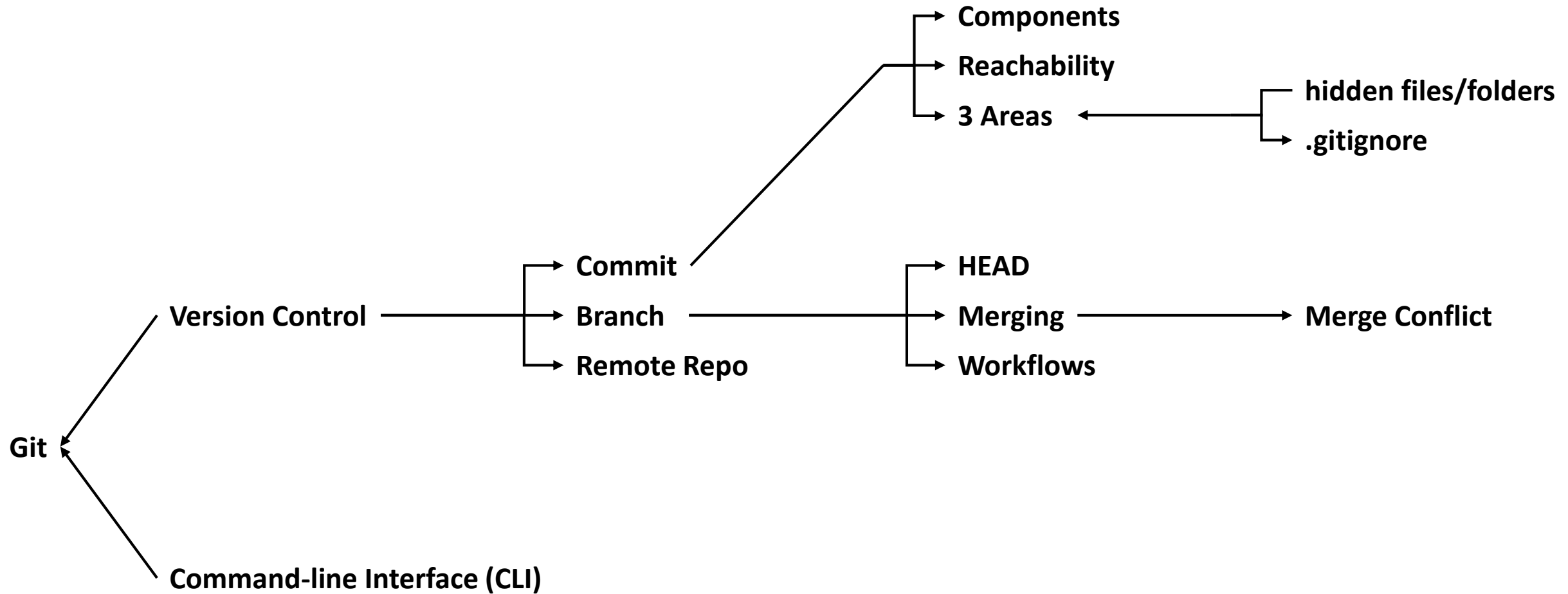


# Key Concepts

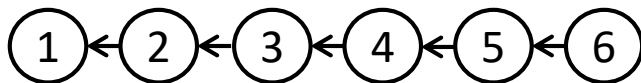


# Version Control

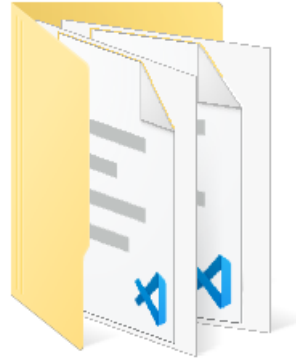
Def: "A system that allows you to record the changes you have made to a file or set of files over time."



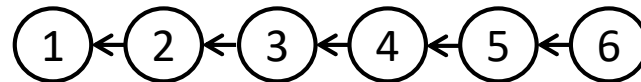
Project



# Commit



Project



Saving a file



Whenever you stop working  
(or at any arbitrary point in between)

Saving the state  
of the project

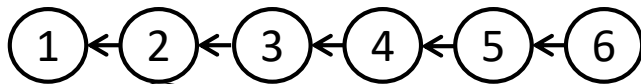


Whenever there is a “meaningful” change

# Components of a Commit



Project



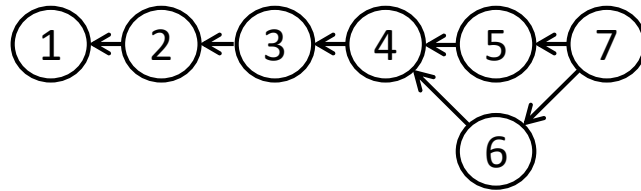
```
Hash : 24b9da6552252987aa493b52f8696cd6d3b00373
Author: Sebastian Mantey <you@example.com>
Date:  Wed Nov 6 10:33:15 2019 +0100

update README
```

