GIT

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Goals

This note should be give you the **introduction** to perform basic **distributed revision control** for **your own/team projects**.

Target

- No experience in *Version Control*
- Version control system but not *GIT*
- *GIT GUI*'s users (visual tools) not *command-line*.

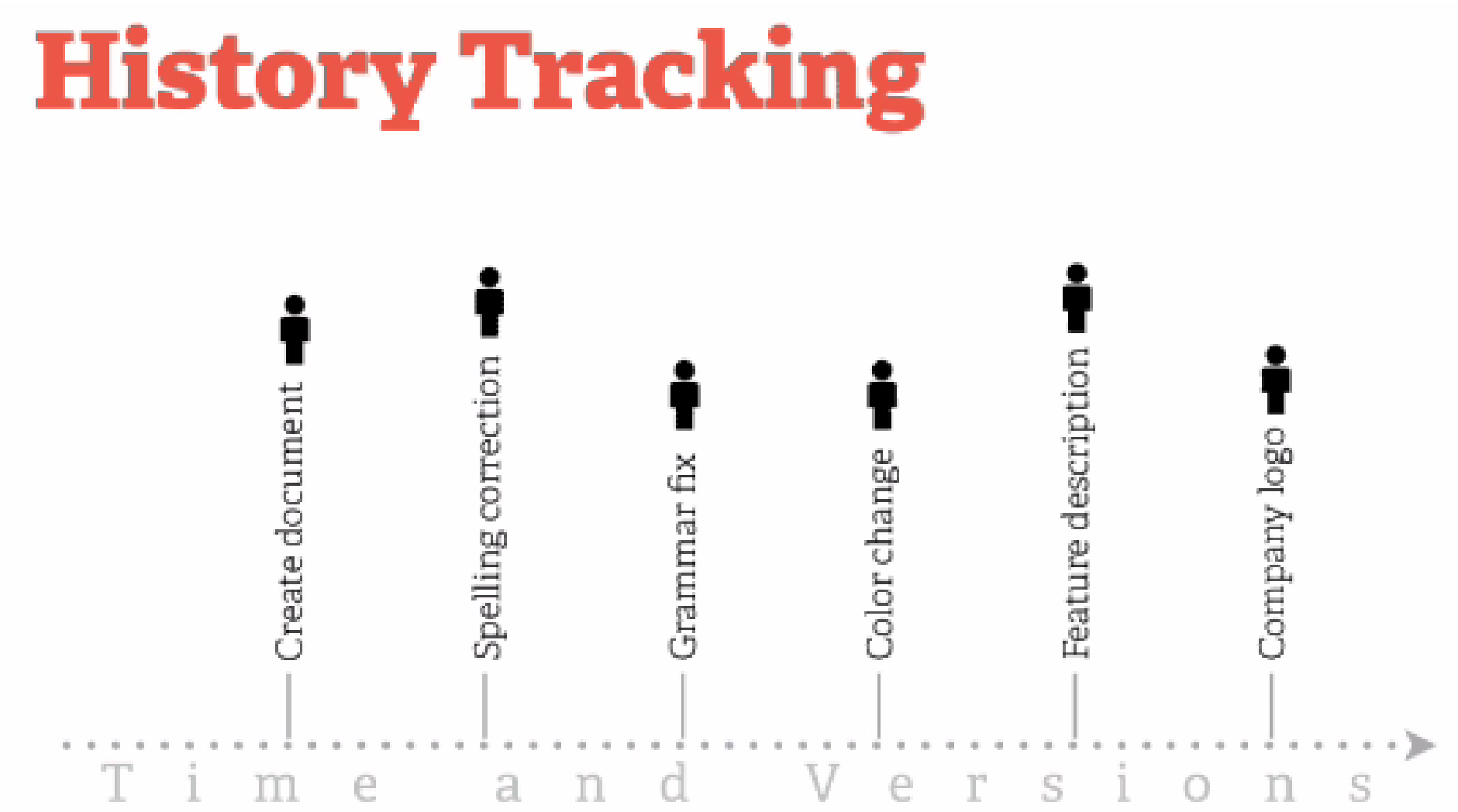
Your job and daily task

- Software developer
- Designer
- Someone who writes code

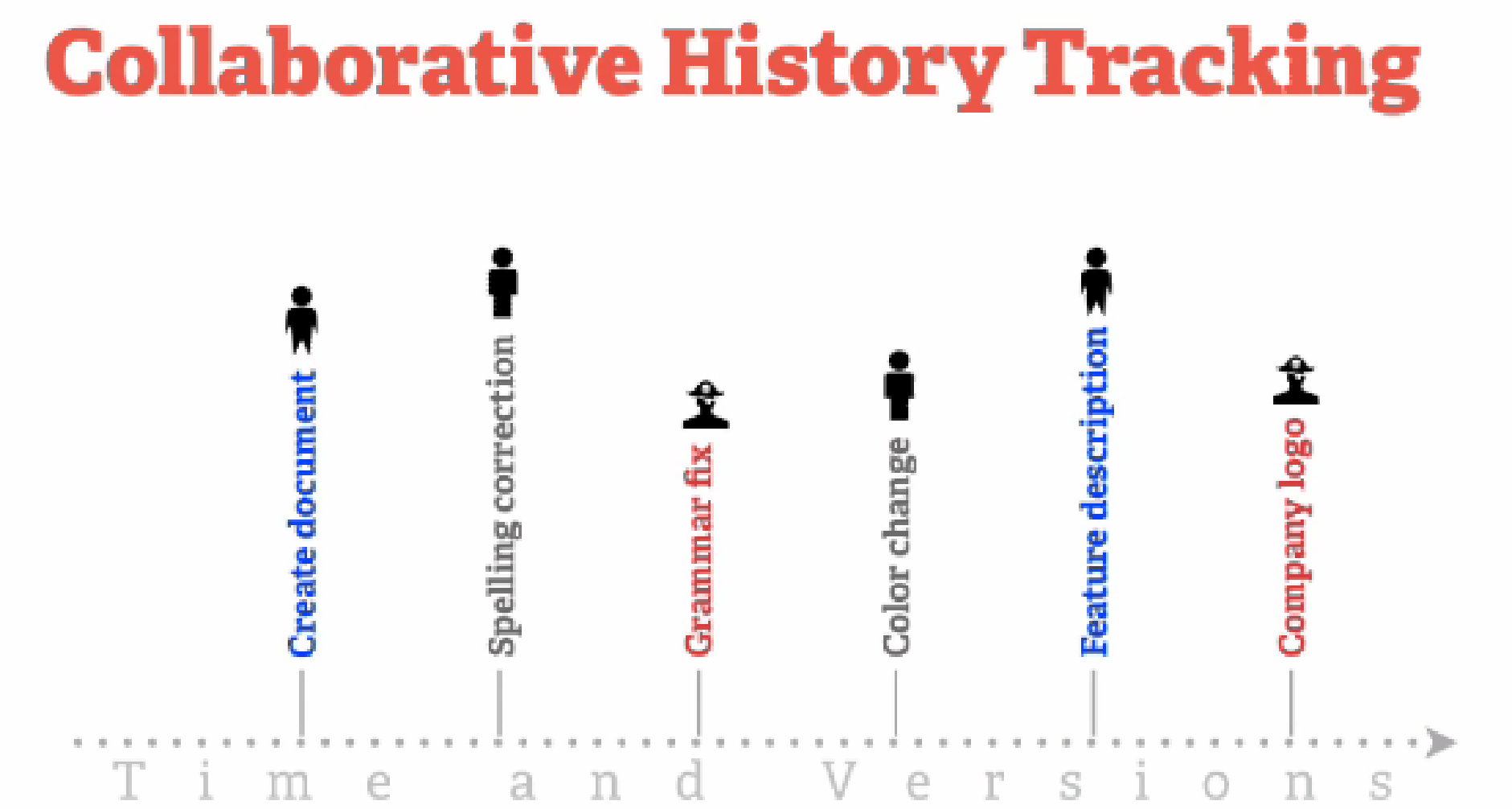
your task

- *Create* things
- *Save* things
- *Edit* things (correction-request of modification)
- Save the thing *again* and *again*

