

Git & GitHub First Task Submission

This is my first task in **Git & GitHub** as part of the hands-on activity for debugging and restoring code.

In this project, I created and managed a simple Python calculator, intentionally introduced a bug, and then used Git to debug and restore a clean version of the code while preserving ongoing work.

" Explore the complete repository and the final version of the Python file here:

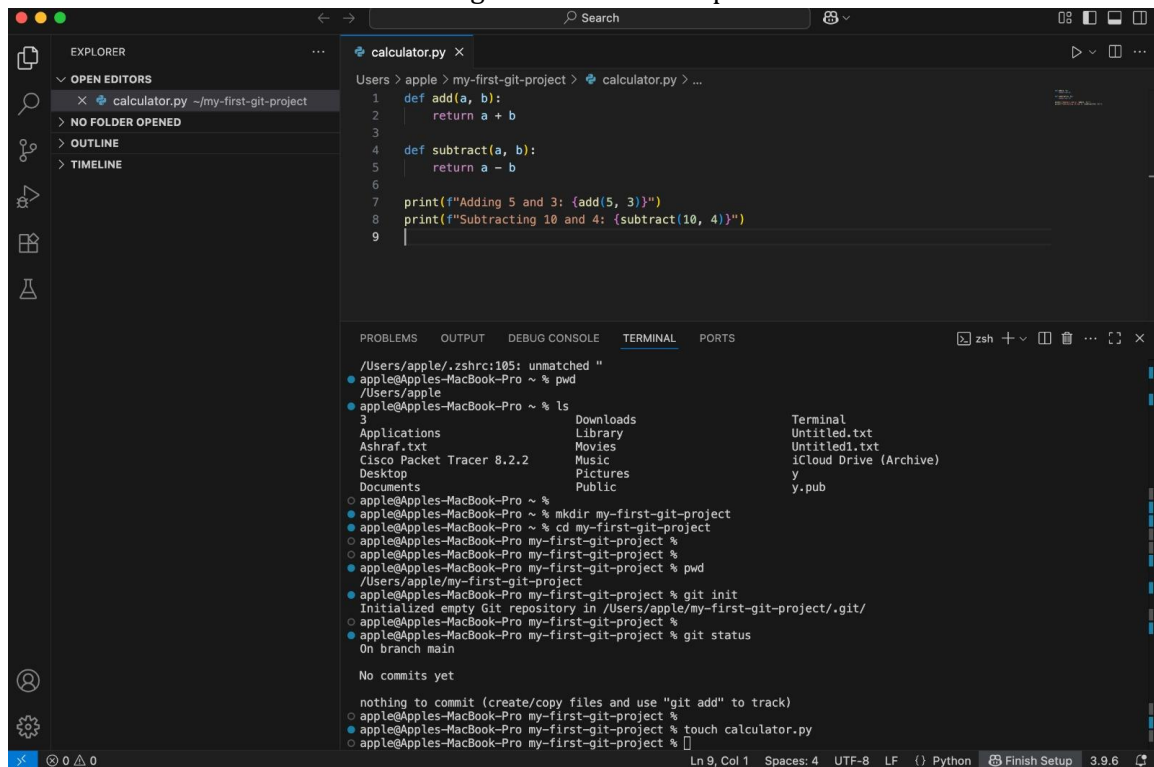
[My First Git Project](#)"

1. Git Commands Used (in order)

```
git init
git add calculator.py
git commit -m "Initial commit"
git log
git diff
git stash
git revert <commit-id>
git stash pop
git push origin main
```

2. Screenshots of Key Commands

Insert the screenshots of the following commands at the placeholders below:



The screenshot displays the Visual Studio Code interface. The Explorer panel on the left shows the project structure with 'calculator.py' selected. The Editor panel shows the content of 'calculator.py', which includes two functions: 'add(a, b)' and 'subtract(a, b)', followed by test calls. The Terminal panel at the bottom shows the execution of the following commands:


```
/Users/apple/.zshrc:105: unmatched "
apple@Apples-MacBook-Pro ~ % pwd
/Users/apple
apple@Apples-MacBook-Pro ~ % ls
3
Applications
Ashraf.txt
Cisco Packet Tracer 8.2.2
Desktop
Documents
Downloads
Library
Movies
Music
Pictures
Public
Terminal
Untitled.txt
Untitled1.txt
iCloud Drive (Archive)
y
y.pub
apple@Apples-MacBook-Pro ~ %
apple@Apples-MacBook-Pro ~ % mkdir my-first-git-project
apple@Apples-MacBook-Pro ~ % cd my-first-git-project
apple@Apples-MacBook-Pro my-first-git-project %
apple@Apples-MacBook-Pro my-first-git-project %
apple@Apples-MacBook-Pro my-first-git-project % pwd
/Users/apple/my-first-git-project
apple@Apples-MacBook-Pro my-first-git-project % git init
Initialized empty Git repository in /Users/apple/my-first-git-project/.git/
apple@Apples-MacBook-Pro my-first-git-project %
apple@Apples-MacBook-Pro my-first-git-project % git status
On branch main

No commits yet

nothing to commit (create/copy files and use "git add" to track)
apple@Apples-MacBook-Pro my-first-git-project %
apple@Apples-MacBook-Pro my-first-git-project % touch calculator.py
apple@Apples-MacBook-Pro my-first-git-project %
```

▶ ▼ □ ...