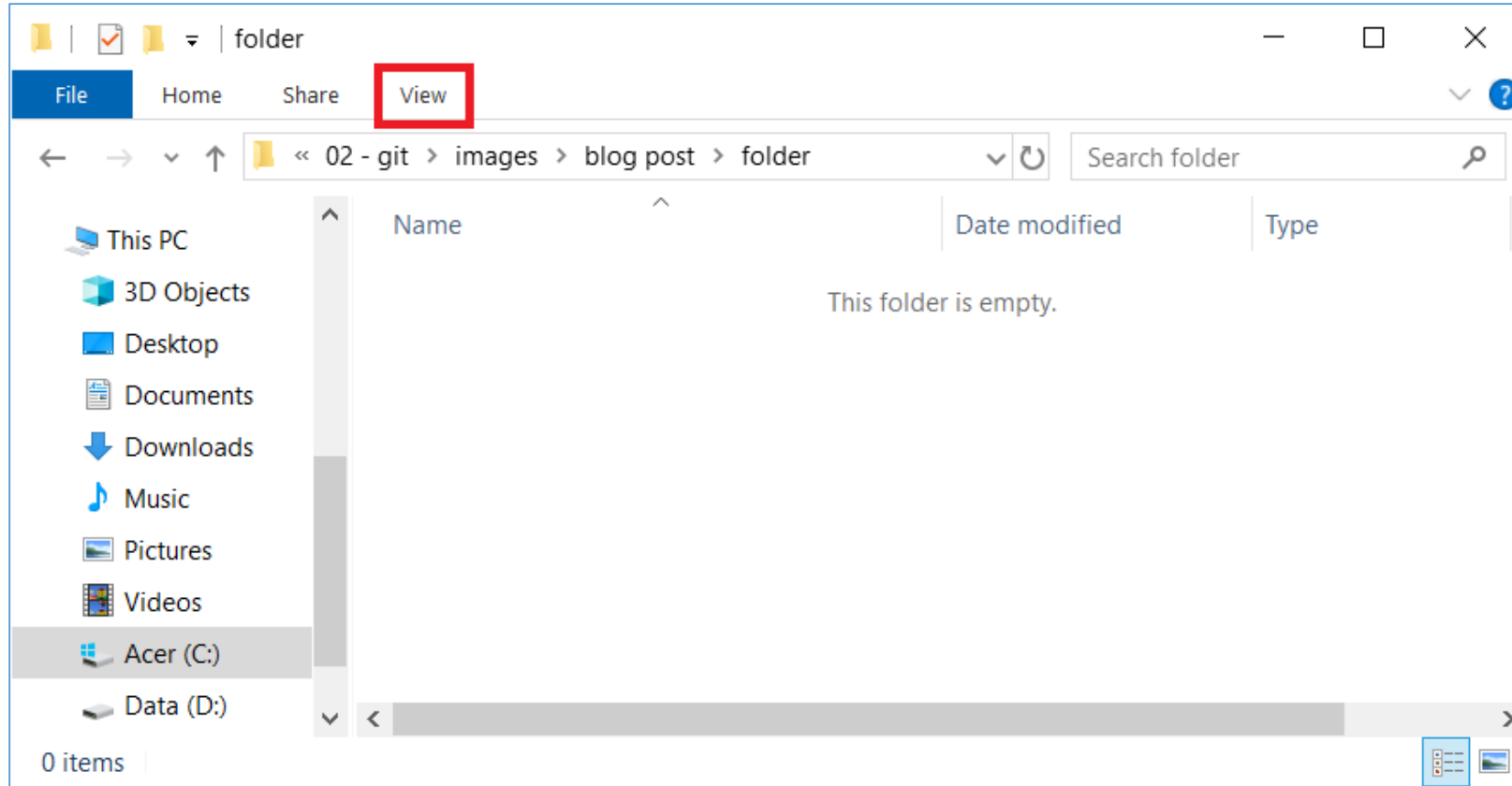
# Reachability



Project

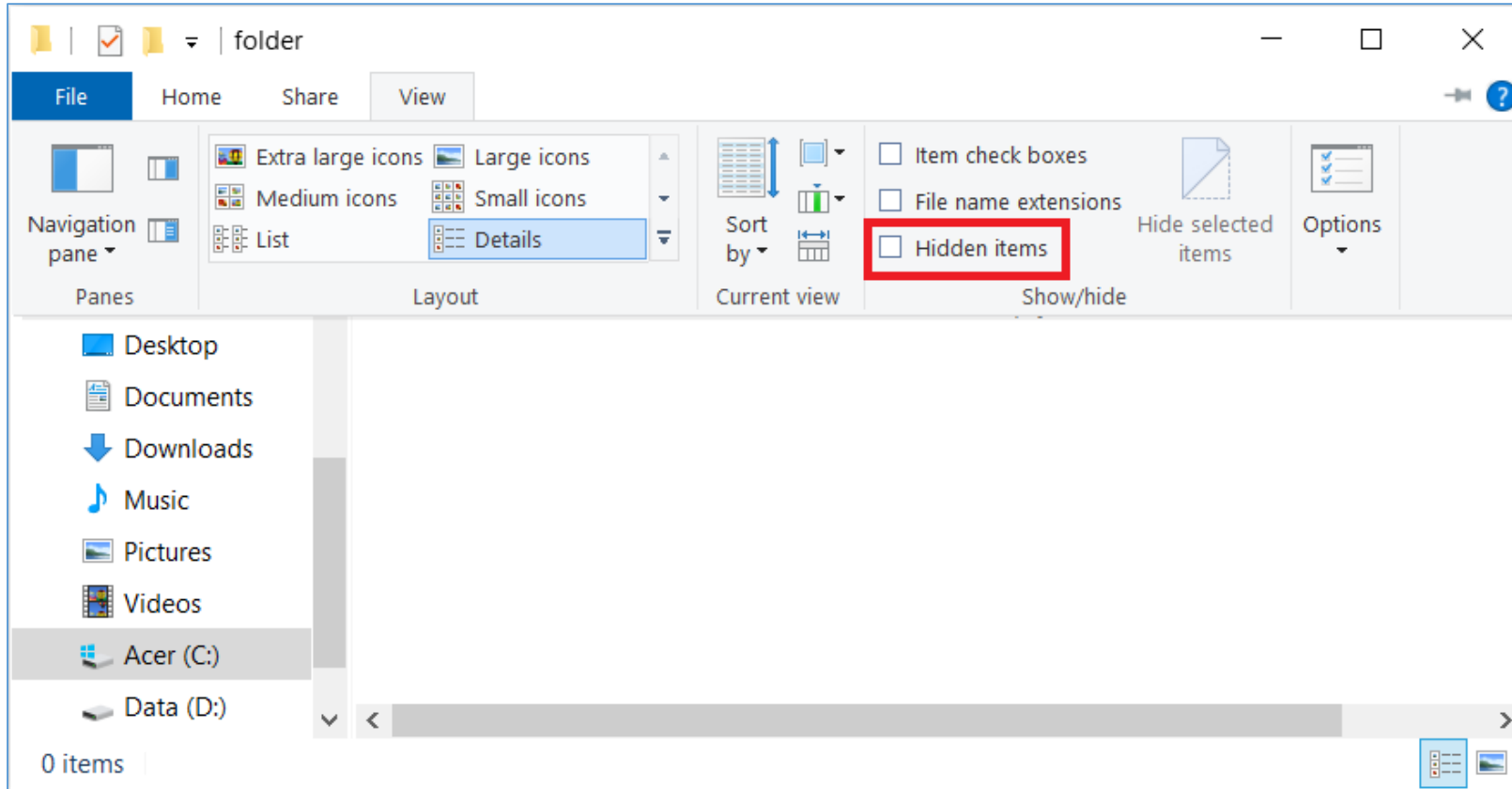


# Hidden Files and Folders



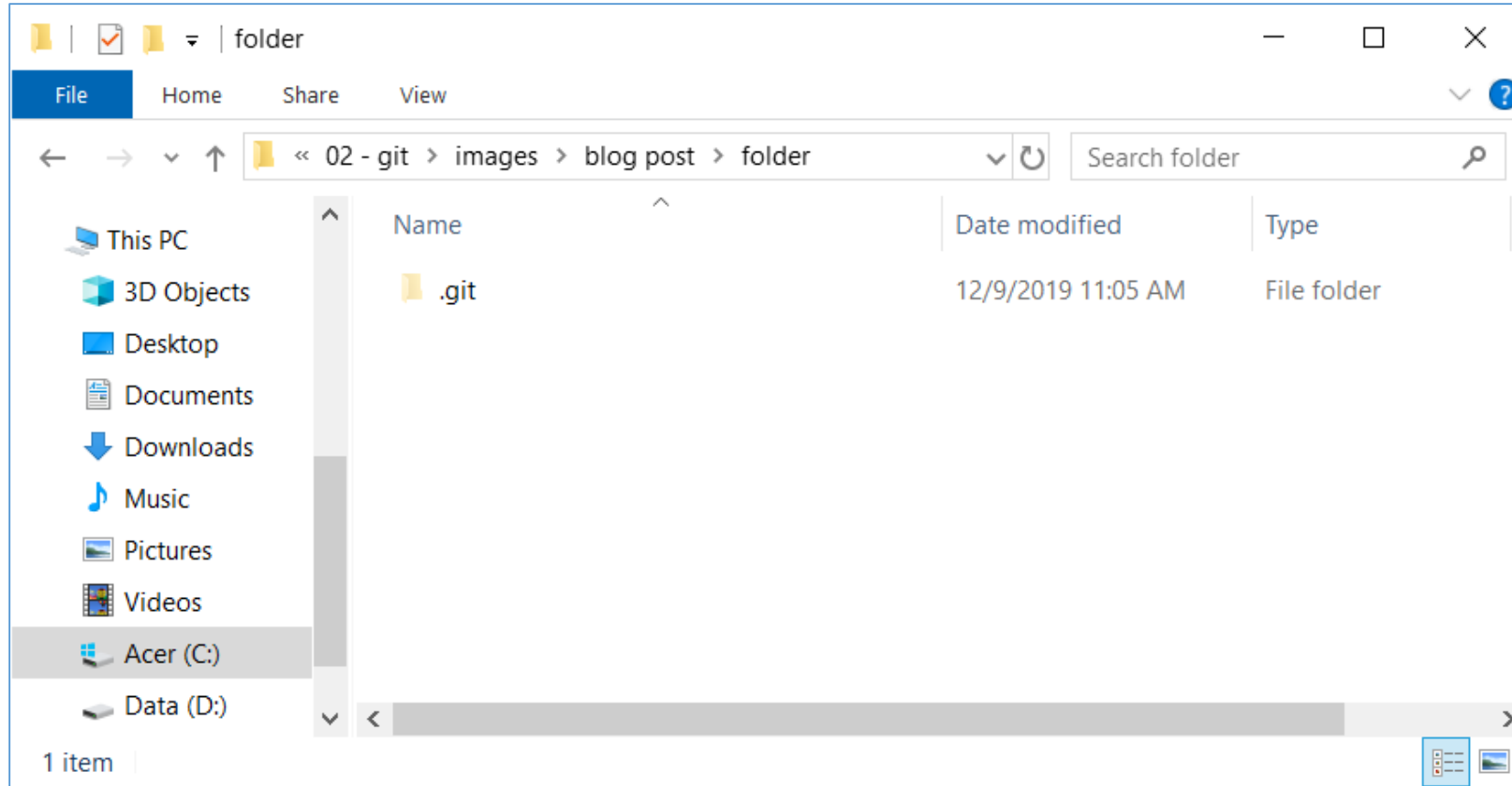
*Select "View" tab*

# Hidden Files and Folders



*Check "Hidden items" box*

# Hidden Files and Folders



*Hidden folder is now depicted*

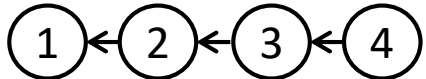


## Working Directory



## Staging Area

## Repository



# 3 Areas

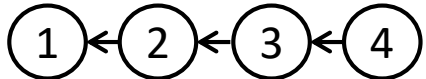
## Working Directory



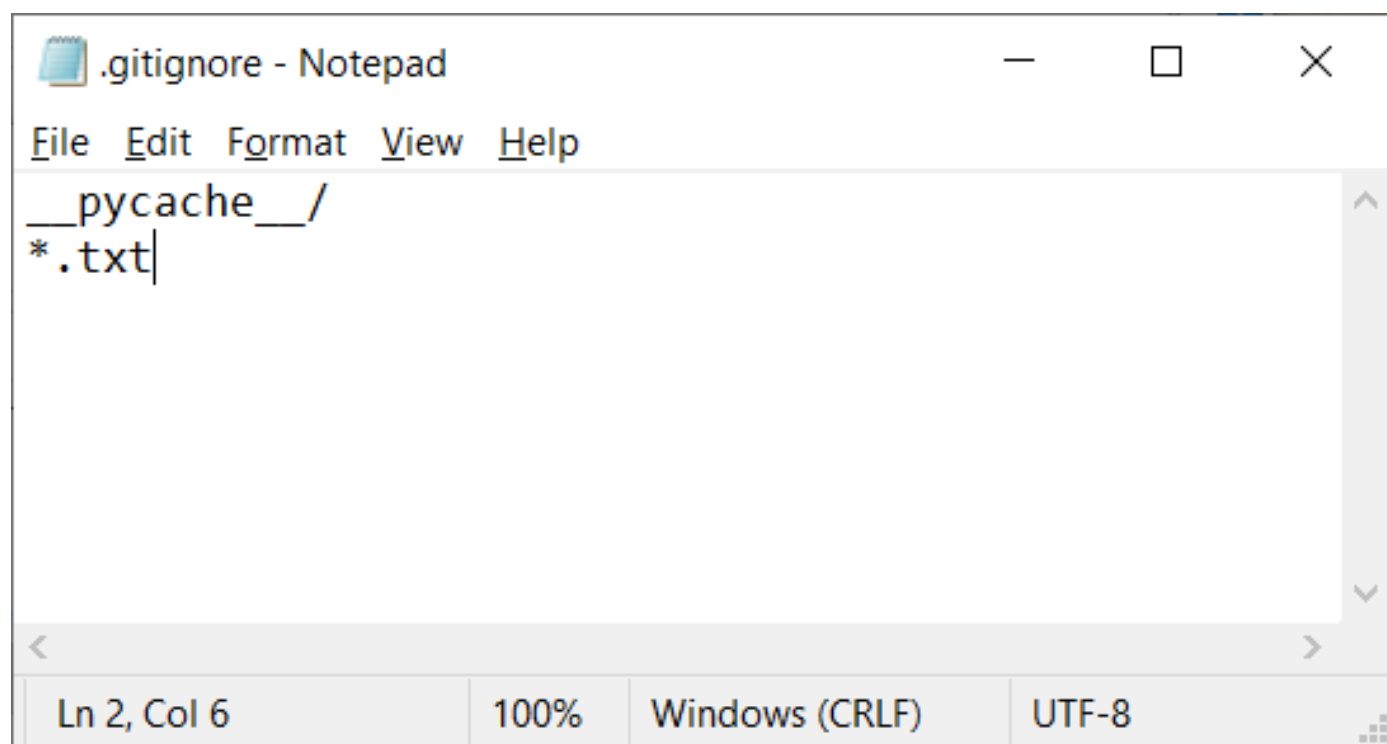
## Staging Area



## Repository



# 3 Areas



The image shows a Notepad window with the title ".gitignore - Notepad". The menu bar includes "File", "Edit", "Format", "View", and "Help". The main text area contains the following lines:

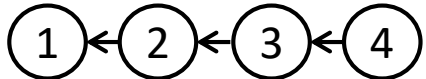
```
__pycache__/  
*.txt|
```

The status bar at the bottom indicates the current position is "Ln 2, Col 6", the zoom level is "100%", the line endings are "Windows (CRLF)", and the encoding is "UTF-8".

