

实验报告 1

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1 实验内容：

版本控制 (Git)

2 实验过程：

2.1 克隆本课程网站的仓库

```
szn@DESKTOP-CCFC49T MINGW64 ~/git
$ git clone https://github.com/missing-semester-cn/missing-semester-cn.github.io
Cloning into 'missing-semester-cn.github.io'...
remote: Enumerating objects: 3194, done.
remote: Counting objects: 100% (3194/3194), done.
remote: Compressing objects: 100% (1126/1126), done.
remote: Total 3194 (delta 2040), reused 2735 (delta 2033), pack-reused 0 (from 0)
Receiving objects: 100% (3194/3194), 15.44 MiB | 4.39 MiB/s, done.
Resolving deltas: 100% (2040/2040), done.
```

2.2 将版本历史可视化并进行探索

```
szn@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io (master)
$ git log --all --graph --decorate
* commit af054fa1aea2f2599e4474d96b63f73dd9bd145f (HEAD -> master, origin/
  origin/HEAD)
  Merge: dd3f3dd 9baa48c
  Author: LingFeng_Ai <chanxiaomax@gmail.com>
  Date: Fri Aug 16 06:54:16 2024 +0800

  Merge pull request #172 from pspdata/master

  Thank you so much

* commit 9baa48c778012164179e4e60725418941f41743b
  Author: psp_data <1824427006@qq.com>
  Date: Thu Aug 15 02:07:36 2024 +0800

  remove irrelevant text

* commit f5df7de89dc7712483665cc6fe8a787aafbef9bf
  Author: psp_data <1824427006@qq.com>
  Date: Thu Aug 15 01:46:12 2024 +0800
```

2.3 是谁最后修改了 README.md 文件？

```
szn@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io (master)
$ git log -1 README.md
commit de0a832ef0d04cf918bab7f39c61a53932c845d8
Author: yuzq <yuzq@sumayworld.com>
Date: Thu Jun 6 14:43:07 2024 +0800

  将readme文件中的url的绝对路径改为相对路径，不用重复访问github，利于分享传播
```

解释: -x 选项: 查看最新的 x 次提交或特定文件的版本信息

2.4 最后一次修改 __config.yml 文件中 collections: 行时的提交信息是什么?

```
ixzz@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io (master)
$ git blame __config.yml | grep collections
a88b4eac (Anish Athalye 2020-01-17 15:26:30 -0500 18) collections:
ixzz@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io (master)
$ git show a88b4eac
commit a88b4eac126483e29bdac5ee0a39b180948ae7fc
Author: Anish Athalye <me@anishathalye.com>
Date: Fri Jan 17 15:26:30 2020 -0500

    Redo lectures as a collection

diff --git a/2020/index.html b/2020/index.html
deleted file mode 100644
index 153adce..0000000
--- a/2020/index.html
+++ /dev/null
@@ -1,3 +0,0 @@
-----
! layout: redirect
! redirect: /
! title: Missing Semester 2020
diff --git a/2019/automation.md b/_2019/automation.md
similarity index 100%
rename from 2019/automation.md
rename to _2019/automation.md
diff --git a/2019/backups.md b/_2019/backups.md
similarity index 100%
rename from 2019/backups.md
rename to _2019/backups.md
ixzz@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io (master)
$ git show --pretty=format:"%s" a88b4eac | head -1
Redo lectures as a collection
ixzz@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io (master)
$ git log --pretty=format:"%s" a88b4eac -1
Redo lectures as a collection
```

解释: 使用 git blame 命令查看该行的最新提交信息, 从 git blame 的输出中找到 collections: 行的提交哈希。在通过提交哈希使用 git show 查看具体的提交信息

题记: 使用 Git 时的一个常见错误是提交本不应该由 Git 管理的大文件, 或是将含有敏感信息的文件提交给 Git。尝试向仓库中添加一个文件并添加提交信息, 然后将其从历史中删除。

