《系统开发工具基础》实验报告

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1 实验目的

1.了解并学习版本控制Git；
2.了解并学习Latex文本编辑；

2 实验内容

1.学习了Git的工作原理、基本操作、如何关联本地仓库和远程仓库。
2.学习了用LaTeX编写文档，并编写实验报告模板。

3 实例

3.1 实例一：克隆课程网站的存储库

```
PS D:\AAA_My_learning\parttime> git clone https://github.com/missing-semester/missing-semester
Cloning into 'missing-semester'...
remote: Enumerating objects: 2511, done.
remote: Counting objects: 100% (1576/1576), done.
remote: Compressing objects: 100% (591/591), done.
remote: Total 2511 (delta 1061), reused 992 (delta 985), pack-reused 935 (from 3)
Receiving objects: 100% (2511/2511), 15.88 MiB | 5.80 MiB/s, done.
Resolving deltas: 100% (1486/1486), done.
PS D:\AAA_My_learning\parttime> cd missing-semester
```

图 1: 实例一：克隆课程网站的存储库

3.2 实例二：尝试本地新建分支

```
PS D:\AAA_My_learning\parttime\missing-semester> git checkout -b myn
Switched to a new branch 'myn'
```

图 2: 实例二：尝试本地新建分支

3.3 实例三：log查看历史提交记录

```
PS D:\AAA_My_learning\parttime\missing-semester> git log
commit 6c7bab601a58639c9378d879ee0d3fe095cbd73c (HEAD -> myn, origin/master, origin/HEAD, master)
Author: Ryan Naveed <ryan.naveed@10xengineers.ai>
Date:   Thu Aug 28 18:36:24 2025 +0500

    Fixed Typo (#334)

commit 8c63acb09d1226e20b206d5cd1d01274320d2371
Author: irtaza <irtaza.hyder@10xengineers.ai>
Date:   Thu Aug 28 18:35:36 2025 +0500

    Updated akward sentence in _2019/backups.md (#335)

commit f76be3c1d02d53ce6f0d9091003ea5c4f588b0f7
Author: muhammadimran-isp <muhammad.imran@10xengineers.ai>
Date:   Wed Aug 27 21:53:54 2025 +0500

    found a typo in the "Aliases" section of command-line.md (#333)

commit b5712795524l4f9d98418ef12075f5188b8cf208
Merge: 7e0d646 d8bb7e2
Author: Anish Athalye <me@anishathalye.com>
Date:   Wed Aug 27 06:53:40 2025 -0700

    Merge pull request #332 from muhammadqasim-10xe/fixed-typo-mistake

    Fix: Typo in Data Wrangling Lecture notes

commit d8bb7e225638617a5a792c0c2d46348dc76548fb
Author: Muhammad Qasim <muhammad.qasim@10xengineers.ai>
```

图 3: log

```
Windows PowerShell
PS D:\AAA_My_learning\parttime\missing-semester> git log --all --graph --decorate
* commit 6c7bab601a58639c9378d879ee0d3fe095cbd73c (HEAD -> myn, origin/master, origin/HEAD, master)
| Author: Ryan Naveed <ryan.naveed@10xengineers.ai>
| Date:   Thu Aug 28 18:36:24 2025 +0500
|
|     Fixed Typo (#334)
|
* commit 8c63acb09d1226e20b206d5cd1d01274320d2371
| Author: irtaza <irtaza.hyder@10xengineers.ai>
| Date:   Thu Aug 28 18:35:36 2025 +0500
|
|     Updated akward sentence in _2019/backups.md (#335)
|
* commit f76be3c1d02d53ce6f0d9091003ea5c4f588b0f7
| Author: muhammadimran-isp <muhammad.imran@10xengineers.ai>
| Date:   Wed Aug 27 21:53:54 2025 +0500
|
|     found a typo in the "Aliases" section of command-line.md (#333)
|
*   commit b5712795524l4f9d98418ef12075f5188b8cf208
|\  Merge: 7e0d646 d8bb7e2
| | Author: Anish Athalye <me@anishathalye.com>
| | Date:   Wed Aug 27 06:53:40 2025 -0700
| |
| |     Merge pull request #332 from muhammadqasim-10xe/fixed-typo-mistake
| |
| |     Fix: Typo in Data Wrangling Lecture notes
| |
| * commit d8bb7e225638617a5a792c0c2d46348dc76548fb
|/  Author: Muhammad Qasim <muhammad.qasim@10xengineers.ai>
:...skipping...
* commit 6c7bab601a58639c9378d879ee0d3fe095cbd73c (HEAD -> myn, origin/master, origin/HEAD, master)
| Author: Ryan Naveed <ryan.naveed@10xengineers.ai>
```

