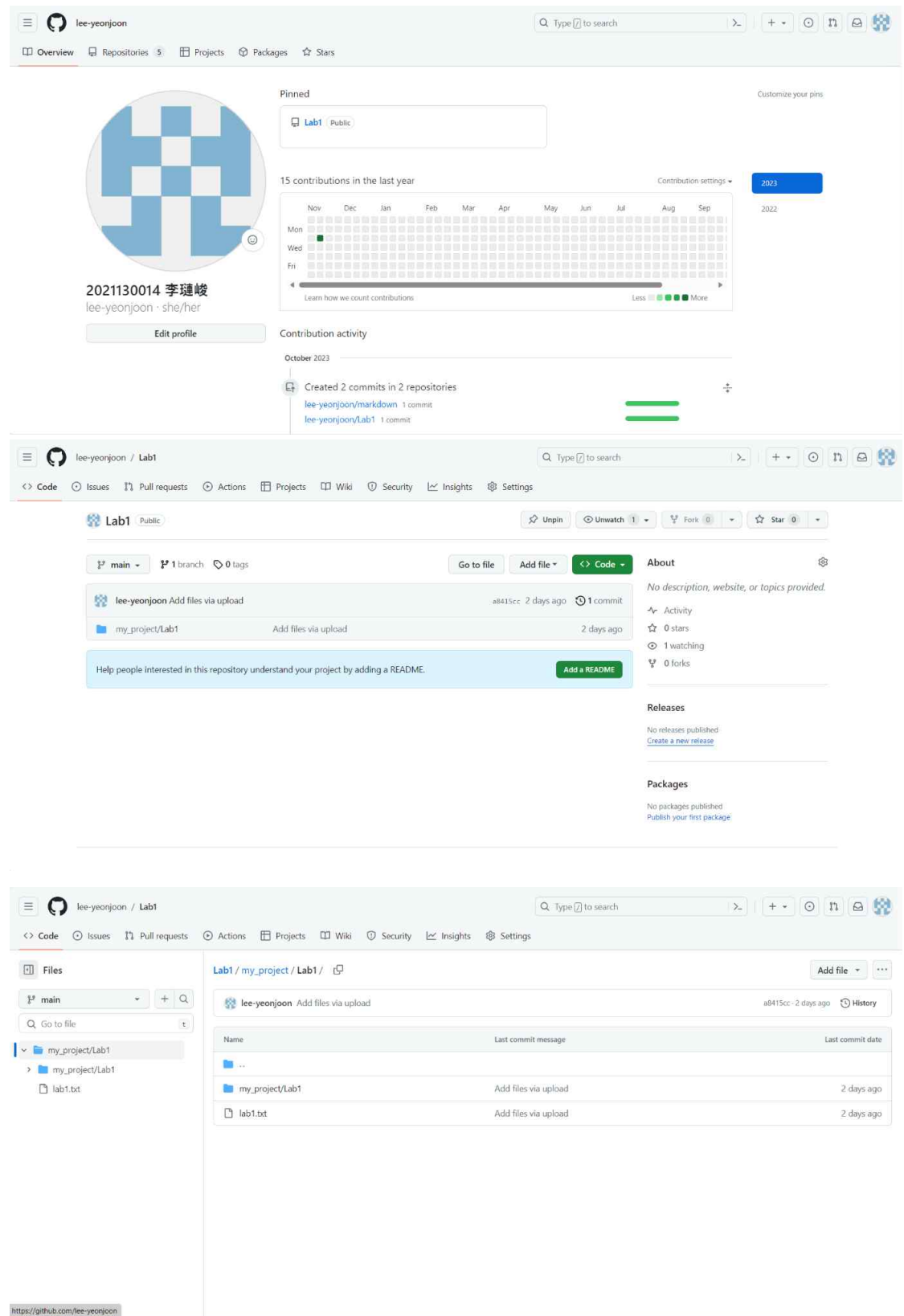
## 2 安装Git

### 2.1 本地机器上安装git



## 2.2 申请github帐号

本次实验中创建仓库地址：<https://github.com/lee-yeonjoon/Lab1>



给出自己在github上申请的帐号名称和本次实验中创建仓库的URL地址（做实验的仓库地址，不是提交报告的地址）。

给出github网站上你的账号信息和项目信息的截图。

### 3 Git操作过程

#### 3.1 实验场景(1): 仓库创建与提交

```
MINGW64 C:\Users\kohak\OneDrive\바탕 화면\github\Lab1
kohak@LAPTOP-TRO8MSUK MINGW64 ~/OneDrive/바탕 화면/github/Lab1 (master)
$ git add "lab1.txt"
kohak@LAPTOP-TRO8MSUK MINGW64 ~/OneDrive/바탕 화면/github/Lab1 (master)
$ git commit -m "첫 번째 커밋"
[master (root-commit) 9b12b21] 첫 번째 커밋
1 file changed, 3 insertions(+)
create mode 100644 lab1.txt
kohak@LAPTOP-TRO8MSUK MINGW64 ~/OneDrive/바탕 화면/github/Lab1 (master)
$ git add "lab1.txt"
kohak@LAPTOP-TRO8MSUK MINGW64 ~/OneDrive/바탕 화면/github/Lab1 (master)
$ git commit -m "두 번째 커밋"
[master 673ba3d] 두 번째 커밋
1 file changed, 2 insertions(+), 1 deletion(-)
kohak@LAPTOP-TRO8MSUK MINGW64 ~/OneDrive/바탕 화면/github/Lab1 (master)
$ git add "lab1.txt"
kohak@LAPTOP-TRO8MSUK MINGW64 ~/OneDrive/바탕 화면/github/Lab1 (master)
$ git commit -m "세 번째 커밋"
[master d0d4006] 세 번째 커밋
1 file changed, 2 insertions(+), 1 deletion(-)
kohak@LAPTOP-TRO8MSUK MINGW64 ~/OneDrive/바탕 화면/github/Lab1 (master)
$ git reset HEAD~1
Unstaged changes after reset:
M   lab1.txt
kohak@LAPTOP-TRO8MSUK MINGW64 ~/OneDrive/바탕 화면/github/Lab1 (master)
$ git log
commit 673ba3d2615a1c18eb1ac2aeb89d8ca1ecd8a440 (HEAD -> master)
Author: yeonjoon <kohakerf@naver.com>
Date: Sat Oct 28 11:44:23 2023 +0800
    두 번째 커밋

commit 9b12b2159bfc00ef259d4da49254eb95dcbaf9
Author: yeonjoon <kohakerf@naver.com>
Date: Sat Oct 28 11:42:18 2023 +0800
    첫 번째 커밋
```