2.5 提交包含敏感信息的文件

```
ixzz@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io (master)
$ echo "password123">my_password
ixzz@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io (master)
$ git add
warning: in the working copy of 'my_password', LF will be replaced by CRLF the n
ext time Git touches it
ixzz@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io (master)
$ git commit -m "add password123 to file"
[master 00eb9ab] add password123 to file
1 file changed, 1 insertion(+)
create mode 100644 my_password
ixzz@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io (master)
$ git log HEAD
commit 00eb9abf406f6d6f60d65c30acd51c1d02203 (HEAD -> master)
Author: Your Name <1128123456@qq.com>
Date: Mon Aug 26 14:48:34 2024 +0800

    add password123 to file

commit af054f1aa2f2599e474d96b63f73dd9bd145f (origin/master, origin/HEAD)
Merge: af054f1aa2f2599e474d96b63f73dd9bd145f (origin/master, origin/HEAD)
Author: psp_dada <1824427006@qq.com>
Date: Fri Aug 16 06:54:16 2024 +0800

    Merge pull request #172 from pspdada/master

    Thank you so much

commit 0ba48c778012164179e4e60725418941f41741b
Author: psp_dada <1824427006@qq.com>
Date: Thu Aug 15 02:07:36 2024 +0800

    remove irrelevant text

commit f5d7de89dc7712483865cc6fe8a787aafbe9bf
Author: psp_dada <1824427006@qq.com>
Date: Thu Aug 15 01:46:12 2024 +0800
```

2.6 使用 ‘git filter-branch’清除提交记录

```
ixzmj@DESKTOP-CCFC49F MINGW64 ~/git/missing-semester-cn.github.io (master)
$ git filter-branch --force --index-filter \
  > git rm --cached --ignore-unmatch ./my_password \
  > --prune-empty --tag-name-filter cat -- --all
WARNING: git-filter-branch has a glut of gotchas generating mangled history
rewrites. Hit Ctrl-C before proceeding to abort, then use an
alternative filtering tool such as 'git filter-repo'
(https://github.com/newren/git-filter-repo/) instead. See the
filter-branch manual page for more details; to squelch this warning,
set FILTER_BRANCH_SQUELCH_WARNING=1.
Proceeding with filter-branch...

Rewrite 112ddbd8362e08dc2e8bc46b93011645bcb4c819 (1/833) (0 seconds passed, rem
Rewrite b2e3a22155ff25b8c2858c23fd6dfdb02b96862 (2/833) (1 seconds passed, rem
Rewrite ffa24fbee935da79eb3101bb28084579219a65d (2/833) (1 seconds passed, rem
Rewrite cc5a838ab39ac043d1c1762d08bae2c92acade (2/833) (1 seconds passed, rem
Rewrite db2904b463fbb1fdec91bd476c7561d3d5f659 (5/833) (3 seconds passed, rem
```

题记：从 GitHub 上克隆某个仓库，修改一些文件。当您使用 git stash 会发生什么？当您执行 git log --all --oneline 时会显示什么？通过 git stash pop 命令来撤销 git stash 操作，什么时候会用到这一技巧？

2.7 修改文件后，使用 git stash

```
ixzmj@DESKTOP-CCFC49F MINGW64 ~/git/missing-semester-cn.github.io (master)
$ git status
On branch master
Your branch is up to date with 'origin/master'.

Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
        modified:   index.md

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

ixzmj@DESKTOP-CCFC49F MINGW64 ~/git/missing-semester-cn.github.io (master)
$ git stash
Saved working directory and index state WIP on master: d50a857 Merge pull reques
- #172 from pspdata/master
```

解释：使用 ‘git stash’ 会将当前工作目录中的未提交更改（包括暂存区和工作区的更改）保存到一个临时的存储区，并将工作目录恢复到最近一次提交的状态。这使得你可以在不提交当前更改的情况下切换分支或执行其他操作。

2.8 执行 git log --all --oneline

```
ixzmj@DESKTOP-CCFC49F MINGW64 ~/git/missing-semester-cn.github.io (master)
$ git log --all --oneline
99e1807 (refs/stash) WIP on master: d50a857 Merge pull request #172 from pspdata/master
750abb index on master: d50a857 Merge pull request #172 from pspdata/master
d50a857 (HEAD -> master, origin/master, origin/HEAD) Merge pull request #172 from pspdata/master
4f05fa Merge pull request #172 from pspdata/master
1eeecd9 remove irrelevant text
0baa4e remove irrelevant text
0f90ef1 fix wrong index
75d7de fix wrong index
2302cd fix typo
ef9a277 fix typo
83466 Merge pull request #171 from Howiechih/for-better-understanding
d03f2d Merge pull request #171 from Howiechih/for-better-understanding
26fced4 更新#课程概念与 shell#一个功能全面又强大的工具关于修改类度文件报错的翻译
4e7b6d4 更新#课程概念与 shell#一个功能全面又强大的工具关于修改类度文件报错的翻译
addf6e1 更新#课程概念与 shell#一个功能全面又强大的工具关于修改类度文件报错的翻译
4e2ff64 更新#课程概念与 shell#一个功能全面又强大的工具关于修改类度文件报错的翻译
050912 Merge pull request #170 from crosslab/type-fix
42904d Merge pull request #170 from crosslab/type-fix
```