Personal changes

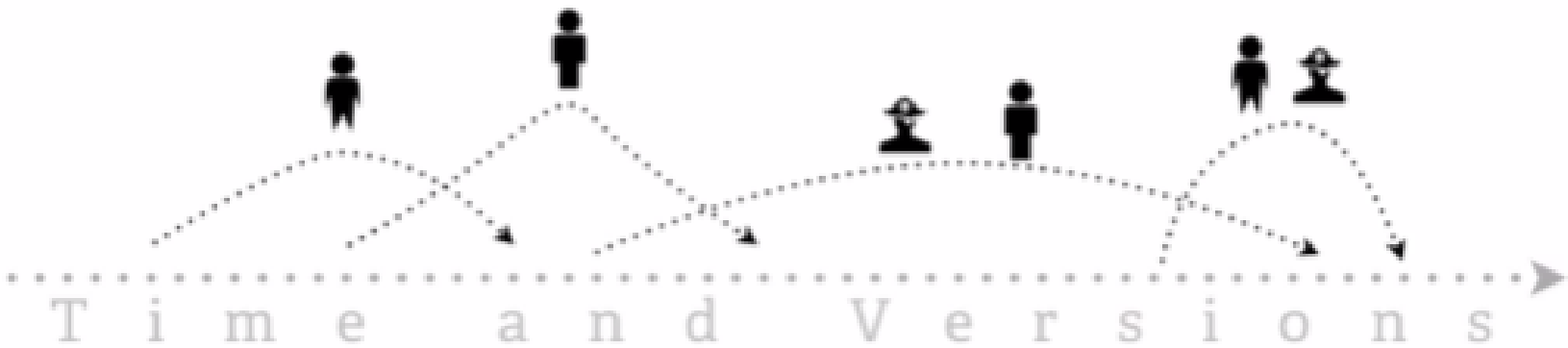


Team work


Collaborative History Tracking
Create document
Spelling correction
Grammar fix
Color change
Feature description
Company logo
Time and Versions

Non-Sequential Overlaping

Collaborative History Tracking



Track modifications

! Important

When-Why-What-Who are the goals *VERSION CONTROL*

Why GIT?

- GIT is a fast and modern
  - implementation of *version control*
- GIT provides a *history* of content changes
- Individual bases, tracking each file's content piece (graphics design, programs and code)

Why GIT? continuation

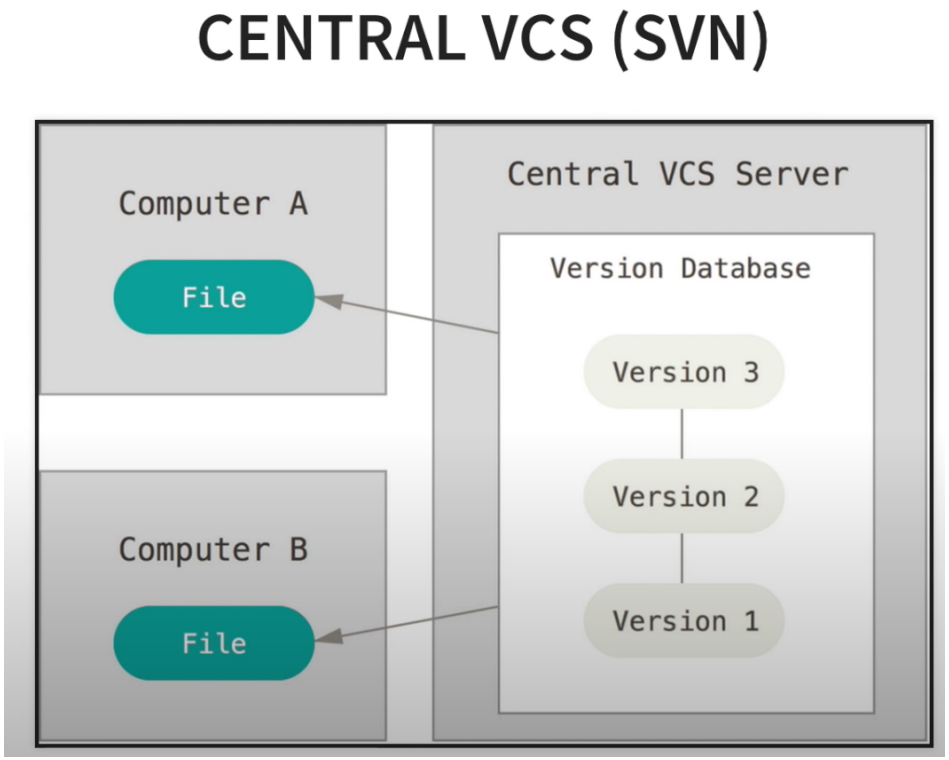
- GIT facilitates **collaborative changes** to files.
- Not just one person bringing modification and for all the team at the same time.
- People simultaneous change files, working at the same time about an idea.
- GIT is easy to use for
  - any type of knowledge worker.

Types of version control

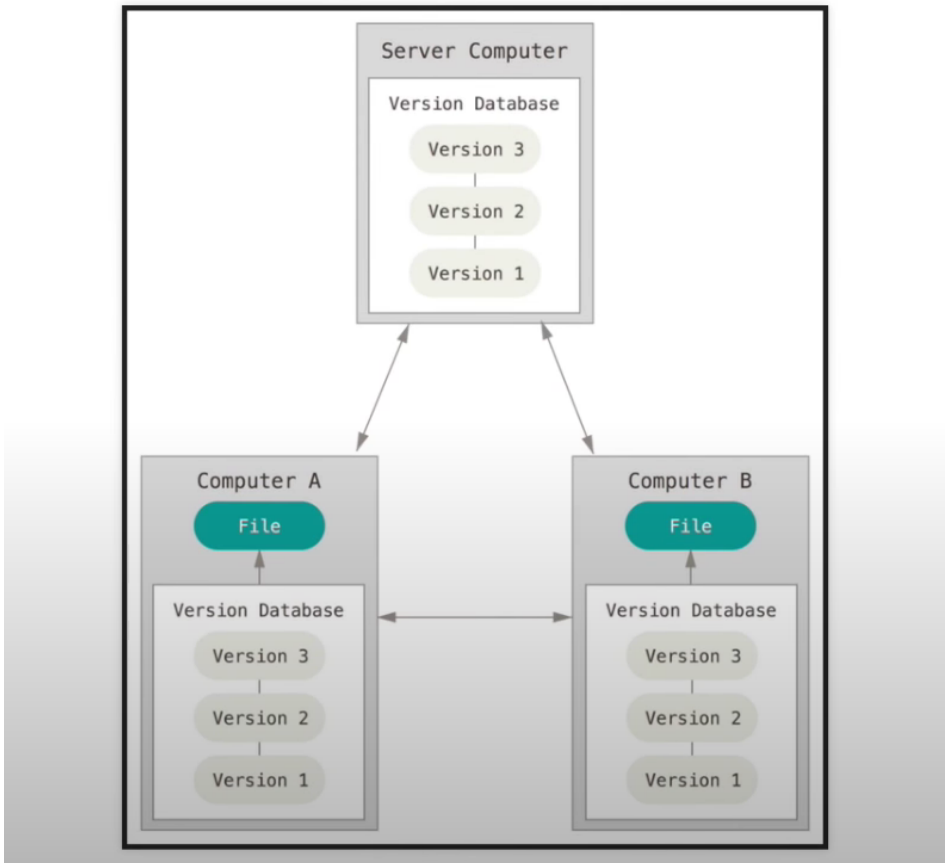
What is the difference between *CENTRAL* and