#### 3.2 实验场景(2): 分支管理

给出2.1~2.12的操作命令，并给出执行界面的截图（命令输入界面和结果界面）

```
MINGW64 C:\lab1\my_project
kohak@LAPTOP-TRO8MSUK MINGW64 /C:/lab1/my_project (master)
$ git status
On branch master
nothing to commit, working tree clean
kohak@LAPTOP-TRO8MSUK MINGW64 /C:/lab1/my_project (master)
$ git branch
* master
kohak@LAPTOP-TRO8MSUK MINGW64 /C:/lab1/my_project (master)
$ git branch b1 master
$ git branch b2 master
kohak@LAPTOP-TRO8MSUK MINGW64 /C:/lab1/my_project (master)
$ git checkout b2
Switched to branch 'b2'
kohak@LAPTOP-TRO8MSUK MINGW64 /C:/lab1/my_project (b2)
$ git checkout -b c4
Switched to a new branch 'c4'
kohak@LAPTOP-TRO8MSUK MINGW64 /C:/lab1/my_project (c4)
$ git add .
kohak@LAPTOP-TRO8MSUK MINGW64 /C:/lab1/my_project (c4)
$ git commit -m "Modify 1 documents in c4"
[master c4] Modify 1 documents in c4
nothing to commit, working tree clean
kohak@LAPTOP-TRO8MSUK MINGW64 /C:/lab1/my_project (c4)
$ git add "lab1.txt"
fatal: pathspec 'lab1.txt' did not match any files
kohak@LAPTOP-TRO8MSUK MINGW64 /C:/lab1/my_project (c4)
$ git add my_project
kohak@LAPTOP-TRO8MSUK MINGW64 /C:/lab1/my_project (c4)
$ git add .
kohak@LAPTOP-TRO8MSUK MINGW64 /C:/lab1/my_project (c4)
$ git commit -m "Modify 1 documents in c4"
[master c4] Modify 1 documents in c4
nothing to commit, working tree clean
kohak@LAPTOP-TRO8MSUK MINGW64 /C:/lab1/my_project (c4)
$ git checkout master
Switched to branch 'master'
kohak@LAPTOP-TRO8MSUK MINGW64 /C:/lab1/my_project (master)
$ git push origin master
remote: Repository not found.
fatal: repository 'https://github.com/lee-yeonjun/my-project.git/' not found
kohak@LAPTOP-TRO8MSUK MINGW64 /C:/lab1/my_project (master)
$ git checkout b1
Switched to branch 'b1'

MINGW64 C:\lab1\my_project
kohak@LAPTOP-TRO8MSUK MINGW64 /C:/lab1/my_project (b1)
$ git add my_project
kohak@LAPTOP-TRO8MSUK MINGW64 /C:/lab1/my_project (b1)
$ git add .
kohak@LAPTOP-TRO8MSUK MINGW64 /C:/lab1/my_project (b1)
$ git commit -m "Modify 2 documents in b1"
[master b1] Modify 2 documents in b1
1 file changed, 4 insertions(+), 1 deletion(-)
kohak@LAPTOP-TRO8MSUK MINGW64 /C:/lab1/my_project (b1)
$ git merge c4
Already up to date.
kohak@LAPTOP-TRO8MSUK MINGW64 /C:/lab1/my_project (b1)
$ git branch -m b1
$ git add my_project
kohak@LAPTOP-TRO8MSUK MINGW64 /C:/lab1/my_project (b1)
$ git add .
kohak@LAPTOP-TRO8MSUK MINGW64 /C:/lab1/my_project (b1)
$ git commit -m "Modify 3 documents in b1"
[master b1] Modify 3 documents in b1
1 file changed, 4 insertions(+), 1 deletion(-)
kohak@LAPTOP-TRO8MSUK MINGW64 /C:/lab1/my_project (b1)
$ git checkout b2
error: Your local changes to the following files would be overwritten by checkout:
       my_project/lab1.txt
Please commit your changes or stash them before you switch branches.
Aborting
kohak@LAPTOP-TRO8MSUK MINGW64 /C:/lab1/my_project (b1)
$ git checkout b2
error: Your local changes to the following files would be overwritten by checkout:
       my_project/lab1.txt
Please commit your changes or stash them before you switch branches.
