Git Gud

Neil Ashford

UQ Computing Society

March 23, 2018

Outline

Who am I

- Neil Ashford

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- Neil Ashford
- 4th year Software[1] Engineering

[1] ish

Who am I

- Neil Ashford
- 4th year Software[1] Engineering
- Committee member

[1] ish

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- Neil Ashford
- 4th year Software[1] Engineering
- Committee member
- **@artemis** on slack, `ashfordneil0@gmail.com`

[1] ish

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- Neil Ashford
- 4th year Software[1] Engineering
- Committee member
- **@artemis** on slack, `ashfordneil0@gmail.com`
- Tutor for CSSE2002, CSSE2010 and CSSE2310

[1] ish

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What I Won't Cover

- How to **cheat** when using git

Outline

Meet the Culprit

- Live demos suck, so we're trying to stick with something familiar.

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- Please welcome our old friend...

Meet the Culprit

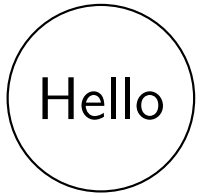
- Live demos suck, so we're trying to stick with something familiar.
- Please welcome our old friend...
- Microsoft Word[2]

[2] Okay I'm on a mac so it's pages but still

Undo / Reverts

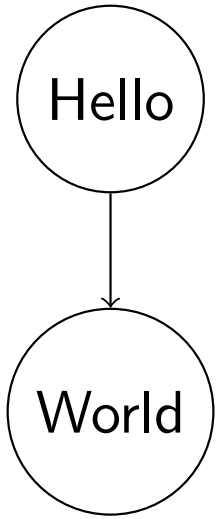
Undo / Reverts

- Type “Hello”



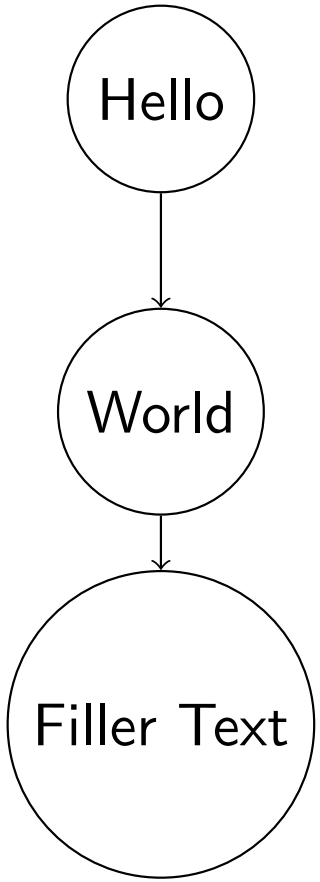
Undo / Reverts

- Type “Hello”
- Type “World”



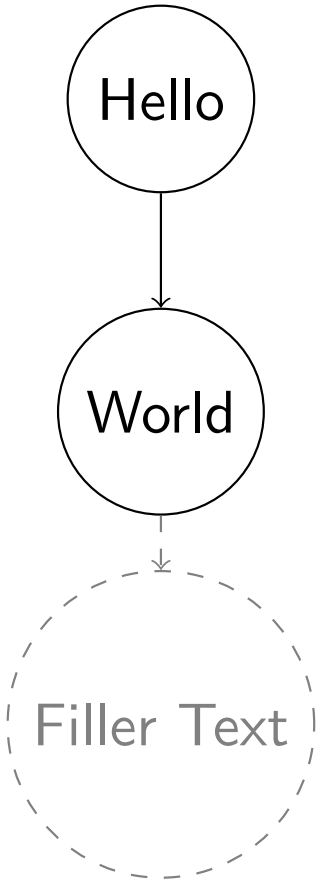
Undo / Reverts

- Type “Hello”
- Type “World”
- Type “Filler Text”



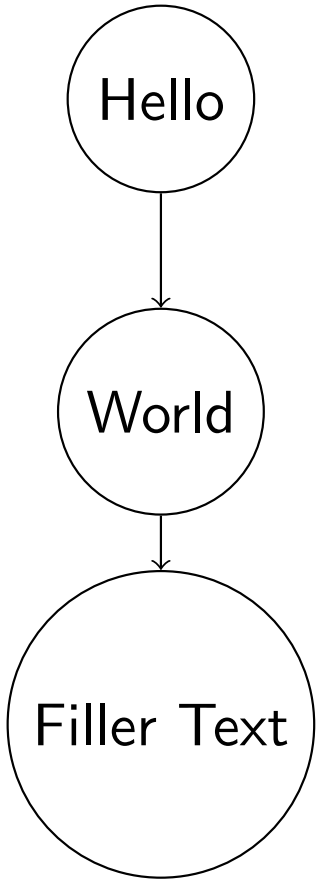
Undo / Reverts

- Type “Hello”
- Type “World”
- Type “Filler Text”
- Press Undo



Undo / Reverts

- Type “Hello”
- Type “World”
- Type “Filler Text”
- Press Undo
- Press Redo



Undo / Reverts

- Type “Hello”
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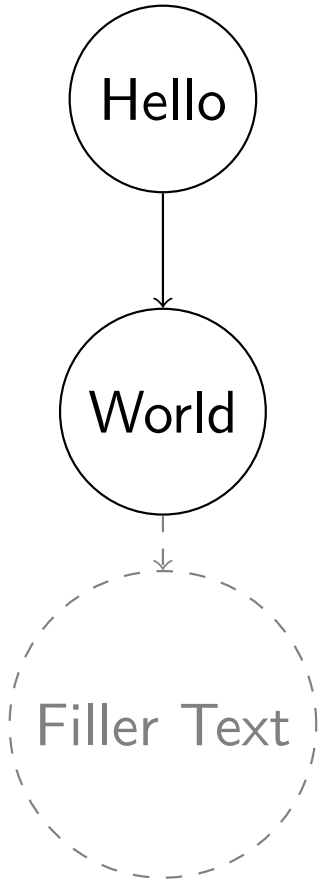
- Type “Filler Text”
- Press Undo
- Press Redo
- Press Undo again



Branches

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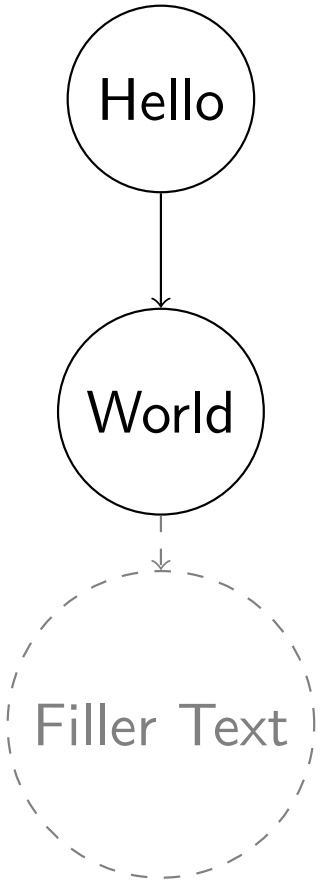