图 4: 将历史记录可视化为DAG

3.4 实例四：最后一次修改 _config.yml 文件中 collections: 行时的提交信息是什么？

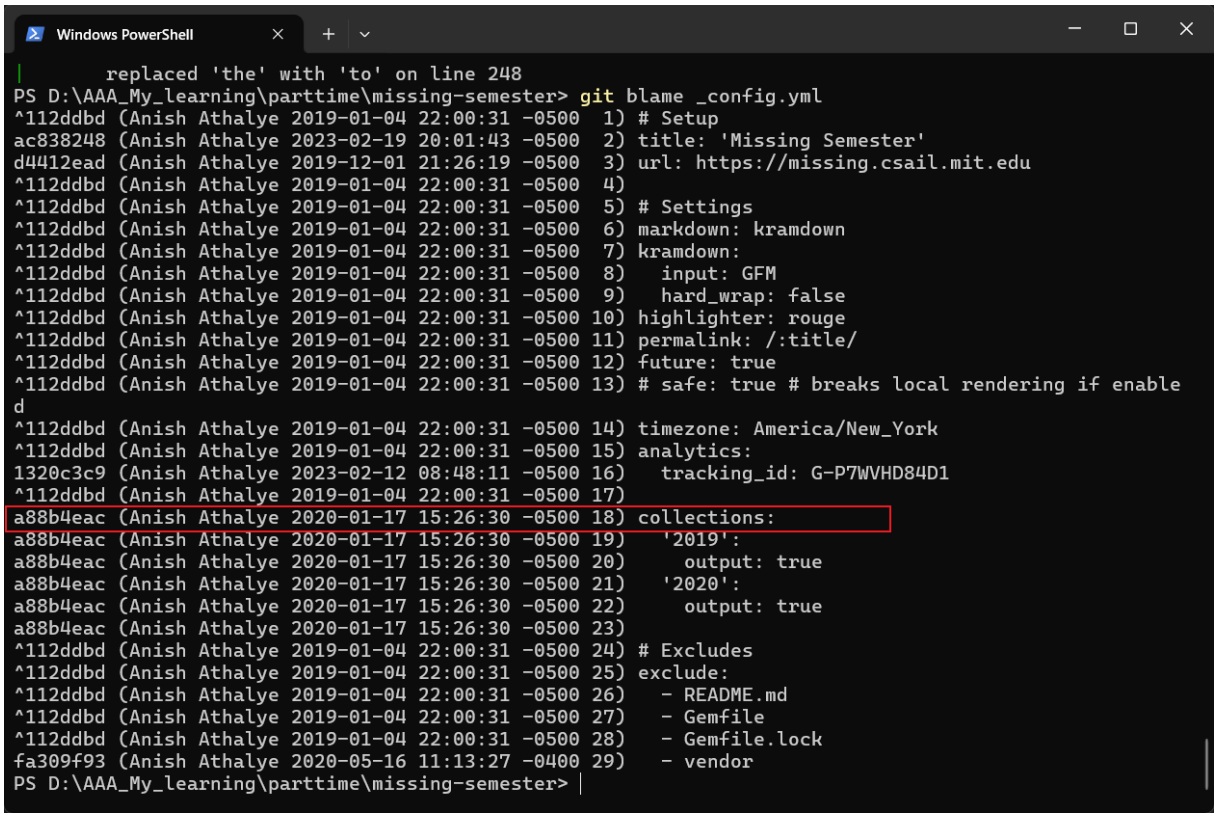

图 5: `git blame`：逐行显示文件最后一次修改的提交、作者、时间

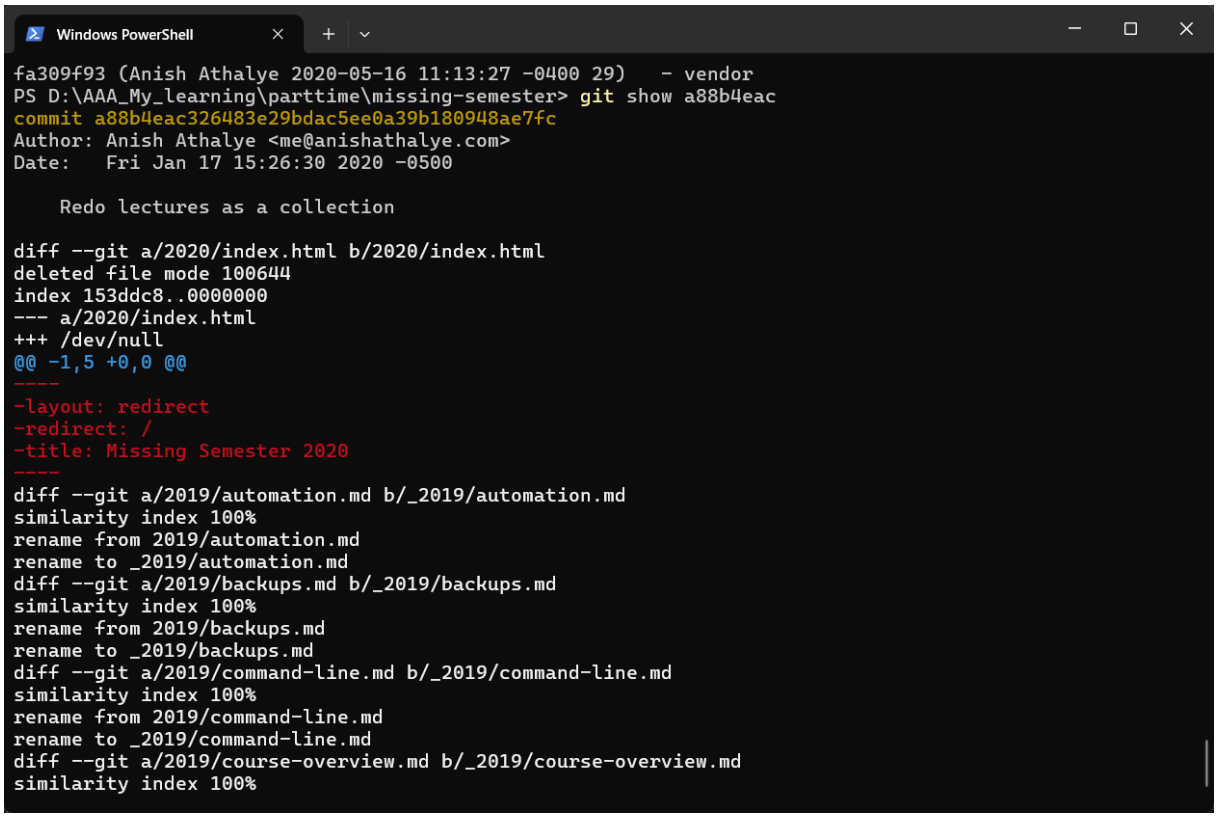

图 6: `git show`：展示某个提交的详细信息（提交消息 + 修改内容）。

3.5 实例五：机密文件上传

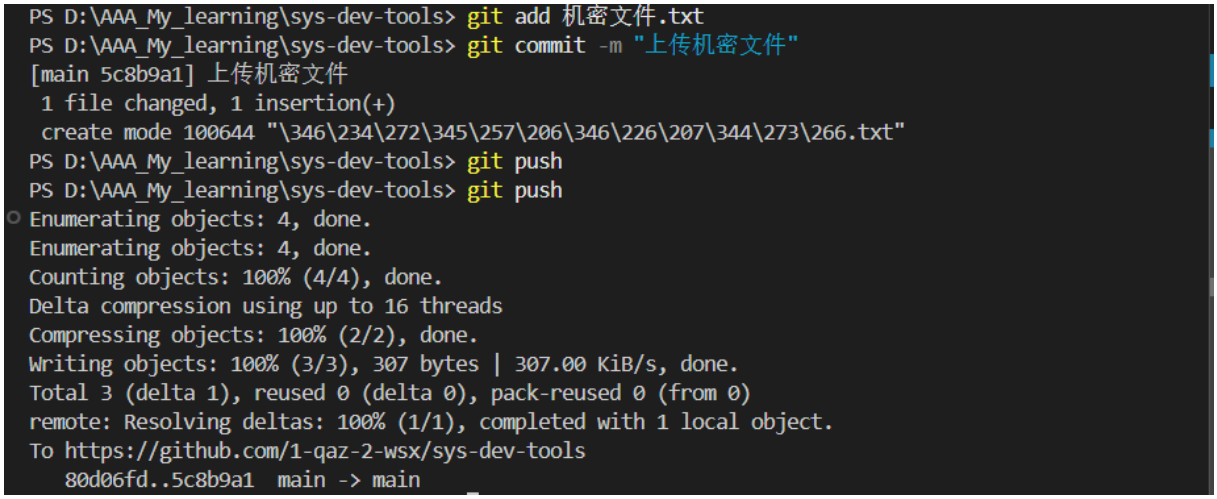

图 7: 推送到远程仓库

3.6 实例六：如何删除敏感文件记录

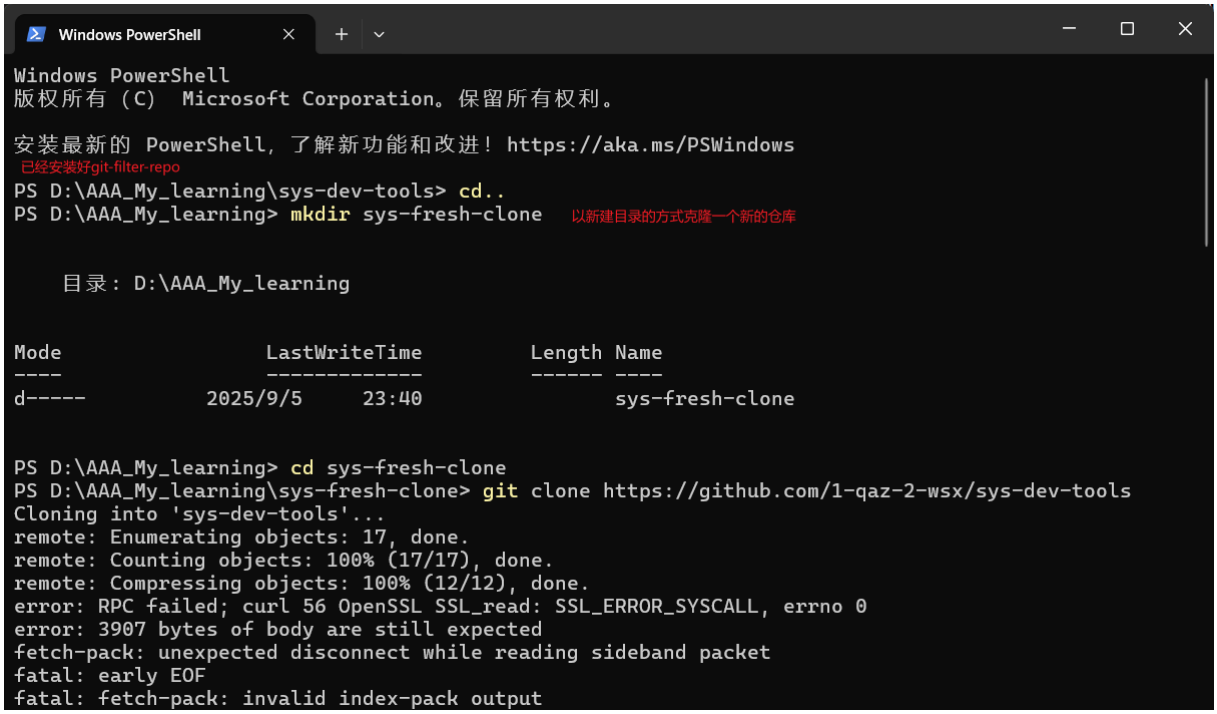

图 8: delete1

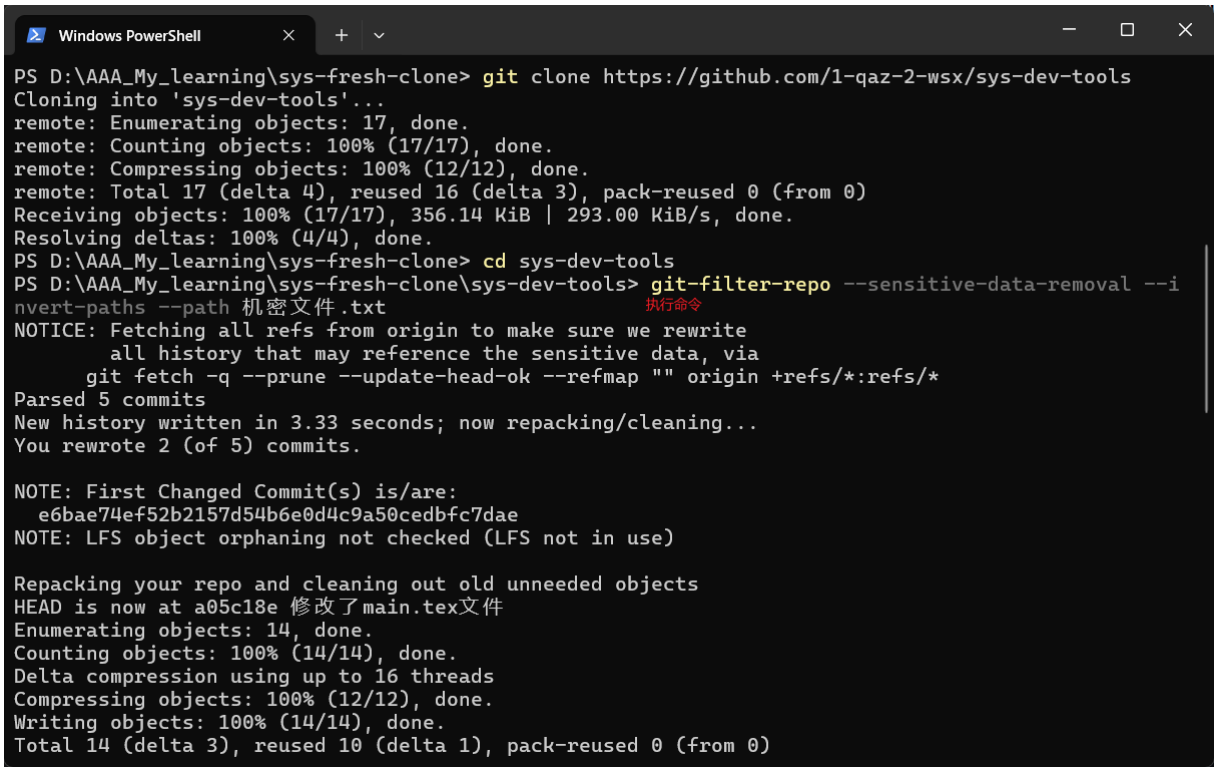
Windows PowerShell
PS D:\AAA_My_learning\sys-fresh-clone> git clone https://github.com/1-qaz-2-wsx/sys-dev-tools
Cloning into 'sys-dev-tools'...
remote: Enumerating objects: 17, done.
remote: Counting objects: 100% (17/17), done.
remote: Compressing objects: 100% (12/12), done.
remote: Total 17 (delta 4), reused 16 (delta 3), pack-reused 0 (from 0)
Receiving objects: 100% (17/17), 356.14 KiB | 293.00 KiB/s, done.
Resolving deltas: 100% (4/4), done.
PS D:\AAA_My_learning\sys-fresh-clone> cd sys-dev-tools
PS D:\AAA_My_learning\sys-fresh-clone\sys-dev-tools> git-filter-repo --sensitive-data-removal --invert-paths --path 机密文件.txt
执行命令
