CS445 - Collaborative Git

Practice with all the local repository commands from the slides:
1. `git init`

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL

Windows PowerShell
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Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Duyen's Github\duyen.tran_CS445.github.io> git init
Reinitialized existing Git repository in C:/Duyen's Github/duyen.tran_CS445.github.io/.git/
PS C:\Duyen's Github\duyen.tran_CS445.github.io>
```

2. `git status`

```
DUYEN.TRAN_CS445.GITH...
  myFiles                 ●
     .gitignore          U
  JS  test1.js
  JS  test2.js           U
```

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL

PS C:\Duyen's Github\duyen.tran_CS445.github.io> git status
On branch main

No commits yet

Untracked files:
  (use "git add <file>..." to include in what will be committed)
        myFiles/
        test2.js

nothing added to commit but untracked files present (use "git add" to track)
PS C:\Duyen's Github\duyen.tran_CS445.github.io>
```

3. `git diff`

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL

PS C:\Duyen's Github\duyen.tran_CS445.github.io> git diff
diff --git a/test2.js b/test2.js
index c0ae5bb..c55f212 100644
--- a/test2.js
+++ b/test2.js
@@ -1,3 +1,7 @@
 function sum( a, b) {
     return a + b;
+}
+
+function mult(a, b) {
+    return a * b;
 }
\ No newline at end of file
PS C:\Duyen's Github\duyen.tran_CS445.github.io>
```

4. Create `.gitignore` file, and notice how it works

5. `git add`

6. `git commit`

```
   (use "git branch --unset-upstream" to fixup)

Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        new file:   myFiles/.gitignore
        new file:   myFiles/test2.js
        deleted:    test2.js

PS C:\Duyen's Github\duyen.tran_CS445.github.io> git commit -m "first time committed"
[main b212bd7] first time committed
 3 files changed, 8 insertions(+), 3 deletions(-)
 create mode 100644 myFiles/.gitignore
 create mode 100644 myFiles/test2.js
 delete mode 100644 test2.js
PS C:\Duyen's Github\duyen.tran_CS445.github.io> git status
On branch main
Your branch is based on 'origin/main', but the upstream is gone.
  (use "git branch --unset-upstream" to fixup)

nothing to commit, working tree clean
PS C:\Duyen's Github\duyen.tran_CS445.github.io>
```

7. `git commit –amend` (updating the last commit)

```
PS C:\Duyen's Github\duyen.tran_CS445.github.io> git log --oneline
93c4221 (HEAD -> main) added one more console log statement
ba4000e log
25989e0 commit test2.js
PS C:\Duyen's Github\duyen.tran_CS445.github.io> git commit --amend -m "removed one console log statement out of test2.js" --allow-
empty
[main e17e5bd] removed one console log statement out of test2.js
 Date: Tue Nov 1 17:18:31 2022 -0500
PS C:\Duyen's Github\duyen.tran_CS445.github.io>  git log --oneline
e17e5bd (HEAD -> main) removed one console log statement out of test2.js
ba4000e log
25989e0 commit test2.js
PS C:\Duyen's Github\duyen.tran_CS445.github.io>
```

8. `git log`

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL

PS C:\Duyen's Github\duyen.tran_CS445.github.io> git log
commit b212bd7404d0e83a94159da0013886764ad6a8ea (HEAD -> main)
Author: duyentth <duyen.tran@miu.edu>
Date:   Tue Nov 1 17:02:44 2022 -0500

        first time committed

commit 25989e086ce83c93ea12d9464cac96603f7dc0cd
Author: duyentth <duyen.tran@miu.edu>
Date:   Mon Oct 31 22:44:43 2022 -0500

        commit test2.js
PS C:\Duyen's Github\duyen.tran_CS445.github.io>
```

