LEARN
GIT
USING
GITHUB
IN 5 MINUTES

S. BASU

LEARN

GIT

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LEARN
GIT
WITH
GITHUB
IN 5 MINUTES

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Contents

Chapter 1 : Introduction

What is Git ?

- Git is a **version control tool** which helps programmers to keep track of changes made in the project files.

- Git also helps to synchronize code between a programmer and his/her colleague.

- Git is a command line tool.

- Git holds the project code in a **Repository** .

What is a Repository?

Git repository contains main project's source code.

What is GitHub?

GitHub is an Internet hosting platform for software development and version control using **Git** .
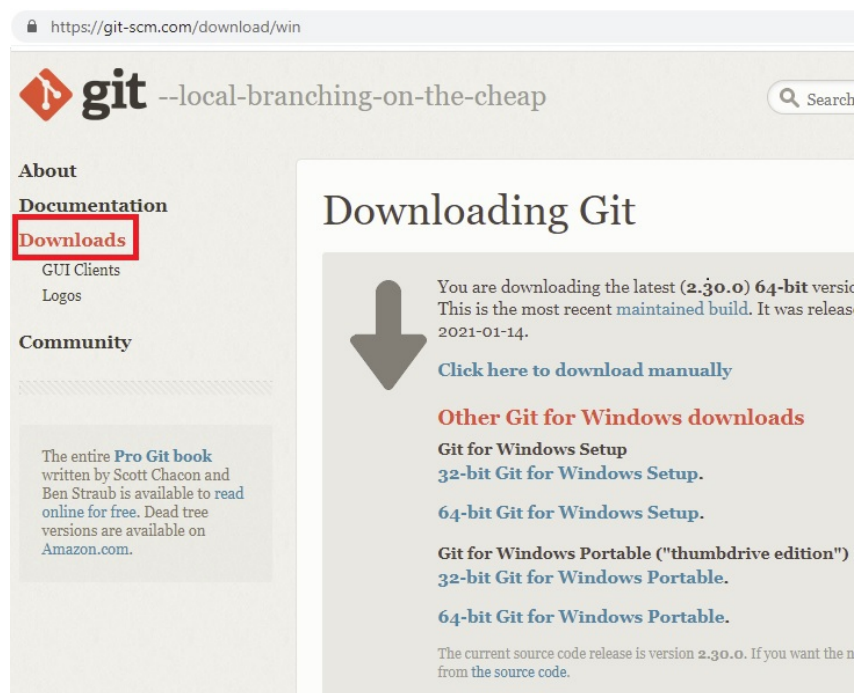
In order words **GitHub** is simply a website which holds the **Git repository** which in turn holds the project's source code.

Now let's install **Git** and set up the **GitHub** account.

Chapter 2 : Git installation & setting up GitHub account

2.1: Git Installation

In order to download and install **Git** in our local machine, go to the following website https://git-scm.com/downloads

After successful installation, open command prompt and type the command **git --version** to check the **Git** version you downloaded.