NOTICE: Fetching all refs from origin to make sure we rewrite
all history that may reference the sensitive data, via
git fetch -q --prune --update-head-ok --refmap "" origin +refs/*:refs/*
Parsed 5 commits
New history written in 3.33 seconds; now repacking/cleaning...
You rewrote 2 (of 5) commits.
NOTE: First Changed Commit(s) is/are:
e6bae74ef52b2157d54b6e0d4c9a50cedbfc7dae
NOTE: LFS object orphaning not checked (LFS not in use)
Repacking your repo and cleaning out old unneeded objects
HEAD is now at a05c18e 修改了main.tex文件
Enumerating objects: 14, done.
Counting objects: 100% (14/14), done.
Delta compression using up to 16 threads
Compressing objects: 100% (12/12), done.
Writing objects: 100% (14/14), done.
Total 14 (delta 3), reused 10 (delta 1), pack-reused 0 (from 0)

图 9: delete2

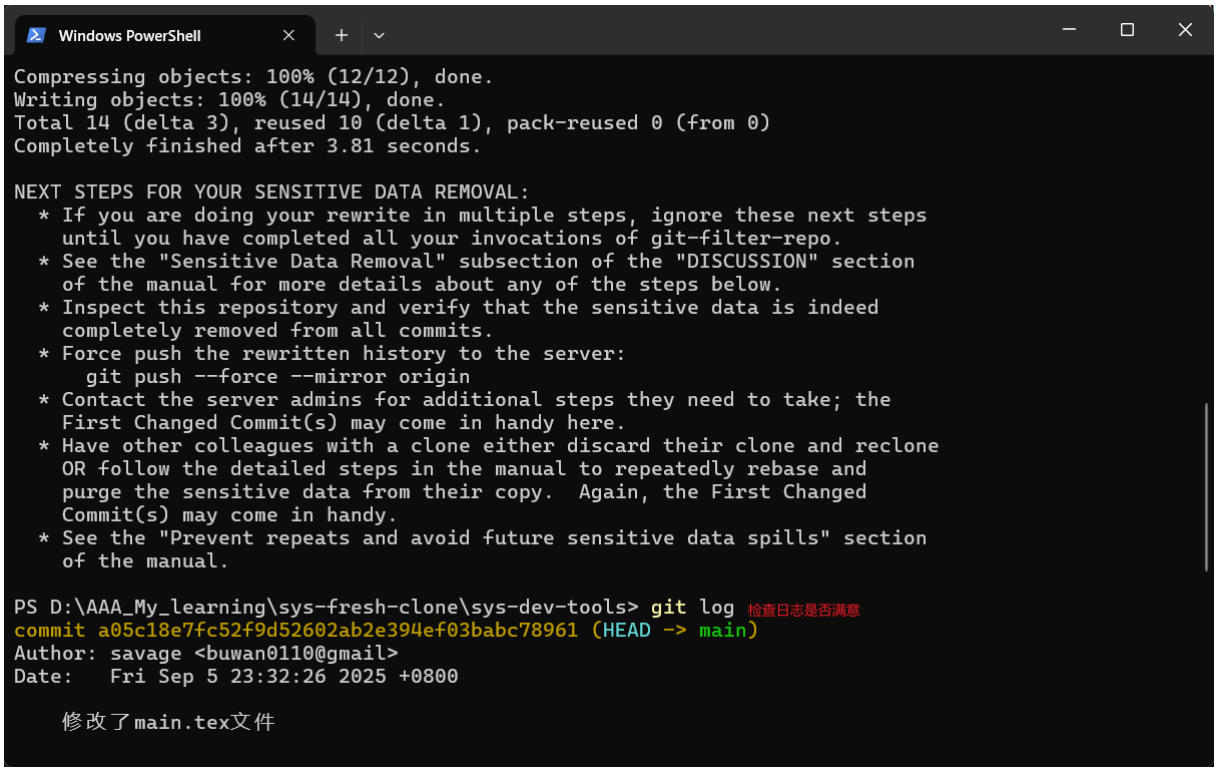
Windows PowerShell
Compressing objects: 100% (12/12), done.
Writing objects: 100% (14/14), done.
Total 14 (delta 3), reused 10 (delta 1), pack-reused 0 (from 0)
Completely finished after 3.81 seconds.
NEXT STEPS FOR YOUR SENSITIVE DATA REMOVAL:
* If you are doing your rewrite in multiple steps, ignore these next steps until you have completed all your invocations of git-filter-repo.
* See the "Sensitive Data Removal" subsection of the "DISCUSSION" section of the manual for more details about any of the steps below.
* Inspect this repository and verify that the sensitive data is indeed completely removed from all commits.
* Force push the rewritten history to the server:
git push --force --mirror origin
* Contact the server admins for additional steps they need to take; the First Changed Commit(s) may come in handy here.
* Have other colleagues with a clone either discard their clone and reclone OR follow the detailed steps in the manual to repeatedly rebase and purge the sensitive data from their copy. Again, the First Changed Commit(s) may come in handy.
* See the "Prevent repeats and avoid future sensitive data spills" section of the manual.
PS D:\AAA_My_learning\sys-fresh-clone\sys-dev-tools> git log 检查日志是否满意
commit a05c18e7fc52f9d52602ab2e394ef03babc78961 (HEAD -> main)
Author: savage <buwan0110@gmail>
Date: Fri Sep 5 23:32:26 2025 +0800
修改了main.tex文件