**Working Directory**

**Staging Area**

**Repository**

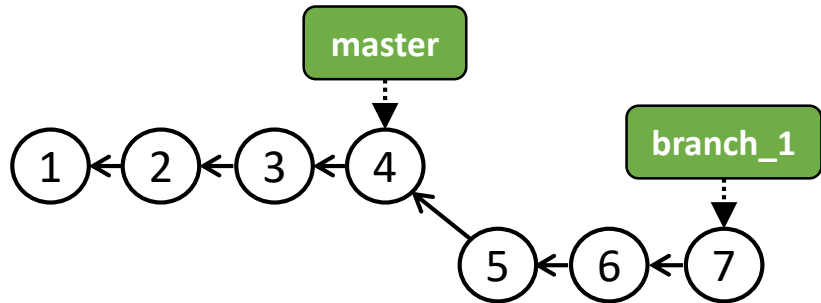


# Branch

Working Directory

Staging Area

Repository

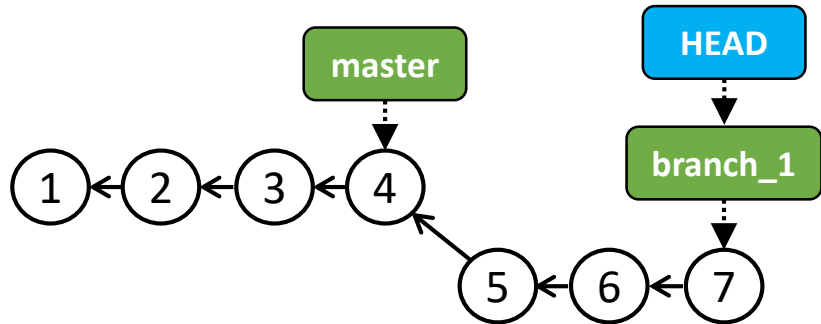


# Branch

Working Directory

Staging Area

Repository

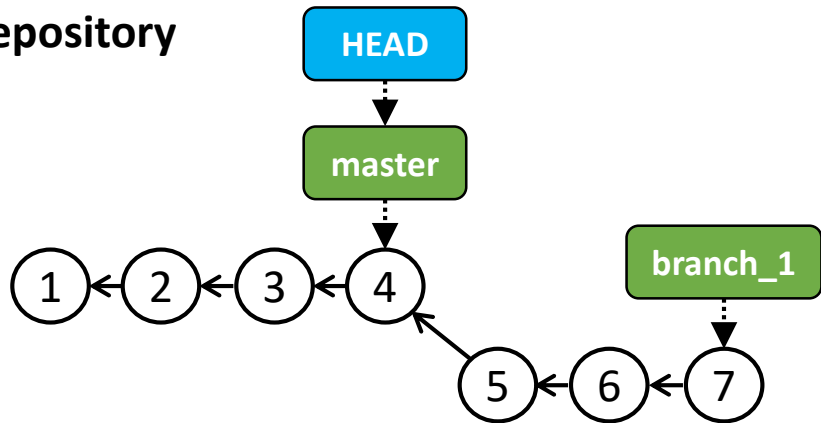


**HEAD**

Working Directory

Staging Area

Repository

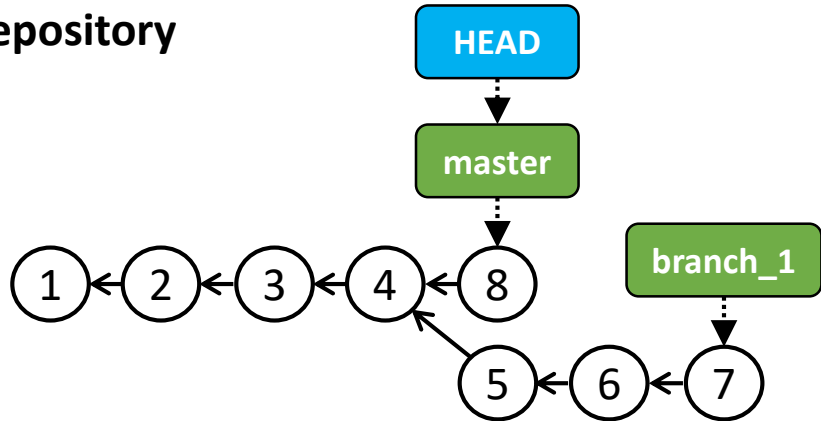


HEAD

Working Directory

Staging Area

Repository



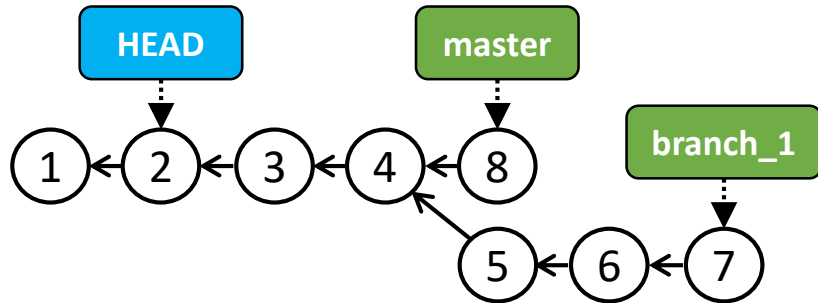
HEAD



Working Directory

Staging Area

Repository

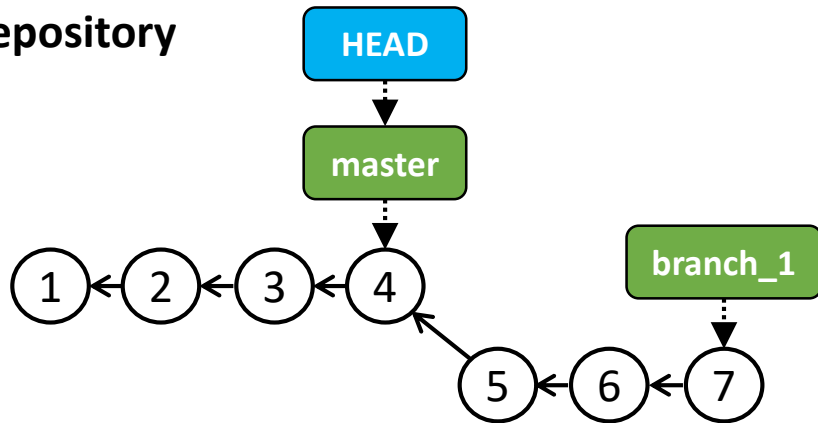


HEAD

Working Directory

Staging Area

Repository



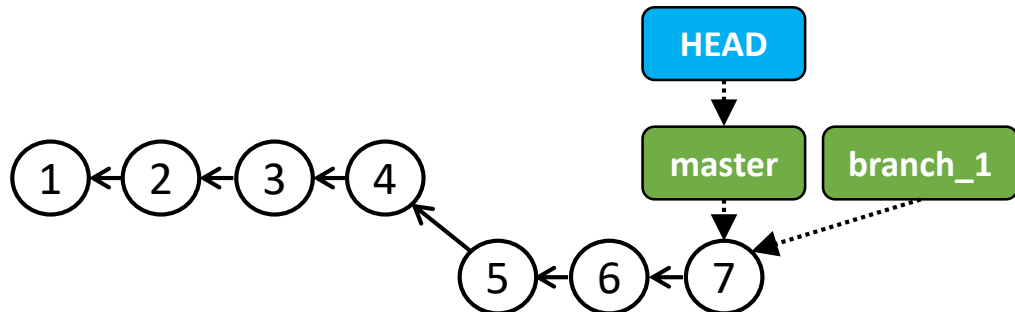
# Merging

- fast-forward
-

Working Directory

Staging Area

Repository



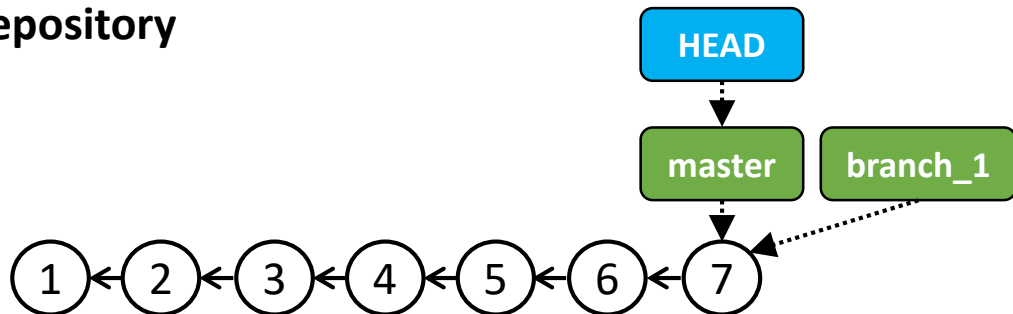
# Merging

- fast-forward
-

Working Directory

Staging Area

Repository



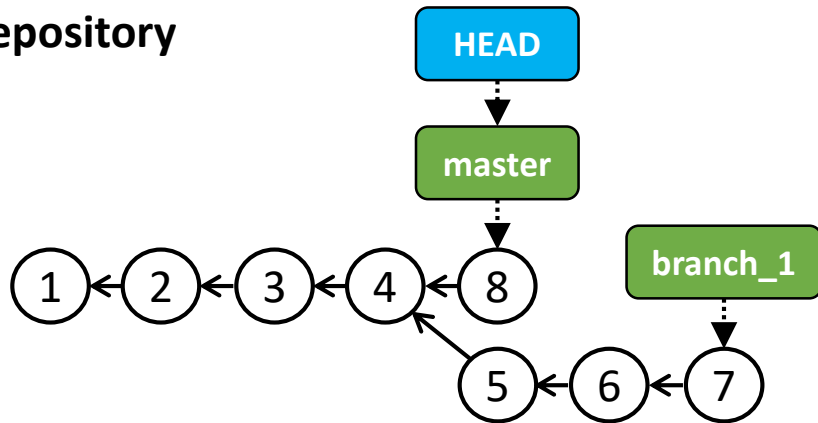
# Merging

- fast-forward
-

Working Directory

Staging Area

Repository



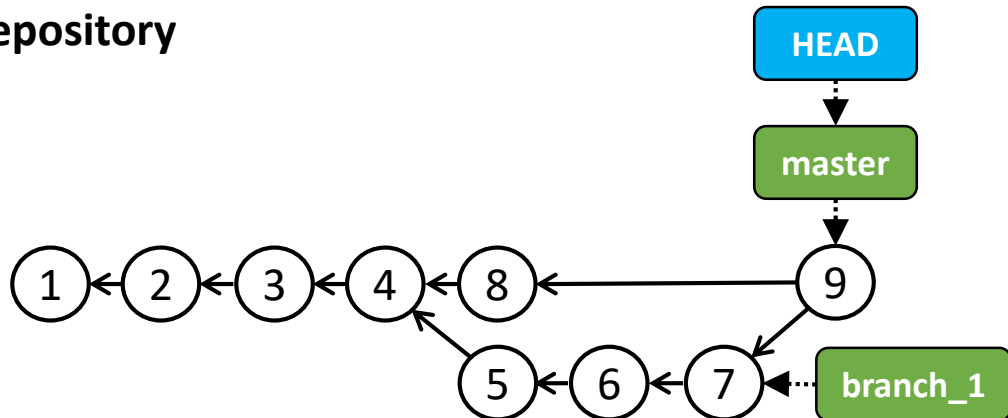
# Merging

- fast-forward
- three-way

Working Directory

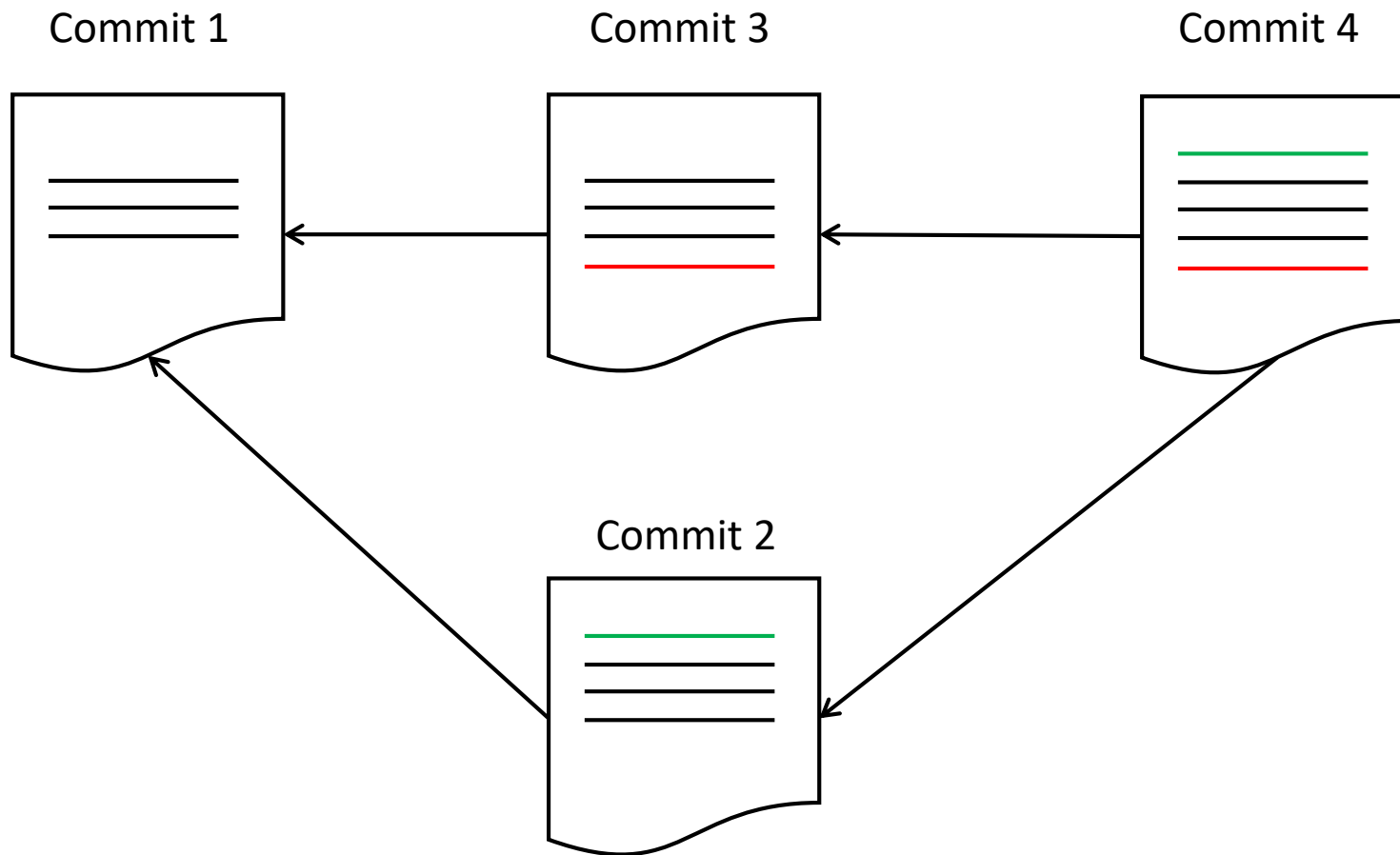
Staging Area

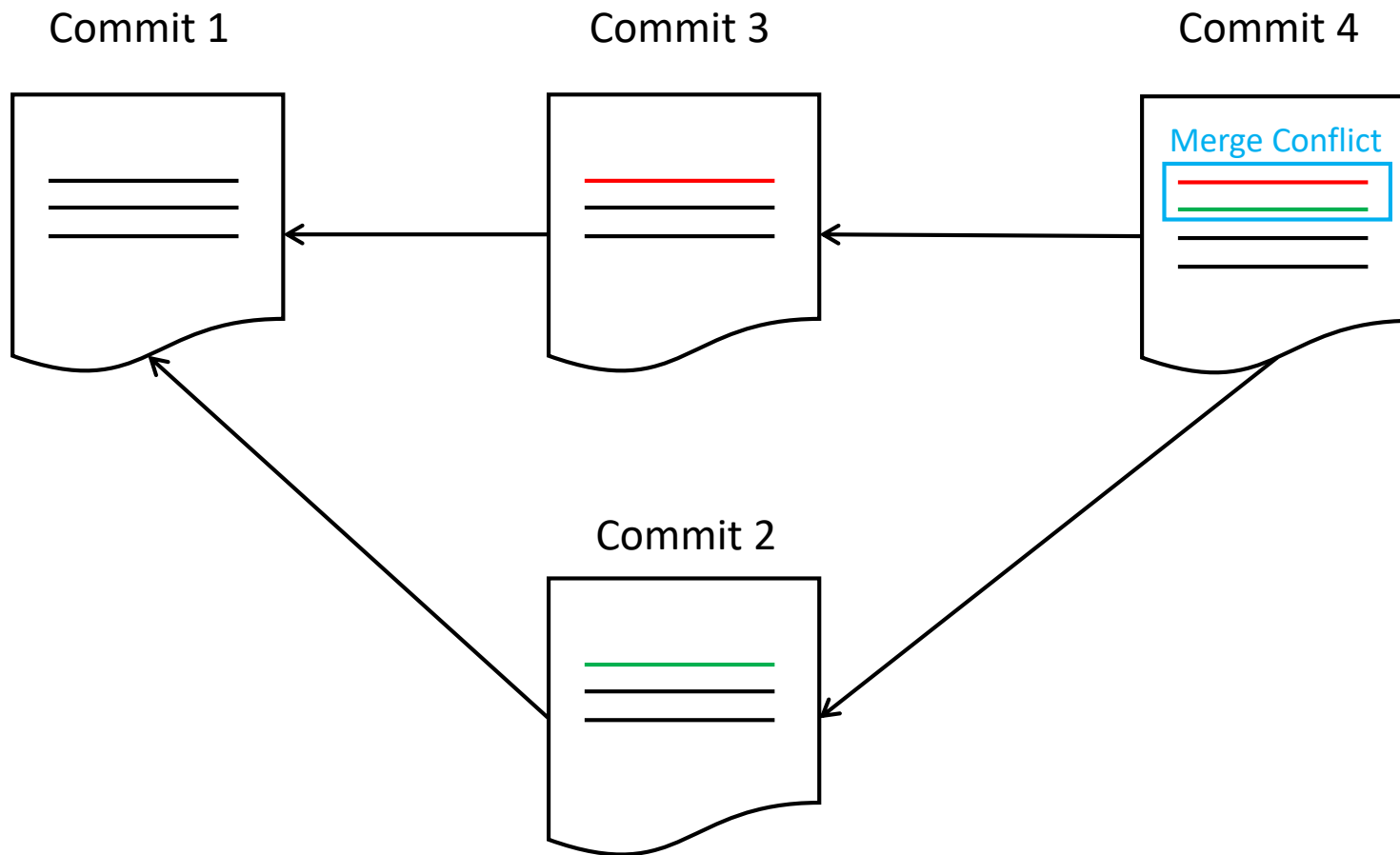
Repository



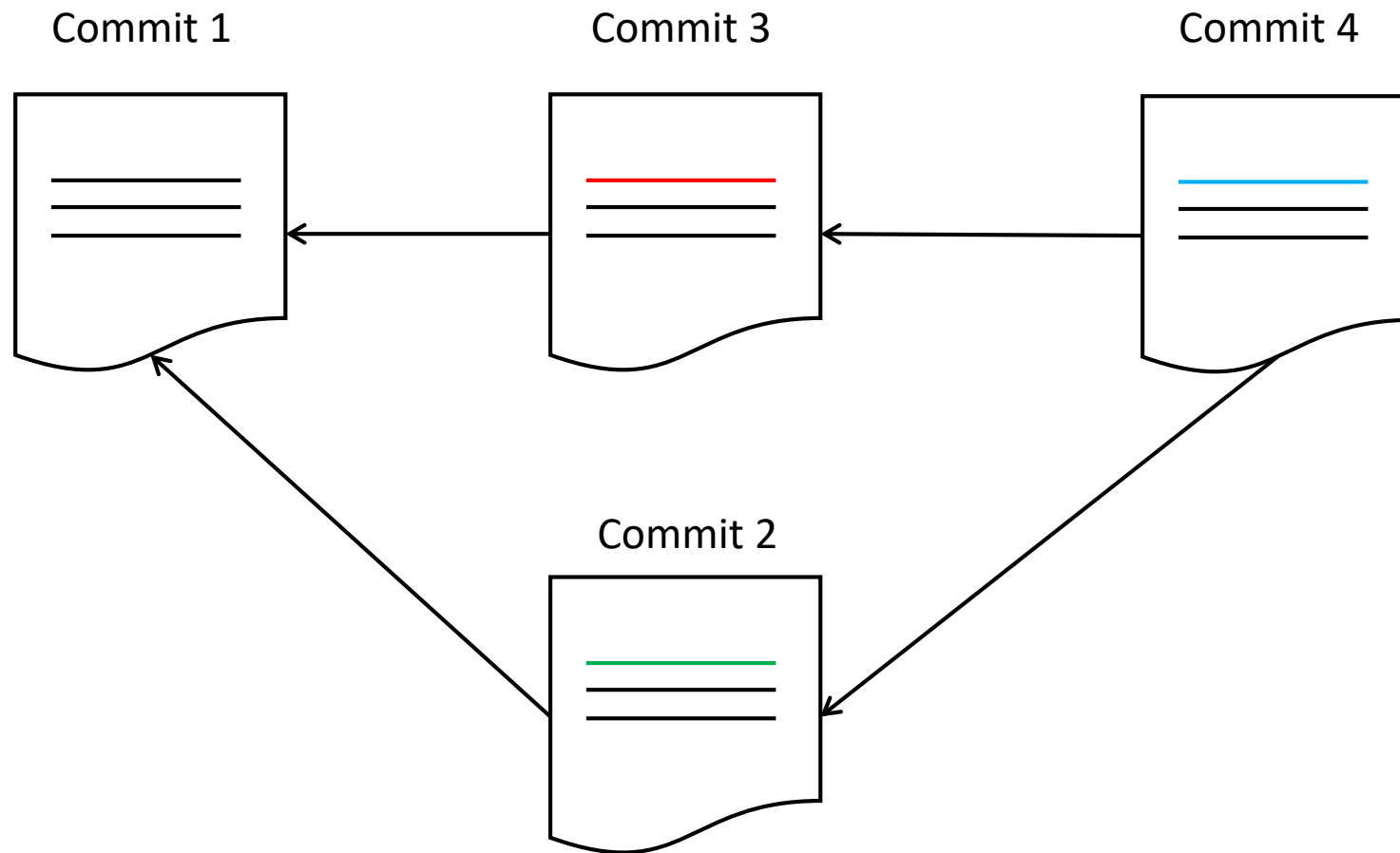
# Merging

- fast-forward
- three-way





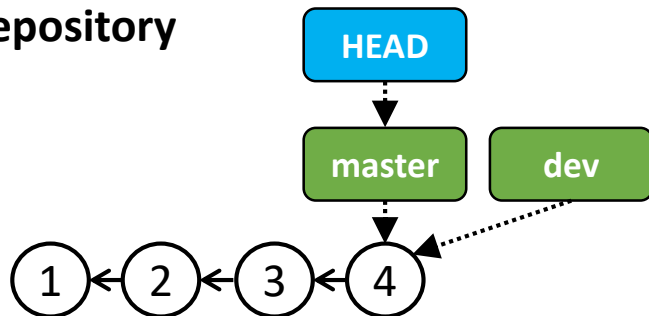




Working Directory

Staging Area

Repository



