Compiled and Scrutinized by Mr. Shaan Shaik (Senior DevOps Lead)

### Words To The Students

Though we have taken utmost efforts to present you this book error free, but still it may contain some errors or mistakes. Students are encouraged to bring, if there are any mistakes or errors in this document to our notice. So that it may be rectified in the next edition of this document.

"Suppressing your doubts is Hindering your growth".

We urge you to work hard and make use of the facilities we are providing to you, because there is no substitute for hard work. We wish you all the best for your future.

"The grass isn't greener on the other side; the grass is greener where you water it."

You and your suggestions are valuable to us; Help us to serve you better. In case of any suggestions, grievance, or complaints, please feel free to write us your suggestions, grievance and feedback on the following

Dvs.training@gmail.com

### **Git and Git Hub Learning::**

We have many version control software's in market. They are as follows

- 1. CVS
- 2. PVCS
- 3. Subversion(svn)
- 4. Perforce
- 5. Microsoft Visual Sourcesafe
- 6. Mercurial
- 7. Teamsite
- 8. vault
- 9. Bitkeeper Used to manage the linux kernel before
- 10. Git Created by Linus author of linux

#### Different Phases as part of Git:

#### **Initialization:**

creating the empty repository for use

#### Clone:

Making a local full copy on your workstation

#### **Checking out:**

Locking a copy of one or more files for exclusive use

#### **Branching:**

Allowing a set of files to be developed concurrently and at different speeds for different reasons

### **Merging:**

Taking different branches or sets of changes and integrating into one set or branch

#### **Resolving:**

Taking conflicting changes from multiple people on the same file and manually addressing

#### Commit:

Taking changes from the local system and comiting them to the branch

#### **Push/Pull:**

Taking changes locally or remotely and merging into one or more branches

#### **Installation:**

yum install git -y

```
[root@ip-172-31-9-43 ~] # yum install git -y
Loaded plugins: extras_suggestions, langpacks, priorities, update-motd
192 packages excluded due to repository priority protections
Resolving Dependencies
--> Running transaction check
---> Package git.x86_64 0:2.23.3-1.amzn2.0.1 will be installed
--> Processing Dependency: perl-Git = 2.23.3-1.amzn2.0.1 for package: git-2.23.3-1.amzn2.0.1.x86_64
--> Processing Dependency: git-core-doc = 2.23.3-1.amzn2.0.1 for package: git-2.23.3-1.amzn2.0.1.x86_64
--> Processing Dependency: git-core = 2.23.3-1.amzn2.0.1 for package: git-2.23.3-1.amzn2.0.1.x86_64
--> Processing Dependency: emacs-filesystem >= 25.3 for package: git-2.23.3-1.amzn2.0.1.x86_64
--> Processing Dependency: perl(Term::ReadKey) for package: git-2.23.3-1.amzn2.0.1.x86_64
--> Processing Dependency: perl(Git::I18N) for package: git-2.23.3-1.amzn2.0.1.x86_64
```

[root@node2 ~]# git --version git version 2.7.5

```
[root@ip-172-31-9-43 mytest]# git --version
git version 2.23.3
[root@ip-172-31-9-43 mytest]#
```

#### Configuring User and email:

~/.gitconfig

```
[root@ip-172-31-9-43 mytest]# git config --global user.name "gituserid"
[root@ip-172-31-9-43 mytest]# git config --global user.email "shahan.aix@gmail.com"
[root@ip-172-31-9-43 mytest]# git config --list
user.name=gituserid
user.email=shahan.aix@gmail.com
[root@ip-172-31-9-43 mytest]# cat ~/.gitconfig
[user]
    name = gituserid
    email = shahan.aix@gmail.com
[root@ip-172-31-9-43 mytest]#
```