图 10: delete3

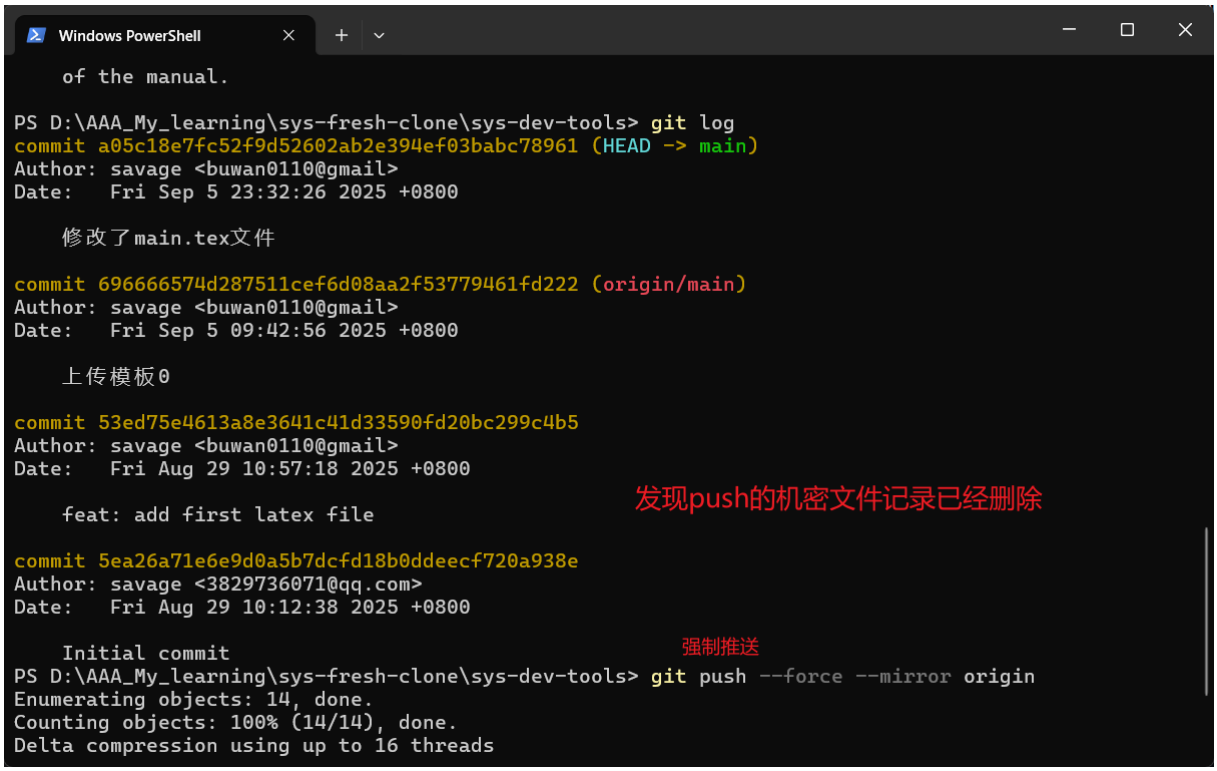

图 11: delete4

3.7 实例七：使用stash（和add不同）

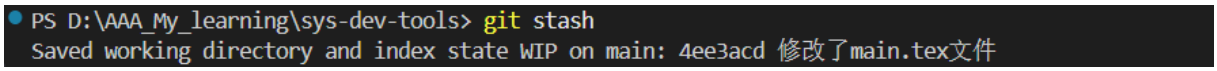

图 12: `git stash`

已经把当前未提交的修改保存成一个临时快照（stash），标记为 WIP on main。

当需要暂时保存但又不提交时，使用`git stash`将改动存放到特殊的栈里，后续需要commit时再pop（实例八）

3.8 实例八：stash后的提交记录以及弹出stash

```
PS D:\AAA_My_learning\sys-dev-tools> git log --all --oneline
b1b5c4a (refs/stash) WIP on main: 4ee3acd 修改了main.tex文件
ecc537a index on main: 4ee3acd 修改了main.tex文件
4ee3acd (HEAD -> main) 修改了main.tex文件
a05c18e (origin/main) 修改了main.tex文件
e6bae74 上传机密文件
6966665 上传模板0
53ed75e feat: add first latex file
5ea26a7 Initial commit
```