DISTRIBUTED Version Control System.

Without GIT: SVN



DISTRIBUTED VCS (GIT)



GIT

Version control

- Local GIT
  - Simple commands.
- *Distributed*
  - Connectivity not required
  - Simple software
- *Easy* $\rightarrow$ commands can be learnt *progressively*.

Summary

Important

with GIT you have a way **how to track** your/team project progress

Tip

To fully understand the depth and power of Git you need to understand two simple ideas (LOCAL-REMOTE).

Get going with git

- How to install
- Setup
- Configure
- Make your first use of the command line

Installing GIT

Official GIT's homepage

https://git-scm.com/

Opening GIT

Important

GIT Bash

check version

Tip

$ git - -version

Configuration

- Configure your *username* and *email*

Note

$ git config - -global user.name “Ana Devops”

Note

$ git config - -global user.email “anadevops@gmail.com”

Help

Important

$ git help config

Important

$ git config - -help

- Google is your friend

Example

Developer Ana :

- She is working on her new project in a file called clients.txt

Creating a new repository

Note

$ git init project

- If the directory exists use only

Note

$ git init

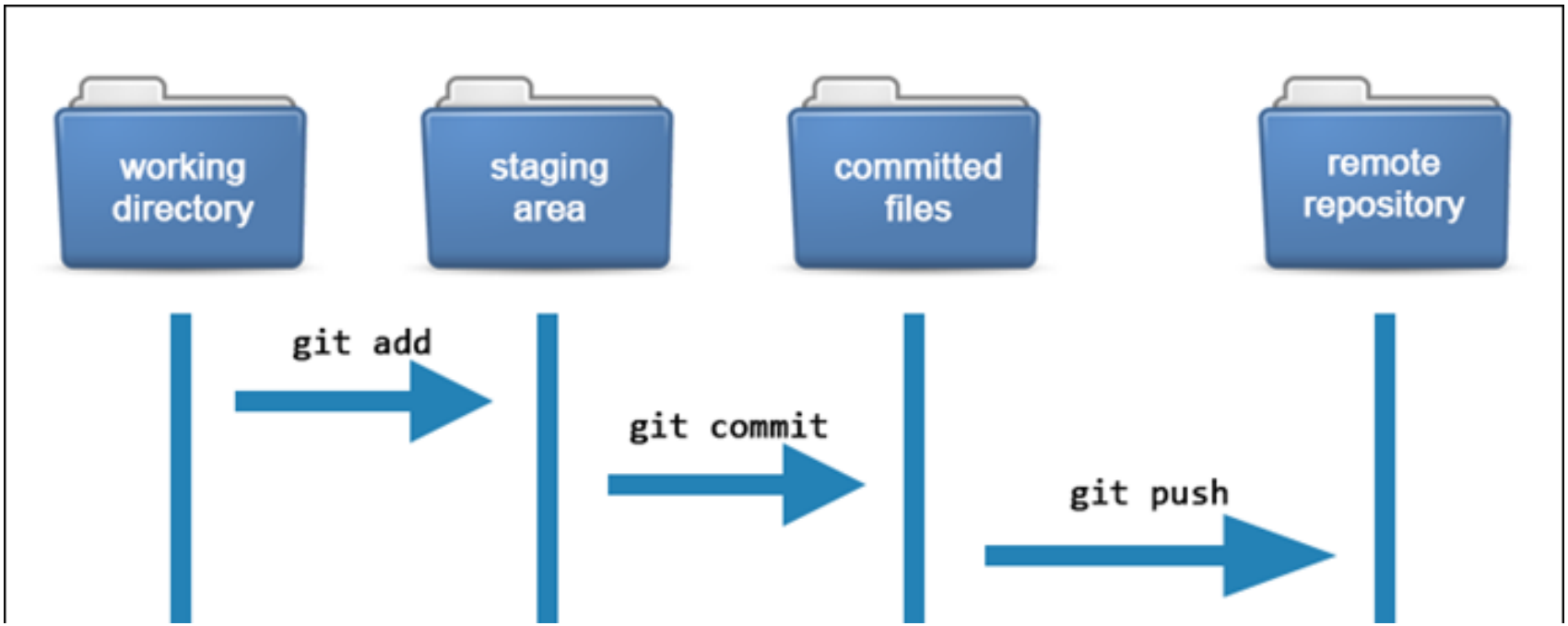
Note

$ cd project

In your Git Bash

```
Pamela@PC1022350854 MINGW64 ~/Documents (master)
$ git init Pam
Initialized empty Git repository in C:/Users/Pamela/Documents/Pam/.git/

Pamela@PC1022350854 MINGW64 ~/Documents (master)
$ cd Pam

Pamela@PC1022350854 MINGW64 ~/Documents/Pam (master)
$ git status
On branch master

No commits yet

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

nothing added to commit but untracked files present (use "git add" to track)
```

Git workflow



Tracking-Staged *git add*

Start tracking using **git add** command.

git add tells Git that you want to include updates to a particular file in the next commit.