# Workflows

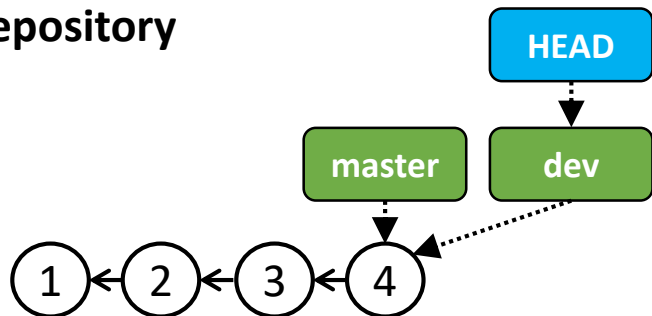
- long-running branches
- 

*Starting situation*

Working Directory

Staging Area

Repository



# Workflows

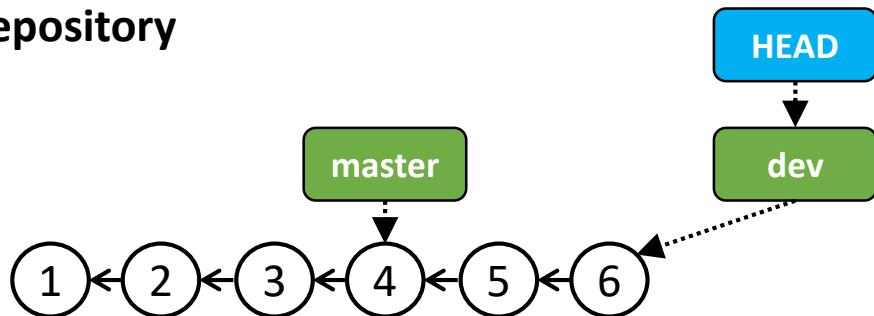
- long-running branches
- 

*Check-out "dev"*

Working Directory

Staging Area

Repository



# Workflows

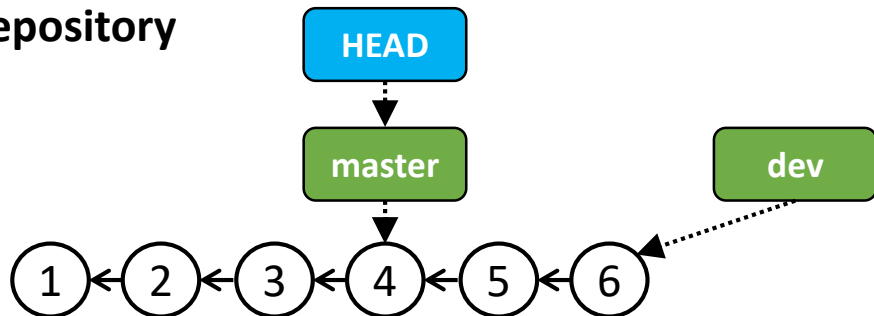
- long-running branches
- 

*Work on code*

Working Directory

Staging Area

Repository



# Workflows

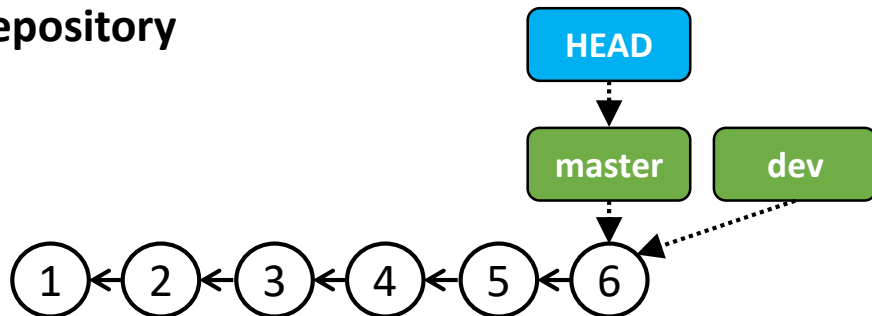
- long-running branches
- 

*Check-out "master"*

Working Directory

Staging Area

Repository



# Workflows

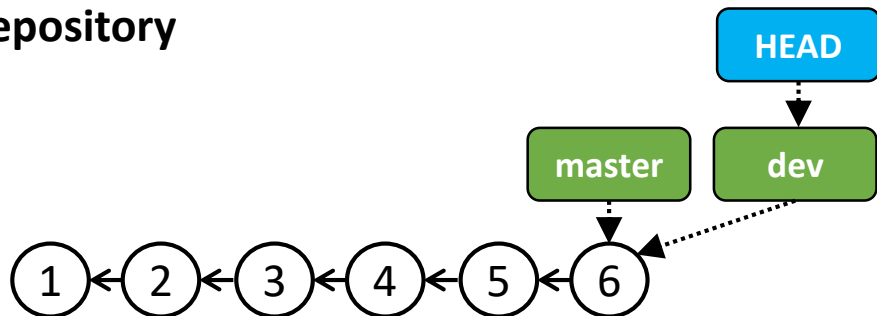
- long-running branches
- 

*Merge "dev" into "master"*

Working Directory

Staging Area

Repository



# Workflows

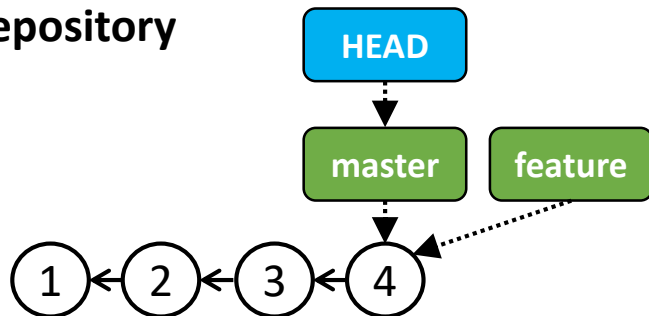
- long-running branches
- 

*Check-out “dev” again to keep working on the code*

Working Directory

Staging Area

Repository



# Workflows

- long-running branches
- topic branches

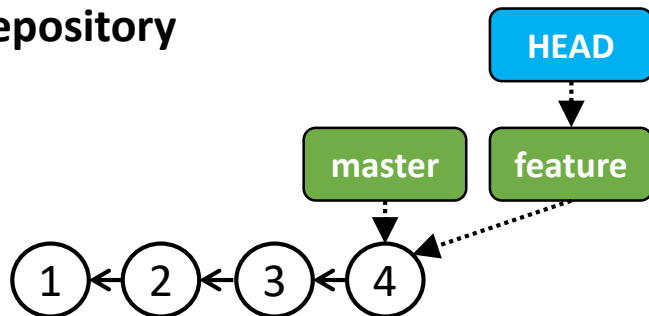
*Starting situation*



Working Directory

Staging Area

Repository



# Workflows

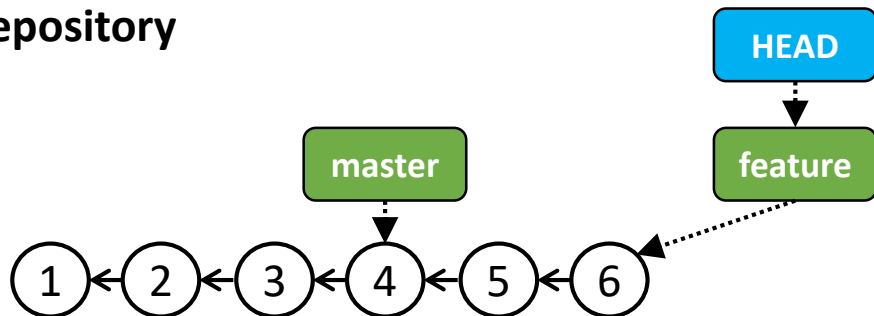
- long-running branches
- topic branches

*Check-out “feature”*

Working Directory

Staging Area

Repository



# Workflows

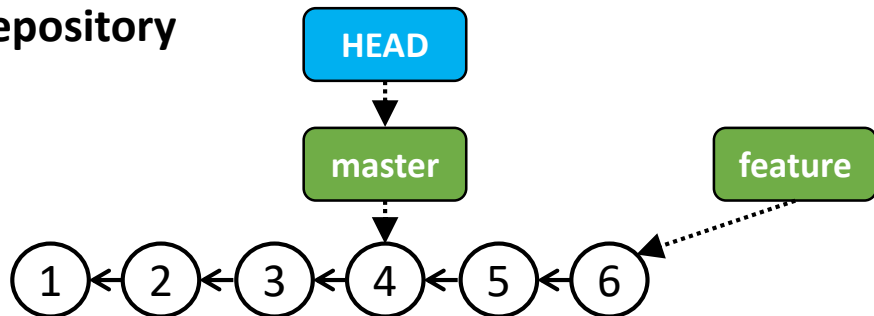
- long-running branches
- topic branches