#### **Basic Configuration:**

/etc/gitconfig

We have three things to be considered here

- --local :-> Deals with the local repository
- --global:-> Deals with the global repository
- --system :-> Deals with the system respository

configure the editor for our git

#### Git Basics:

#### **Empty Repositories:**

Initializing empty folder as git repos with "git init." command as specified below. Before initilization we don't have anything called ".git" but post initialization we can see that ".git" folder got created.

```
[root@ip-172-31-9-43 tmp] # mkdir myrepo
[root@ip-172-31-9-43 tmp]# cd myrepo/
[root@ip-172-31-9-43 myrepo]# ls -al
total 0
drwxr-xr-x 2 root root 6 Jul 27 18:05 .
drwxrwxrwt 12 root root 328 Jul 27 18:05 ...
[root@ip-172-31-9-43 myrepo]# git init.
Initialized empty Git repository in /tmp/myrepo/.git/
[root@ip-172-31-9-43 myrepo]# ls -al
total 0
drwxr-xr-x 3 root root 18 Jul 27 18:05 .
drwxrwxrwt 12 root root 328 Jul 27 18:05 ...
drwxr-xr-x 7 root root 119 Jul 27 18:05 .git
[root@ip-172-31-9-43 myrepo]# ls -la .git/
total 12
drwxr-xr-x 7 root root 119 Jul 27 18:05 .
drwxr-xr-x 3 root root 18 Jul 27 18:05 ...
drwxr-xr-x 2 root root 6 Jul 27 18:05 branches
-rw-r--r-- 1 root root 92 Jul 27 18:05 config
-rw-r--r-- 1 root root 73 Jul 27 18:05 description
-rw-r--r-- 1 root root 23 Jul 27 18:05 HEAD
drwxr-xr-x 2 root root 301 Jul 27 18:05 hooks
drwxr-xr-x 2 root root 21 Jul 27 18:05 info
drwxr-xr-x 4 root root 30 Jul 27 18:05 objects
drwxr-xr-x 4 root root 31 Jul 27 18:05 refs
[root@ip-172-31-9-43 myrepo]#
```

### **Performing Operations:**

We are going to perform below operations as part of our git

```
[root@ip-172-31-9-43 myrepo] touch test{1..4}.txt
[root@ip-172-31-9-43 myrepo] touch test{1..4}.txt
[root@ip-172-31-9-43 myrepo] touch test{1..4}.txt
total 0
-rw-r--r-- 1 root root 0 Jul 27 18:09 test1.txt
-rw-r--r-- 1 root root 0 Jul 27 18:09 test2.txt
-rw-r--r-- 1 root root 0 Jul 27 18:09 test3.txt
-rw-r--r-- 1 root root 0 Jul 27 18:09 test4.txt
```

### **Git Ignore:**

Before adding the ".gitignore" file

Post adding ".gitignore" file lets see if our git add/recognizes the myscript.sh file or not.

From the above output we can say that soon after we add our "\*.sh" to our ".gitignore" file it's simply ignoring my files ending with "\*.sh" files in our case its "myscript.sh"

Normal copy operation

### Post copy operation

Main drawback is if dest ''localdest'' is having update it can't sync directly with my source ''localsrc''. I have to do it manually by executing commands.

**Cloning: Local Repositories:** 

Perform the below operation in the src folder as below



```
[root@ip-172-31-9-43 tmp]# mkdir src
[root@ip-172-31-9-43 tmp]# cd src/
[root@ip-172-31-9-43 src] # git init .
Initialized empty Git repository in /tmp/src/.git/
[root@ip-172-31-9-43 src # touch test{1..4}.txt
[root@ip-172-31-9-43 src] # ls -1
-rw-r--r-- 1 root root 0 Jul 27 18:29 test1.txt
-rw-r--r-- 1 root root 0 Jul 27 18:29 test3.txt
-rw-r--r-- 1 root root 0 Jul 27 18:29 test4.txt
[root@ip-172-31-9-43 src]# git status
On branch master
No commits yet
Untracked files:
  (use "git add <file>..." to include in what will be committed)
nothing added to commit but untracked files present (use "git add" to track)
[root@ip-172-31-9-43 src]# git add .
[root@ip-172-31-9-43 src]# git commit -m "testing git local clone"
[master (root-commit) 489f1zu] testing git local clone
4 files changed, 0 insertions(+), 0 deletions(-)
create mode 100644 test1.txt
create mode 100644 test2.txt
create mode 100644 test3.txt
create mode 100644 test4.txt
[root@ip-172-31-9-43 src]#
```

### Now let's clone the "src" to our destination folder i.e, "dest" as below

```
[root@ip-172-31-9-43 src]# ls -ld /tmp/dest
ls: cannot access /tmp/dest: No such file or directory
[root@ip-172-31-9-43 src]# git clone /tmp/src /tmp/dest
Cloning into '/tmp/dest'...
done.
[root@ip-172-31-9-43 src]# ls -ld /tmp/dest
drwxr-xr-x 3 root root 86 Jul 27 18:32 /tmp/dest
[root@ip-172-31-9-43 src]#
```