after *git add* this file is ready to be committed

Note

$ git add clients.txt

Note

$ git status

In your Git Bash

```
Pamela@PC1022350854 MINGW64 ~/Documents/Pam (master)
$ git add Clients.txt

Pamela@PC1022350854 MINGW64 ~/Documents/Pam (master)
$ git status
On branch master

No commits yet

Changes to be committed:
  (use "git rm --cached <file>..." to unstage)
        new file:   Clients.txt
```

unTracking - unstage clients.txt

Note

- $ $ git rm –cached clients.txt
- $ git restore - -staged clients.txt

Note

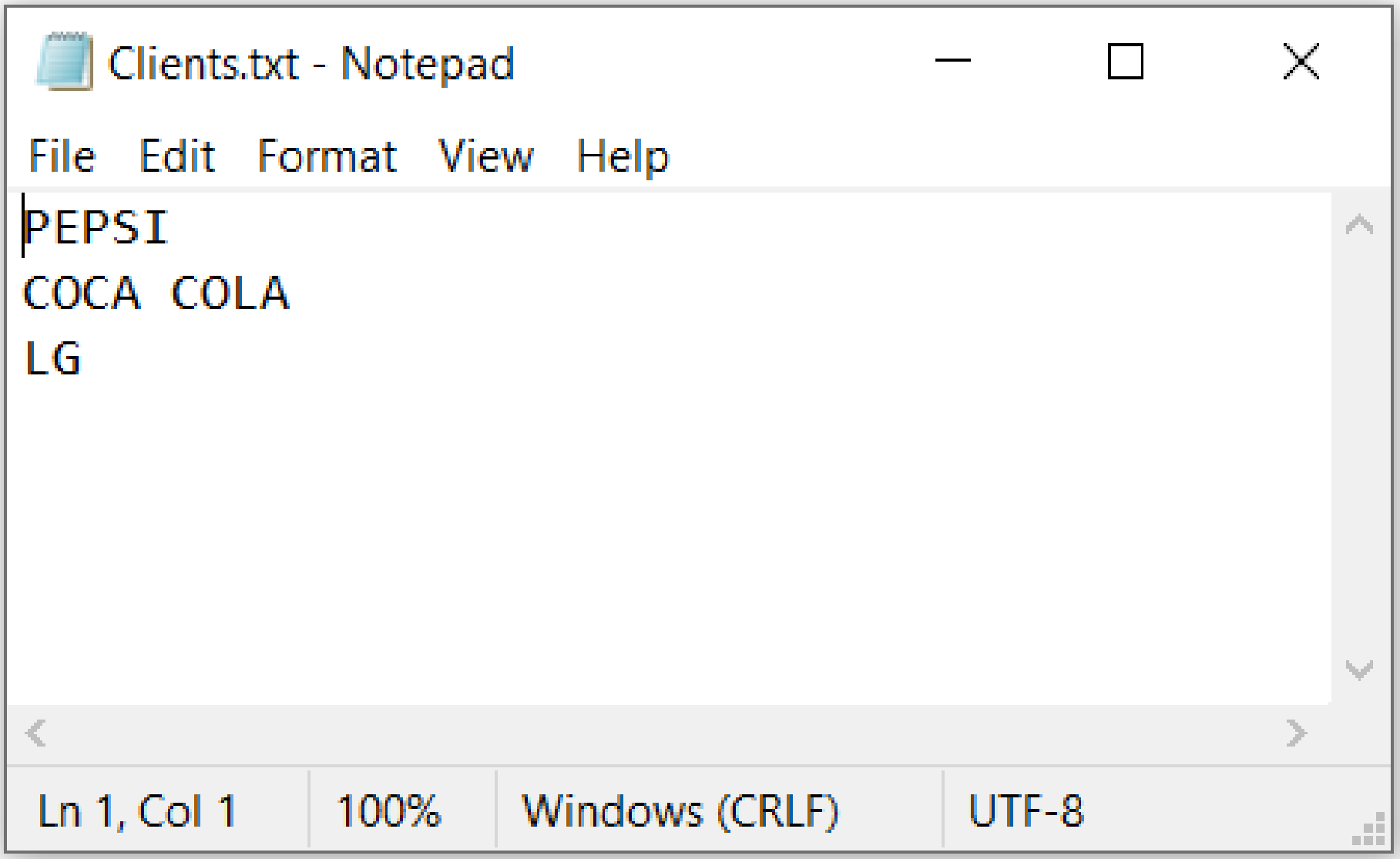
$ git status

In color *red*

In your Git Bash

```
Pamela@PC1022350854 MINGW64 ~/Documents/Pam (master)
$ git rm --cached Clients.txt
rm 'Clients.txt'

Pamela@PC1022350854 MINGW64 ~/Documents/Pam (master)
$ git status
On branch master

No commits yet

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

nothing added to commit but untracked files present (use "git add" to track)
```

Making changes



Commit command

Remember: put in stage area with add before commit

Note

$ git add clients.txt

Note

$ git commit -m “first commit”

Commit is the keyword that permanently logs changes.

Note: git add adds your modified files to the queue to be committed later. Files are not committed.

git commit commits the files that have been added and creates a new revision with a log. It step is associated with a unique identifier.

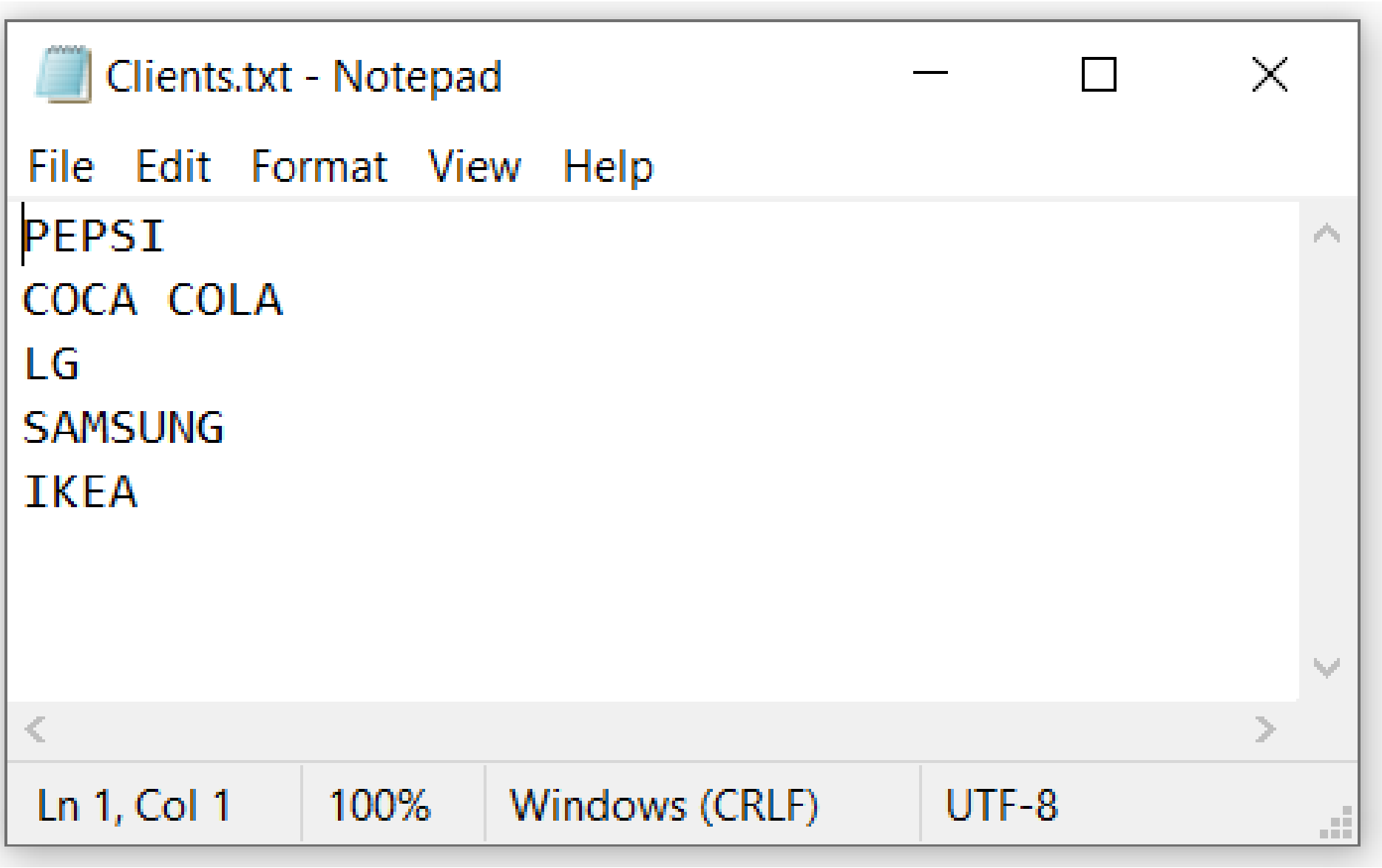
In your Git Bash

```
Pamela@PC1022350854 MINGW64 ~/Documents/Pam (master)
$ git add Clients.txt

Pamela@PC1022350854 MINGW64 ~/Documents/Pam (master)
$ git status
On branch master

No commits yet

Changes to be committed:
  (use "git rm --cached <file>..." to unstage)
        new file:   Clients.txt


Pamela@PC1022350854 MINGW64 ~/Documents/Pam (master)
$ git commit -m "Including Clients"
[master (root-commit) 4a671af] Including Clients
 1 file changed, 3 insertions(+)
 create mode 100644 Clients.txt
```