10. `git tag`

```
PS C:\Duyen's Github\duyen.tran_CS445.github.io> git tag -a "v1" -m "version 1"  ba4000e
PS C:\Duyen's Github\duyen.tran_CS445.github.io> git tag
v1
PS C:\Duyen's Github\duyen.tran_CS445.github.io> git log --oneline
e17e5bd (HEAD -> main) removed one console log statement out of test2.js
ba4000e (tag: v1) log
25989e0 commit test2.js
PS C:\Duyen's Github\duyen.tran_CS445.github.io> []
```

11. `git branch`

```
PS C:\Duyen's Github\duyen.tran_CS445.github.io\myFiles> git branch
* main
PS C:\Duyen's Github\duyen.tran_CS445.github.io\myFiles> git branch "salary"
PS C:\Duyen's Github\duyen.tran_CS445.github.io\myFiles> git branch
* main
  salary
PS C:\Duyen's Github\duyen.tran_CS445.github.io\myFiles> []
```

12. `git checkout`

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL

PS C:\Duyen's Github\duyen.tran_CS445.github.io\myFiles> git checkout salary
Switched to branch 'salary'
A       myFiles/test 3.js
PS C:\Duyen's Github\duyen.tran_CS445.github.io\myFiles> []
```

13. `git merge`

```
PS C:\Duyen's Github\duyen.tran_CS445.github.io> git merge salary
Updating e17e5bd..07a6d93
Fast-forward
 myFiles/test 3.js | 2 ++
 1 file changed, 2 insertions(+)
 create mode 100644 myFiles/test 3.js
PS C:\Duyen's Github\duyen.tran_CS445.github.io> git log --oneline
07a6d93 (HEAD -> main, salary) committed test3.js onto salary branch
e17e5bd removed one console log statement out of test2.js
ba4000e (tag: v1) log
25989e0 commit test2.js
PS C:\Duyen's Github\duyen.tran_CS445.github.io> []
```

Create a conflict and solve the conflict

```
$ test1.js
1    alert("Hi");
     Accept Current Change | Accept Incoming Change | Accept Both Changes | Compare Changes
2    <<<<<<< HEAD (Current Change)       Merge conflict marker encountered.
3    console.log("abc");
4    =======        Merge conflict marker encountered.
5    console.log("Hello...");
6    >>>>>>> salary (Incoming Change)     Merge conflict marker encountered.
7
```

14. Undo changes from a certain commit `git revert`
This command line "git revert head" => the file test1.js will
be deleted

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL

 1 file changed, 1 insertion(+)
 create mode 100644 test1.js
 ~\Desktop\CS445-Lab\exercises      master    git status
On branch master
nothing to commit, working tree clean
 ~\Desktop\CS445-Lab\exercises      master    git log
commit 7a6f3aecaaffc69db3b034513c1105bc05c4d3d7 (HEAD -> master)
Author: duyentth <duyen.tran@miu.edu>
Date:   Wed Nov 2 13:06:40 2022 -0500

    Added test1.js on master first time
 ~\Desktop\CS445-Lab\exercises      master    git revert head
[master 7ac7271] Revert "Added test1.js on master first time"
 1 file changed, 1 deletion(-)
 delete mode 100644 test1.js
 ~\Desktop\CS445-Lab\exercises      master    git log --oneline
7ac7271 (HEAD -> master) Revert "Added test1.js on master first time"
7a6f3ae Added test1.js on master first time
 ~\Desktop\CS445-Lab\exercises      master    git status
On branch master
nothing to commit, working tree clean
 ~\Desktop\CS445-Lab\exercises      master    []
                                        Ln 1, Col 31    Spaces: 4    UTF-8    C
```
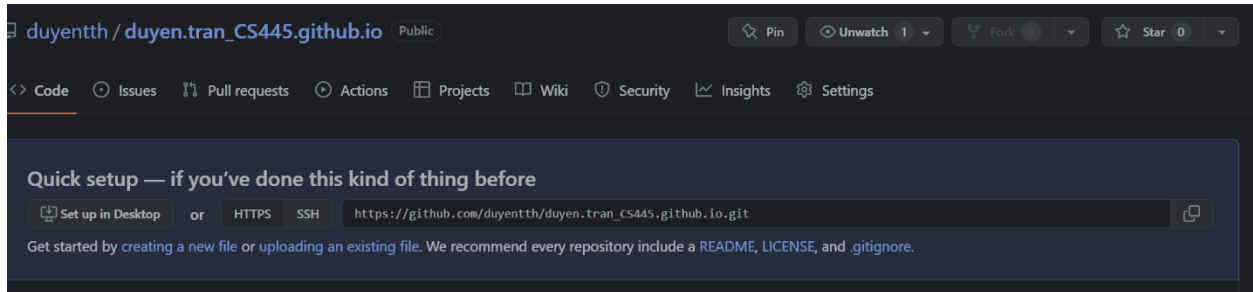
Revert with hash

```
~\Desktop\CS445-Lab\exercises  master  git log --oneline
f3473d4 (HEAD -> master) added test3.js
f329174 added test2.js on master branch
7ac7271 Revert "Added test1.js on master first time"
7a6f3ae Added test1.js on master first time
~\Desktop\CS445-Lab\exercises  master  git revert f329174
[master ef066f4] Revert "added test2.js on master branch"
 1 file changed, 1 deletion(-)
 delete mode 100644 test2.js
~\Desktop\CS445-Lab\exercises  master  git log --oneline
ef066f4 (HEAD -> master) Revert "added test2.js on master branch"
f3473d4 added test3.js
f329174 added test2.js on master branch
7ac7271 Revert "Added test1.js on master first time"
7a6f3ae Added test1.js on master first time
~\Desktop\CS445-Lab\exercises  master  
```