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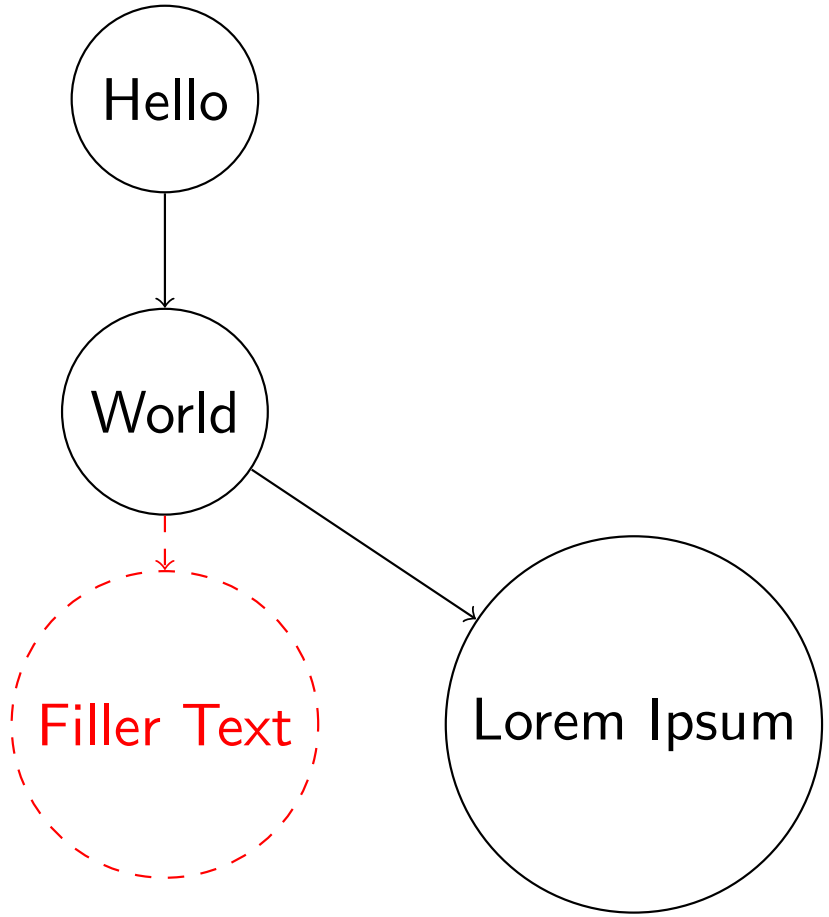
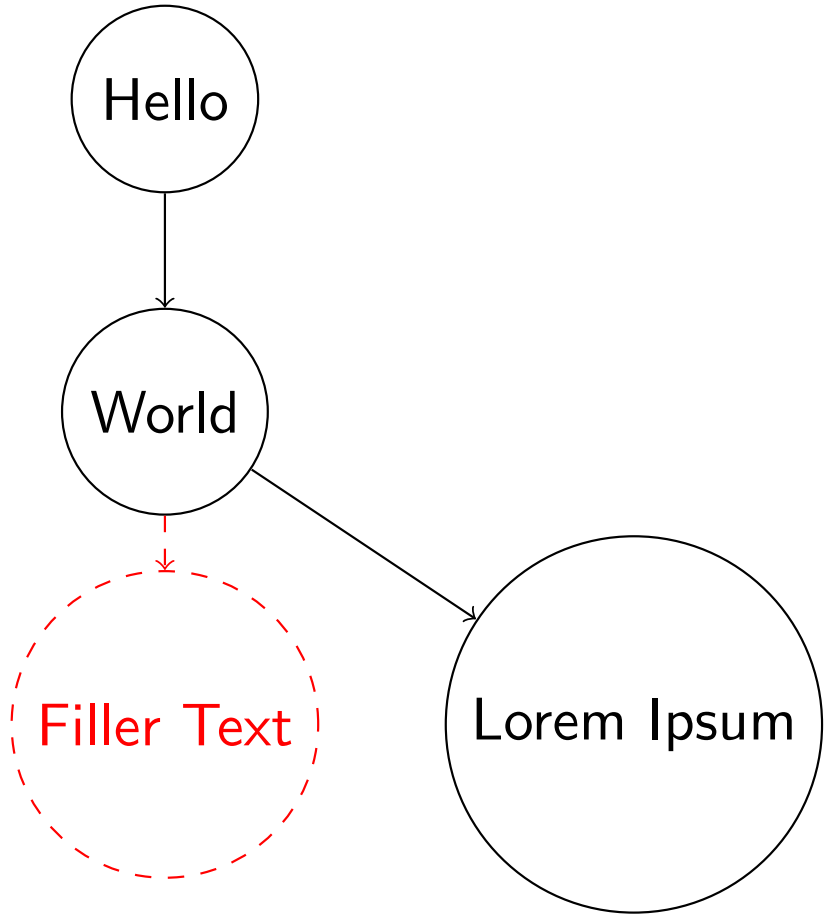


Branches

- From where we were before...
- Type "Lorem Ipsum"
- Realise we want "Filler Text" back



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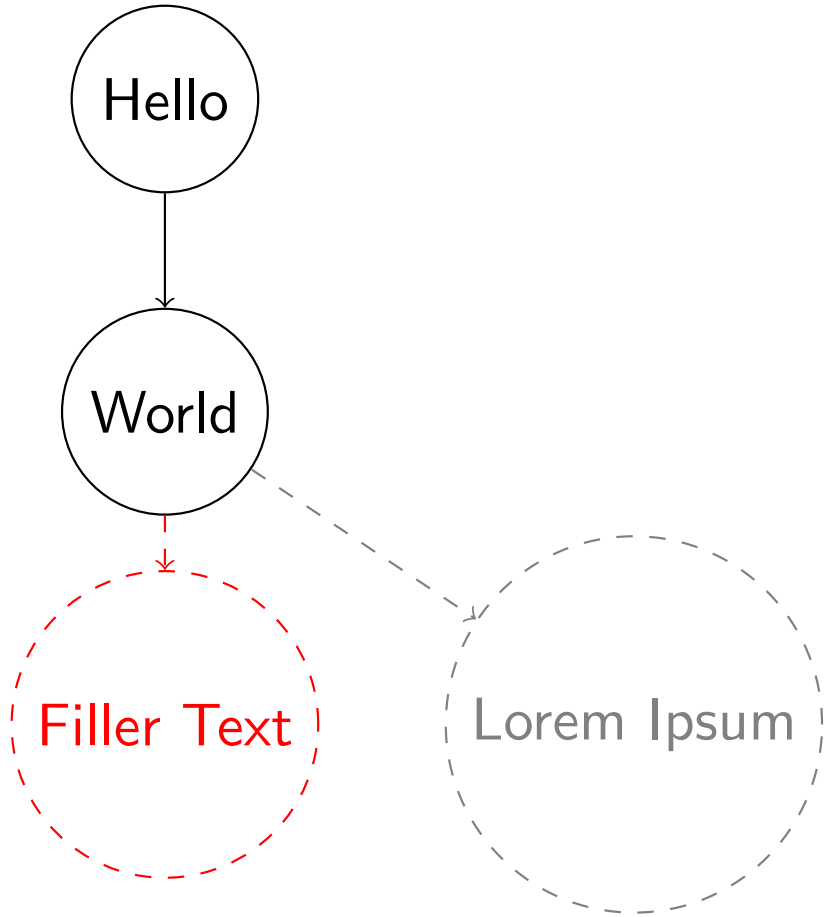