Let's do the modification in the destination folder and try to sync it from src as below.

```
[root@ip-172-31-9-43 dest]# pwd
/tmp/dest
[root@ip-172-31-9-43 dest]# touch mytest{1..4}
[root@ip-172-31-9-43 dest]# ls -1
-rw-r--r-- 1 root root 0 Jul 27 18:34 mytest1
-rw-r--r-- 1 root root 0 Jul 27 18:34 mytest2
-rw-r--r-- 1 root root 0 Jul 27 18:34 mytest3
-rw-r--r-- 1 root root 0 Jul 27 18:34 mytest4
-rw-r--r-- 1 root root 0 Jul 27 18:32 test1.txt
-rw-r--r-- 1 root root 0 Jul 27 18:32 test2.txt
-rw-r--r-- 1 root root 0 Jul 27 18:32 test3.txt
-rw-r--r- 1 root root 0 Jul 27 18:32 test4.txt
[root@ip-172-31-9-43 dest]# git status
On branch master
Your branch is up to date with 'origin/master'.
Untracked files:
  (use "git add <file>..." to include in what will be committed)
nothing added to commit but untracked files present (use "git add" to track)
[root@ip-172-31-9-43 dest] # git add .
[root@ip-172-31-9-43 dest]# git commit -m "adding data in dest folder"
[master ef5224d] adding data in dest folder
4 files changed, 0 insertions(+), 0 deletions(-)
create mode 100644 mytest1
create mode 100644 mytest2
create mode 100644 mytest3
create mode 100644 mytest4
```

Sync from src folder as follows:

```
[root@ip-172-31-9-13 src]# git status
On branch master
nothing to commit, working tree clean
[root@ip-172-31-9-43 src]# ls -1
total 0
-rw-r--r-- 1 root root 0 Jul 27 18:29 test1.txt
-rw-r--r-- 1 root root 0 Jul 27 18:29 test2.txt
-rw-r--r-- 1 root root 0 Jul 27 18:29 test3.txt
-rw-r--r-- 1 root root 0 Jul 27 18:29 tost/ tut
[root@ip-172-31-9-43 src] # git pull /tmp/dest/
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Compressing objects: 100% (2/2), done.
remote: Total 2 (delta 0), reused 0 (delta 0)
Unpacking objects: 100% (2/2), done.
From /tmp/dest
 * branch
                                  -> FETCH HEAD
Updating 489f120..ef5224d
Fast-forward
mytest1 | 0
mytest2 | 0
mytest3 | 0
mytest4 | 0
 4 files changed, 0 insertions(+), 0 deletions(-)
 create mode 100644 mytest1
 create mode 100644 mytest2
 create mode 100644 mytest3
 create mode 100644 mytest4
[root@ip-172-31-9-43 src]# ls -1
```

**Branching, Merging and Tagging:** 

#### **Branches:**

Master branch is the default branch which will gets initialized when you create the repository and initialize it.

```
[root@ip-172-31-9-43 tmp] # mkdir mybranchrepo
[root@ip-172-31-9-43 tmp] # cd mybranchrepo/
[root@ip-172-31-9-43 mybranchrepo] # git init .
Initialized empty Git repository in /tmp/mybranchrepo/.git/
[root@ip-172-31-9-43 mybranchrepo] # touch test.txt
[root@ip-172-31-9-43 mybranchrepo] # git add .
[root@ip-172-31-9-43 mybranchrepo] # git commit -m "working with branches"
[master (root-commit) 8fb80f8] working with branches
1 file changed, 0 insertions(+), 0 deletions(-)
create mode 100644 test.txt
[root@ip-172-31-9-43 mybranchrepo] # git branch
* master
[root@ip-172-31-9-43 mybranchrepo] # git checkout -b branch1
Switched to a new branch 'branch1'
[root@ip-172-31-9-43 mybranchrepo] # git branch
* branch1
master
```