15. Erase commits with `git reset`

```
~\Desktop\CS445-Lab\exercises  master  git log --oneline
ef066f4 (HEAD -> master) Revert "added test2.js on master branch"
f3473d4 added test3.js
f329174 added test2.js on master branch
7ac7271 Revert "Added test1.js on master first time"
7a6f3ae Added test1.js on master first time
~\Desktop\CS445-Lab\exercises  master  git reset f329174
Unstaged changes after reset:
D       test2.js
~\Desktop\CS445-Lab\exercises  master  ?1 -1  git status
On branch master
Changes not staged for commit:
  (use "git add/rm <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
        deleted:    test2.js

Untracked files:
  (use "git add <file>..." to include in what will be committed)
        test3.js

no changes added to commit (use "git add" and/or "git commit -a")
~\Desktop\CS445-Lab\exercises  master  ?1 -1  git add .
```
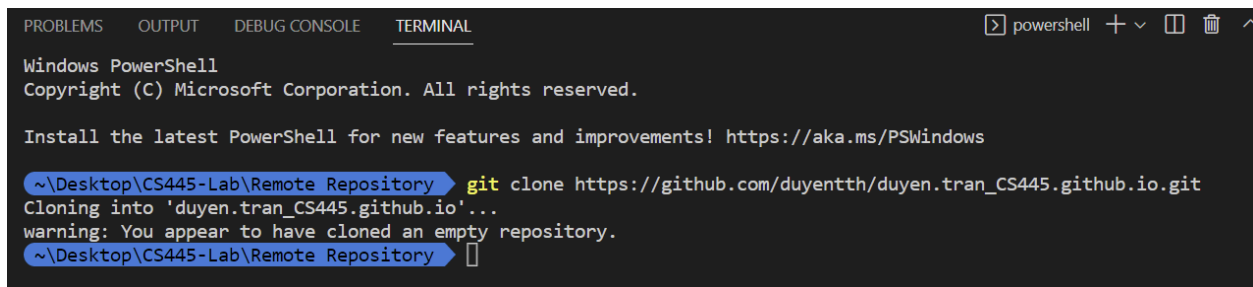
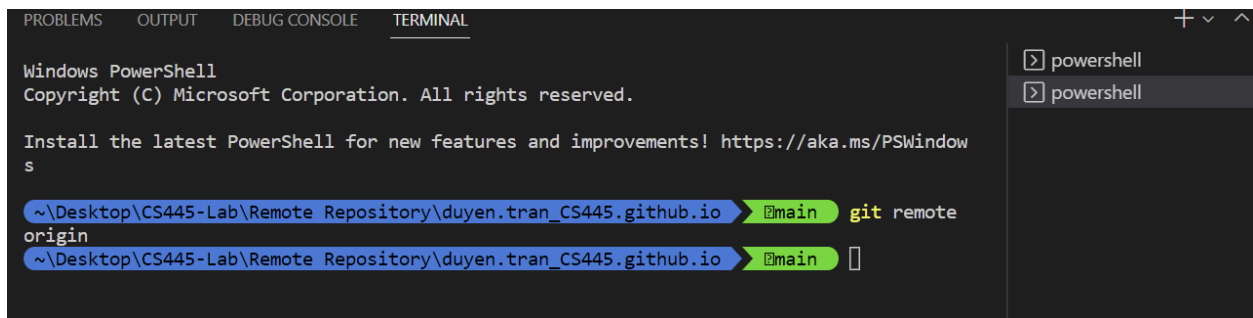## Practice with all the remote repository commands from the slides:
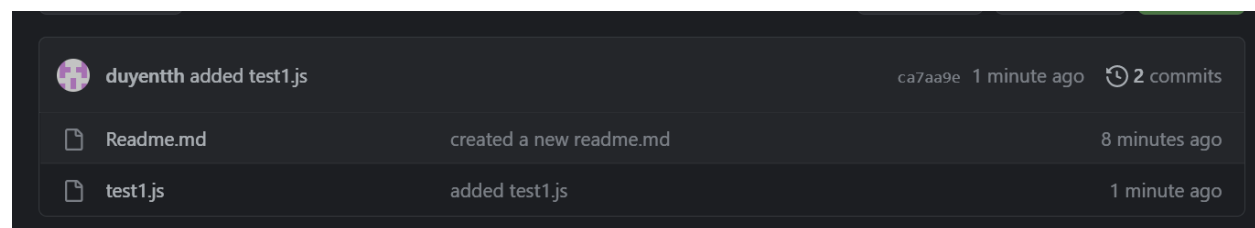1. Create a remote repository