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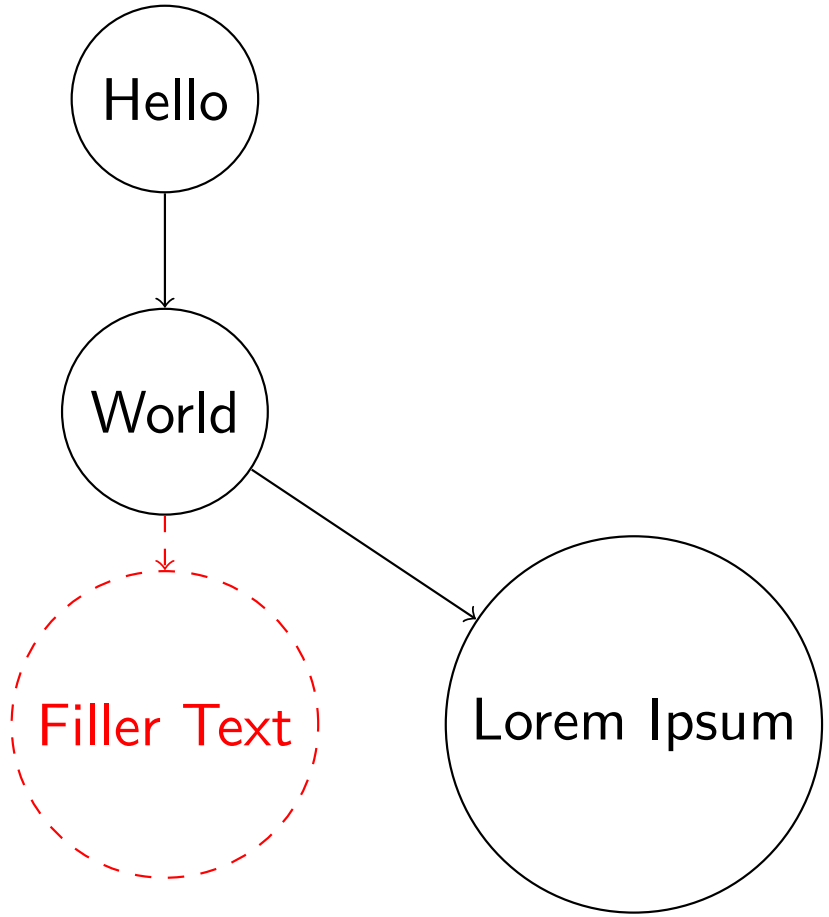
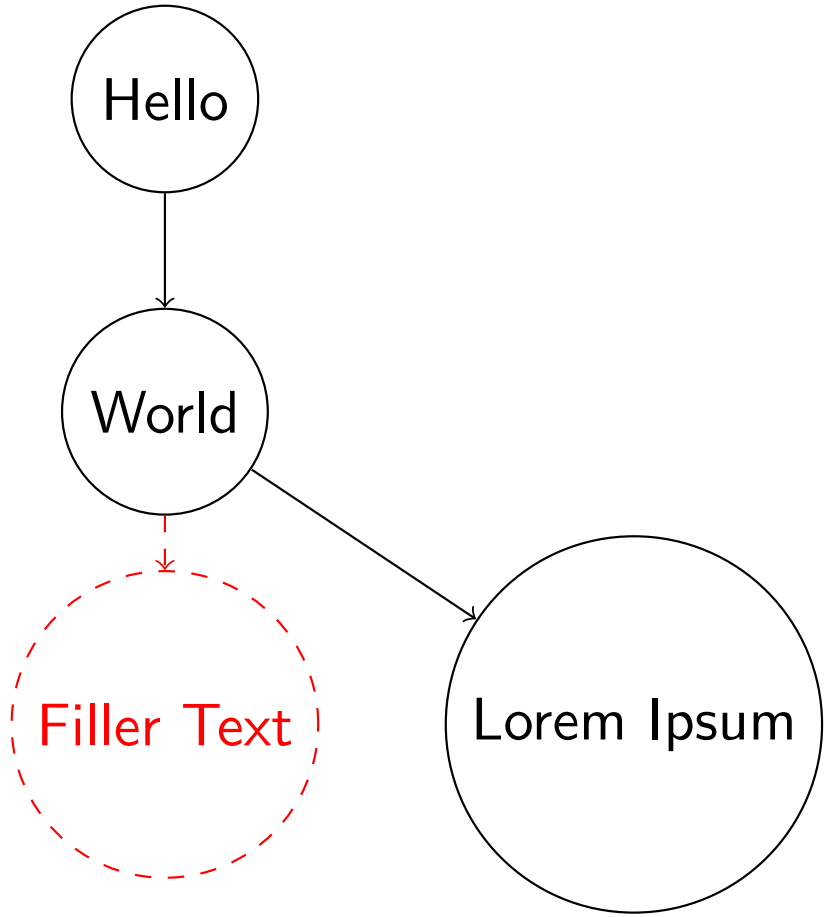


Branches

- From where we were before...
- Type “Lorem Ipsum”
- Realise we want “Filler Text” back
- Press Undo
- Press Redo
- Weep



Merges and Collaborative Work

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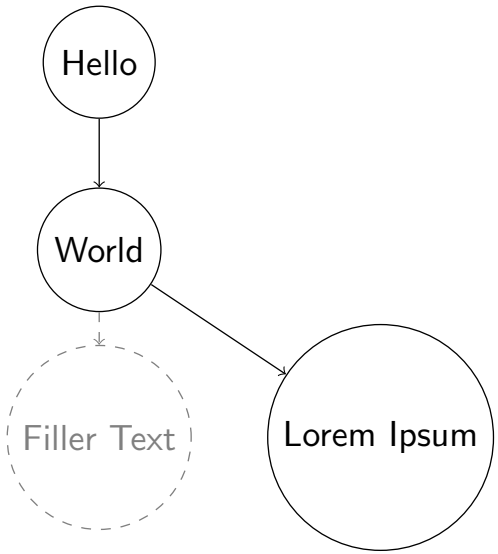