Exercise

- Make 3 commits
- Use $ git diff to see differences when relevant

In your Git Bash



In your Git Bash

```
Pamela@PC1022350854 MINGW64 ~/Documents/Pam (master)
$ git add Clients.txt

Pamela@PC1022350854 MINGW64 ~/Documents/Pam (master)
$ git commit -m "new clients"
[master 5032123] new clients
 1 file changed, 3 insertions(+), 1 deletion(-)

Pamela@PC1022350854 MINGW64 ~/Documents/Pam (master)
$ git log --oneline
5032123 (HEAD -> master) new clients
4a671af Including Clients
```

Return to the previous commit

Note

$ git log - - oneline

Note

$ git revert ID

write :qa! (VIM's command)

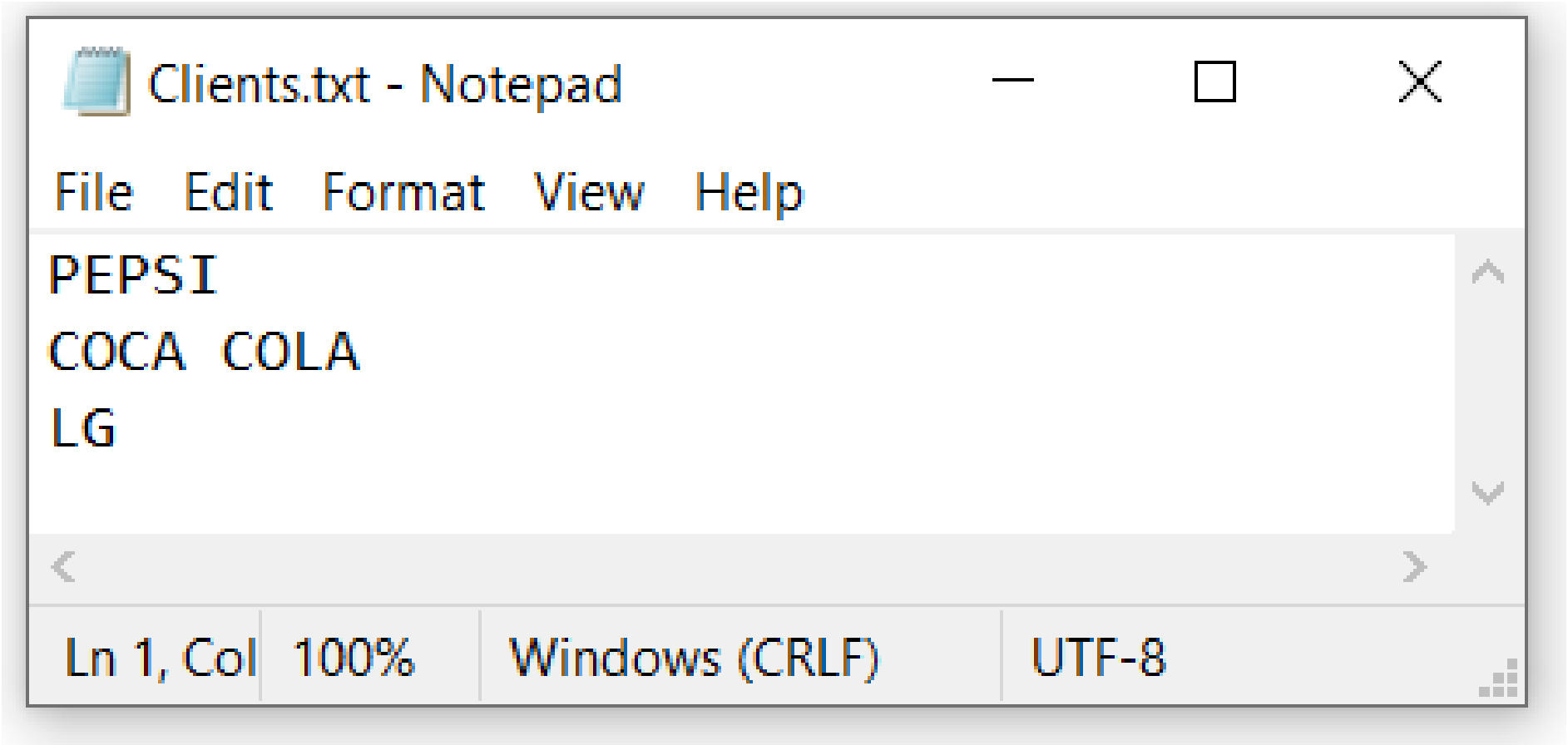
Note

$ git log - - oneline

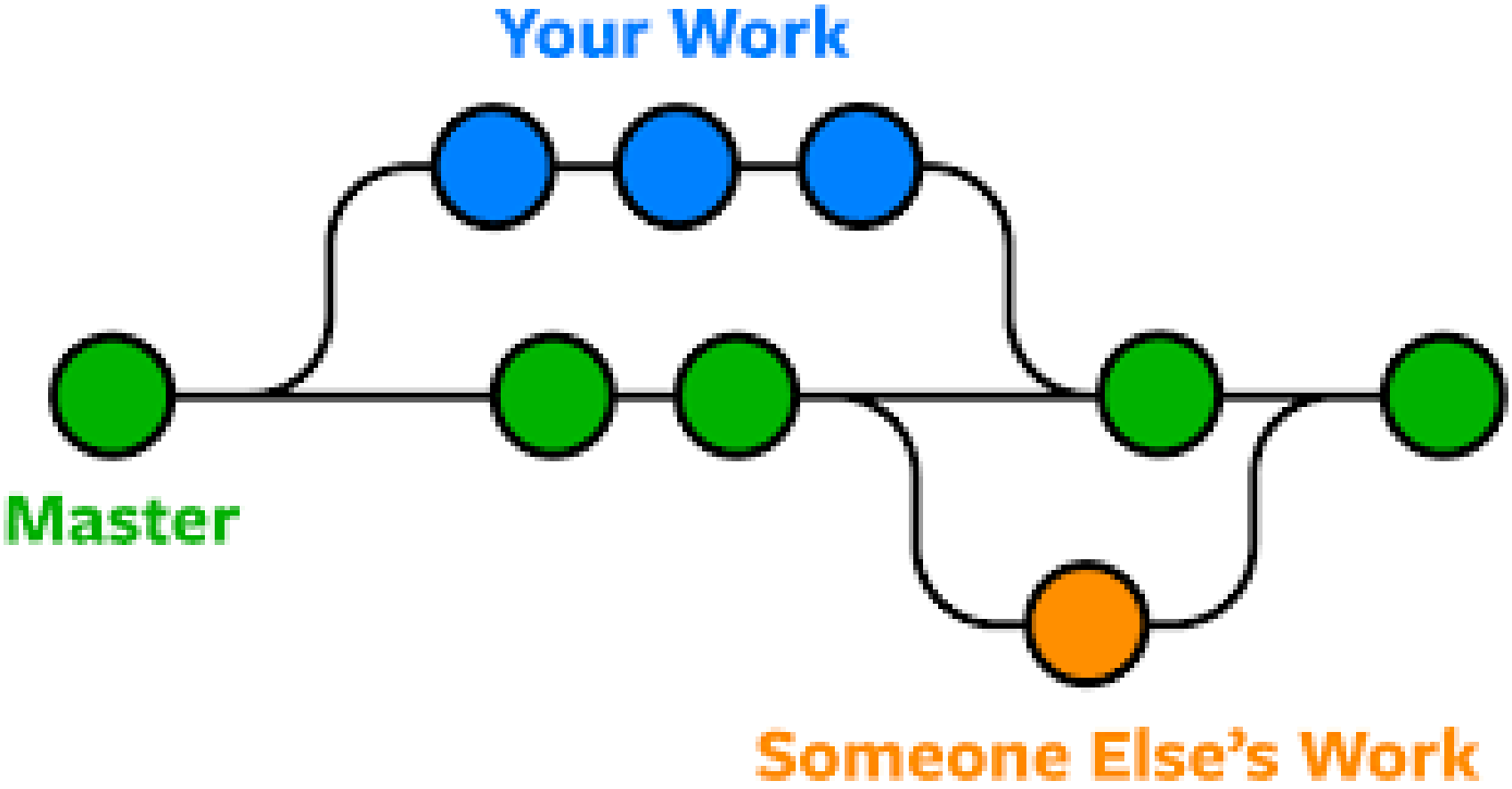
In your Git Bash

```
[master 2687c16] Revert "new clients"
 1 file changed, 1 insertion(+), 3 deletions(-)