2.2: Setting up GitHub account

Go to github.com and create a new account -> then click on **Create New Repository** button as shown in the screen shot below.
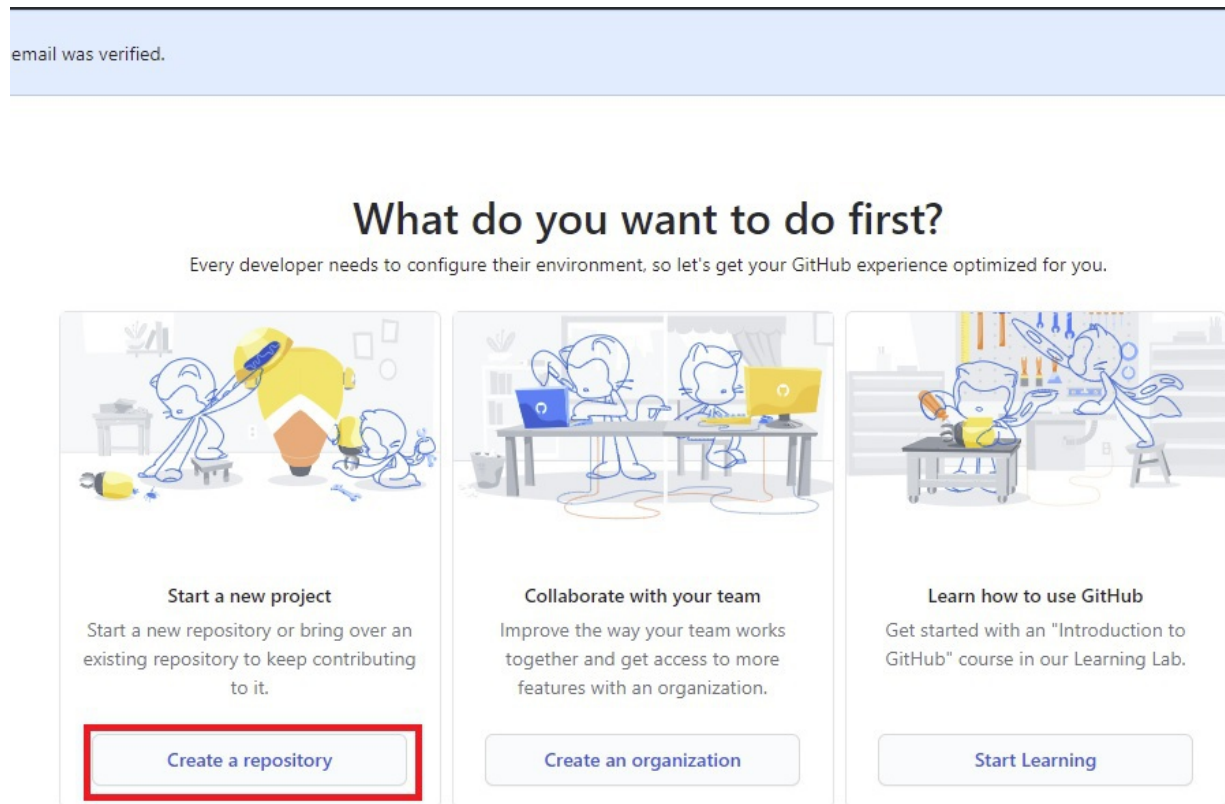
In create a new repository page, give the **Repository name (*suppose hello_world)* -> Description ->** accessibility (**Public or Private**) and click on the **Create repository** button shown in the screen shot below.

Import a repository.

Create a new repository

Owner *   Repository name *

⊕ ~~kava sanjana1818~~ ▾ / | hello_world   ✓ |

Great repository names are short and memorable. Need inspiration? How about s

Description (optional)

| Test |

○ 📖 **Public**
Anyone on the internet can see this repository. You choose who can commit.

○ 🔒 **Private**
You choose who can see and commit to this repository.

Initialize this repository with:

Skip this step if you're importing an existing repository.

☐ **Add a README file**
This is where you can write a long description for your project. Learn more.

☐ **Add .gitignore**
Choose which files not to track from a list of templates. Learn more.

☐ **Choose a license**
A license tells others what they can and can't do with your code. Learn more.

| Creating repository... |

We have successfully created our **GitHub repository** .

In the next chapter we will learn how to add the **GitHub repository** into our local machine.

Chapter 3 : Git clone

In the previous chapter we have successfully created our **GitHub repository** . In this chapter we will learn how to get a copy of the **GitHub repository** for our own local machine and have our own **local repository.**

In order to do perform this task **Git** provides us with **git clone** command and the syntax is:

git clone *url,* y ou can get the *url* from **GitHub repository** page highlighted in the screen shot below.
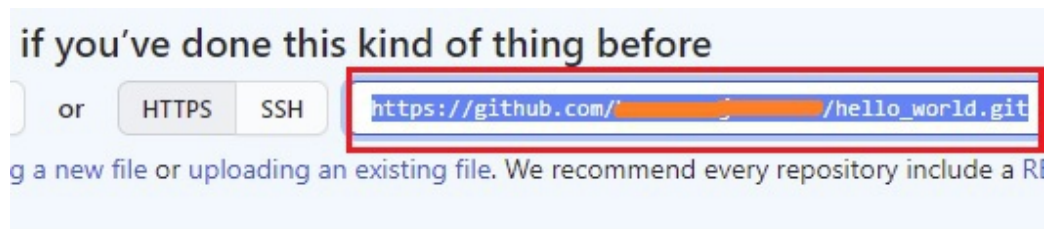
In your local machine, open command prompt -> navigate to any folder or directory where you would like to have your **local repository** set and type the following command:

git clone *url*

Now open the directory or folder where you have cloned the **GitHub repository** .
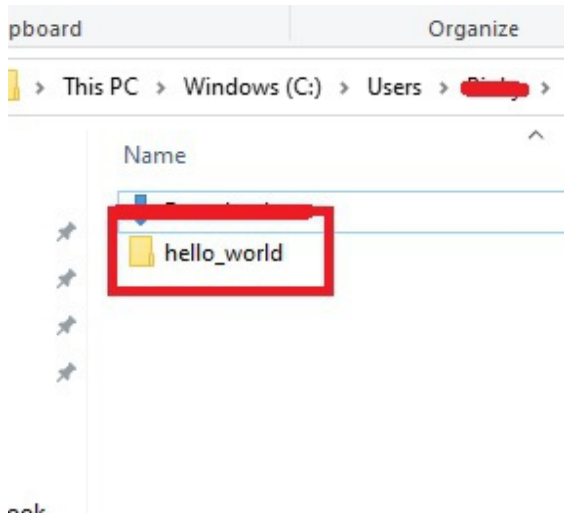
The *hello_world* directory shows.

For our **local Git repository,** let's set up the name and email address with the help of **git config** command.

In your local machine, open command prompt -> navigate to the *hello_world* directory and type the following commands:

git config --global user.email " *youremail@example.com* **"**

git config --global user.name " *Your Name* **"**

In the next chapter we will learn how to add files into our **local repository** and then push those changes into the main **GitHub repository** .

Chapter 4 : Git add, Git commit & Git push

Whenever you make any changes in the **local repository** , those changes have no effect in the main **GitHub repository** . In order to push those changes into the main **GitHub repository** we need to follow few steps.

But before we learn how to do this task, first we need to understand the difference between a **working directory** and **local repository** .

What is a working directory?

A working directory is simply a directory which contains your project files and these files are not tracked by **Git** . In order to make **Git** aware and to keep track of these file we need to run **git add** command.

git add command adds the file from the **working directory** to the **staging area** .

Then **git commit** is used to save the changes from the **staging area** into our **local repository** .

> **What is staging area?**
>
> Staging area is the area where a file waits to for a **commit** to occur. In this area a file is tracked and checked by **Git** for any changes made to it.
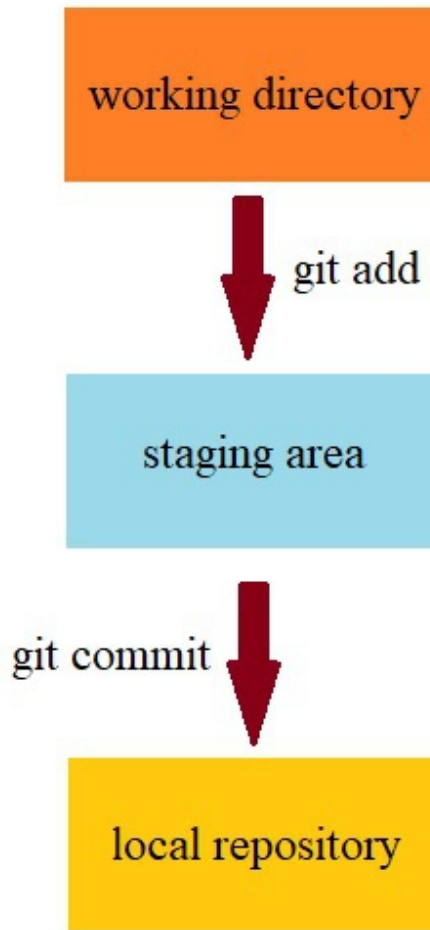
Now let's create a simply HTML (**index.html)** file and save it in **hello_world** directory.

Please Note: To create and code **index.html** we will be using **Notepad++**

index.html

```
<!DOCTYPE html>
<html>
<head>
<meta name="viewport" content="width=device-width, :
<title>Learn Git using GitHub in 5 minutes</title>
</head>

<body>
<h1>Git Tutorial</h1>
<h3>Git Commands : </h3>
git clone <i>url</i>
</body>

</html>
```

In order to add *index.html* into the **GitHub repository** , we need to follow three steps:

Step 1: Use **git add** command to add the file from **working directory** to the **staging area** . The syntax is **git add** *filename*

In your local machine, open command prompt -> navigate to the *hello_world* directory and types the following command as shown in the screen shot below.

```
C:\Users\      >cd hello_world

C:\Users\      \hello_world>git add index.html

C:\Users\      \hello_world>
```