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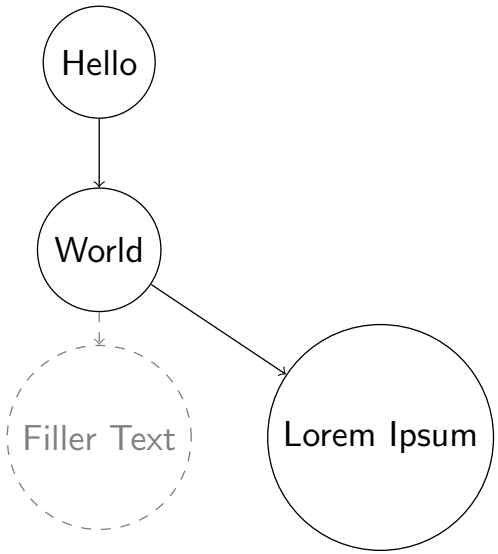
- From where we were before...
- Save it, throw it on a USB, give it to a friend



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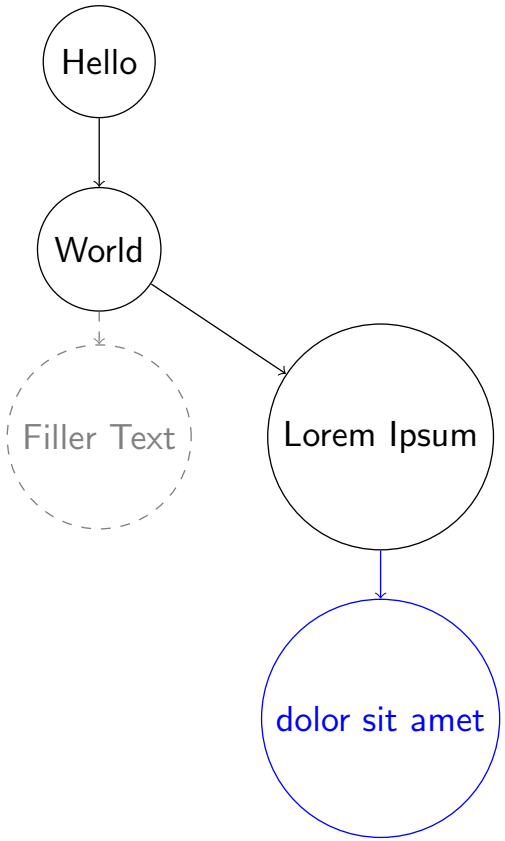
- **We** write "dolor sit amet" at the **end** of the document



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- **We** write "dolor sit amet" at the **end** of the document
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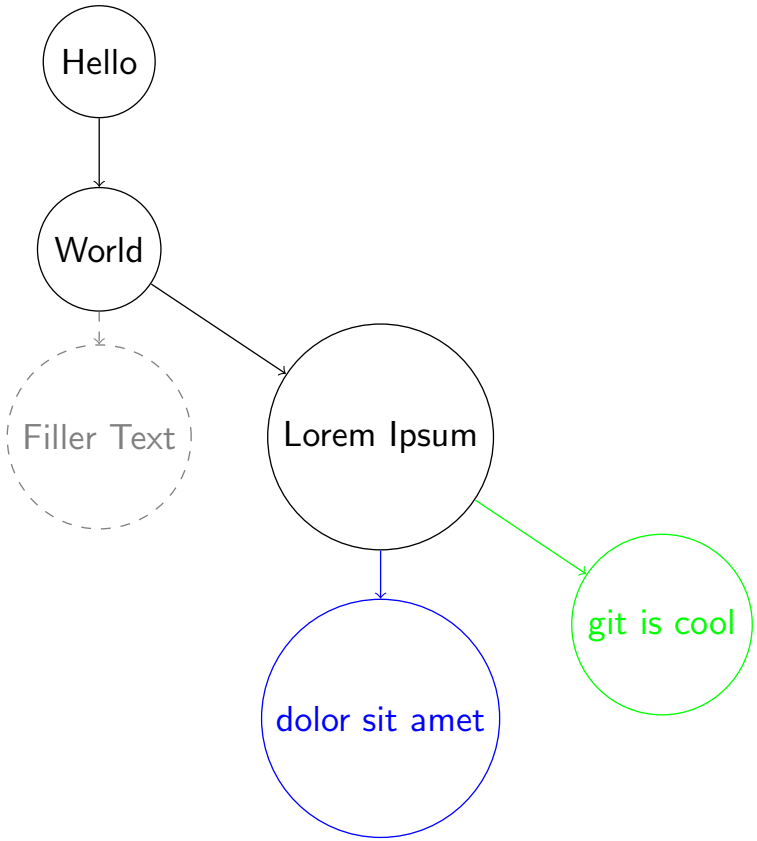

Merges and Collaborative Work

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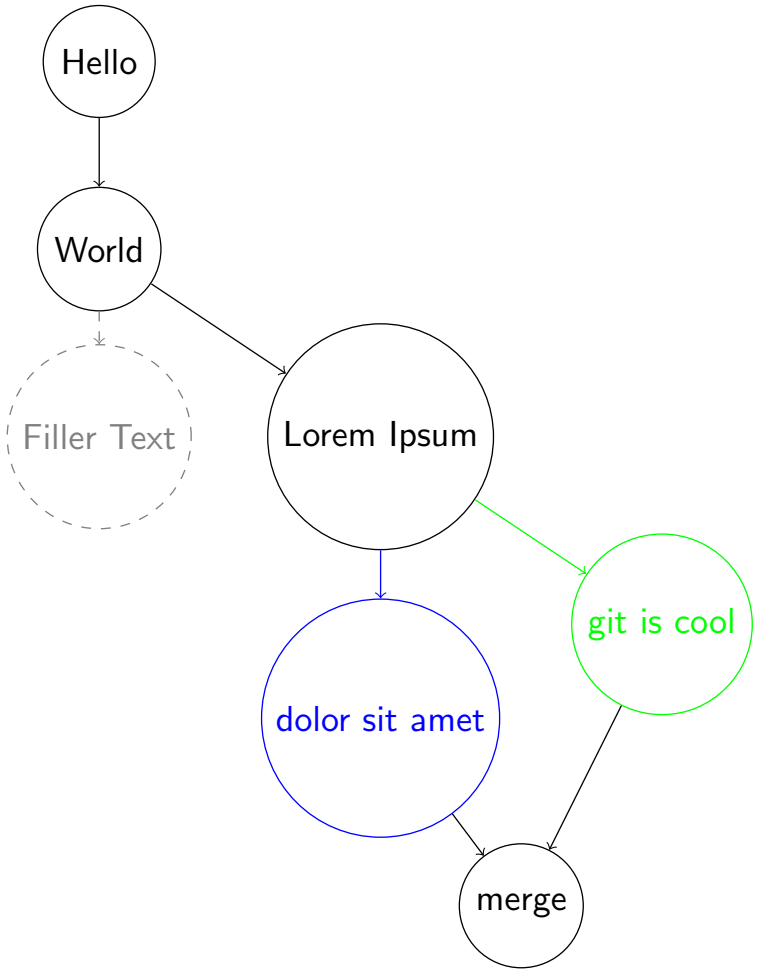
- Save it, throw it on a USB, give it to a friend
- **We** write "dolor sit amet" at the **end** of the document
- **They** write "git is cool" at the **top** of the document
- How to combine these?