Pamela@PC1022350854 MINGW64 ~/Documents/Pam (master)
$ git log --oneline
2687c16 (HEAD -> master) Revert "new clients"
5032123 new clients
4a671af Including Clients
```

File Clients.txt



Our objective



Branches

A **Branch** is a version of your repository. An independent line of development.

> **Note**
>
> $ git branch potential

into branch potential: checkout

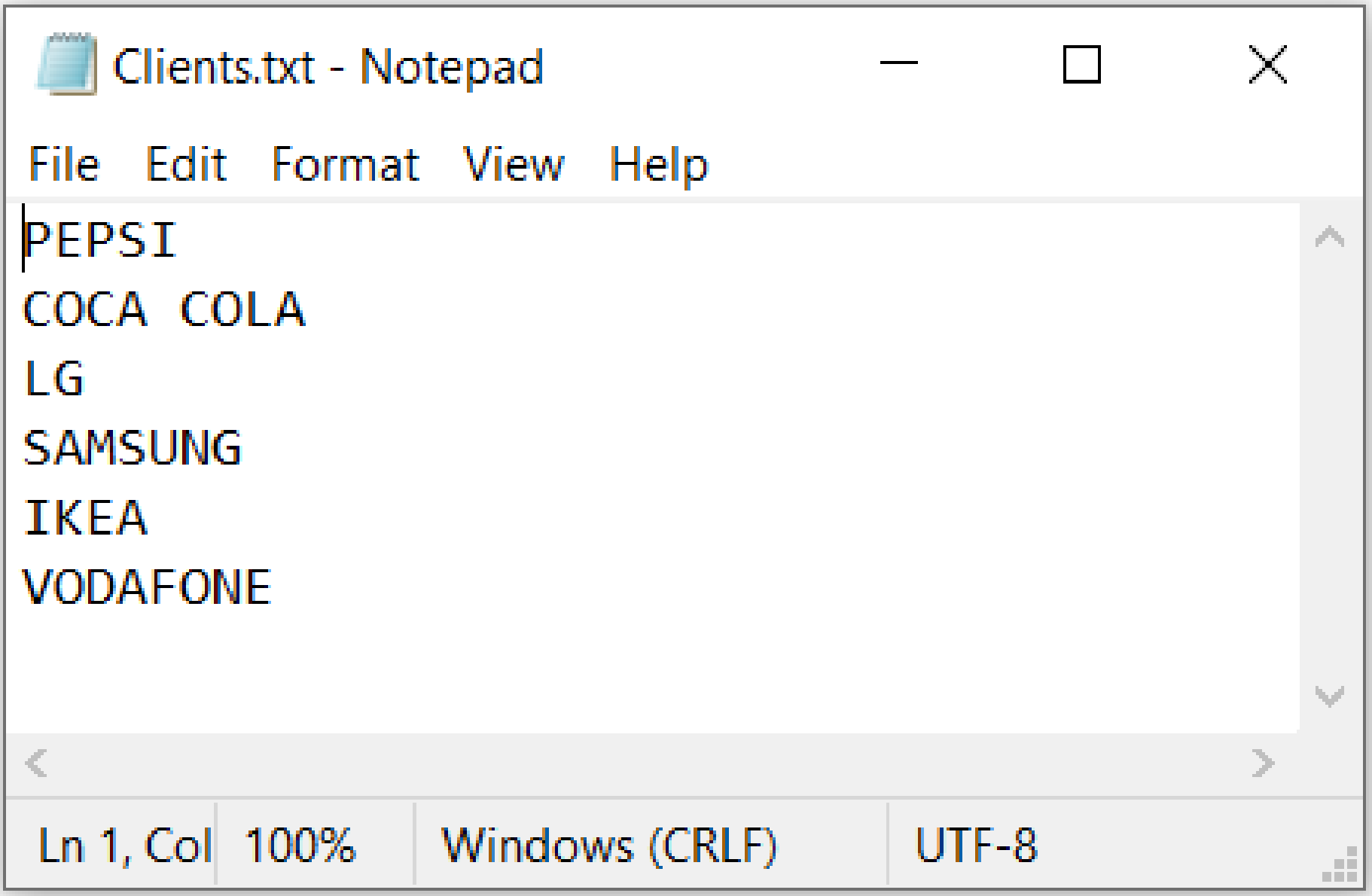
> **Note**
>
> $ git checkout potential

> **Note**
>
> $ git branch -l

In your Git Bash

```
Pamela@PC1022350854 MINGW64 ~/Documents/Pam (master)
$ git branch potential

Pamela@PC1022350854 MINGW64 ~/Documents/Pam (master)
$ git checkout potential
Switched to branch 'potential'

Pamela@PC1022350854 MINGW64 ~/Documents/Pam (potential)
$ git branch -l
  master
* potential
```