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Let's check it out what data do we have in branch1 & master branch

```
<u>root@ip-17</u>2-31-9-43 mybranchrepc]# git branch
root@ip-172-31-9-43 mybranchrepo # touch mybranchdata{1..3}
[root@ip-172-31-9-43 mybranchrepo]
                                       # git status
On branch branch1
Untracked files:
  (use "git add <file>..." to include in what will be committed)
nothing added to commit but untracked files present (use "git add" to track)
[root@ip-172-31-9-43 mybranchrepo]# git add .
root@ip-172-31-9-43 mybranchrepo]# git commit -m "iam commiting in my branch branch1"
[branch1 902fca5] iam committing in my branch branch1 3 files changed, 0 insertions(+), 0 deletions(-) create mode 100644 mybranchdata1
create mode 100644 mybranchdata2
create mode 100644 mybranchdata3
[root@ip-172-31-9-43 mybranchrepo]# ls
nybranchdata1 mybranchdata2 mybranchdata3 test.txt
[root@ip-172-31-9-43 mybranchrepo]# git checkout master
witched to branch 'master'
[root@ip-172-31-9-43 mybranchrepo]# ls -l
cotal 0
-rw-r--r-- 1 root root 0 Jul 27 18:43 test.txt
root@ip-172-31-9-43 mybranchrepo]# git branch
root@ip-172-31-9-43 mybranchrepo]#
```

### **Merging:**

```
[root@ip-172-31-9-43 mybranchrepo]# git branch
[root@ip-172-31-9-43 mybranchrepo]# ls -1
total 0
-rw-r--r-- 1 root root 0 Jul 27 18:43 tost.txt
[root@ip-172-31-9-43 mybranchrepo] # git merge branch1
Updating 8fb80f8..902fca5
Fast-forward
mybranchdata1 | 0
mybranchdata2 | 0
mybranchdata3 | 0
3 files changed, 0 insertions(+), 0 deletions(-)
create mode 100644 mybranchdata1
create mode 100644 mybranchdata2
create mode 100644 mybranchdata3
[root@ip-172-31-9-43 mybranchrepo]# ls -l
total 0
-rw-r--r-- 1 root root 0 Jul 27 18: 19 mybranchdata1
-rw-r--r-- 1 root root 0 Jul 27 18:19 mybranchdata2
-rw-r--r-- 1 root root 0 Jul 27 18:49 mybranchdata3
-rw-r--r-- 1 root root 0 Jul 27 18:<mark>1</mark>3 test.txt
[root@ip-172-31-9-43 mybranchrepo]# git branch
 branch1
```

#### Tags:

Tags helps us to save the state of the previous things, before it created.

```
[root@ip-172-31-9-43 tmp] # mkdir mytagging
[root@ip-172-31-9-43 tmp] # cd mytagging/
[root@ip-172-31-9-43 mytagging] # ls -l
total 0
[root@ip-172-31-9-43 mytagging] # pw
[root@ip-172-31-9-43 mytagging] # pwd
/tmp/mytagging
[root@ip-172-31-9-43 mytagging] # git init .
Initialized empty Git repository in /tmp/mytagging/.git/
```

```
[root@ip-172-31-9-43 mytagging]# git init .
Initialized empty Git repository in /tmp/mytagging/.git/
[root@ip-172-31-9-43 mytagging]# touch test{1..4}.txt
[root@ip-172-31-9-43 mytagging]# git status
On branch master
No commits yet
Untracked files:
  (use "git add <file>..." to include in what will be committed)
nothing added to commit but untracked files present (use "git add" to track)
[root@ip-172-31-9-43 mytagging]# git add .
[root@ip-172-31-9-43 mytagging]# git commit -m "working with git tag"
[master (root-commit) 64f968a] working with git tag
4 files changed, 0 insertions(+), 0 deletions(-)
create mode 100644 test1.txt
create mode 100644 test2.txt
create mode 100644 test3.txt
create mode 100644 test4.txt
[root@ip-172-31-9-43 mytagging]# git tag v1.0
[root@ip-172-31-9-43 mytagging]# touch finaltest{1..4}.txt
[root@ip-172-31-9-43 mytagging]# git add .
[root@ip-172-31-9-43 mytagging]# git commit -m "testing tag option"
[master bff302b] testing tag option
4 files changed, 0 insertions(+), 0 deletions(-)
create mode 100644 finaltest1.txt
create mode 100644 finaltest2.txt
```

```
[root@ip-172-31-9-43 mytagging] # ls -1
total 0
-rw-r--r-- 1 root root 0 Jul 27 18:52 finaltest1.txt
-rw-r--r-- 1 root root 0 Jul 27 18:52 finaltest2.txt
-rw-r--r-- 1 root root 0 Jul 27 18:52 finaltest3.txt
-rw-r--r-- 1 root root 0 Jul 27 18:52 finaltest4.txt
-rw-r--r-- 1 root root 0 Jul 27 18:52 test1.txt
-rw-r--r-- 1 root root 0 Jul 27 18:52 test2.txt
-rw-r--r-- 1 root root 0 Jul 27 18:52 test3.txt
-rw-r--r-- 1 root root 0 Jul 27 18:52 test3.txt
-rw-r--r-- 1 root root 0 Jul 27 18:52 test4.txt
[root@ip-172-31-9-43 mytagging] # ]
```