Outline

Differences Between Our Live Demo and Git

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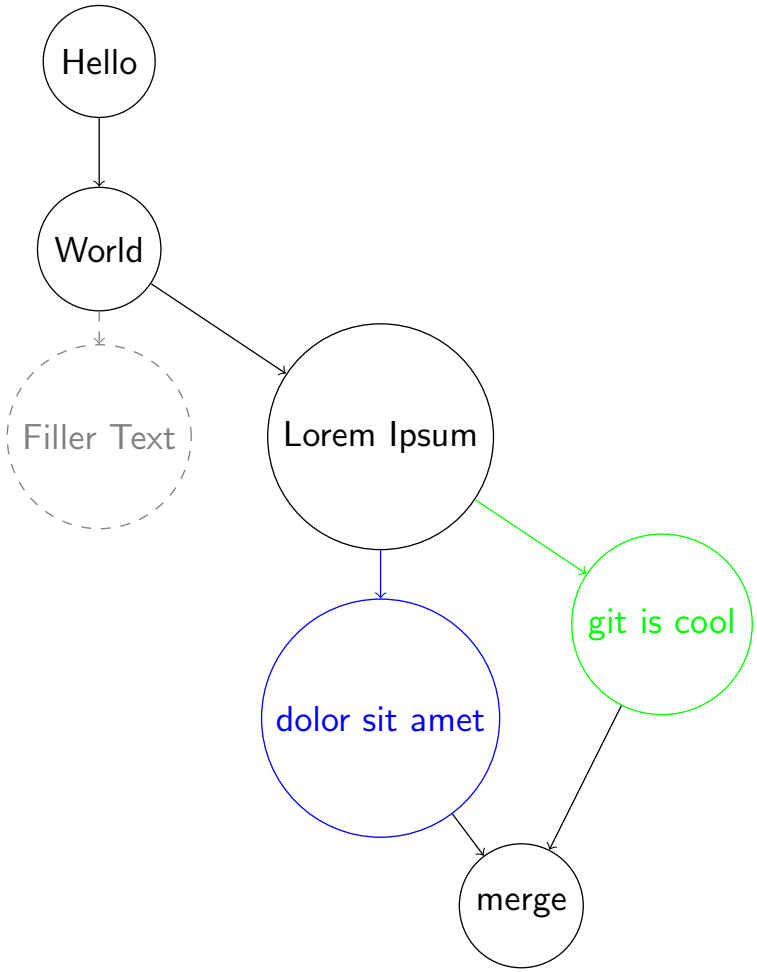

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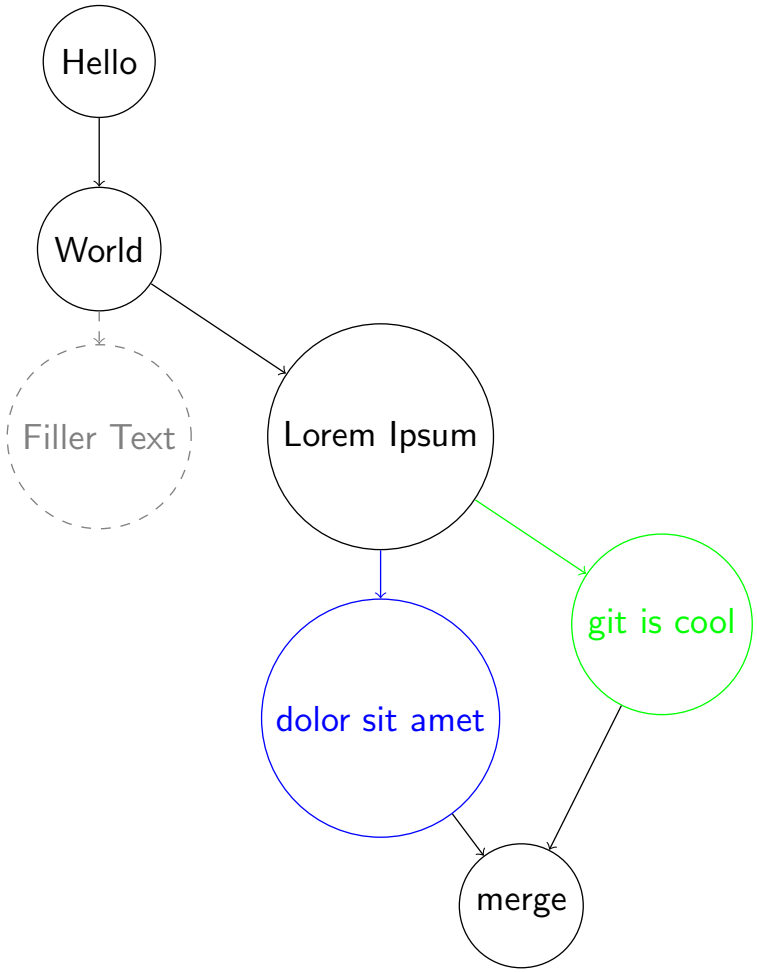