2. `git clone`

3. `git remote`

4. `git push`

Push test1.js into remote repository from local respository

```
nothing to commit, working tree clean
~\Desktop\CS445-Lab\Remote Repository\duyen.tran_CS445.github.io     main   git push origin main
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 16 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 303 bytes | 303.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/duyentth/duyen.tran_CS445.github.io.git
   3f427bb..ca7aa9e  main -> main
~\Desktop\CS445-Lab\Remote Repository\duyen.tran_CS445.github.io     main
```

duyentth added test1.js		ca7aa9e 1 minute ago	2 commits
Readme.md	created a new readme.md		8 minutes ago
test1.js	added test1.js		1 minute ago

5. `git fetch`

```
PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL                                    powershell  + ∨

~\Desktop\CS445-Lab\Remote Repository\duyen.tran_CS445.github.io     main   git remote
origin
~\Desktop\CS445-Lab\Remote Repository\duyen.tran_CS445.github.io     main   git fetch origin main
remote: Enumerating objects: 5, done.
remote: Counting objects: 100% (5/5), done.
remote: Compressing objects: 100% (3/3), done.
remote: Total 3 (delta 1), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (3/3), 694 bytes | 38.00 KiB/s, done.
From https://github.com/duyentth/duyen.tran_CS445.github.io
 * branch            main        -> FETCH_HEAD
   94856ac..08dc989  main        -> origin/main
~\Desktop\CS445-Lab\Remote Repository\duyen.tran_CS445.github.io     main   git merge origin/main
Updating 94856ac..08dc989
Fast-forward
 Readme.md | 2 +-
 1 file changed, 1 insertion(+), 1 deletion(-)
~\Desktop\CS445-Lab\Remote Repository\duyen.tran_CS445.github.io     main
```
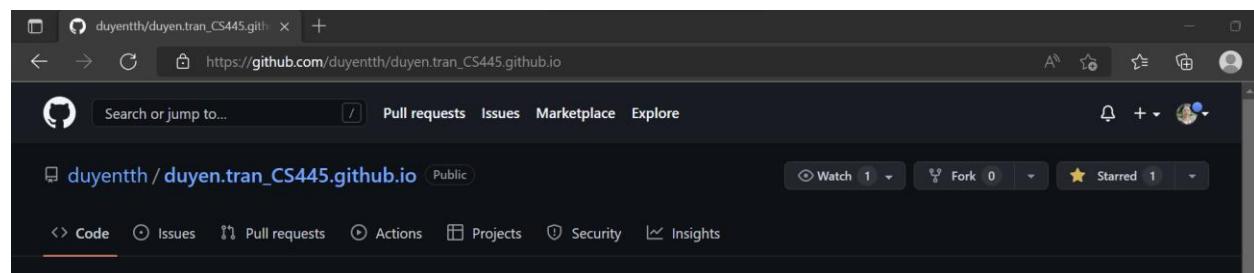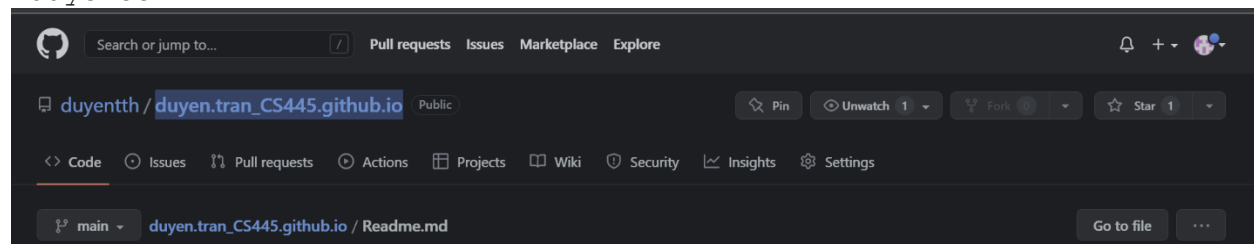
6. `git pull`