Now let's revert back to the previous state i.e where we have our files test1.txt,test2.txt,test3.txt,test4.txt

```
[root@ip-172-31-9-43 mytagging] # git tag
v1.0
[root@ip-172-31-9-43 mytagging] # git log
commit bff302b7715dbcaac36fa203bc12c95df616691e (HEAD -> master)
Author: gituserid <shahan.aix@gmail.com>
Date: Mon Jul 27 18:53:15 2020 +0000

testing tag option

commit 64f968a81ce6b7e77ba05b279ed11898e4fe9079 (tag: v1.0)
Author: gituserid <shahan.aix@gmail.com>
Date: Mon Jul 27 18:52:29 2020 +0000

working with git tag
working with git tag
```

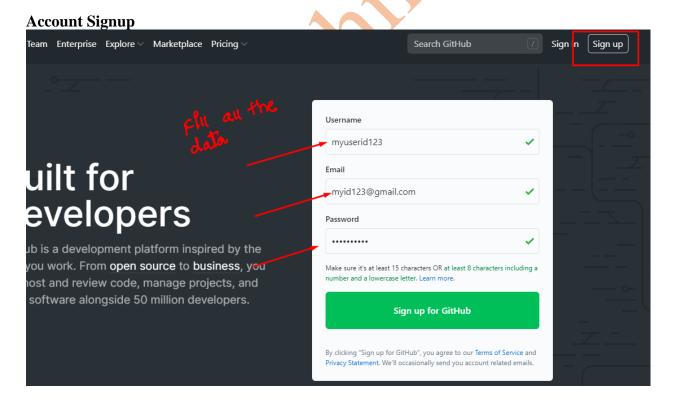
```
[root@ip-172-31-9-43 mytagoing]# git checkout 64f968a81ce6b7e77ba05b279ed11898e4fe9079
Note: switching to '64f968a81ce6h7e77ha05h279ed11898e4fe9079'
You are in 'detached HEAD' state. You can look around, make experimental
changes and commit them, and you can discard any commits you make in this
state without impacting any branches by switching back to a branch.
If you want to create a new branch to retain commits you create, you may
do so (now or later) by using -c with the switch command. Example:
  git switch -c <new-branch-name>
Or undo this operation with:
Turn off this advice by setting config variable advice.detachedHead to false
HEAD is now at 64f968a working with git tag
[root@ip-172-31-9-43 mytagging]# git checkout -b mynewrecovery
Switched to a new branch 'mynewrecovery'
[root@ip-172-31-9-43 mytagging]# ls -1
total 0
-rw-r--r-- 1 root root 0 Jul 27 18:52 test1.txt
-rw-r--r-- 1 root root 0 Jul 27 18:52 test3.txt
 -rw-r--r-- 1 root root 0 Jul 27 18:52 test4.txt
[root@ip-172-31-9-43 mytagging]# git branch
[root@ip-172-31-9-43 mytagging]#
```