Changes in Clients.txt



In your Git Bash

```
Pamela@PC1022350854 MINGW64 ~/Documents/Pam (potential)
$ git branch -l
  master
* potential

Pamela@PC1022350854 MINGW64 ~/Documents/Pam (potential)
$ git add Clients.txt

Pamela@PC1022350854 MINGW64 ~/Documents/Pam (potential)
$ git diff
diff --git a/Clients.txt b/Clients.txt
index f00cf49..5934292 100644
--- a/Clients.txt
+++ b/Clients.txt
@@ -1,3 +1,6 @@
 PEPSI
 COCA COLA
-LG
\ No newline at end of file
+LG
+SAMSUNG
+IKEA
+VODAFONE
\ No newline at end of file

Pamela@PC1022350854 MINGW64 ~/Documents/Pam (potential)
$ git commit -m "potential clients"
On branch potential
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:   Clients.txt
```

Branch vs Master

Make changes

Note

- $ git add .
- $git commit -m “potential clients”

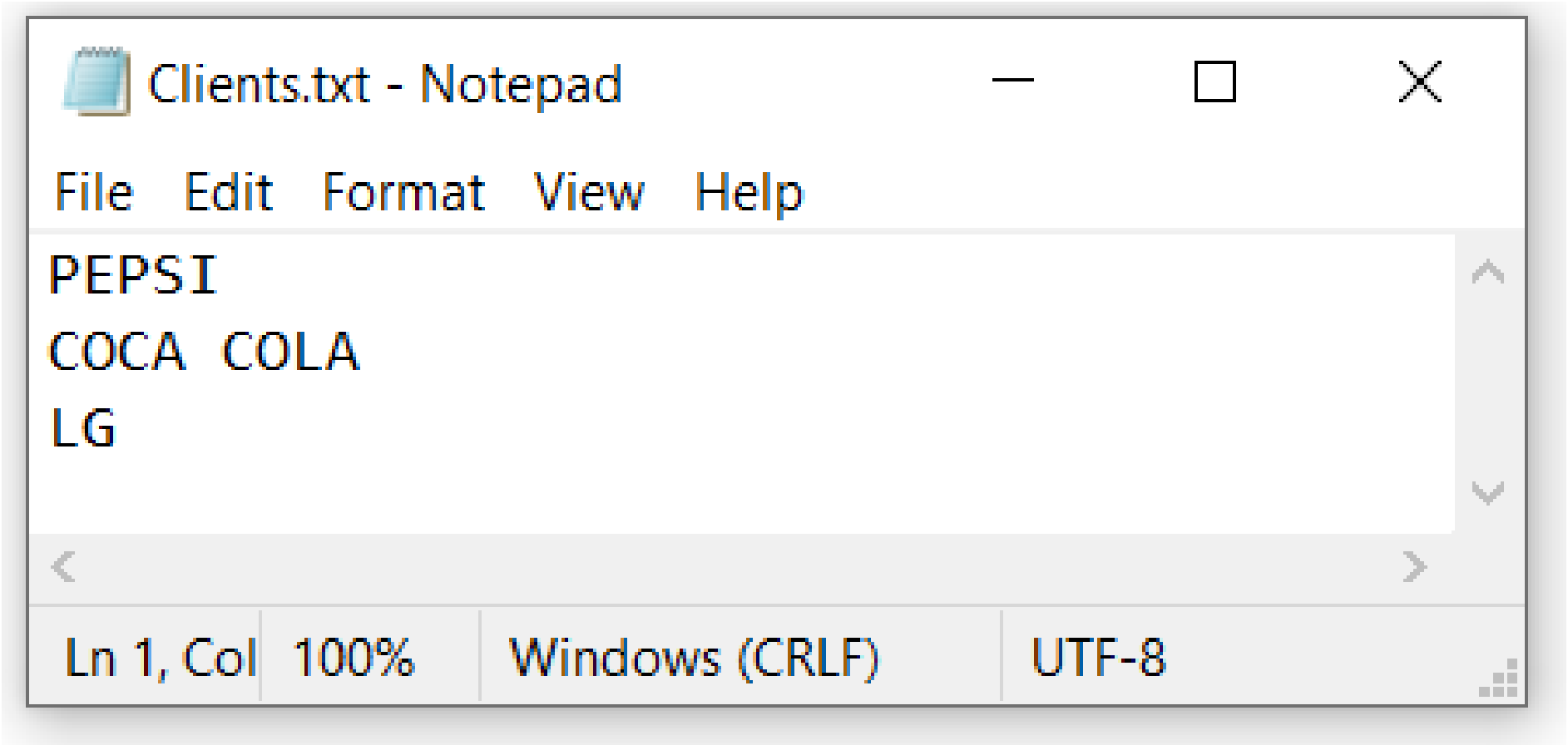
Master branch still old version

- $ git checkout master

In your Git Bash

```
Pamela@PC1022350854 MINGW64 ~/Documents/Pam (potential)
$ git checkout master
Switched to branch 'master'
M       Clients.txt

Pamela@PC1022350854 MINGW64 ~/Documents/Pam (master)
$ git status
On branch master
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:   Clients.txt

no changes added to commit (use "git add" and/or "git commit -a")

Pamela@PC1022350854 MINGW64 ~/Documents/Pam (master)
$ git diff
diff --git a/Clients.txt b/Clients.txt
index f00cf49..5934292 100644
--- a/Clients.txt
+++ b/Clients.txt
@@ -1,3 +1,6 @@
 PEPSI
 COCA COLA
-LG
\ No newline at end of file
+LG
+SAMSUNG
+IKEA
+VODAFONE
```

File Clients.txt in MASTER



Merge branches

- Put the changes from **potential** into **master**

Note

$ git checkout master

Note

$ git merge potential

In your Git Bash

```
Pamela@PC1022350854 MINGW64 ~/Documents/Pam (master)
$ git merge potential
Already up to date.
```

Deleting potential branch

Note

$ git branch -d potential

Note

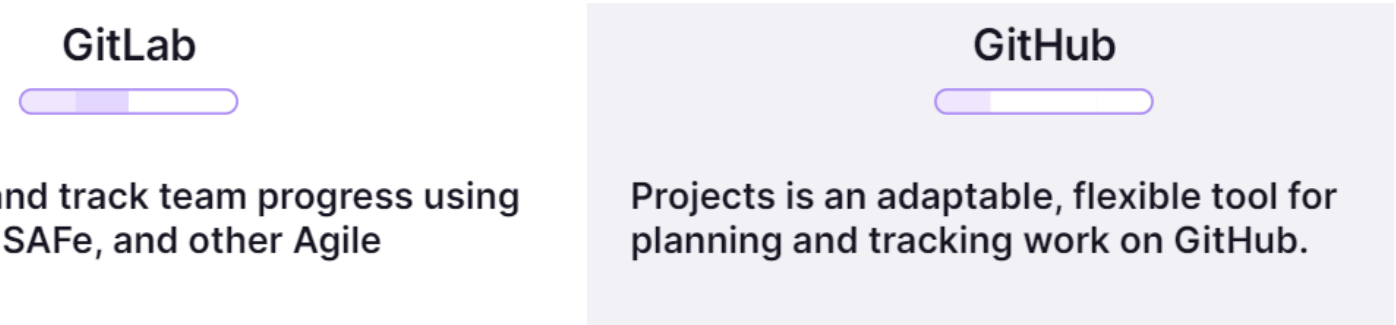
$ git branch -l

In your Git Bash

```
Pamela@PC1022350854 MINGW64 ~/Documents/Pam (master)
$ git branch -d potential
Deleted branch potential (was 2687c16).

Pamela@PC1022350854 MINGW64 ~/Documents/Pam (master)
$ git branch -l
* master
```