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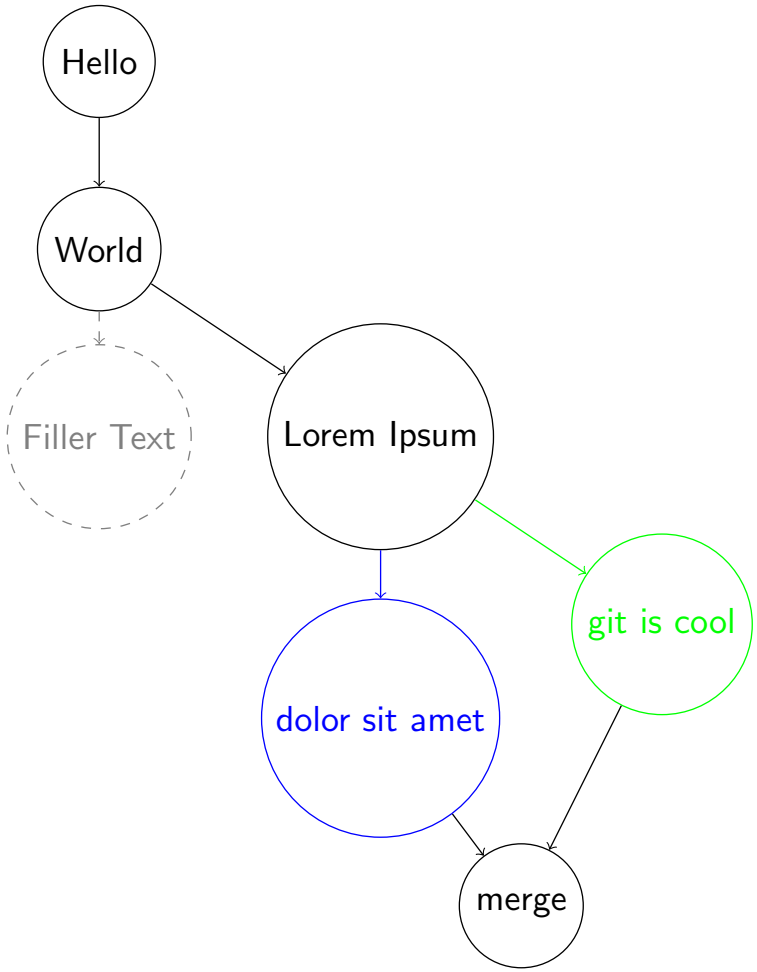

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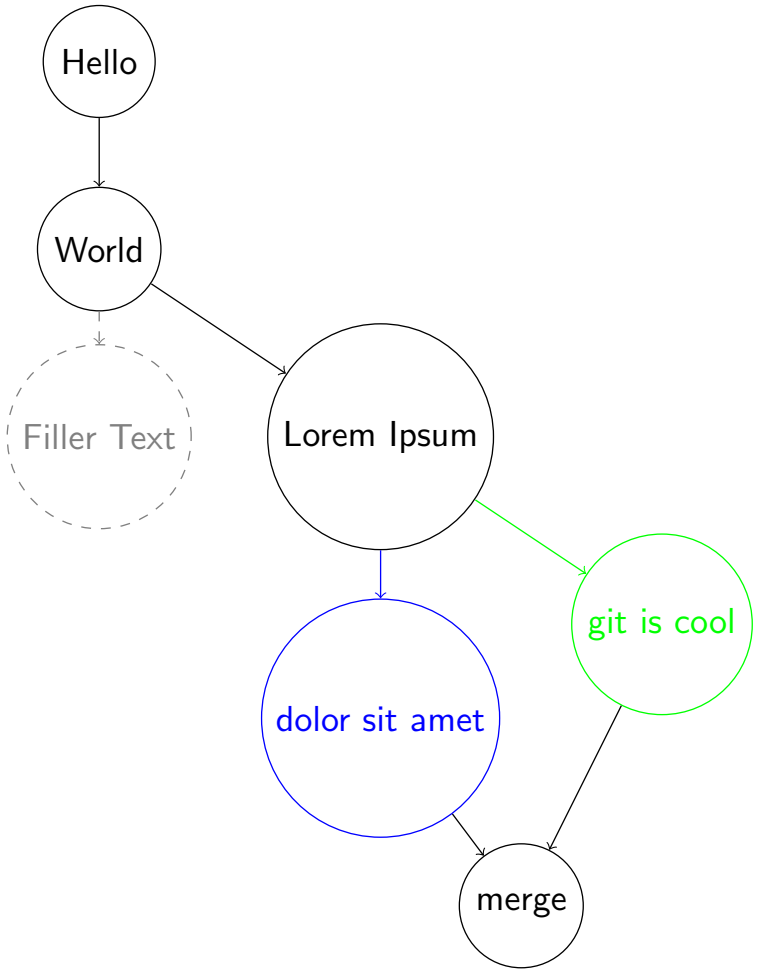

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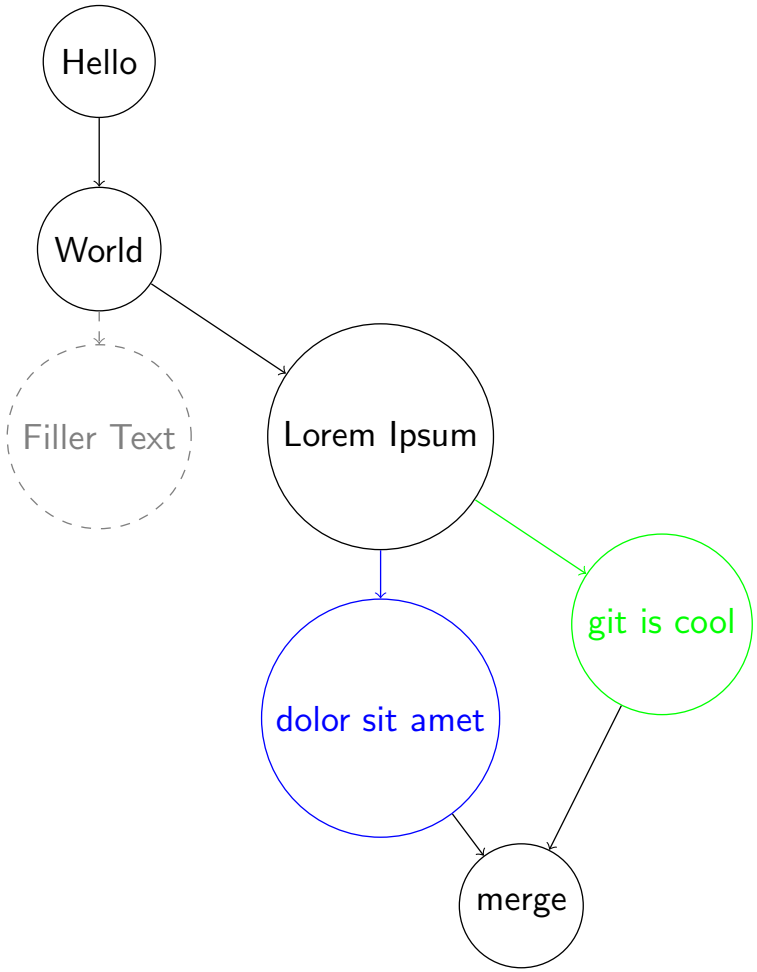
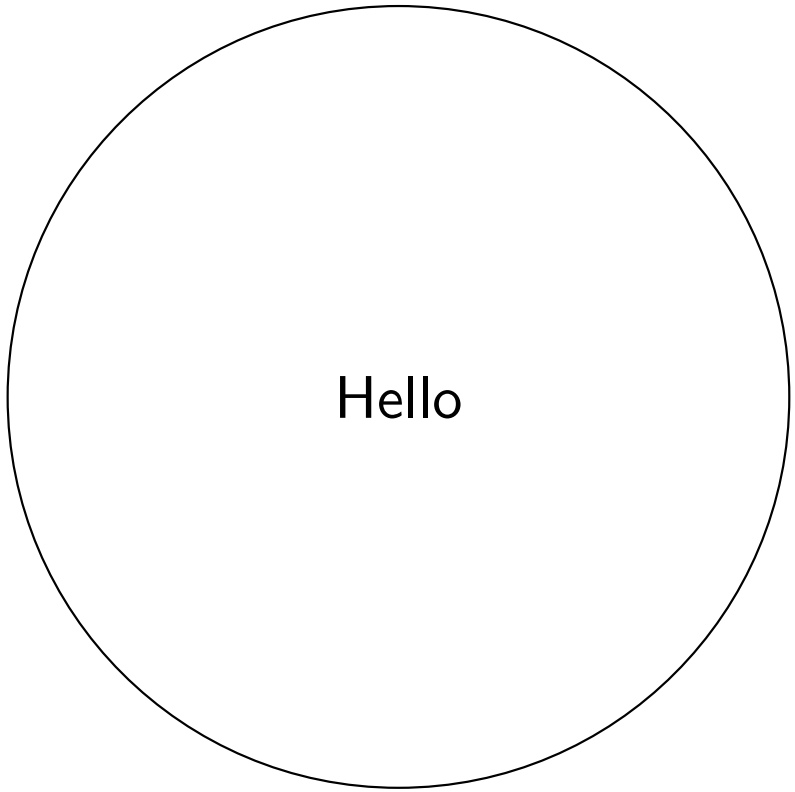
- ...and more