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

Ln 9, Col 1 Spaces: 4 UTF-8 LF {} Python  Finish Setup 3.9.6 

▶ ✓ □ ...

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

Ln 13, Col 1 Spaces: 4 UTF-8 LF {} Python Finish Setup 3.9.6

```
calculator.py ×
Users > apple > my-first-git-project > calculator.py > ...

7 def multiply(a, b):
8     return a * b
9
10 def divide(a, b):
11     if b == 0:
12         return "Cannot divide by zero!"
13     return a / b
14
15 print(f"Adding 5 and 3: {add(5, 3)}")
16 print(f"Subtracting 10 and 4: {subtract(10, 4)}")
17 print(f"Multiplying 6 and 7: {multiply(6, 7)}")
18 print(f"Dividing 20 by 5: {divide(20, 5)}")
19

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
On branch main
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
    modified:   calculator.py

● apple@Apples-MacBook-Pro my-first-git-project % git commit -m " adding multiplying function "
[main a75da4c] adding multiplying function
 1 file changed, 5 insertions(+)
● apple@Apples-MacBook-Pro my-first-git-project % git add .
● apple@Apples-MacBook-Pro my-first-git-project % git commit -m " introducing BUG "
[main ac4da34] introducing BUG
 1 file changed, 1 insertion(+), 1 deletion(-)
○ apple@Apples-MacBook-Pro my-first-git-project %
● apple@Apples-MacBook-Pro my-first-git-project % git add .
● apple@Apples-MacBook-Pro my-first-git-project % git commit -m " Add divide function with zero check"
[main 91295a8] Add divide function with zero check
 1 file changed, 7 insertions(+)
○ apple@Apples-MacBook-Pro my-first-git-project %
○ apple@Apples-MacBook-Pro my-first-git-project %
● apple@Apples-MacBook-Pro my-first-git-project % git log --one line
fatal: ambiguous argument 'line': unknown revision or path not in the working tree.
Use '-' to separate paths from revisions, like this:
'git <command> [<revision>...] -- [<file>...]'
● apple@Apples-MacBook-Pro my-first-git-project % git log --oneline
91295a8 (HEAD -> main) Add divide function with zero check
ac4da34 introducing BUG
a75da4c adding multiplying function
60eb7a7 Add basic calculator functions (add, subtract)
○ apple@Apples-MacBook-Pro my-first-git-project %

Ln 19, Col 1 Spaces: 4 UTF-8 LF {} Python Finish Setup 3.9.6
```

```
calculator.py ×
Users > apple > my-first-git-project > calculator.py > ...

8     return a * b
9
10 def divide(a, b):
11     if b == 0:
12         return "Cannot divide by zero!"
13     return a / b
14
15 print(f"Adding 5 and 3: {add(5, 3)}")
16 print(f"Subtracting 10 and 4: {subtract(10, 4)}")
17 print(f"Multiplying 6 and 7: {multiply(6, 7)}")
18 print(f"Dividing 20 by 5: {divide(20, 5)}")
19
20 print("Experimental feature: Fibonacci sequence next")
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```

```

return a * b
● apple@Apples-MacBook-Pro my-first-git-project % git stash push -m " experimental feature"
Saved working directory and index state On main: experimental feature
● apple@Apples-MacBook-Pro my-first-git-project % git status
On branch main
nothing to commit, working tree clean
● apple@Apples-MacBook-Pro my-first-git-project % git stash list
stash@{0}: On main: experimental feature
○ apple@Apples-MacBook-Pro my-first-git-project %

```

calculator.py ×

Users > apple > my-first-git-project > calculator.py > ...