*Work on the feature*

Working Directory

Staging Area

Repository



# Workflows

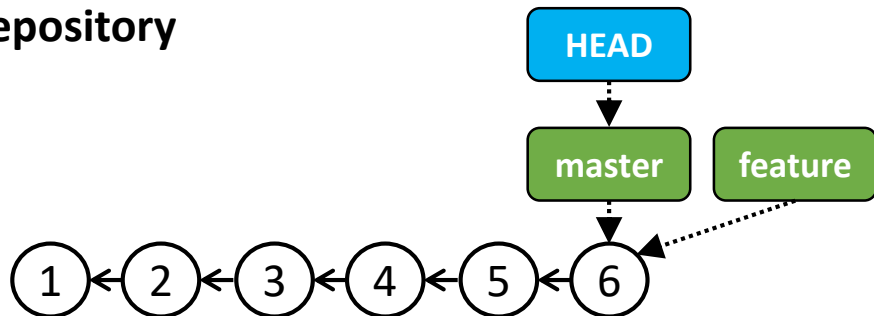
- long-running branches
- topic branches

*Check-out "master"*

Working Directory

Staging Area

Repository



# Workflows

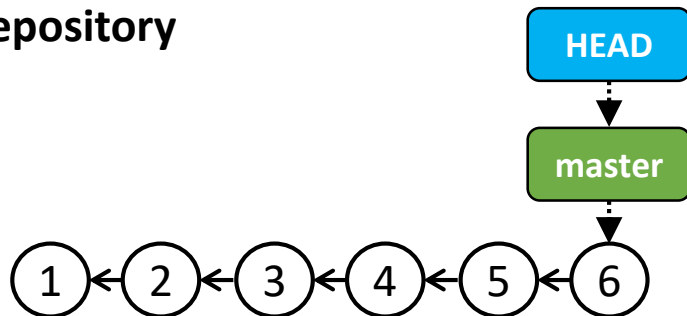
- long-running branches
- topic branches

*Merge "feature" into "master"*

Working Directory

Staging Area

Repository



# Workflows

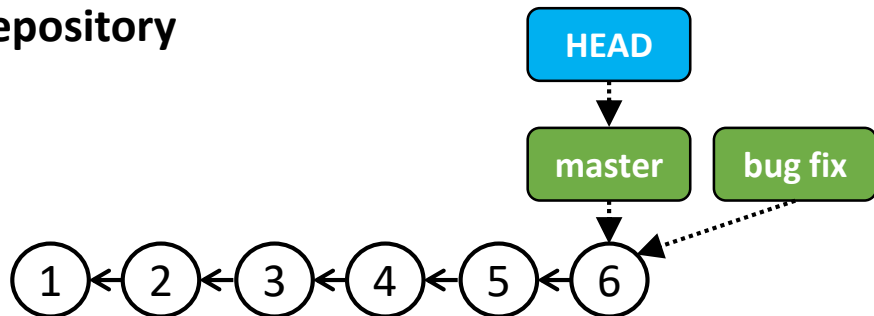
- long-running branches
- topic branches

*Delete “feature” branch*

Working Directory

Staging Area

Repository



# Workflows

- long-running branches
- topic branches

*Create “bug fix” branch to work on fixing a certain bug*

## Person 1

Working Directory

Staging Area

Local Repo

## Person 2

Working Directory

Staging Area

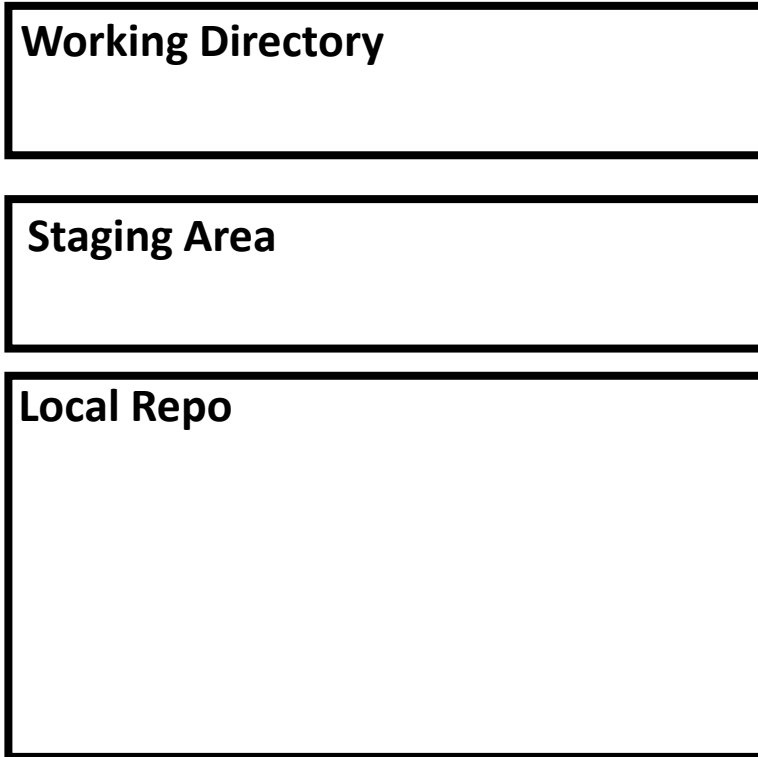
Local Repo



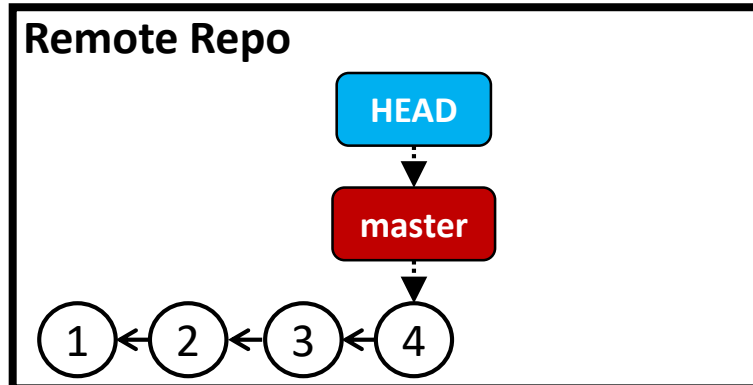
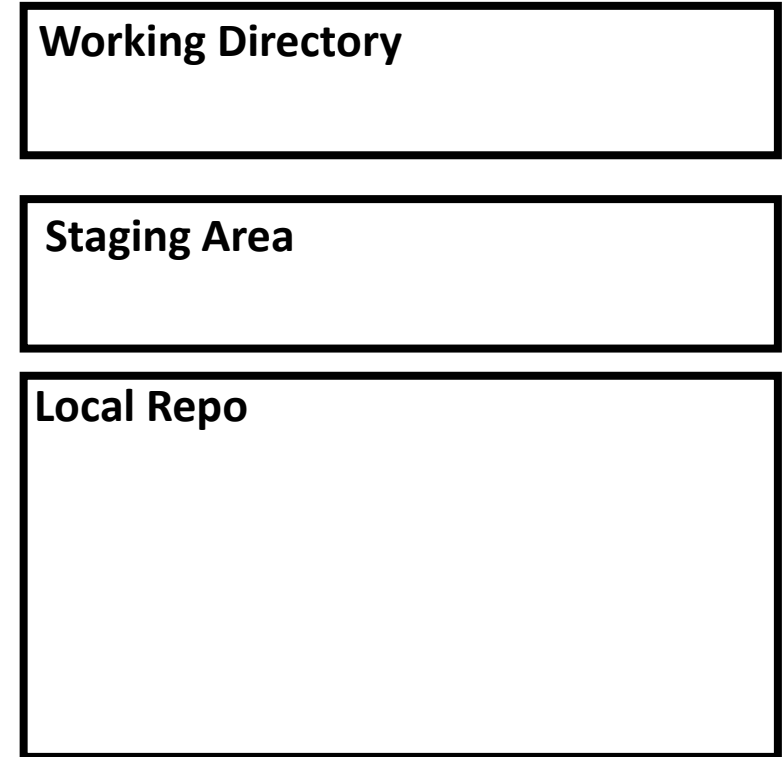
Remote Repo



# Person 1



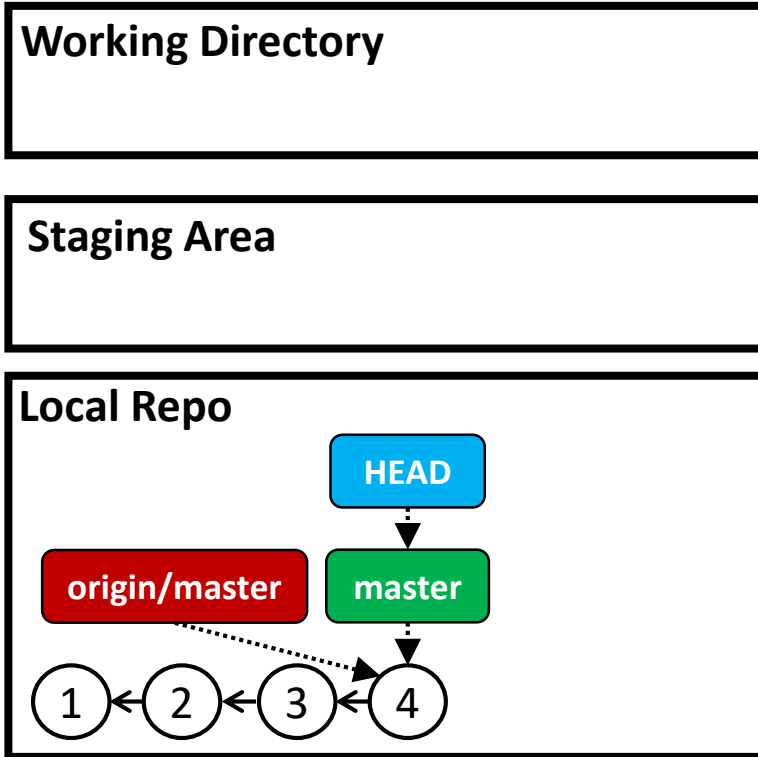
# Person 2



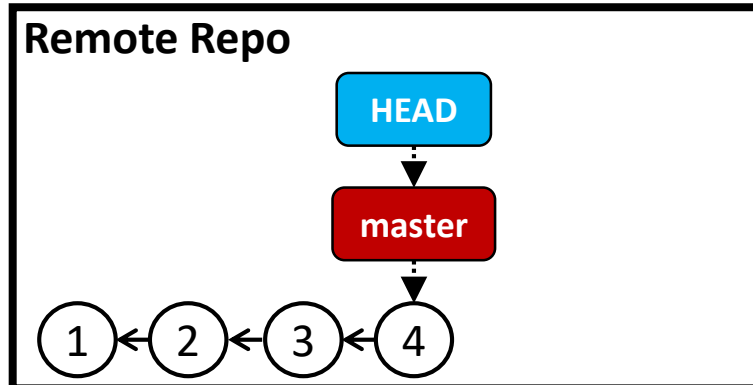
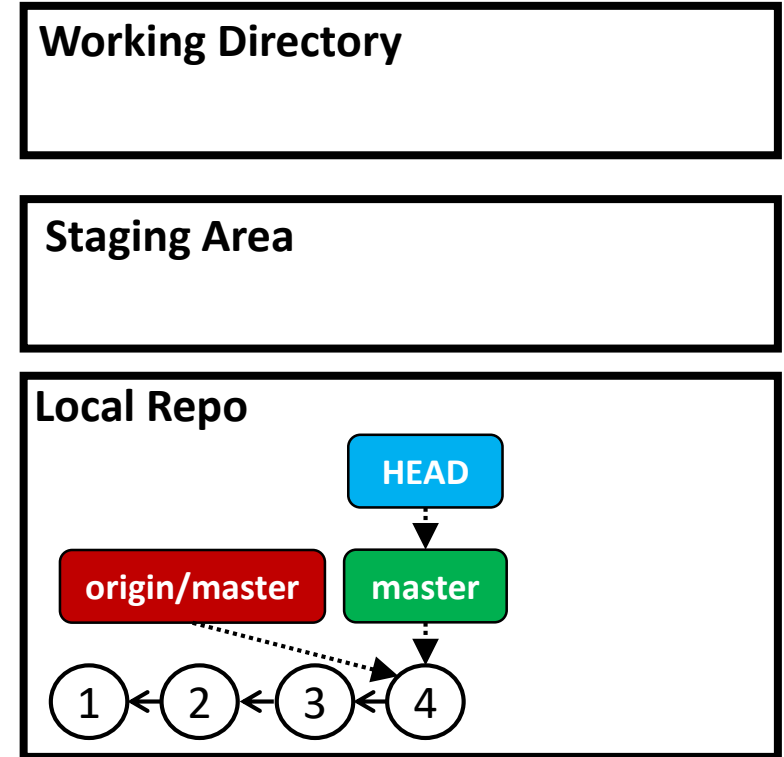
*The remote contains the commit history and acts as the central repository*