Aborting
kohak@LAPTOP-TRO8MSUK MINGW64 /C:/lab1/my_project (b1)
$ git add my_project
kohak@LAPTOP-TRO8MSUK MINGW64 /C:/lab1/my_project (b1)
$ git add .
```

```
MINGW64/C:/lab1/my_project
$ git commit -m "Modify 3 documents in B1"
[master 81:2021130014] Modify 3 documents in B1
1 file changed, 1 insertion(+), 1 deletion(-)

$ git checkout B2
Switched to branch 'B2'

$ git add my_project
$ git add .
$ git commit -m "Modify 3 documents in B2"
[B2 82:2021130015] Modify 3 documents in B2
1 file changed, 10 insertions(+), 1 deletion(-)

$ git branch --merged
c4
master

$ git branch
* B2
c4
master

$ git branch -d B2
error: Cannot delete branch 'B2': checked out at 'C:/lab1/my_project'

$ git branch -d B2
error: Cannot delete branch 'B2': checked out at 'C:/lab1/my_project'

$ git checkout master
Switched to branch 'master'

$ git branch -d B2
Deleted branch B2 (was 82d8d77).

$ git merge B1
$ git merge B1
Fast-forward
 my_project/lab1.txt | 8 ++++++
 1 file changed, 7 insertions(+), 1 deletion(-)

$ git merge c4
$ git merge c4
```

```
MINGW64/C:/lab1/my_project
Already up to date.

$ git push origin B1
fatal: unable to access 'https://github.com/lee-yeonjoon/my_project.git/': Recv
failure: Connection was reset

$ git push origin B1
fatal: unable to access 'https://github.com/lee-yeonjoon/my_project.git/': Fail
ed to connect to github.com port 443 after 21549 ms: Couldn't connect to server

$ git push origin B1
remote: Repository not found.
fatal: repository 'https://github.com/lee-yeonjoon/my_project.git/' not found

$ git remote -v
origin https://github.com/lee-yeonjoon/my_project.git (fetch)
origin https://github.com/lee-yeonjoon/my_project.git (push)

$ git remote set-url origin https://github.com/lee-yeonjoon/lab1.git

$ git push origin B1
fatal: unable to access 'https://github.com/lee-yeonjoon/lab1.git/': Recv failur
e: Connection was reset

$ git push origin B1
fatal: unable to access 'https://github.com/lee-yeonjoon/lab1.git/': Recv failur
e: Connection was reset

$ git push origin B1:2021130014
fatal: unable to access 'https://github.com/lee-yeonjoon/lab1.git/': Failed to c
onnect to github.com port 443 after 21589 ms: Couldn't connect to server

$ git push origin B1
To https://github.com/lee-yeonjoon/lab1.git
 ! [rejected]        B1 -> B1 (fetch first)
error: failed to push some refs to 'https://github.com/lee-yeonjoon/lab1.git'
hint: Updates were rejected because the remote contains work that you do not
hint: have locally. This is usually caused by another repository pushing to
hint: the same ref. If you want to integrate the remote changes, use
hint: 'git pull' before pushing again.
hint: See the 'Note about fast-forwards' in 'git push --help' for details.

$ git pull origin B1
remote: Enumerating objects: 16, done.
remote: Counting objects: 100% (16/16), done.
remote: Compressing objects: 100% (9/9), done.
remote: Total 16 (delta 6), reused 16 (delta 4), pack-reused 0
Unpacking objects: 100% (16/16), 1.54 KiB | 98.00 KiB/s, done.