图 13: stash-log

```
PS D:\AAA_My_learning\sys-dev-tools> git stash pop
On branch main
Your branch and 'origin/main' have diverged,
and have 2 and 1 different commits each, respectively.
and have 2 and 1 different commits each, respectively.
  (use "git pull" if you want to integrate the remote branch with yours)

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:   main.tex

Untracked files:
  (use "git add <file>..." to include in what will be committed)
        0/
        1/
        main.pdf
        model.pdf

no changes added to commit (use "git add" and/or "git commit -a")
Dropped refs/stash@{0} (b1b5c4abc16a084888a78566d6a2e1278394870c)
```

图 14: pop

3.9 实例九:为长命令设置别名

```
PS D:\AAA_My_learning\sys-dev-tools> git config --global alias.graph "log --all --graph --decorate --onelin
e"
PS D:\AAA_My_learning\sys-dev-tools> git graph  运行下配置好的别名命令
* 4ee3acd (HEAD -> main) 修改了main.tex文件
* e6bae74 上传机密文件
| * a05c18e (origin/main) 修改了main.tex文件
|/
* 6966665 上传模板0
* 53ed75e feat: add first latex file
* 5ea26a7 Initial commit
```

图 15: alias

3.10 实例十：全局忽略规则

已经在新建仓库时初始化好，忽略跟踪临时文件，可以看到github仓库没有临时文件的上传

图 16: ignore1

检查仓库状态，确定没有追踪不必要的临时文件

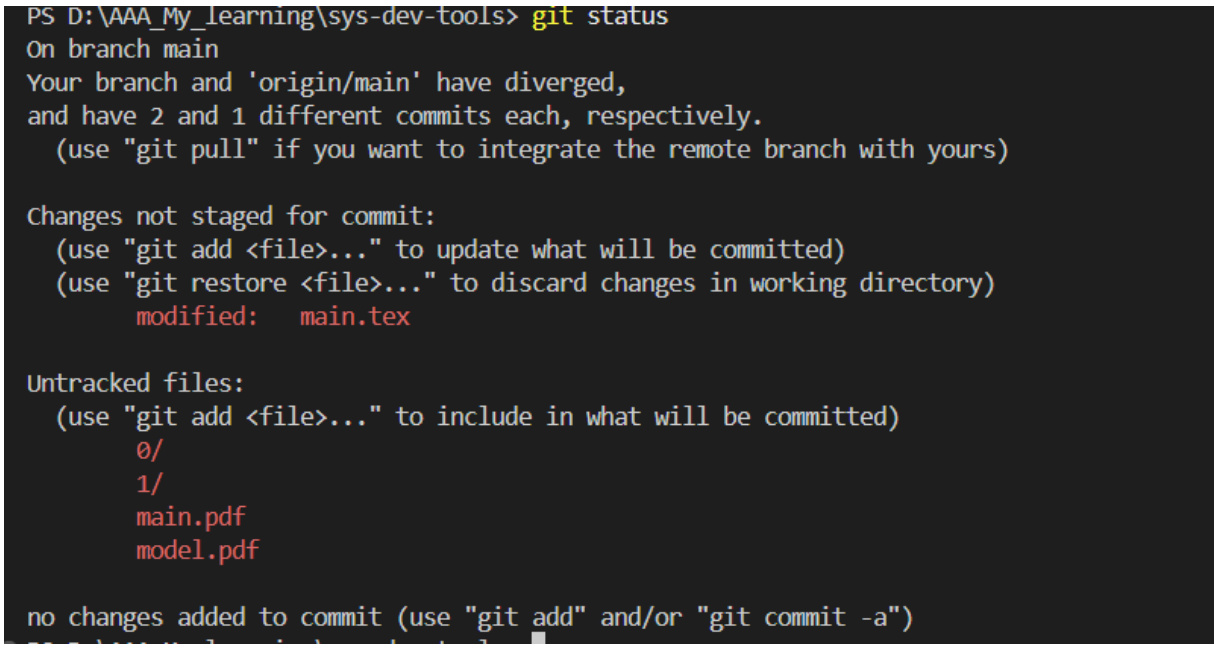

图 17: ignore2

3.11 实例十一：推送分支、合并分支

```
PS D:\AAA_My_learning\sys-dev-tools> git checkout -b myn
Switched to a new branch 'myn'
PS D:\AAA_My_learning\sys-dev-tools> git push
fatal: The current branch myn has no upstream branch.
To push the current branch and set the remote as upstream, use

    git push --set-upstream origin myn

To have this happen automatically for branches without a tracking
upstream, see 'push.autoSetupRemote' in 'git help config'.

PS D:\AAA_My_learning\sys-dev-tools> git push origin myn
Enumerating objects: 7, done.
Counting objects: 100% (7/7), done.
Delta compression using up to 16 threads
Compressing objects: 100% (5/5), done.
Writing objects: 100% (6/6), 2.29 KiB | 1.15 MiB/s, done.
Total 6 (delta 2), reused 2 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (2/2), completed with 1 local object.
remote:
remote: Create a pull request for 'myn' on GitHub by visiting:
remote:      https://github.com/1-qaz-2-wsx/sys-dev-tools/pull/new/myn
remote:
To https://github.com/1-qaz-2-wsx/sys-dev-tools
 * [new branch]      myn -> myn
PS D:\AAA_My_learning\sys-dev-tools> git branch
  main
* myn
```