Step 2: Use **git commit** command to save the changes from **staging area** into our **local repository** . The syntax is **git commit -m "** *commit_message* **"**

commit_message contains a simple message of what changes you have made to the file.

```
C:\Users\____\hello_world>git commit -m "Add index.html file"
[master (root-commit) 659cae8] Add index.html file
 1 file changed, 14 insertions(+)
 create mode 100644 index.html
```
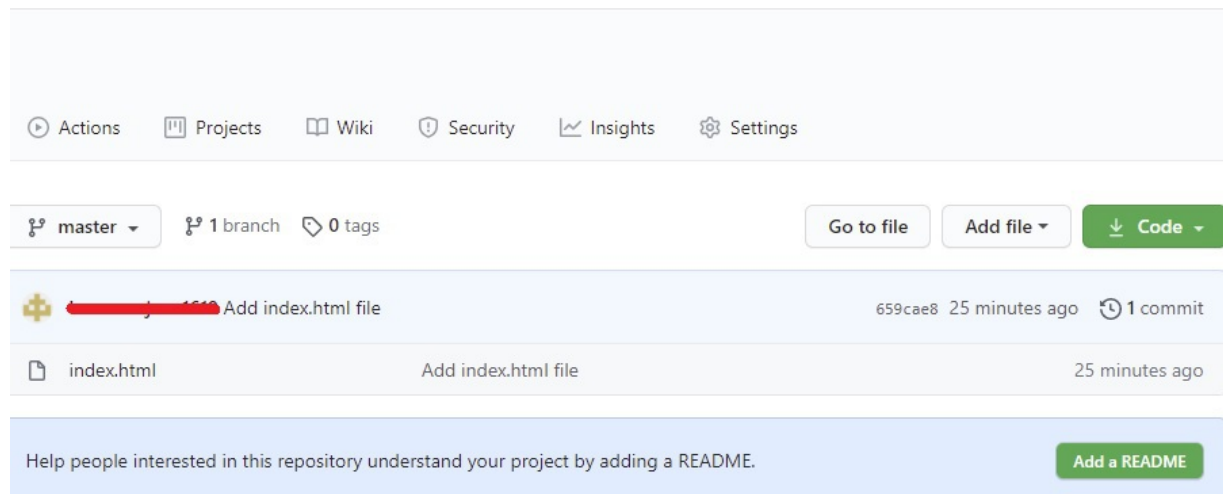
index.html is now successfully added to our **local repository.**

Step 3: Use **git push** command to push the changes from our **local repository** into the main **GitHub repository** .

```
C:\Users\____\hello_world>git push
info: please complete authentication in your browser...
Enumerating objects: 3, done.
Counting objects: 100% (3/3), done.
Delta compression using up to 4 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 403 bytes | 100.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/____/hello_world.git
 * [new branch]      master -> master
```

We have successfully added *index.html* into the **GitHub repository.**

Refresh the **GitHub** website **repository** page and check for the presence of the HTML file.

index.html file shows.

Now in the next chapter we will learn how to get the updated new version of ***index.html*** from **GitHub repository** into our local machine**.**

Chapter 5 : Git pull

In the previous chapter we have learnt how to add a file from our **local repository** to **GitHub repository.** Now we will learn how to get the latest version of a file from **GitHub repository** into our local machine.

Let's update the ***index.html*** file present in the **GitHub repository.**

Open **GitHub repository** page -> open ***index.html*** file -> click edit as shown in the screen shot below.

Add a line of code in ***index.html*** -> write the ***commit messag* e** -> click on ***commit changes*** button as shown in the screen shot below.

<> **Edit file**   ⊙ Preview changes

```
1   <!DOCTYPE html>
2   <html>
3   <head>
4   <meta name="viewport" content="width=device-width, initial-scale=1.0">
5   <title>Learn Git using GitHub in 5 minutes</title>
6   </head>
7
8   <body>
9   <h1>Git Tutorial</h1>
10  <h3>Git Commands : </h3>
11  git clone <i>url</i>
12  <br>
13   git add <i>filename</i>
14  </body>
15
16  </html>
```

Commit changes

Added a line git add <filename>

Added a line git add <filename>

○ -○- Commit directly to the `master` branch.

○ ⌇↑ Create a **new branch** for this commit and start a pull request. Lea

Commit changes   Cancel

Now **GitHub repository** contains the latest updated version of *index.html* file. In order to get this new version into our **local repository** git pull command is used.