```

```
MINGW64/C:/lab1/my_project
from https://github.com/lee-yeonjoon/lab1
 * [new branch]      B1 -> FETCH_HEAD
 * [new branch]      B1 -> origin/B1
fatal: refusing to merge unrelated histories

$ git pull origin B1 --allow-unrelated-histories
fatal: unable to access 'https://github.com/lee-yeonjoon/lab1.git/': Recv failur
e: Connection was reset

$ git push origin B1:2021130014
Enumerating objects: 21, done.
Counting objects: 100% (21/21), done.
Delta compression using up to 8 threads
Compressing objects: 100% (18/18), done.
Writing objects: 100% (21/21), 62.35 KiB | 12.47 MiB/s, done.
Total 21 (delta 4), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (4/4), done.
remote: Create a pull request for '2021130014' on GitHub by visiting:
remote:   https://github.com/lee-yeonjoon/lab1/pull/new/2021130014
To https://github.com/lee-yeonjoon/lab1.git
 * [new branch]      B1 -> 2021130014

$ git push origin C4:2021130014
fatal: unable to access 'https://github.com/lee-yeonjoon/lab1.git/': Failed to c
onnect to github.com port 443 after 21304 ms: Couldn't connect to server

$ git push origin C4:2021130014
fatal: unable to access 'https://github.com/lee-yeonjoon/lab1.git/': Recv failur
e: Connection was reset

$ git push origin C4:2021130014
fatal: unable to access 'https://github.com/lee-yeonjoon/lab1.git/': Recv failur
e: Connection was reset

$ git push origin C4:2021130014
fatal: unable to access 'https://github.com/lee-yeonjoon/lab1.git/': Failed to c
onnect to github.com port 443 after 21474 ms: Couldn't connect to server

$ git push origin C4:2021130014
fatal: unable to access 'https://github.com/lee-yeonjoon/lab1.git/': Recv failur
e: Connection was reset

$ git push origin C4:2021130014
fatal: unable to access 'https://github.com/lee-yeonjoon/lab1.git/': Failed to c
onnect to github.com port 443 after 22010 ms: Couldn't connect to server

$ git push origin C4:2021130014
```

```

MINGW64/C:/Lab1/my_project
fatal: unable to access 'https://github.com/lee-yeonjoon/Lab1.git/': failed to connect to github.com port 443 after 21352 ms: could not connect to server
lab1@MINGW64:~/my_project$ git push origin C4:2021130014
fatal: unable to access 'https://github.com/lee-yeonjoon/Lab1.git/': failed to connect to github.com port 443 after 22095 ms: could not connect to server
lab1@MINGW64:~/my_project$ git push origin C4:2021130014
fatal: unable to access 'https://github.com/lee-yeonjoon/Lab1.git/': Recv failure: Connection was reset
lab1@MINGW64:~/my_project$ git push origin C4:2021130014
To https://github.com/lee-yeonjoon/Lab1.git
! [rejected]        C4 -> 2021130014 (non-fast-forward)
error: failed to push some refs to 'https://github.com/lee-yeonjoon/Lab1.git'
hint: Updates were rejected because a pushed branch tip is behind its remote
hint: counterpart. If you want to integrate the remote changes, use 'git pull'
hint: before pushing again.
hint: See the 'Note about fast-forwards' in 'git push --help' for details.