Practice with all the third party repositories commands from the slides:
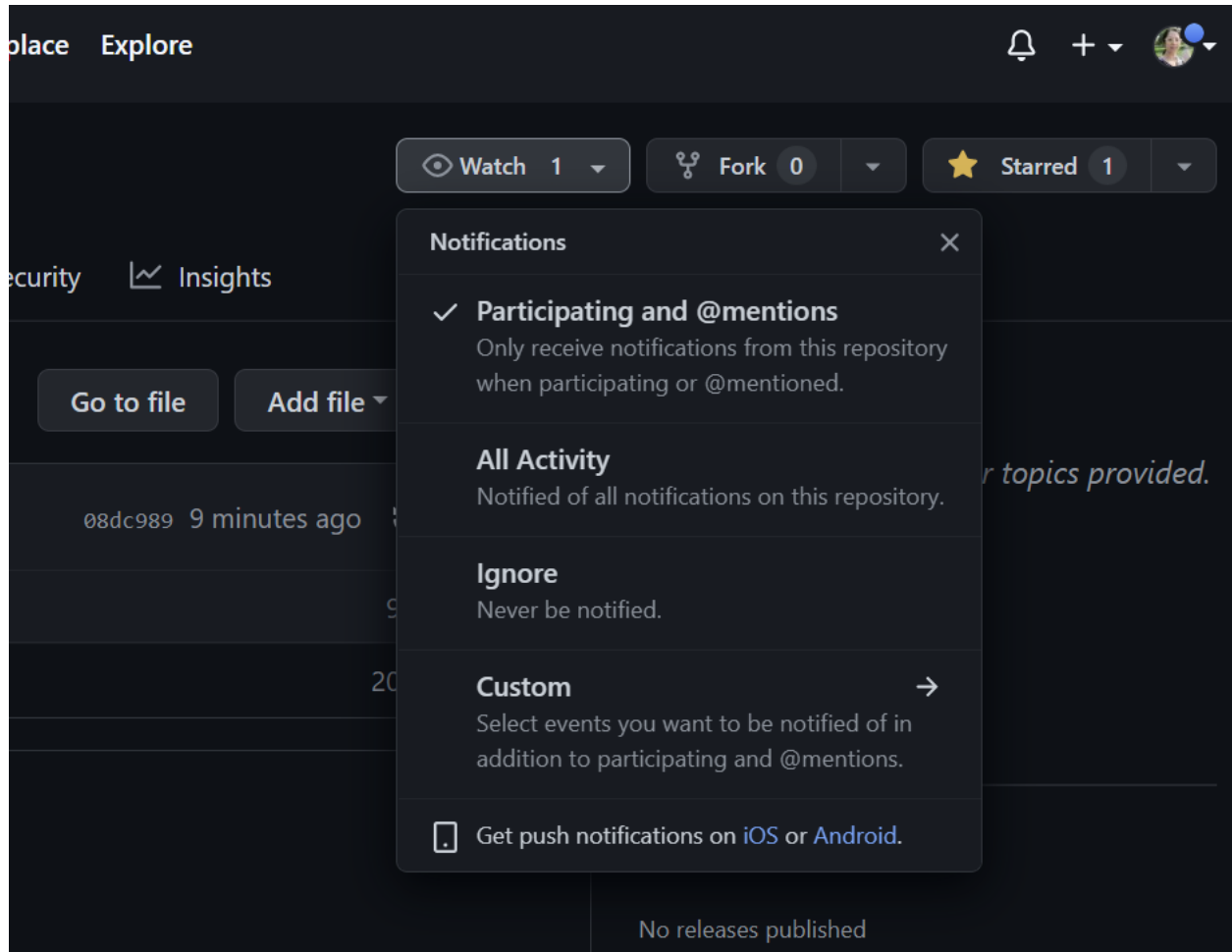
Assume we are working with the following upstream:
`https://github.com/bellaxing/cs445-labs`
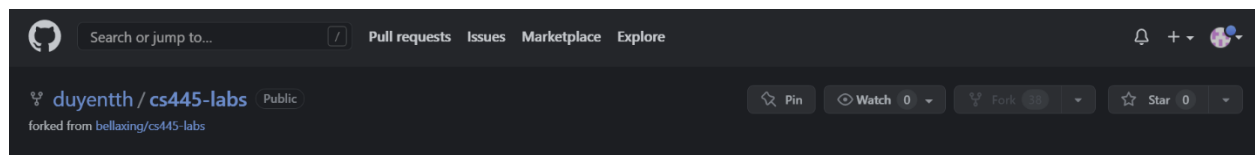
1. Star the repository

Login with user "duyen82" to star the repository that belong to user "duyentth"

2. Watch the repository for any changes

3. Fork the repository

4. Clone your forked repository into your local machine

5. Create a new topic branch using `studentId-studentName` format, For example: 610001-JohnSmith

Create a new branch named "100022-DuyenTran"

```
 ~\Desktop\CS445-Lab\Remote Repository\forked\cs445-labs  main  git branch 100022-DuyenTran
 ~\Desktop\CS445-Lab\Remote Repository\forked\cs445-labs  main  git branch
  100022-DuyenTran
* main
```

6. Checkout your new branch

```
* main
 ~\Desktop\CS445-Lab\Remote Repository\forked\cs445-labs  main  git checkout 100022-DuyenTran
Switched to branch '100022-DuyenTran'
```

7. Add a new file with your name, example: `hello.js`

```
 ~\Desktop\CS445-Lab\Remote Repository\forked\cs445-labs  100022-DuyenTran  git status
On branch 100022-DuyenTran
Untracked files:
  (use "git add <file>..." to include in what will be committed)
        hello.js

nothing added to commit but untracked files present (use "git add" to track)
 ~\Desktop\CS445-Lab\Remote Repository\forked\cs445-labs  100022-DuyenTran  ?1  git add .
 ~\Desktop\CS445-Lab\Remote Repository\forked\cs445-labs  100022-DuyenTran  +1  git status
On branch 100022-DuyenTran
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        new file:   hello.js
```