In your local machine, open command prompt -> navigate to the *hello_world* directory and type the command **git pull**

```
C:\Users_____\hello_world>git pull
remote: Enumerating objects: 5, done.
remote: Counting objects: 100% (5/5), done.
remote: Compressing objects: 100% (2/2), done.
remote: Total 3 (delta 1), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (3/3), 710 bytes | 4.00 KiB/s, done.
From https://github.com/b_____/hello_world
   659cae8..8b459e8  master     -> origin/master
Updating 659cae8..8b459e8
Fast-forward
 index.html | 4 +++-
 1 file changed, 3 insertions(+), 1 deletion(-)
```

Refresh *index.html* file in our local machine and you will see the updated version of *index.html* is added (*the line git add <i>filename</i> is present as shown in the screen shot below*).

```
<!DOCTYPE html>
<html>
<head>
<meta name="viewport" content="width=device-width,
<title>Learn Git using GitHub in 5 minutes</title>
</head>

<body>
<h1>Git Tutorial</h1>
<h3>Git Commands : </h3>
git clone <i>url</i>
<br>
git add <i>filename</i>
</body>

</html>
```

Chapter 6 : Git Merge Conflict

Merge conflict happens in the scenarios in which two different developers are working on the same file and on the same lines of code. When this happen **Git** does not know how to fix the issue and throws a **merge conflict** message and it is up to the developer to resolve such situation.

Let us consider a programmer *x* is working on a file (*suppose **index.html***) and made some changes in line 10 in his/her **local repository** . Suppose there is another programmer *y* that made some changes to *index.html* in the same line 10 and pushed those changes into the main **GitHub repository** .

Now when programmer *x* **pulls** the latest version of *index.html* from **GitHub repository** into his/her local machine**,** then he/she will receive a **merge conflict** message due to line 10.

The screen shot below shows the pattern in which the *index.html* will appear to programmer *x* .

```
<<<<<<< HEAD

...changes made by programmer x.....


=======

...changes made by programmer y....

>>>>>>> a986dd5bc3ebe.
```

The line of code written within the **head** and **===** are changes made by programmer *x* and the lines of code written within **===** and **>>>>a99…** are the changes made by programmer *y* .

For better understanding, let's create a **merge conflict** scenario by following the steps below.
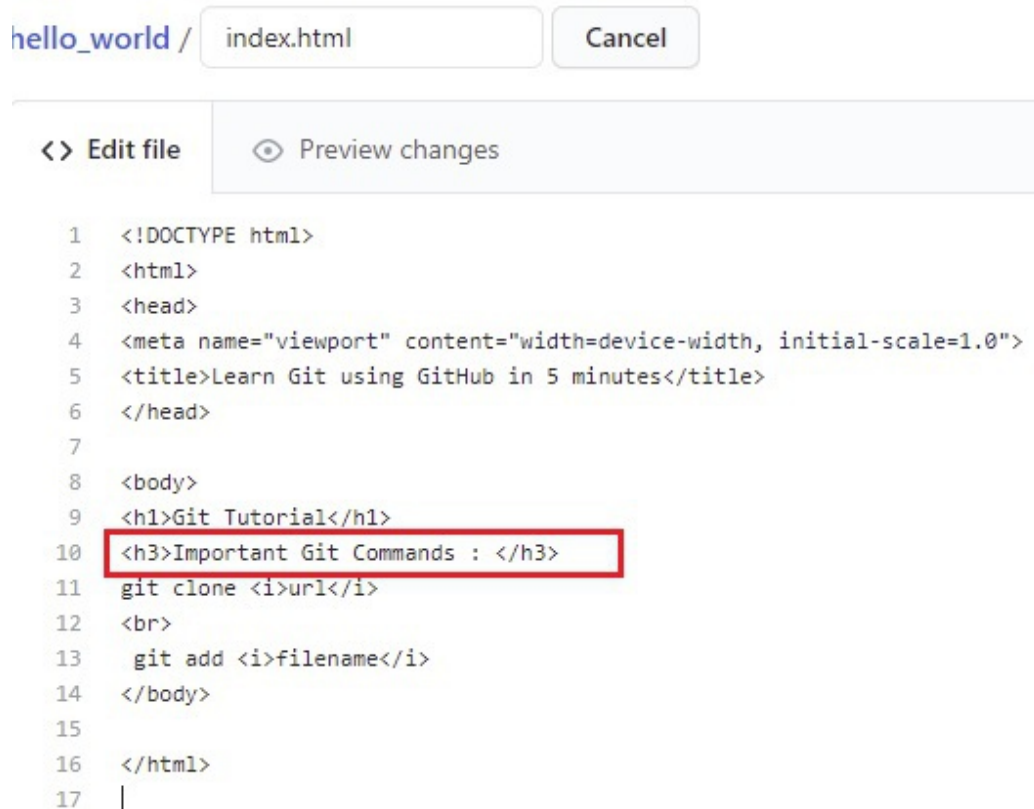
Step 1 : In your local machine, open *index.html* and make changes to any line (*I updated the line with <h3> tag as shown in the screen shot below*).

```html
<!DOCTYPE html>
<html>
<head>
<meta name="viewport" content="width=device-width,
<title>Learn Git using GitHub in 5 minutes</title>
<style>
h1{
font-family:Kristen ITC
}
</style>
</head>

<body>
<h1>Git Tutorial</h1>
<h3>Git Command List : </h3>
git clone <i>url</i>
<br>
 git add <i>filename</i>
</body>

</html>
```