lab1@MINGW64:~/my_project$ git pull origin 2021130014
From https://github.com/lee-yeonjoon/Lab1
* branch      2021130014 -> FETCH_HEAD
Already up to date.
lab1@MINGW64:~/my_project$ git push origin C4:2021130014
To https://github.com/lee-yeonjoon/Lab1.git
! [rejected]        C4 -> 2021130014 (non-fast-forward)
error: failed to push some refs to 'https://github.com/lee-yeonjoon/Lab1.git'
hint: Updates were rejected because a pushed branch tip is behind its remote
hint: counterpart. If you want to integrate the remote changes, use 'git pull'
hint: before pushing again.
hint: See the 'Note about fast-forwards' in 'git push --help' for details.
lab1@MINGW64:~/my_project$ git push -f origin C4:2021130014
Total 0 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/lee-yeonjoon/Lab1.git
+ 632b27c...4415780 C4 -> 2021130014 (forced update)
lab1@MINGW64:~/my_project$ git status
On branch master
nothing to commit, working tree clean
lab1@MINGW64:~/my_project$ git log --all --graph --oneline
* e32b276 (HEAD -> master, B1) Modify 3 documents in B1
* a260898 Modify 3 documents in B1
* a4d9550 Modify 3 documents in B1
* 4415780 (origin/2021130014, C4) Add Lab1 submodule
* ed26ccf Initial commit
* 25ace8d (origin/B1) Re-add my_project submodule in B1

MINGW64/C:/Lab1/my_project
552f08b Merge branch 'C4' into B1
* be8a847 Modify 3 documents in C4
* 4c89e2d Modify 3 documents in B1
* 1b70ad5 Remove my_project submodule
* 3d1d4fb Initialize repository and add submodule
lab1@MINGW64:~/my_project$ git log
commit e32b27616161c1a1b3b3b3e87b0b0b0e77a5eab09 (HEAD -> master, B1)
Author: yeonjoon <kohakerflednaver.com>
Date:   Wed Nov 1 20:01:46 2023 +0800

    Modify 3 documents in B1

commit a264089052a7d0c8fcd202faa906fed57e998e6
Author: yeonjoon <kohakerflednaver.com>
Date:   Wed Nov 1 19:59:18 2023 +0800

    Modify 3 documents in B1

commit a4d95501d0b16733647c8108e035fec3b0872085
Author: yeonjoon <kohakerflednaver.com>
Date:   Wed Nov 1 19:57:35 2023 +0800

    Modify 3 documents in B1

commit 44157807382881ddc1b4a2626f8a736e660da24 (origin/2021130014, C4)
Author: yeonjoon <kohakerflednaver.com>
Date:   Wed Nov 1 19:42:30 2023 +0800

    Add Lab1 submodule

commit ed26ccf639f5afeff59ade3973268d37fff00b21
Author: yeonjoon <kohakerflednaver.com>
Date:   Wed Nov 1 19:32:25 2023 +0800

    Initial commit

[END]
commit a264089052a7d0c8fcd202faa906fed57e998e6
Author: yeonjoon <kohakerflednaver.com>
Date:   Wed Nov 1 19:59:18 2023 +0800

    Modify 3 documents in B1

commit a4d95501d0b16733647c8108e035fec3b0872085
Author: yeonjoon <kohakerflednaver.com>
Date:   Wed Nov 1 19:57:35 2023 +0800

    Modify 3 documents in B1

commit 44157807382881ddc1b4a2626f8a736e660da24 (origin/2021130014, C4)
Author: yeonjoon <kohakerflednaver.com>
Date:   Wed Nov 1 19:42:30 2023 +0800

    Add Lab1 submodule

commit ed26ccf639f5afeff59ade3973268d37fff00b21
Author: yeonjoon <kohakerflednaver.com>
Date:   Wed Nov 1 19:32:25 2023 +0800

    Initial commit

[END]