# Person 1

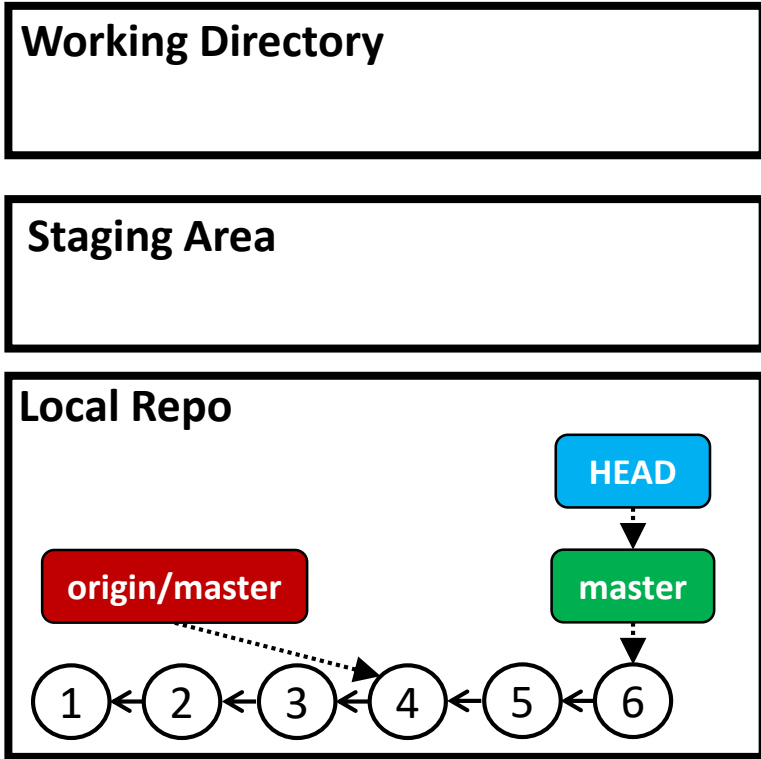


# Person 2

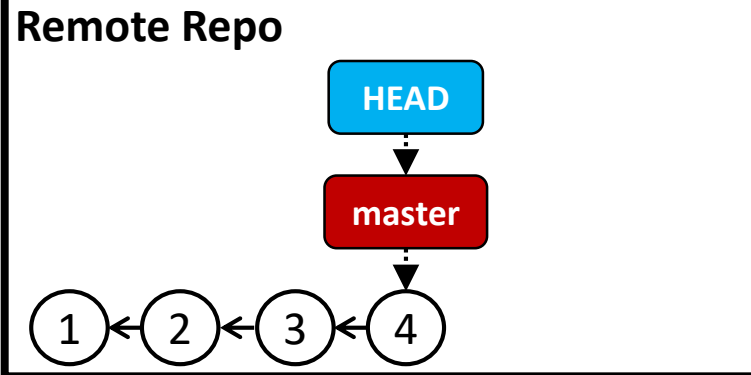
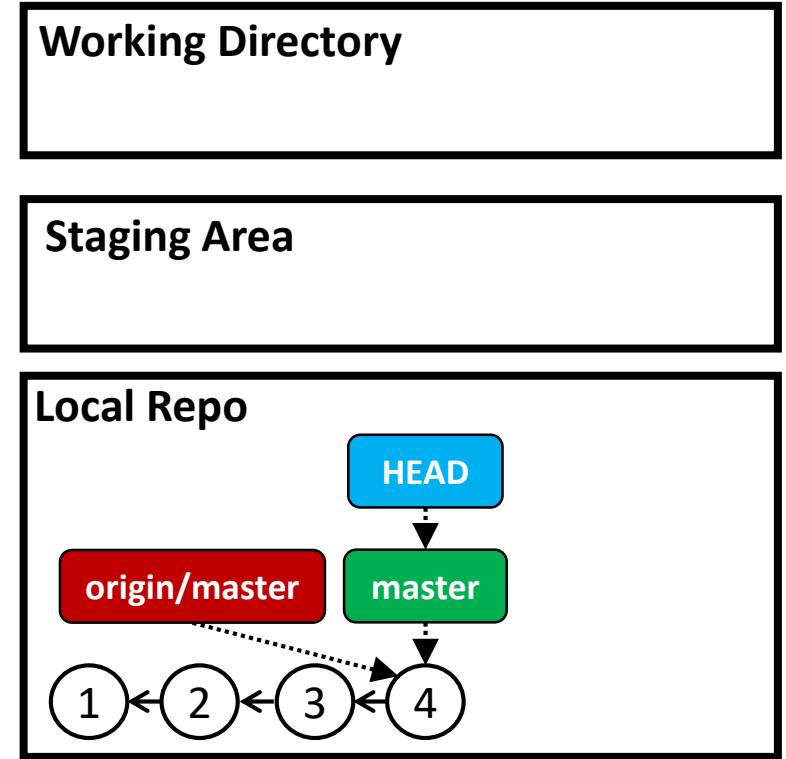


*Anybody with access to the remote can “pull” the commit history into his/her local repo, i.e. create a local copy*

# Person 1

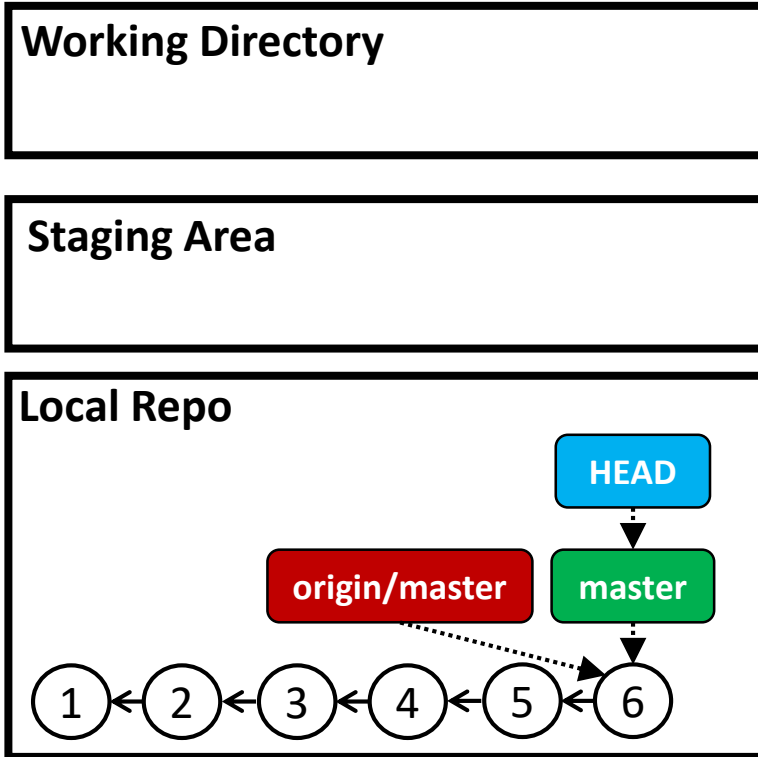


# Person 2

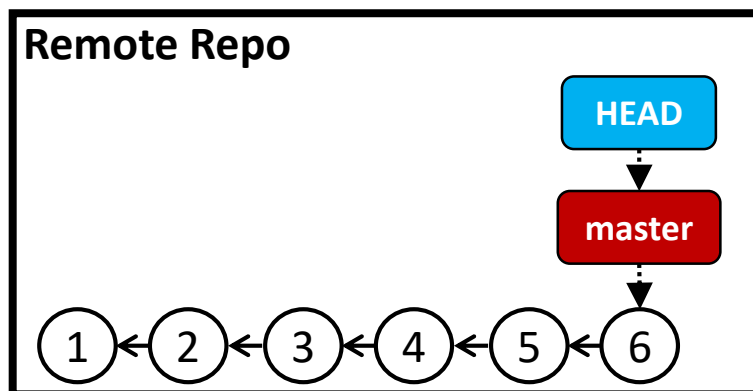
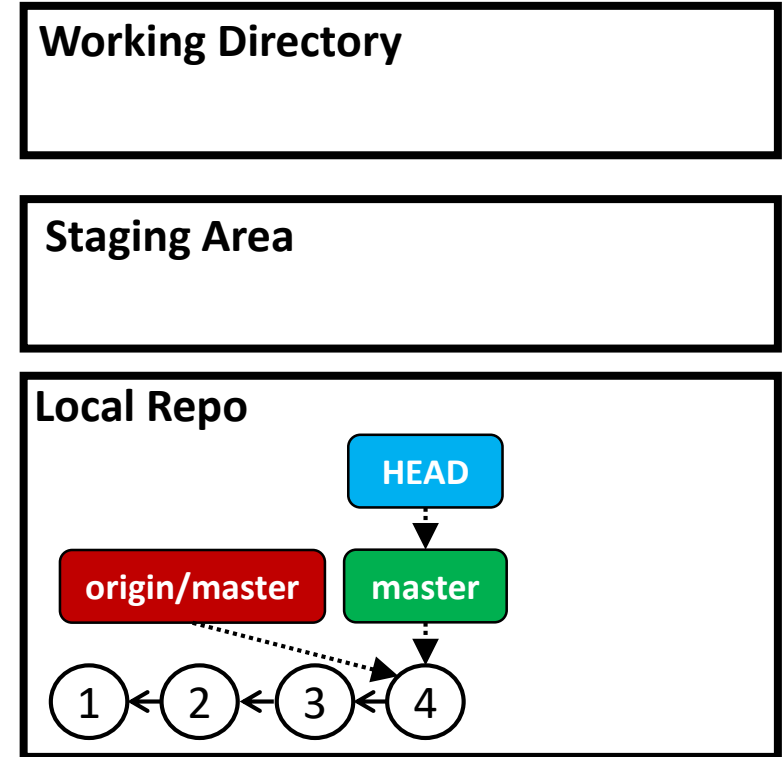


*Then, you can make changes locally*

# Person 1

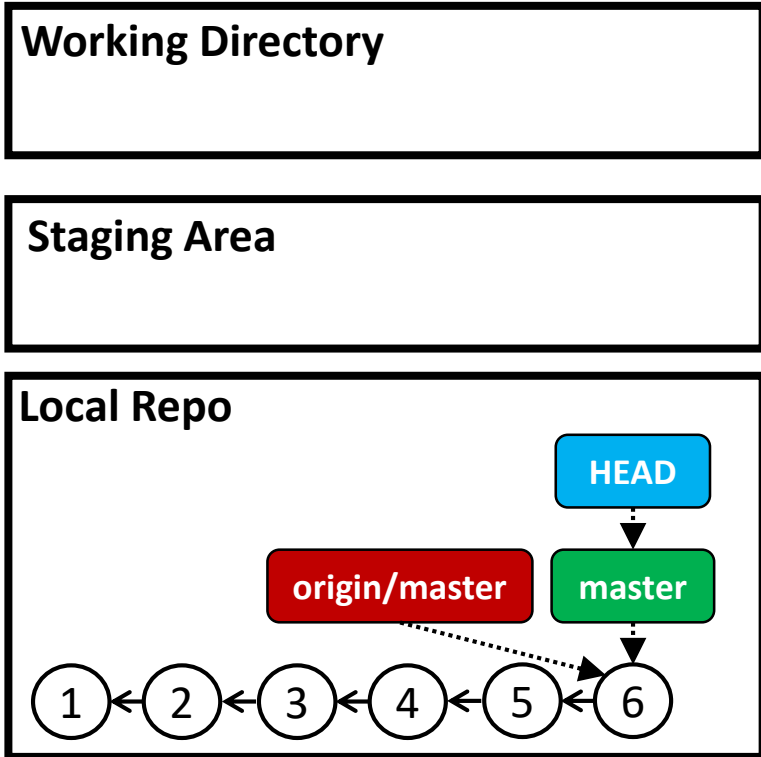


# Person 2

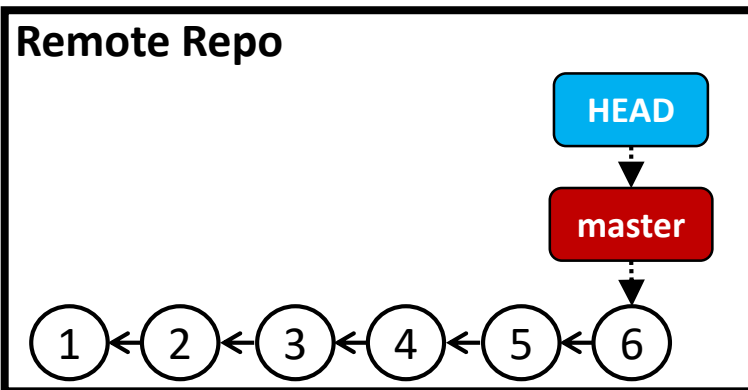
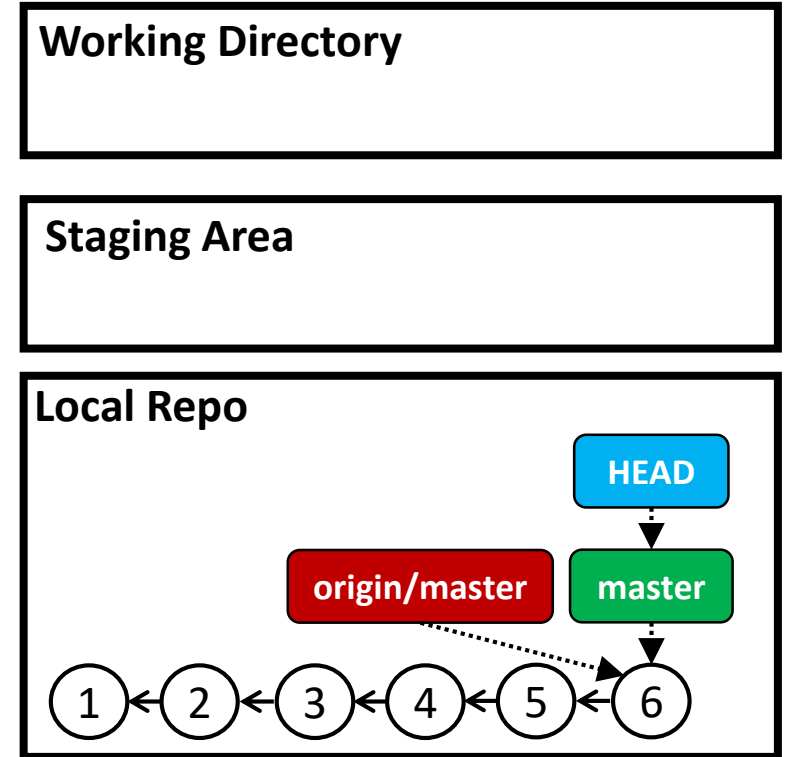