Commits

- The **atomic unit** of git



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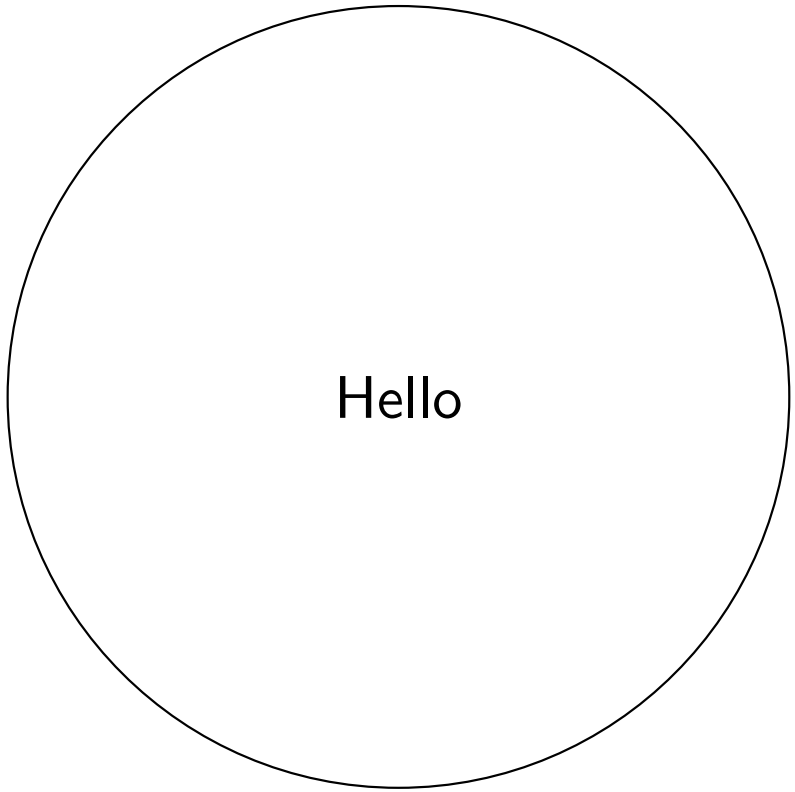
- You make the commits



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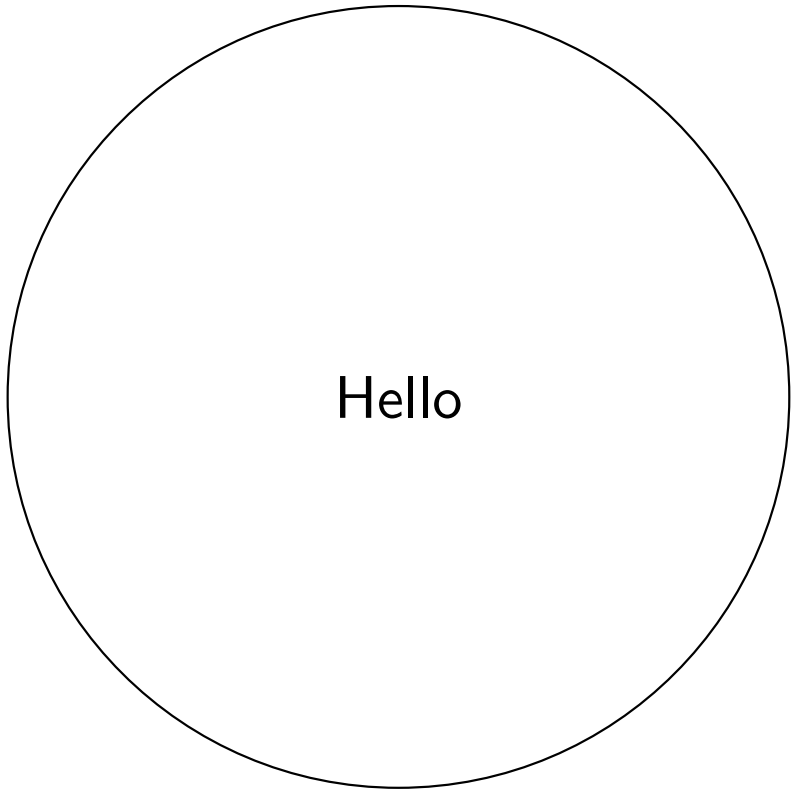
- A commit consists of 3 things