```

### 3.3 实验场景(3): 在线Git练习

给出完成的所有任务的命令，格式如下：

(1) 主要页面-基础篇

任务1: git commit

操作命令集



《命令》

**git commit;**

**git commit;**

任务2: git branch

操作命令集



《命令》

**git branch bugFix ;**

**git checkout bugFix;**



任务3: git merge

操作命令集



任务4: git rebase

操作命令集



(2) 主要页面-高级篇



(3) 主要页面-移动提交记录



#### (4) 主要页面-杂项



#### (5) 远程页面-Git远程仓库



#### (6) 远程页面-Git远程仓库高级操作



#### (7) 通关后的主界面截图





[Git 主要页](#)

## 4 小结

这个实验的过程是用git命令创建一个本地存储库，将其推送到GitHub，创建一个B1、B2、C4主分支，并将这些分支存储在GitHub远程存储中，学习git的基本命令和功能，并在学习git分支时尝试应用程序，以更熟悉git。

通过这个实验，我们能够看到git的基本功能和指令，并获得了使用它们创建存储库和创建分支的能力，通过直接纠正过程中的各种错误，我们获得了在类似情况下可以解决而不必恐慌的平静。

就我个人而言，通过学习git分支详细了解git的各种命令的含义和功能是非常有用的。

特别是，通过直观地显示程序在输入命令时是如何进行的，理解程序非常有帮助。在学习Git时使用这个网站会很好。

通过在实验中应用各种命令，可以详细了解每个命令的确切含义和功能。这段经历极大地帮助我们提高了整体编程知识，不仅通过实验的成功，还通过对每个命令的深入理解。