```

1  def add(a, b):
2      return a + b
3
4  def subtract(a, b):
5      return a - b
6
7  def multiply(a, b):
8      return a * b
9
10 def divide(a, b):
11     if b == 0:
12         return "Cannot divide by zero!"
13     return a / b
14
15 print(f"Adding 5 and 3: {add(5, 3)}")
16 print(f"Subtracting 10 and 4: {subtract(10, 4)}")
17 print(f"Multiplying 6 and 7: {multiply(6, 7)}")
18 print(f"Dividing 20 by 5: {divide(20, 5)}")
19

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```

def multiply(a, b):
    return a * b
apple@Apples-MacBook-Pro my-first-git-project % git stash push -m " experimental feature"
Saved working directory and index state On main: experimental feature
apple@Apples-MacBook-Pro my-first-git-project % git status
On branch main
nothing to commit, working tree clean
apple@Apples-MacBook-Pro my-first-git-project % git stash list
stash@{0}: On main: experimental feature
● apple@Apples-MacBook-Pro my-first-git-project % git revert ac4da34
Auto-merging calculator.py
[main 9dfeld1] Revert " introducing BUG"
1 file changed, 1 insertion(+), 1 deletion(-)
● apple@Apples-MacBook-Pro my-first-git-project % python calculator.py
zsh: command not found: python
● apple@Apples-MacBook-Pro my-first-git-project % python3 calculator.py
Adding 5 and 3: 8
Subtracting 10 and 4: 6
Multiplying 6 and 7: 42
Dividing 20 by 5: 4.0
○ apple@Apples-MacBook-Pro my-first-git-project %

```

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```

● apple@Apples-MacBook-Pro my-first-git-project % git log --oneline
9dfe1d1 (HEAD -> main) Revert " introducing BUG"
91295a8 Add divide function with zero check
ac4da34 introducing BUG
a75da4c adding multiplying function
60eb7a7 Add basic calculator functions (add, subtract)
● apple@Apples-MacBook-Pro my-first-git-project % git status
On branch main
nothing to commit, working tree clean
● apple@Apples-MacBook-Pro my-first-git-project % git stash pop
Auto-merging calculator.py
On branch main
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:   calculator.py

no changes added to commit (use "git add" and/or "git commit -a")
Dropped refs/stash@{0} (58d58735abdd186b07d76340e16d19cdd9f9df58)
○ apple@Apples-MacBook-Pro my-first-git-project %

```

calculator.py ×

Users > apple > my-first-git-project > calculator.py > ...

```

7  def multiply(a, b):
8      return a * b
9
10 def divide(a, b):
11     if b == 0:
12         return "Cannot divide by zero!"
13     return a / b
14
15 print(f"Adding 5 and 3: {add(5, 3)}")
16 print(f"Subtracting 10 and 4: {subtract(10, 4)}")
17 print(f"Multiplying 6 and 7: {multiply(6, 7)}")
18 print(f"Dividing 20 by 5: {divide(20, 5)}")
19
20 print("Experimental feature: Fibonacci sequence next")
21

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

Steps Overview:

1. Created `my-first-git-project` folder and initialized Git with a simple `calculator.py` file.
2. Staged and committed the initial calculator functions and verified using `git log`.
3. Added a multiply function and committed the changes.
4. Added a divide function with zero check and confirmed updates in commit history.
5. Introduced a bug in the subtract function and used `git diff` to identify the changes.
6. Stashed uncommitted work using `git stash` for safe temporary storage.
7. Reverted the buggy commit using `git revert` and verified functionality by running the Python file.
8. Popped the stashed changes back into the working directory using `git stash pop`.
9. Pushed all final changes to the remote repository.

3. Final calculator.py Code

```
def add(a, b):  
    return a + b  
  
def subtract(a, b):  
    return a - b  
  
def multiply(a, b):  
    return a * b  
  
def divide(a, b):  
    if b == 0:  
        return "Cannot divide by zero!"  
    return a / b  
  
print(f"Adding 5 and 3: {add(5, 3)}")  
print(f"Subtracting 10 and 4: {subtract(10, 4)}")  
print(f"Multiplying 6 and 7: {multiply(6, 7)}")  
print(f"Dividing 20 by 5: {divide(20, 5)}")  
  
print("Experimental feature: Fibonacci sequence next")
```

4. Written Explanations

How did git log and git diff help identify the erroneous commit?

Using git log, I could review the commit history and locate the commit where the bug was introduced. git diff allowed me to compare the changes in that commit to previous ones and identify the exact line of code causing the error.

Why was git stash necessary in this scenario?

git stash allowed me to temporarily save uncommitted work. This made it possible to revert the repository to a clean state without losing ongoing changes.

Why did I choose git revert over git reset --hard?

I used git revert because it safely undoes the changes by creating a new commit, preserving the repository's history. In contrast, git reset --hard rewrites history and can cause problems when collaborating with others. Reset is useful in local-only scenarios, while revert is safer for shared repositories.

Difference between git stash pop and git stash apply:

git stash pop applies the stashed changes and removes them from the stash list. git stash apply applies the stashed changes but keeps them in the stash list for potential reuse.

Thanks for reviewing my work!

Omar Ashraf