*When you are satisfied with your changes, you “push” them to the remote. So, you push the local master branch to the remote*

# Person 1



# Person 2

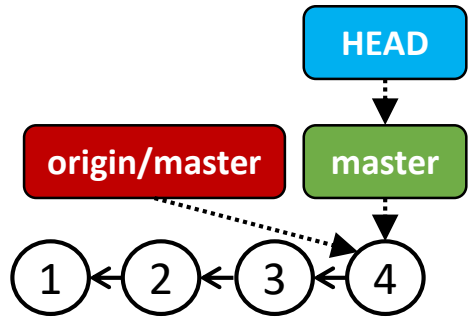


*And then, anybody else can again pull these changes to have the most up-to-date code*

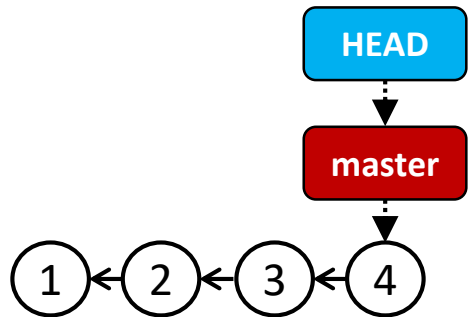
Working Directory

Staging Area

Local Repository

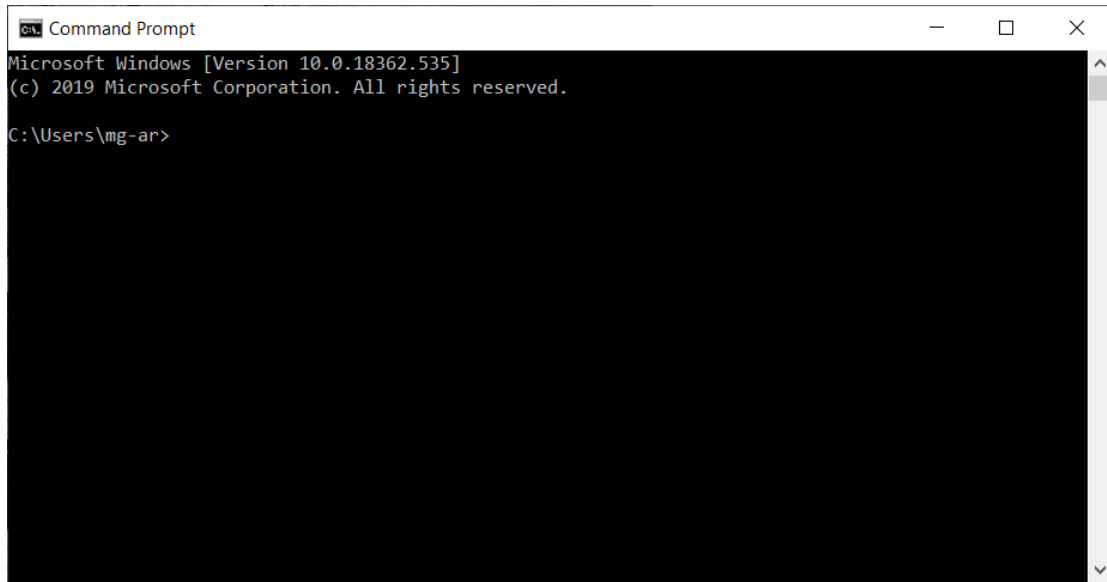


Remote Repository

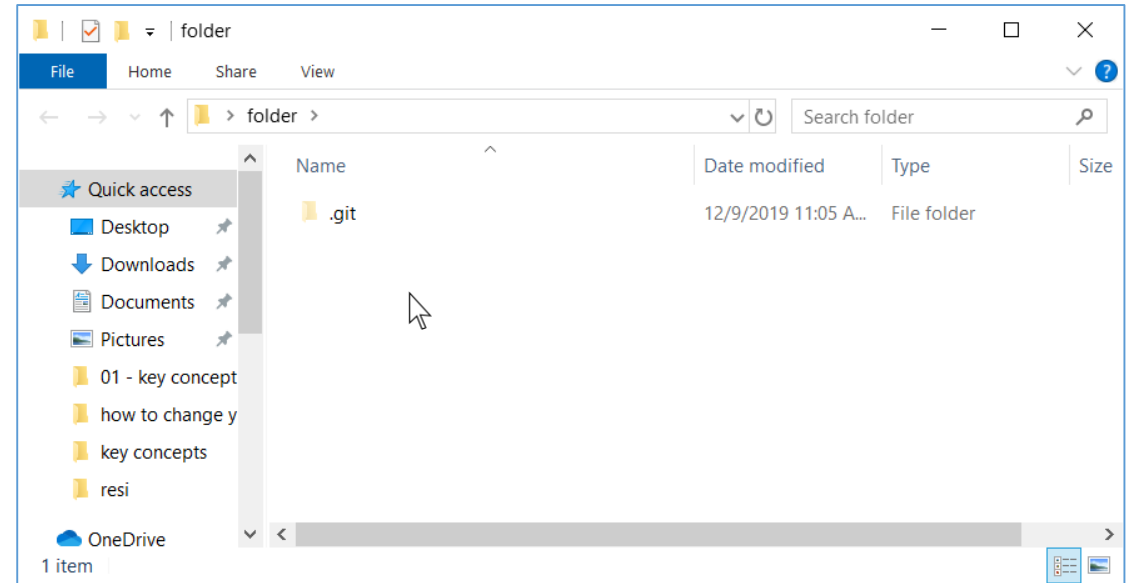


Remote Repo

# Command-line Interface

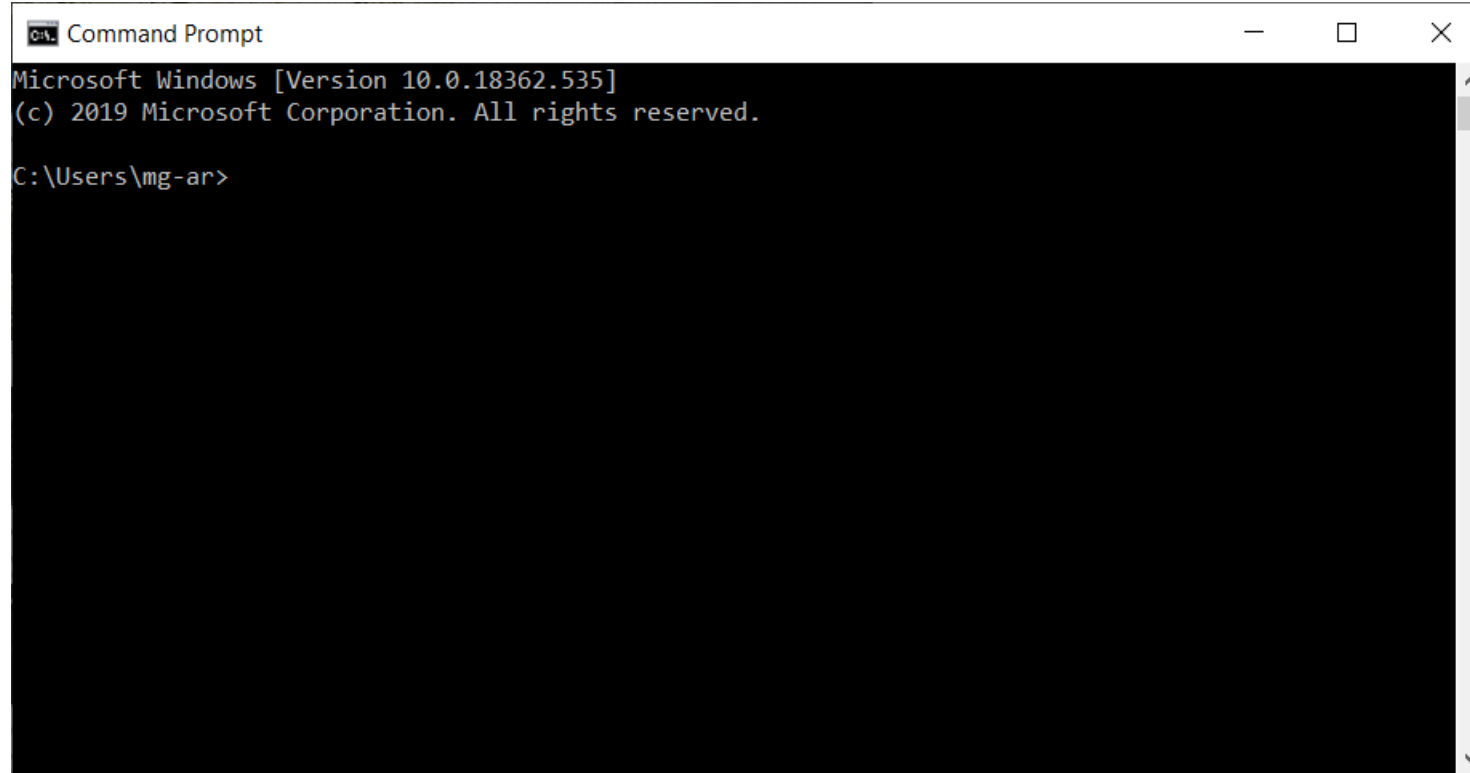


CLI



GUI

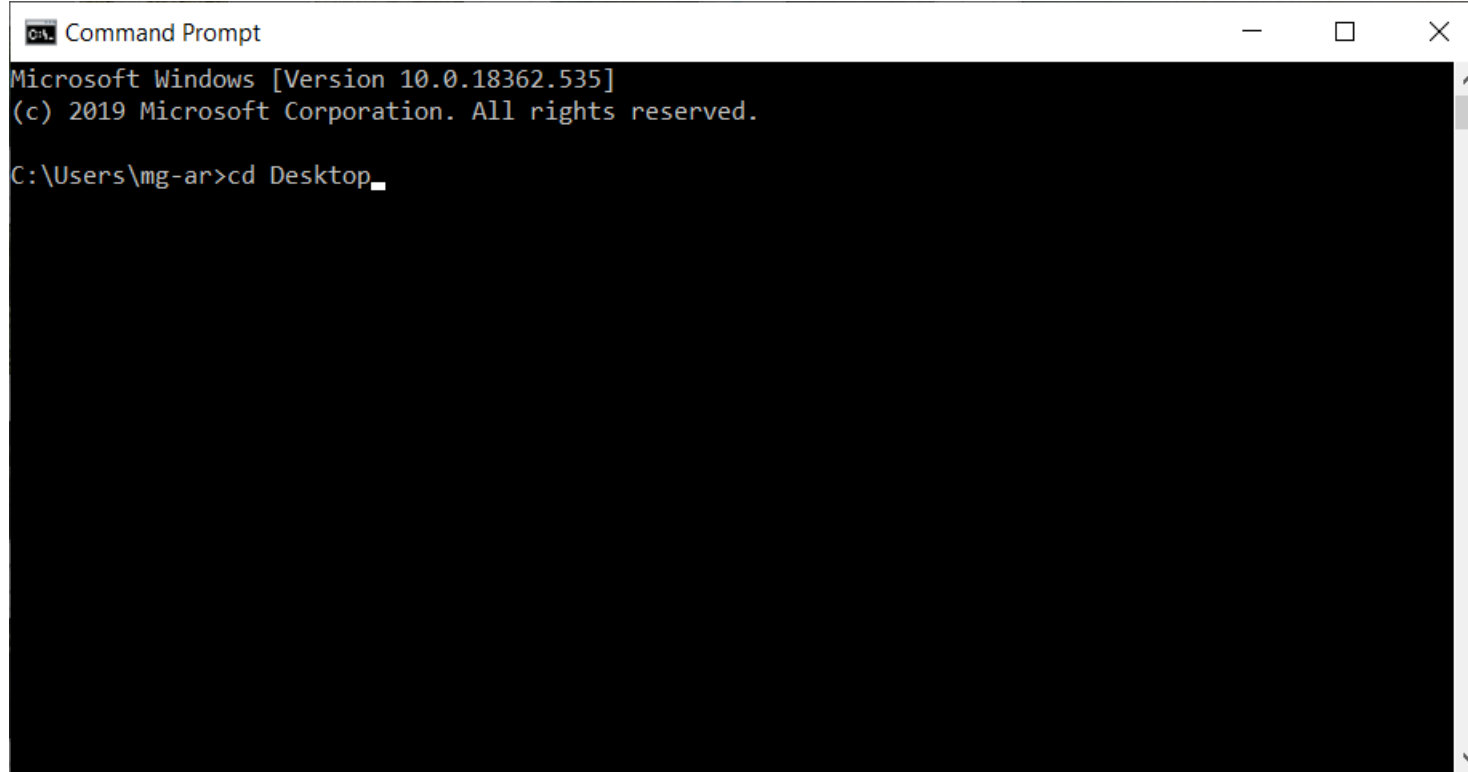
# Command-line Interface



```
Command Prompt
Microsoft Windows [Version 10.0.18362.535]
(c) 2019 Microsoft Corporation. All rights reserved.
C:\Users\mg-ar>
```

*Currently we are in the home directory*

# Command-line Interface

A screenshot of a Windows Command Prompt window. The title bar reads "Command Prompt". The window content shows the following text: "Microsoft Windows [Version 10.0.18362.535]", "(c) 2019 Microsoft Corporation. All rights reserved.", and "C:\Users\mg-ar>cd Desktop\_". The cursor is positioned at the end of the command. The window has standard Windows window controls (minimize, maximize, close) in the top right corner.