图 18: branch1

```
PS D:\AAA_My_learning\sys-dev-tools> git checkout main
M       main.tex
Already on 'main'
Your branch and 'origin/main' have diverged,
and have 2 and 1 different commits each, respectively.
Already on 'main'
Your branch and 'origin/main' have diverged,
and have 2 and 1 different commits each, respectively.
  (use "git pull" if you want to integrate the remote branch with yours)
and have 2 and 1 different commits each, respectively.
  (use "git pull" if you want to integrate the remote branch with yours)
  (use "git pull" if you want to integrate the remote branch with yours)
PS D:\AAA_My_learning\sys-dev-tools> git commit -m "合并分支"
On branch main
Your branch and 'origin/main' have diverged,
and have 2 and 1 different commits each, respectively. 有改动的文件但没提交

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:   main.tex

Untracked files:
  (use "git add <file>..." to include in what will be committed)
        0/
        1/
        main.pdf
        model.pdf
```

图 19: branch2

```
PS D:\AAA_My_learning\sys-dev-tools> git add main.tex
PS D:\AAA_My_learning\sys-dev-tools> git add main.pdf
PS D:\AAA_My_learning\sys-dev-tools> git add model.pdf
PS D:\AAA_My_learning\sys-dev-tools> git commit -m "合并分支"
[main a606ef7] 合并分支
 3 files changed, 1 insertion(+), 1 deletion(-)
 create mode 100644 main.pdf
 create mode 100644 model.pdf
PS D:\AAA_My_learning\sys-dev-tools> git push origin myn
Everything up-to-date                                    合并成功
PS D:\AAA_My_learning\sys-dev-tools> gti branch
gti: The term 'gti' is not recognized as a name of a cmdlet, function, script file, or executable pr
ogram.
Check the spelling of the name, or if a path was included, verify that the path is correct and try a
gain.
PS D:\AAA_My_learning\sys-dev-tools> git branch
* main
  myn
```

图 20: branch3

3.12 实例十二：删除本地和远程分支

如果确定已经合并好分支并且不需要分分支时，可以对分支进行删除

```
PS D:\AAA_My_learning\sys-dev-tools> git branch
* main
  myn
PS D:\AAA_My_learning\sys-dev-tools> git branch -d myn   -d安全删除
Deleted branch myn (was 4ee3acd).
PS D:\AAA_My_learning\sys-dev-tools> git push origin --delete myn
To https://github.com/1-qaz-2-wsx/sys-dev-tools
 - [deleted]         myn
PS D:\AAA_My_learning\sys-dev-tools> git branch
* main
PS D:\AAA_My_learning\sys-dev-tools>
```

图 21: delete branch

3.13 实例十三：git diff查看工作区和暂存区间的差异

```
PS D:\AAA_My_learning\sys-dev-tools> git add 1
PS D:\AAA_My_learning\sys-dev-tools> git diff 1/rep1.tex
```

图 22: diff1

```
PS D:\AAA_My_learning\sys-dev-tools> git diff --cached
diff --git a/1/images/addSecret.png b/1/images/addSecret.png
new file mode 100644
index 0000000..d20952b
Binary files /dev/null and b/1/images/addSecret.png differ
diff --git a/1/images/blame.png b/1/images/blame.png
new file mode 100644
index 0000000..4fd0b3f
Binary files /dev/null and b/1/images/blame.png differ
diff --git a/1/images/branch1.png b/1/images/branch1.png
diff --git a/1/images/branch1.png b/1/images/branch1.png
new file mode 100644
index 0000000..2ce6ad5
Binary files /dev/null and b/1/images/branch1.png differ
diff --git a/1/images/branch2.png b/1/images/branch2.png
new file mode 100644
index 0000000..53e0bd6
Binary files /dev/null and b/1/images/branch2.png differ
diff --git a/1/images/branch3.png b/1/images/branch3.png
new file mode 100644
index 0000000..490e3a4
Binary files /dev/null and b/1/images/branch3.png differ
diff --git a/1/images/checkout.png b/1/images/checkout.png
new file mode 100644
index 0000000..ff1f885
new file mode 100644
index 0000000..ff1f885
Binary files /dev/null and b/1/images/checkout.png differ
```

图 23: diff2

3.14 实例十四：Latex插入图片

```
\begin{document}

\begin{titlepage}
    \centering
    \huge \textbf{《系统开发工具基础》实验报告}
    \vspace{5cm}
    \begin{figure}[ht]
    \centering
    \includegraphics[width=0.6\textwidth]{images/face.jpg}
    \end{figure}

    \Large
    \vspace{3cm}
```