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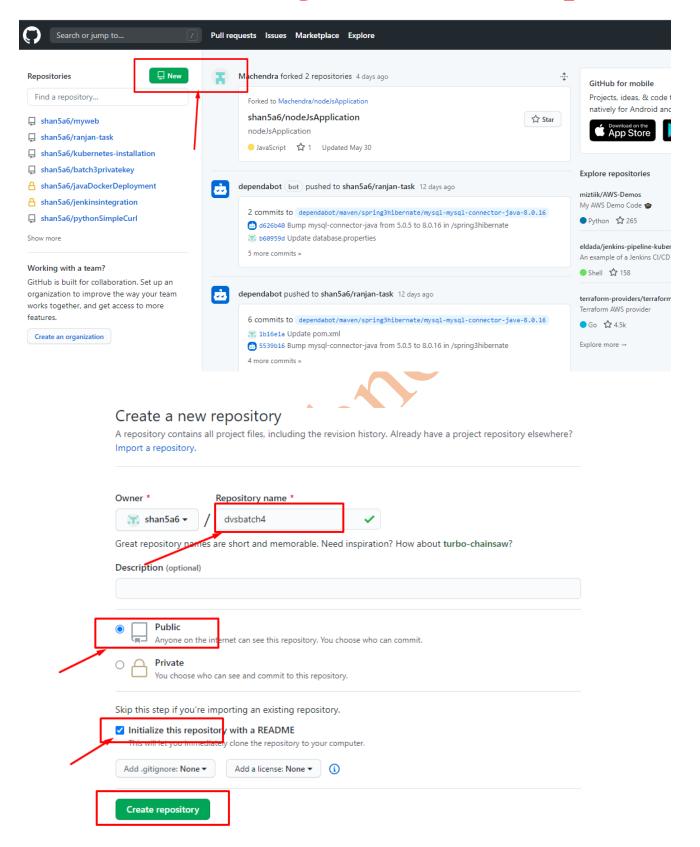
### Git Log:

git log --pretty=oneline

### **Working with Github:**

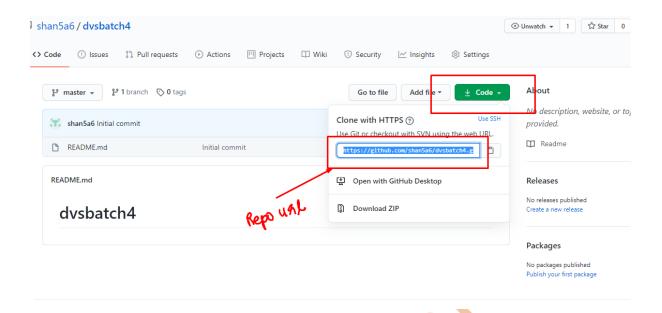


### Creating a repository:



### **Cloning Repository to server:**

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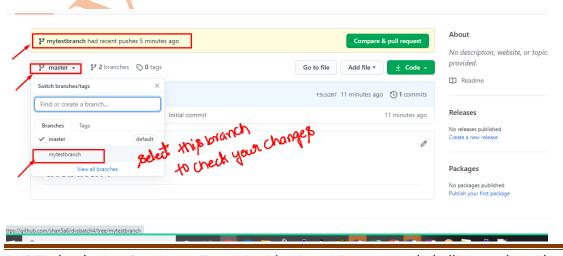


```
[root@gitserver tmp] # git clone https://github.com/shan5a6/dvsbatch4.git Cloning into 'dvsbatch4:...
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (3/3), done.
[root@gitserver tmp]#
```

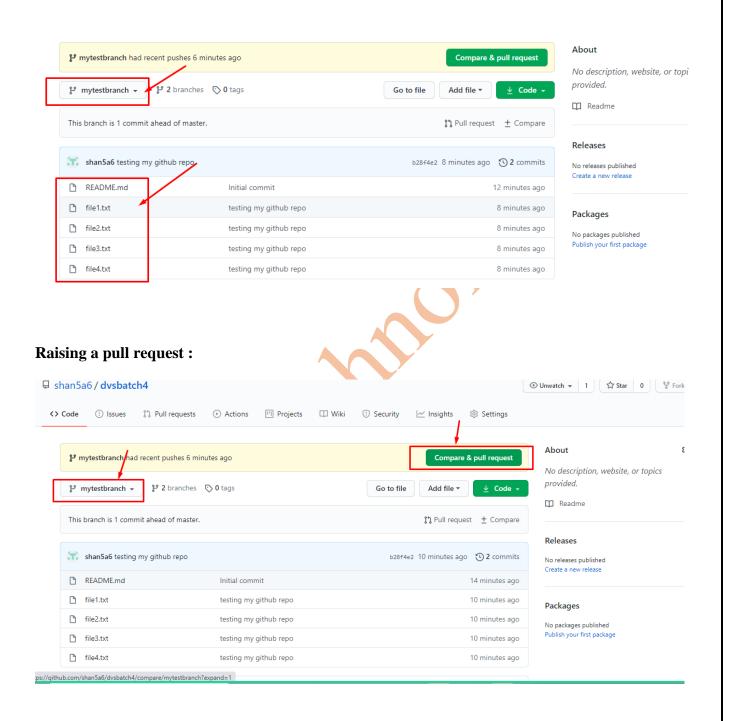
Pushing Data to Github under our branch:

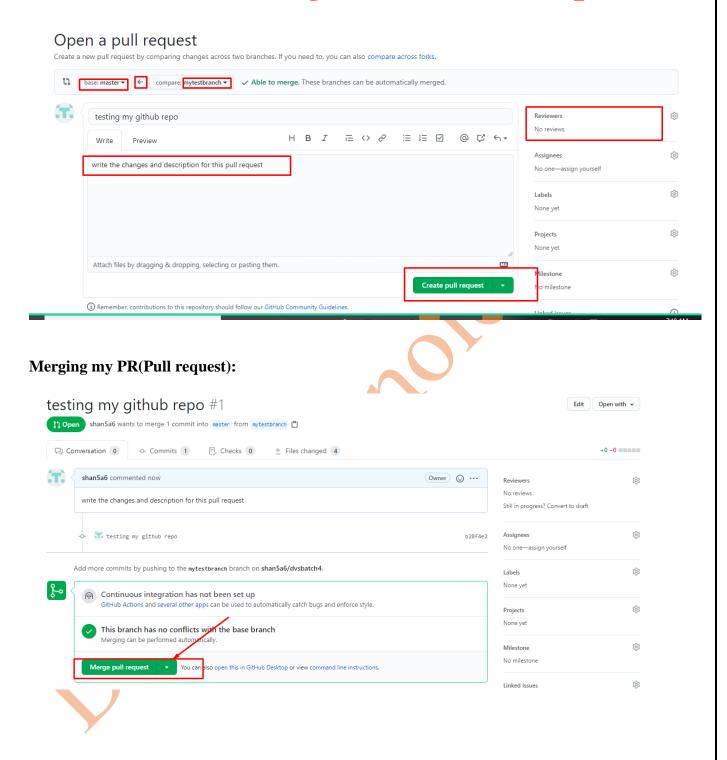
```
[cott@itserver tmp] # git clone https://github.com/shan5a6/dvsbatch4.git
cloning into 'dvsbatch4...
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
Impacking objects: 100% (3/3), done.
[roott@itserver tmp] # cd dvsbatch4/
[root@itserver dvsbatch4] # is -1
total 4
-rw-r--r- 1 root root 11 Jul 28 03:05 README.md
[root@gitserver dvsbatch4] # git checkout -b mytestbranch
Switched to a new branch 'mytestbranch'
[root@gitserver dvsbatch4] # touch file(1..4).txt
[root@gitserver dvsbatch4] # touch file(1..4).txt
[root@gitserver dvsbatch4] # touch file(1..4).txt
-rw-r--r- 1 root root 0 Jul 28 03:06 file1.txt
-rw-r--r- 1 root root 0 Jul 28 03:06 file2.txt
-rw-r--r- 1 root root 0 Jul 28 03:06 file3.txt
-rw-r--r- 1 root root 0 Jul 28 03:06 file3.txt
-rw-r--r- 1 root root 1 Jul 28 03:06 file3.txt
-rw-r--r- 1 root root 1 Jul 28 03:06 file3.txt
-rw-r--r- 1 root root 1 Jul 28 03:05 README.md
[root@gitserver dvsbatch4] # git add .
[root@gitserver dvsbatch4] # git commit -m "testing my github repo"
[mytestbranch b28f4e2] testing my github repo
4 files changed, 0 insertions(+), 0 deletions(-)
create mode 100644 file3.txt
create mode 100644 file2.txt
create mode 100644 file2.txt
create mode 100644 file3.txt
```