Let's **commit** the changes (*do not push the changes to GitHub repository*).

```
C:\Users_____\hello_world>git add index.html

C:\Users_____\hello_world>git commit -m "Updated tag h3 line"
[master 7500683] Updated tag h3 line
 1 file changed, 1 insertion(+), 1 deletion(-)
```

Step 2: Open the **GitHub repository** page and update *index.html* file at the same line containing **<h3>** tag as shown in the screen shot below and **commit** the changes.

Step 3: In our local machine, **pull** the *index.html* file from **GitHub repository** using **git pull** command**.**

Since changes were made to the same file and to the same line containing **<h3>** tag, **Git** will throws a **merge conflict** message as shown in the screen shot below.

Step 4: Let's refresh *index.html* file in our local machine

```html
<style>
h1{
font-family:Kristen ITC
}
</style>
</head>

<body>
<h1>Git Tutorial</h1>
<<<<<<< HEAD
<h3>Git Command List : </h3>
=======
<h3>Important Git Commands : </h3>
>>>>>>> a986dd5bc3ebea42f5a712182485b62c0b1e895e
git clone <i>url</i>
<br>
 git add <i>filename</i>
</body>

</html>
```

<<<<<<< HEAD

...my changes.......

=======

....changes made by my colleague......

>>>>>>> a986dd5bc3ebe.

Step 5: In order to resolve this issue, delete all the **merge conflict** messages from *index.html* file and update the line containing **<h3>** tag which suits the best.

```
<!DOCTYPE html>
<html>
<head>
<meta name="viewport" content="width=device-width,
<title>Learn Git using GitHub in 5 minutes</title>
<style>
h1{
font-family:Kristen ITC
}
</style>
</head>

<body>
<h1>Git Tutorial</h1>
<h3>Important Git Command List : </h3>
git clone <i>url</i>
<br>
 git add <i>filename</i>
</body>

</html>
```

Step 6: Now let's **push** the updated *index.html* file into the **GitHub repository** .

```
C:\Users\         \hello_world>git commit -am "fixed merge conflit & updated file"
[master 75df2ae] fixed merge conflit & updated file
```

```
C:\Users\         \hello_world>git push
Enumerating objects: 13, done.
Counting objects: 100% (13/13), done.
Delta compression using up to 4 threads
Compressing objects: 100% (6/6), done.
Writing objects: 100% (9/9), 854 bytes | 106.00 KiB/s, done.
Total 9 (delta 3), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (3/3), completed with 1 local object.
To https://github.com/                  /hello_world.git
   a986dd5..75df2ae  master -> master
```

NOTE: Shortcut of **git add** + **git commit** is:

git commit –am " *commit message* "

Chapter 7 : Git Branching

Git branching allows a programmer to work on different versions of the same file without disturbing the main master source code of the project. For example: Let us consider in **branch master** , you have the original main source code of the project. Suppose you want to work on a new feature but you do not wish to disturb the original functionality of the main project. So for this reason another **branch** (*suppose test)* is created. In **branch** *test* you create the new feature and once it gets approved by the clients that new feature is merged with the main project source code present in **branch master** .

In order to view all available **branches** , **Git** provide us with **git branch** command.