解释：执行 ‘git log --all --oneline’ 时，Git 会显示所有分支的提交历史，每个提交以一行的形式呈现。每行包括提交的简短哈希值和提交消息。

2.9 执行 git stash pop

```
lxzm@80c3c70e-c4cc-49f7-9106d4 ~/git/missing-semester-cn.github.io (master)
$ git stash pop
On branch master
Your branch is up to date with 'origin/master'.

Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
        modified:   index.md

no changes added to commit (use "git add" and/or "git commit -a")
Dropped refs/stash@{0} (99c18073d219e14d88b1684c17c0b3209239481)
```

备注：

git stash pop 命令用于将最近一次使用 git stash 保存的更改应用回工作目录，并从存储区中删除该更改。如果需要撤销 git stash 操作并恢复之前的更改，就可以使用 git stash pop。以下一些常见的场景，会用到这一技巧：

切换分支：假设在某个分支上进行了一些更改，但需要切换到另一个分支处理紧急任务。可以使用 git stash 暂时保存更改，切换分支，完成工作后再使用 git stash pop 恢复原来的更改。

清理工作目录：有时可能需要暂时清理工作目录以进行某些操作，例如编译或测试。可以使用 git stash 保存当前更改，进行必要的操作后，使用 git stash pop 恢复更改。

修复冲突：在处理合并冲突时，如果发现需要更清晰的视图来解决冲突，可以 stash 当前的更改，完成合并操作，然后使用 git stash pop 恢复你在合并前的工作。

代码审查：在进行代码审查，需要暂时将更改保存到存储区以审查别的部分代码，可以 stash 当前更改，完成审查后使用 git stash pop 恢复。

与其他的命令行工具一样，Git 也提供了一个名为 `/.gitconfig` 配置文件（或 dotfile）。请在 `/.gitconfig` 中创建一个别名，使您在运行 git graph 时，您可以得到 git log -all --graph --decorate --oneline 的输出结果；

2.10 在 /.gitconfig 中创建一个别名

```
[user]
  email = 3128123545@qq.com
  name = Your Name
[credential "https://codehub.devcloud.cn-north-4.huaweicloud.com"]
  provider = generic
[core]
  excludesfile = C:/Users/lxzm/.gitignore
[alias]
  graph = log --all --graph --decorate --oneline
```

直接使用 `git graph` 来代替 `git log -all -graph -decorate -oneline`

```
lxzm@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io (master)
$ vim ~/.gitconfig
lxzm@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io (master)
$ git graph
* 92d493f (refs/stash) WIP on master: d50a857 Merge pull request #172 from pspdada/master
* 0f74a37 index on master: d50a857 Merge pull request #172 from pspdada/master
* d50a857 (HEAD -> master, origin/master, origin/HEAD) Merge pull request #172 from pspdada/master
* 1eeed59 remove irrelevant text
* 0f90ef1 fix wrong index
* 12802cd fix typo
//
* 7534662 Merge pull request #171 from HowieChih/for-better-understanding
* 26fce64 更新#课程概述与 shell#一个功能全面又强大的工具关于修改复杂度文件报错的翻译
* ad0fbeb 更新#课程概述与 shell#一个功能全面又强大的工具关于修改复杂度文件报错的翻译
* a965910 Merge pull request #170 from crosscap/typo-fix
* f243760 fix some typo in version-control.md
```

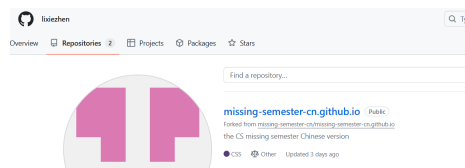
题记:您可以通过执行 `git config --global core.excludesfile ~/.gitignore_global` 在 `~/.gitignore_global` 中创建全局忽略规则。配置您的全局 `gitignore` 文件来自动忽略系统或编辑器的临时文件,例如.DS/_Store;

2.11 在 `~/.gitignore_global` 中创建全局忽略规则

```
lxzm@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io (master)
$ git config --global core.excludesfile ~/.gitignore_DS_Store
lxzm@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io (master)
```

题记:克隆本课程网站的仓库,找找有没有错别字或其他可以改进的地方,在 GitHub 上发起拉取请求 (Pull Request); 首先 fork 本网站仓库,然后克隆 fork 后的仓库