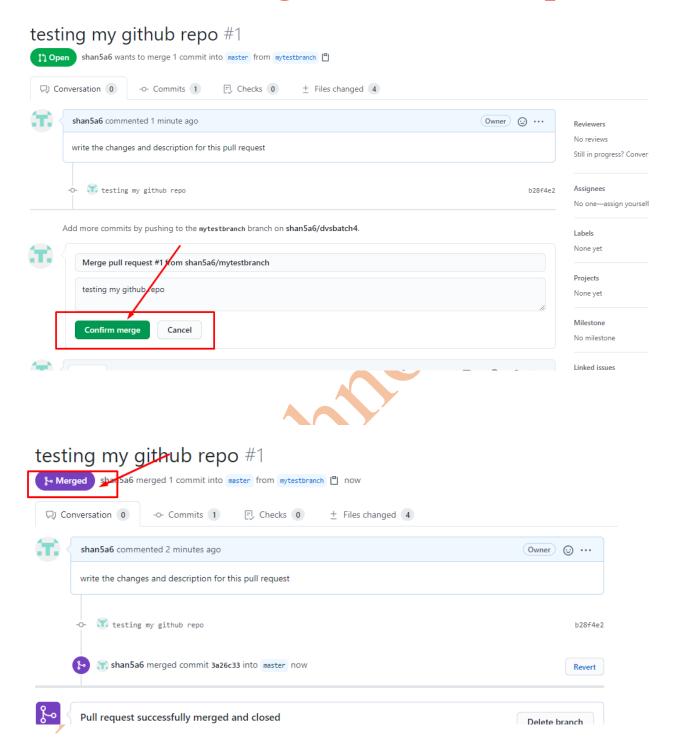
### Verifying data in the github repository:

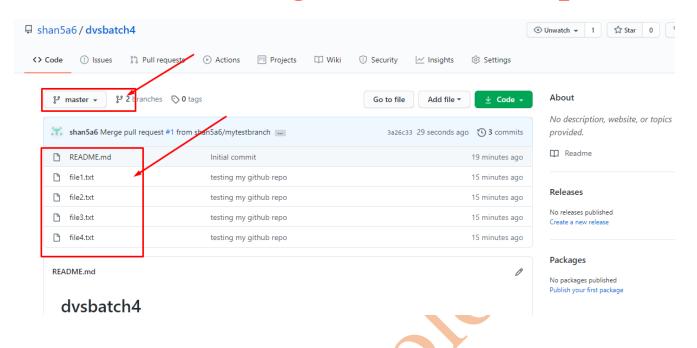


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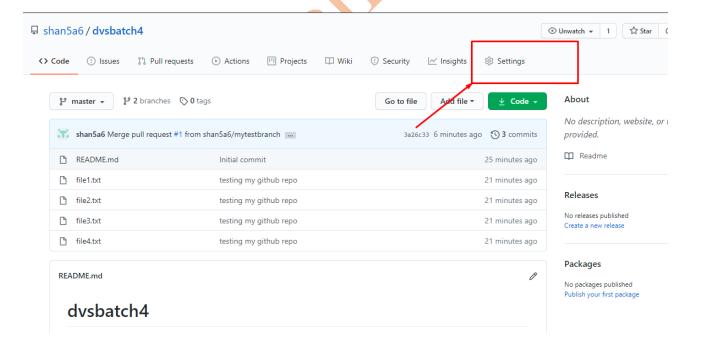






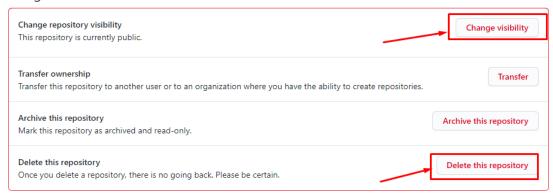


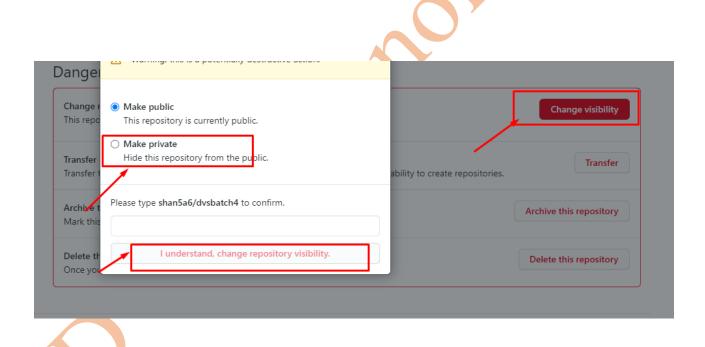
### Making Private & Deleting the repository:



#### Scroll down the site

#### Danger Zone





- Multiple assignees for issues and PRs
   Multiple reviewers for PRs
   Branch protection rules.
   Please type shan5a6/dvsbatch4 to confirm.
   shan5a6/dvsbatch4
   I understand, change repository visibility.
- Password Forgot password?

  Confirm password

  Tip: You are entering sudo mode. We won't ask for your password again for a few hours.