8. Commit the changes

```
~\Desktop\CS445-Lab\Remote Repository\forked\cs445-labs  ⬤100022-DuyenTran ⬤ +1  git commit -m "commit hello.js"
[100022-DuyenTran 4969465] commit hello.js
 1 file changed, 1 insertion(+)
 create mode 100644 hello.js
~\Desktop\CS445-Lab\Remote Repository\forked\cs445-labs  ⬤100022-DuyenTran  git status
On branch 100022-DuyenTran
nothing to commit, working tree clean
```

9. Merge your `studentId-studentName` branch with the main branch

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL

~\Desktop\CS445-Lab\Remote Repository\forked\cs445-labs  ⬤100022-DuyenTran  git checkout main
Switched to branch 'main'
Your branch is up to date with 'origin/main'.
~\Desktop\CS445-Lab\Remote Repository\forked\cs445-labs  ⬤main  git merge 100022-DuyenTran
Updating 1c32ce1..4969465
Fast-forward
 hello.js | 1 +
 1 file changed, 1 insertion(+)
 create mode 100644 hello.js
~\Desktop\CS445-Lab\Remote Repository\forked\cs445-labs  ⬤main  []
```
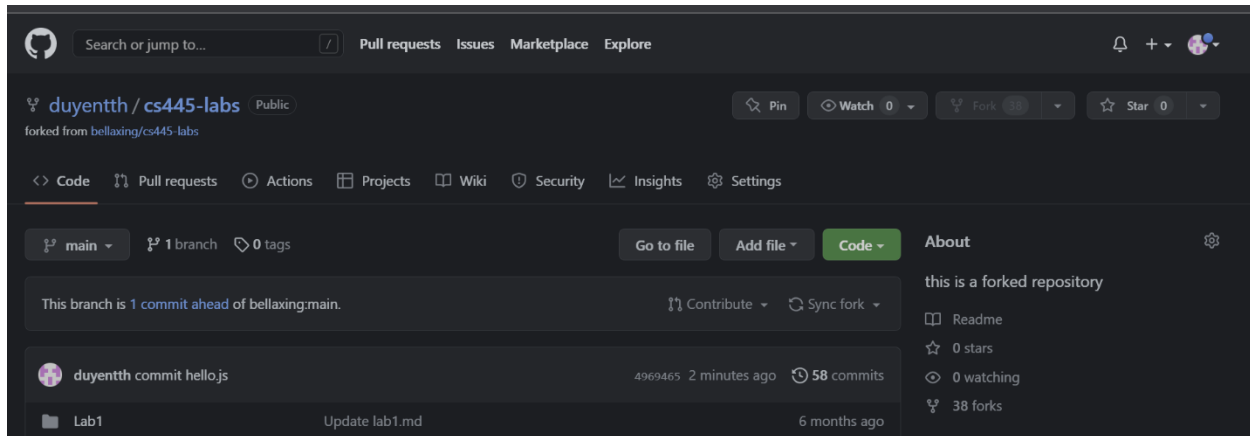
10.   Push your changes to the remote repo

```
 create mode 100644 hello.js
~\Desktop\CS445-Lab\Remote Repository\forked\cs445-labs  ⬤main  git remote
origin
~\Desktop\CS445-Lab\Remote Repository\forked\cs445-labs  ⬤main  git push origin
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 16 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 288 bytes | 288.00 KiB/s, done.
Total 3 (delta 1), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To https://github.com/duyentth/cs445-labs.git
   1c32ce1..4969465  main -> main
~\Desktop\CS445-Lab\Remote Repository\forked\cs445-labs  ⬤main  []
```

11.   Create a new Pull Request to the upstream repo