Webservices

REMOTE repositories



REMOTE repository

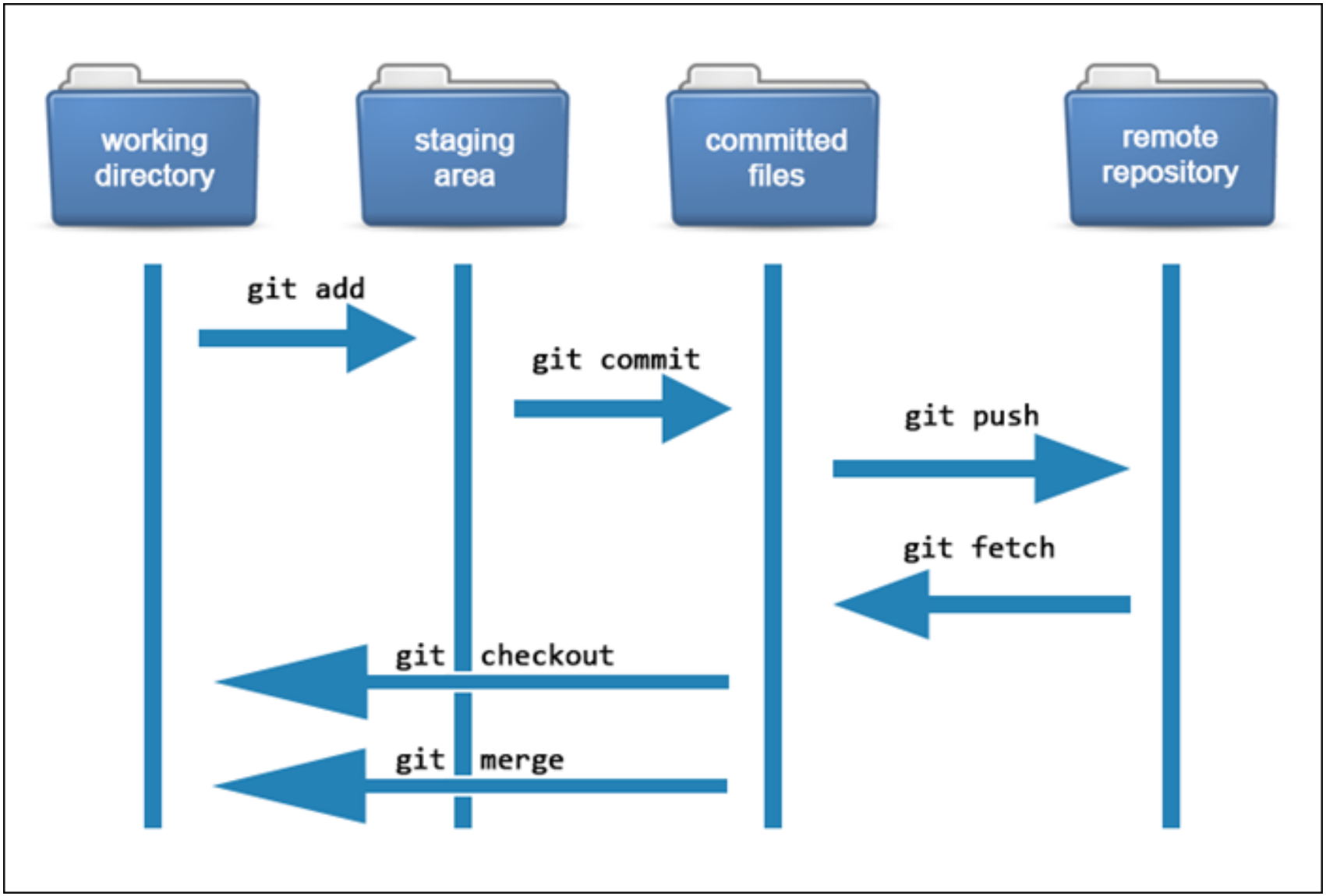
GitHub - *GitLab* your free WEBSERVICES

Commit all your changes and **push** your **branch** to REMOTE

Note

- $ git remote add origin URL
- $ git push -u origin master

GIT workflow details



Tracking an existing remote project

Note

$ git clone URL

Command that clones all the files from the repository and includes in my working directory

- The **url** from GitLab or GitHub

Tracking: Cloned project

- Make changes in the code:
  - add, commit, diff, status
- **Push**

> **!** Important
>
> *REMEMBER*: Multiple developers

PULL any changes that have been made since the last time that we cloned the repository

- $ git pull origin master
- $ git push origin master

In your Git Bash

```
Pamela@PC1022350854 MINGW64 ~/Documents (master)
$ git clone https://github.com/pchiroque/NewTest.git
Cloning into 'NewTest'...
warning: You appear to have cloned an empty repository.
```

In your Git Bash

```
Pamela@PC1022350854 MINGW64 ~/Documents/NewTest (main)
$ git add README.md

Pamela@PC1022350854 MINGW64 ~/Documents/NewTest (main)
$ git commit -m "first commit"
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

Pamela@PC1022350854 MINGW64 ~/Documents/NewTest (main)
$ git push -u origin main
Enumerating objects: 3, done.
Counting objects: 100% (3/3), done.
Writing objects: 100% (3/3), 228 bytes | 228.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/pchiroque/NewTest.git
 * [new branch]      main -> main
branch 'main' set up to track 'origin/main'.
```

Common commands

- $ git branch DOTHIS
- $ git checkout DOTHIS
- make modifications
- $ git add . and then $ git commit -m “changes”
- $ git checkout master
- $ git pull origin master
- $ git merge DOTHIS
- $ git push origin
- $ git branch -d DOTHIS

Wins-Benefits with GIT

- Focus on content.
- OPT in, not OPT-OUT: GIT's idea of the staging area.
- OPEN, not LOCKED, let people make contibution, **open source** project, free.
- DISTRIBUTED, not centralized.
- Exchange of code. WEBSERVICES like **GitHub** or **GitLab**.
- Focus on the PEOPLE, NOT TOOLS
- JOURNAL, NOT BACKUP. Version control system - historical changes
- ANYWHERE, NOT JUST ONLINE: GIT works entirely **OFFLINE** mode

Exercises

Explore commands

- $ git fetch
- What is difference between git fetch and git pull?

Aditional Documentation

https://git-scm.com/

https://education.github.com/git-cheat-sheet-education.pdf.
https://about.gitlab.com/images/GIT-press/git-cheat-sheet.pdf

https://ndpsoftware.com/git-cheatsheet.html

References

Pro Git book, written by Scott Chacon and Ben Straub. 2014.

https://git-scm.com/book/en/v2