In your local machine, open command prompt -> navigate to ***hello_world*** directory and type the command **git branch**

```
C:\Users\█████\hello_world>git branch
* master
```

The * (*star*) prefix denotes that we have currently **branch master** checked out.

> **Please note:** The default **branch name** is **master**

For better understanding of **Git branching** , let's create a new **branch** , make some changes to its file and compare the changes with that of **branch master** .

Step 1: Create a new **branch** . The syntax for it is:

git checkout –b *branch-name*

```
C:\Users\P████\hello_world>git checkout -b test
Switched to a new branch 'test'
```

Now type **git branch** command to view all the available **branches**

```
C:\Users\█████y\hello_world>git branch
  master
* test
```

The * star prefix denotes that we are currently in **branch** *test* as shown in the screen shot above.

Step 2: Open *index.html* file and make some changes to it *(I added some styling information to <h1> tag as shown by the screen shot below)*.

```
<!DOCTYPE html>
<html>
<head>
<meta name="viewport" content="width=device-width,
<title>Learn Git using GitHub in 5 minutes</title>
<style>
h1{
font-family:Kristen ITC
}
</style>
</head>

<body>
<h1>Git Tutorial</h1>
<h3>Git Commands : </h3>
git clone <i>url</i>
<br>
 git add <i>filename</i>
</body>

</html>
```

Save the changes by following the process of **git add** and **git commit**

```
C:\Users\     \hello_world>git add index.html

C:\Users\     \hello_world>git commit -m "In branch test added styling info"
[test 6233492] In branch test added styling info
 1 file changed, 5 insertions(+)
```

We have successfully updated *index.html* file of **branch *test*** .

Step 3: Switch to **branch master** .

In order to switch to another branch **git checkout** *branch_nam e* command is used

```
C:\Users\     \hello_world>git checkout master
Switched to branch 'master'
Your branch is up to date with 'origin/master'.
```

Now type **git branch** command to view all the available **branches**

```
C:\Users\     \hello_world>git branch
* master
  test
```

* prefix denotes that we are currently in **branch master** as shown in the screen shot above.

Step 4: Refresh *index.html* file and you will notice that the styling information which we added to **<h1>** tag in **branch *test*** is not present as shown in the screen shot below.

```
<!DOCTYPE html>
<html>
<head>
<meta name="viewport" content="width=device-width,
<title>Learn Git using GitHub in 5 minutes</title>
</head>

<body>
<h1>Git Tutorial</h1>
<h3>Git Commands : </h3>
git clone <i>url</i>
<br>
 git add <i>filename</i>
</body>

</html>
```

I was satisfied with the changes I made to *index.html* in **branch** *test* and would like to include those changes in **branch master** .

In order to merge the changes from **branch** *test* **to branch master** **git merge** *branch_name* command is used. **git merge** *branch_name* command merges the specified branch (**branch** *test*) into the currently active branch (**branch master**).

```
C:\Users\‪▮▮▮▮‬\hello_world>git merge test
Updating 8b459e8..6233492
Fast-forward
 index.html | 5 +++++
 1 file changed, 5 insertions(+)
```

Refresh *index.html* file and you will notice that the additional lines of code from **branch** *test* are incorporated into *index.html* of **branch master** .

Other important Git commands

- **git rm** *filename*

This command deletes a file from the project.

- **git status**

This command shows the state of the **local repository** .

```
C:\Users\        \hello_world>git status
On branch master
Your branch is ahead of 'origin/master' by 1 commit.
  (use "git push" to publish your local commits)

Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        deleted:    index1.html
```

- **git log**

This command shows all **commit** information occurred in the project.

```
C:\Users\        \hello_world>git log
commit 91d5cb716f133f3b7895ba4cc7b17befff143326 (HEAD -> master)
Author: Basu <                              >
Date:   Sun Jan 31 17:24:48 2021 -0600

    Added index1.html

commit 75df2aeb9f8daccfee789a96ef7db739ffa9c998 (origin/master)
Merge: 7500683 a986dd5
Author: Basu <                              >
Date:   Sun Jan 31 16:56:49 2021 -0600

    fixed merge conflit & updated file

commit a986dd5bc3ebea42f5a712182485b62c0b1e895e
Author:
Date:   Sun Jan 31 16:29:39 2021 -0600

    Updated line containing h3 tag

commit 75006836025d68dc1e0ea42c38c89088948af3eb
```

Wish you all the best and thank you very much for buying this book.

Always remember, the most important learning is Self-Learning..