图 24: insert graph

3.15 实例十五：Latex解决图片排版乱跑

图 25: force1

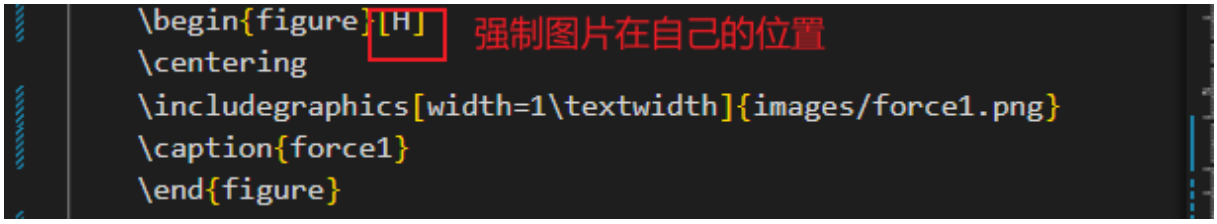

图 26: force2

3.16 实例十六：添加目录

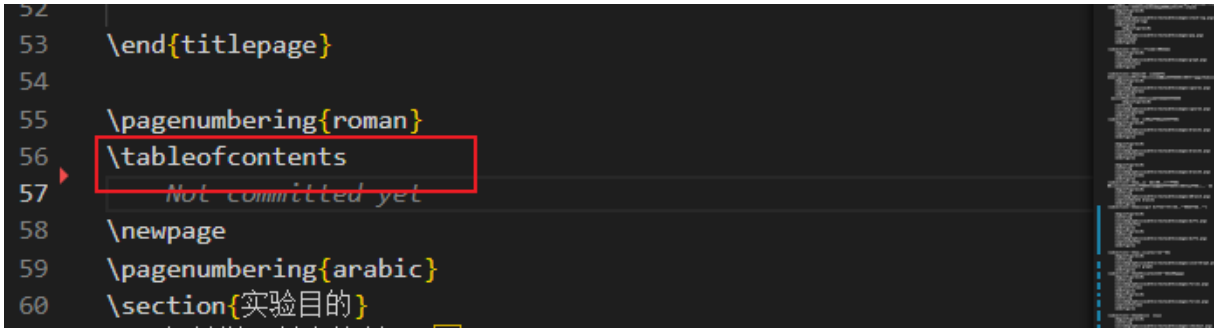

图 27: tableofcontents

3.17 实例十七：添加页眉页脚

```
\pagestyle{fancy}
% 设置页眉页脚风格为 fancyhdr 提供的“fancy”模式
\fancyhf{}
% 清空默认的页眉页脚
\fancyhead[C]{系统开发工具基础 实验报告}
% 页眉（head），C 表示居中，内容是标题
\fancyfoot[C]{\thepage}
% 页脚（foot），C 表示居中，内容是页码 \thepage
```

图 28: headFoot

3.18 实例十八：插入代码块

```
#include <iostream>
using namespace std;

int main()
{
    cout<<"hello"<<endl;
    return 0;
}
```

代码如图29

图 29: code

3.19 实例十九：插入链接

如图30

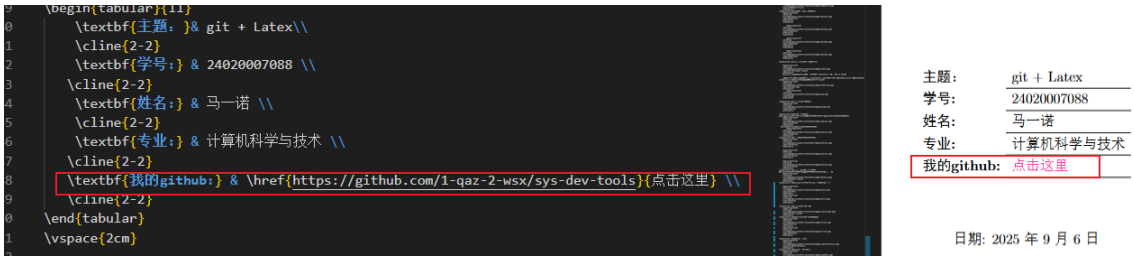

图 30: link

3.20 实例二十：插入公式

$$e = mc^2 \tag{1}$$
$$\pi = \frac{c}{d} \tag{2}$$
$$\frac{d}{dx}\int_0^{\infty} f(s)ds = f(s) \tag{3}$$
$$f(x) = \sum_i 0^{\infty}\frac{f^{(i)}(0)}{i!}x^i \tag{4}$$
$$x = \sqrt{\frac{x_i}{z}y} \tag{5}$$

图 31: eqnarray

4 实验结果

4.1 git

了解学习了git的基本操作，创建了自己的远程github仓库并与本地仓库关联。
了解学习了latex的基本操作，创建了实验报告模板。如图32和33

图 32: model1

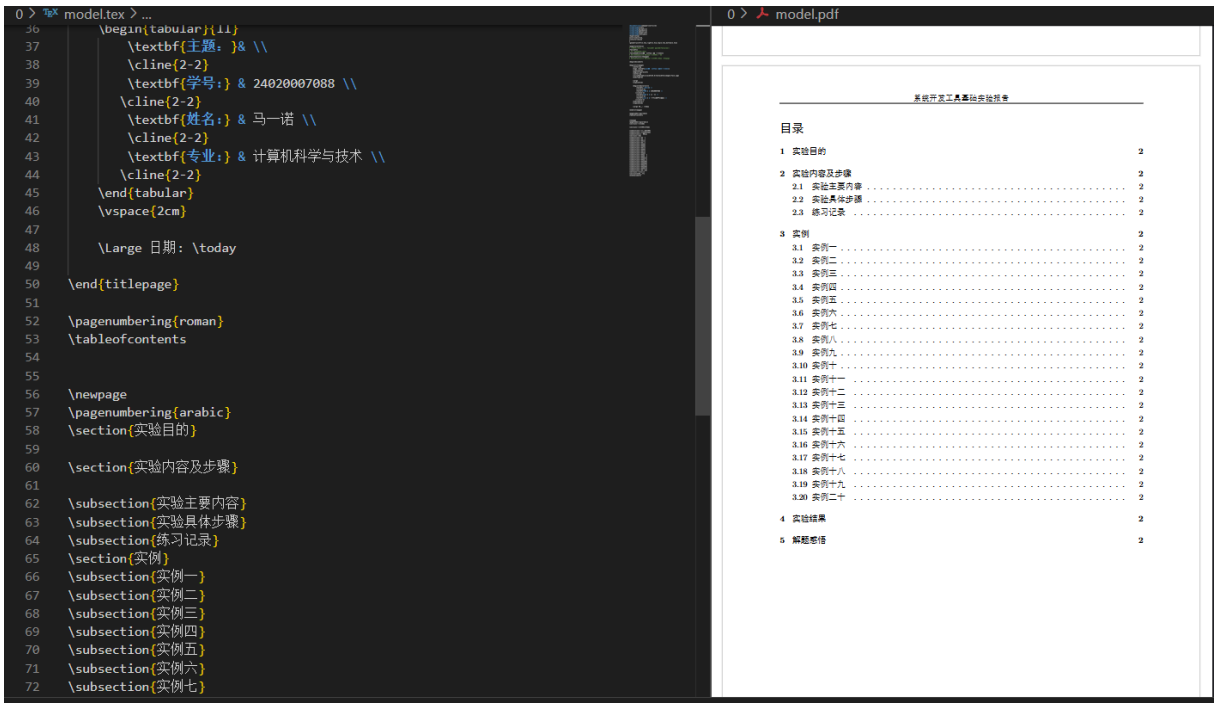

图 33: model2

5 解题感悟

通过使用 Git 进行版本管理和 LaTeX 进行文档排版，我更深入理解了如何高效地进行团队协作与项目管理，同时提高了文档的排版质量与自动化处理能力。