2.12 fork 网站仓库



2.13 克隆 Fork 后的仓库

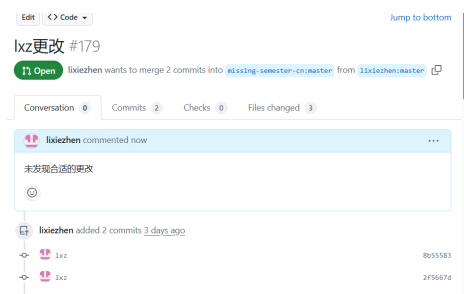
```
lxzm@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io/副本 (master)
$ git clone https://github.com/liexzhen/missing-semester-cn.github.io.git
Cloning into 'missing-semester-cn.github.io'...
remote: Enumerating objects: 3181, done.
remote: Counting objects: 100% (3181/3181), done.
remote: Compressing objects: 100% (1120/1120), done.
remote: Total 3181 (delta 2033), reused 2726 (delta 2026), pack-reused 0 (from 0)
Receiving objects: 100% (3181/3181), 15.44 MiB | 4.74 MiB/s, done.
Resolving deltas: 100% (2033/2033), done.
lxzm@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io/副本 (master)
```

2.14 修改文件并提交和推送更改

```
missing-semester-cn.github.io (master)
$ git commit -m"lxz"
[master 2f5667d] lxz
1 file changed, 1 insertion(+), 1 deletion(-)

lxzmj@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io/脚本/missing-s
$ git push
missing-semester-cn.github.io (master)
$ git push
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Delta compression using up to 8 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 288 bytes | 288.00 KiB/s, done.
Total 3 (delta 2), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (2/2), completed with 2 local objects.
To https://github.com/lixiezhn/missing-semester-cn.github.io.git
  8b55583..2f5667d master -> master
```

2.15 发起请求



2.16 显示分支

```
lxzmj@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io (master)
$ git branch
* master
```

2.17 创建分支

```
lxzmj@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io (master)
$ git branch master2
lxzmj@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io (master)
$ git branch
* master
  master2
```

2.18 创建分支并切换到该分支

```
lxzmj@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io (master)
$ git checkout -b master3
Switched to a new branch 'master3'
lxzmj@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io (master3)
$
```

2.19 合并分支 (将 master3 分支的更改合并到 master2 分支上)

```
lxzmj@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io (master3)
$ git checkout master2
Switched to branch 'master2'
M   index.md
A    "\345\211\257\346\234\254\missing-semester-cn.github.io"
lxzmj@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io (master2)
$ git merge master3
Already up to date.
```

2.20 将一系列提交变基到一个新的基线上 (在 master3 分支上, 希望将它变基到 master2 分支上)

```
lxzmj@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io (master2)
$ git checkout master3
Switched to branch 'master3'
M   index.md
A    "\345\211\257\346\234\254\missing-semester-cn.github.io"
lxzmj@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io (master3)
$ git rebase master2
```

2.21 git config: Git 是一个高度可定制的工具 用 git config 来设置全局用户名和邮箱

```
lxzmj@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io (master3)
$ git config --global user.name "lxz"
lxzmj@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io (master3)
$ git config --global user.email "312812354@qq.com"
lxzmj@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io (master3)
$ git config --global user.name
lxz
lxzmj@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io (master3)
$ git config --global user.email
312812354@qq.com
```

2.22 gitignore: 指定故意不追踪的文件

创建一个 1.txt 文件

```
lxzmj@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io (master3)
$ touch 1
lxzmj@DESKTOP-CCFC49T MINGW64 ~/git/missing-semester-cn.github.io (master3)
$ vim .gitignore
```

编辑.gitignore 文件, 让 git 忽略 1.txt 文件

```
.ruby-version
.bundle/
_site/
.jekyll-metadata
1
```

3 实验收获:

通过这次实验，我掌握了许多 Git 操作技巧，不仅学会了如何克隆仓库、从远程获取更新以及将本地更改推送到远程等基本步骤，还深入了解了如 `git log --all --oneline` 和 `git stash` 等高级命令。这些技能对未来参与合作项目和使用 GitHub 将非常有帮助。除了 git 相关的知识外，本次的实验报告我第一次尝试用了 LaTeX 来写，通过了解 LaTeX 的基本用法，我现在已经可以基本掌握用这个工具来写自己的报告了，我相信这对我以后写各样的实验报告和论文都有所帮助。

github 链接: <https://github.com/lixiezhn>