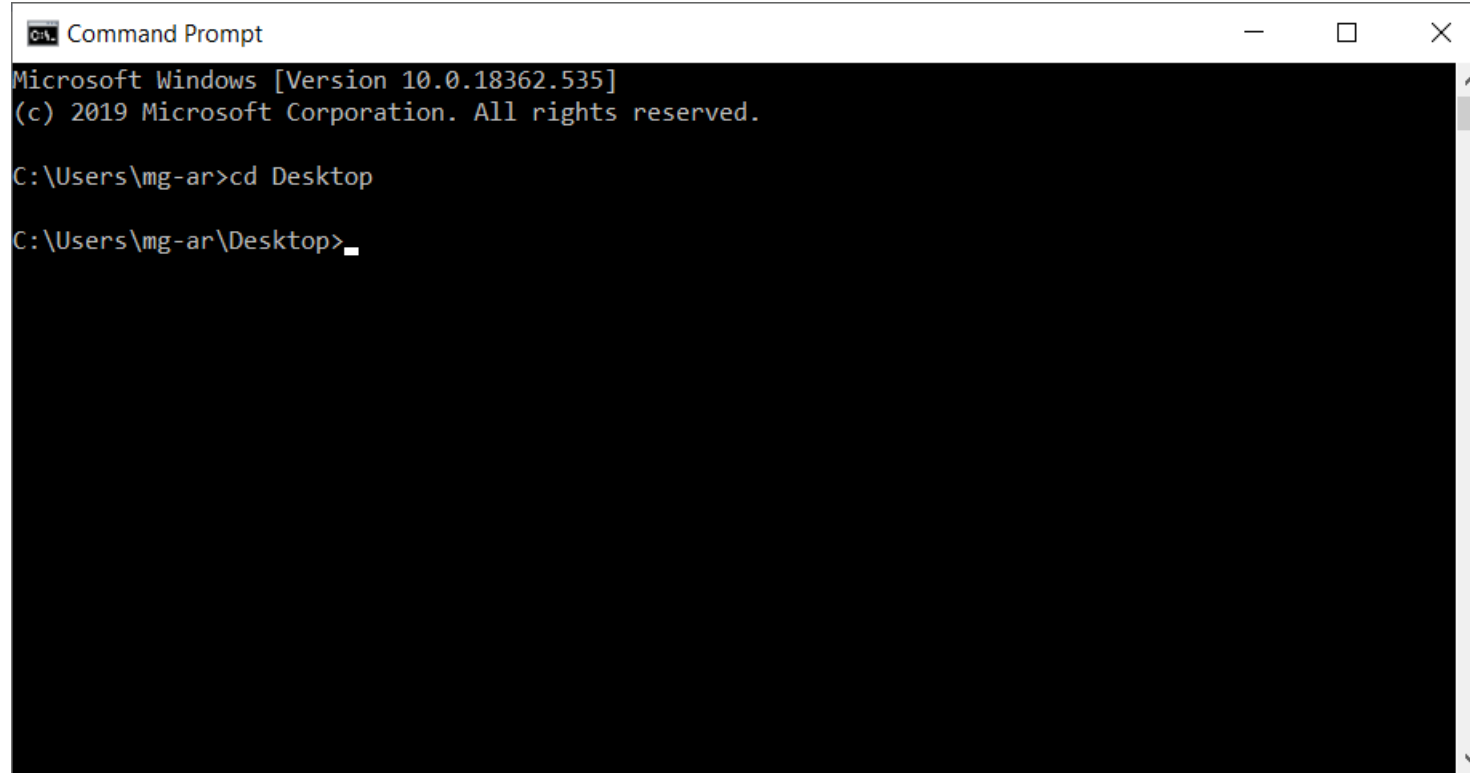
```
Microsoft Windows [Version 10.0.18362.535]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\mg-ar>cd Desktop_
```

*Command for moving to the “Desktop”*



# Command-line Interface

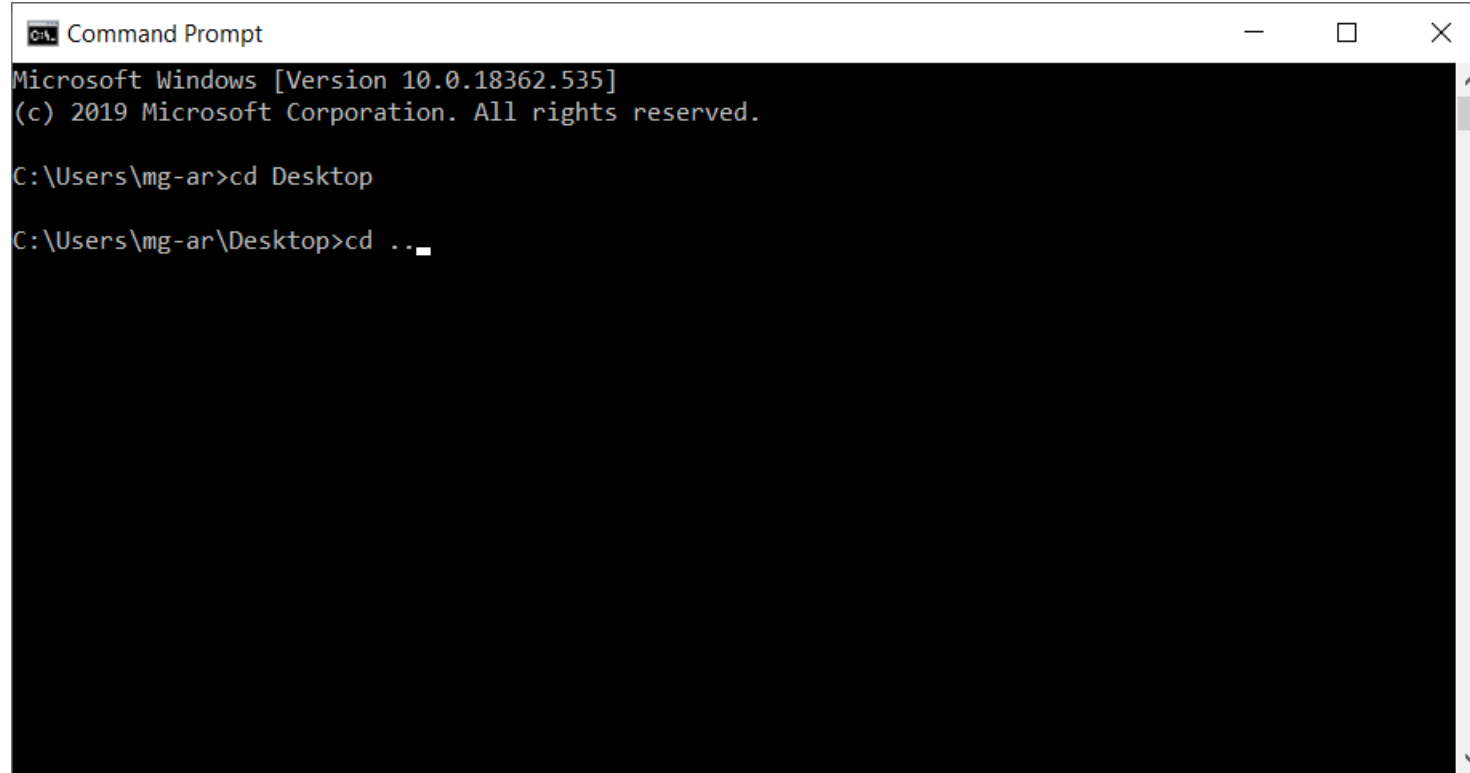


```
Command Prompt
Microsoft Windows [Version 10.0.18362.535]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\mg-ar>cd Desktop
C:\Users\mg-ar\Desktop>_
```

*Now, we are in the “Desktop”*

# Command-line Interface

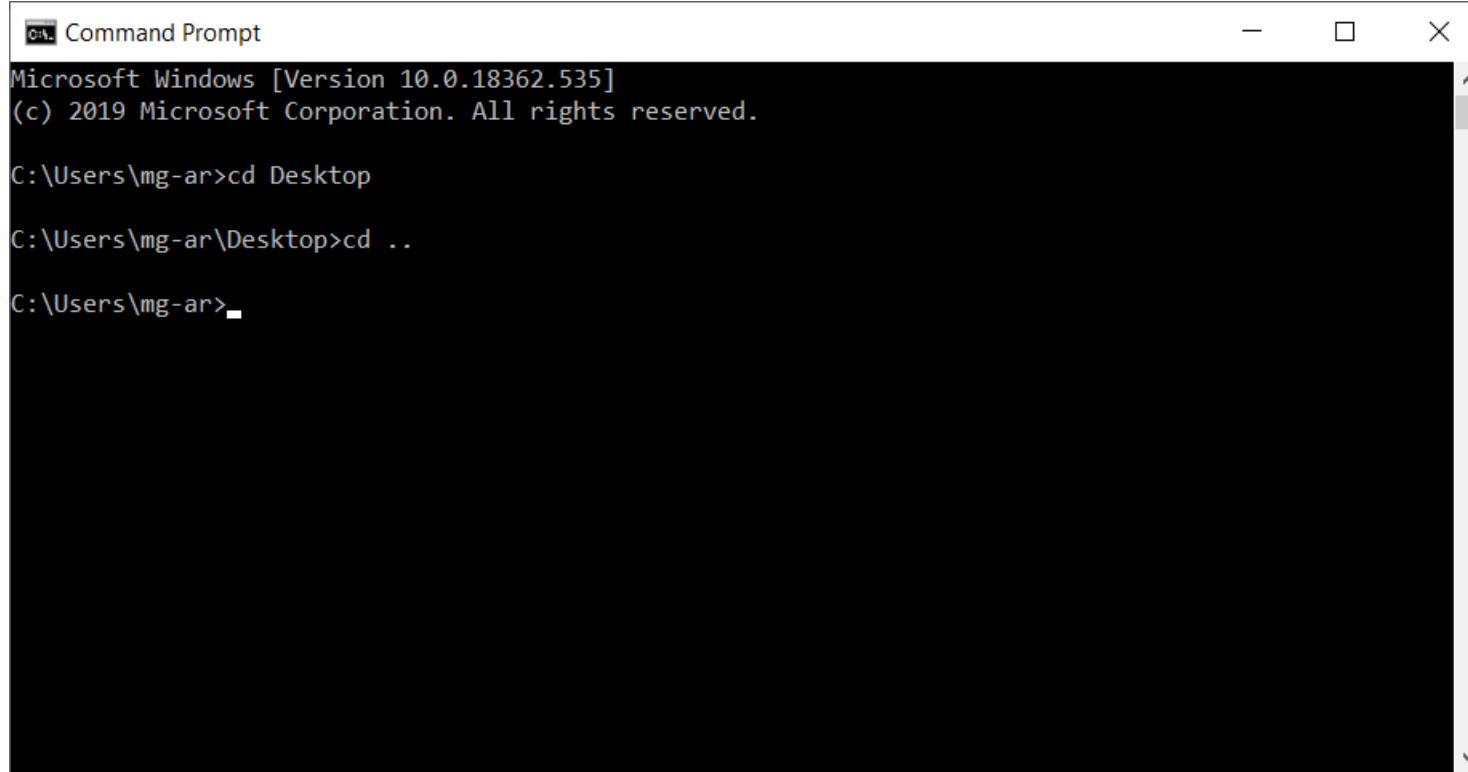


```
Command Prompt
Microsoft Windows [Version 10.0.18362.535]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\mg-ar>cd Desktop
C:\Users\mg-ar\Desktop>cd ..
```

*Command for moving to the parent directory of the current directory*

# Command-line Interface

A screenshot of a Windows Command Prompt window. The title bar reads "Command Prompt". The window content shows the following text:

```
Microsoft Windows [Version 10.0.18362.535]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\mg-ar>cd Desktop
C:\Users\mg-ar\Desktop>cd ..
C:\Users\mg-ar>_
```

The prompt is currently at the home directory, C:\Users\mg-ar>.

*Now, we are at the home directory again*