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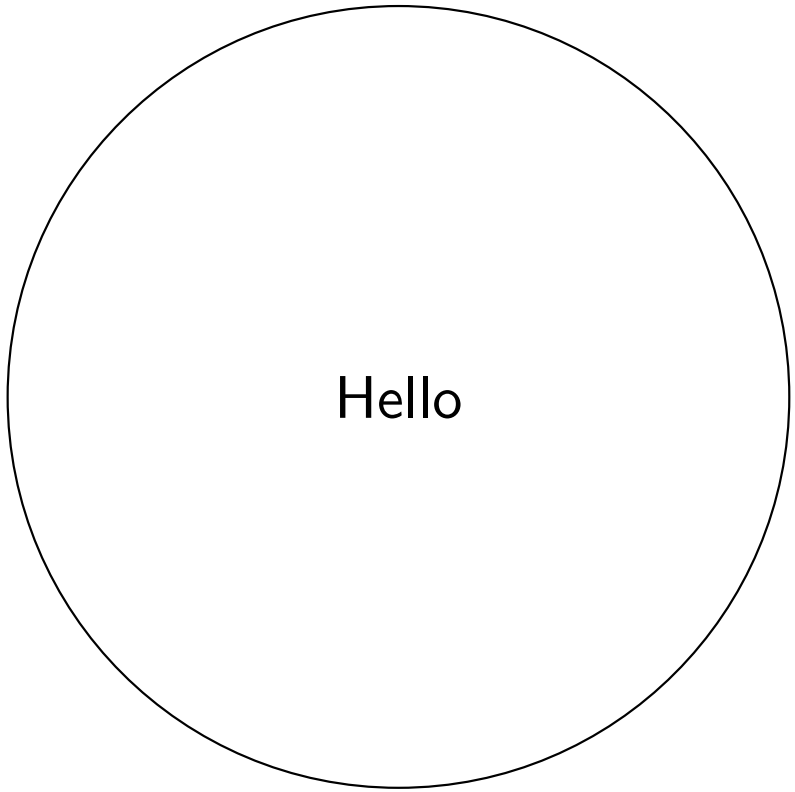

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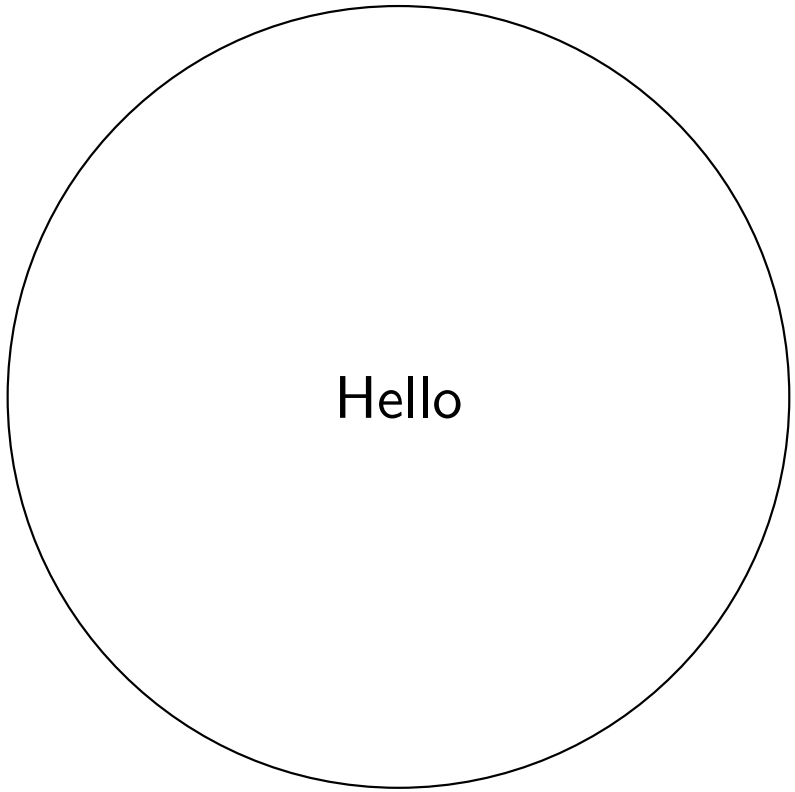

Commits

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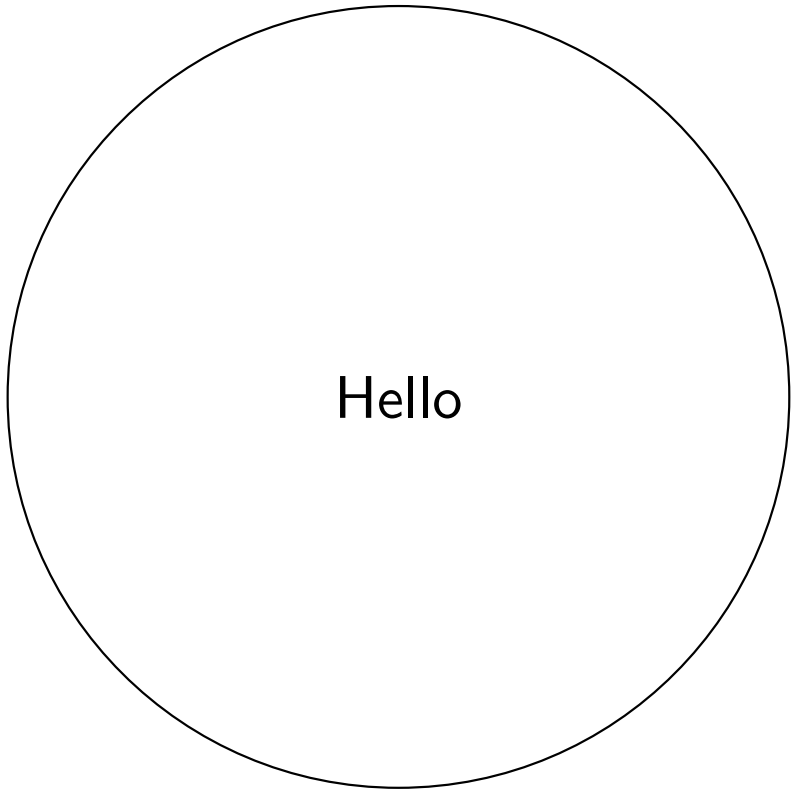
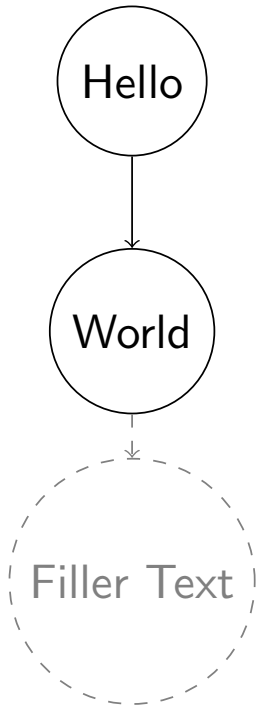
- You make the commits
- A commit consists of 3 things
- The state of the repo when that commit was made
- What commit(s) came immediately before it
- Metadata (timestamp, author, cryptographic hash)



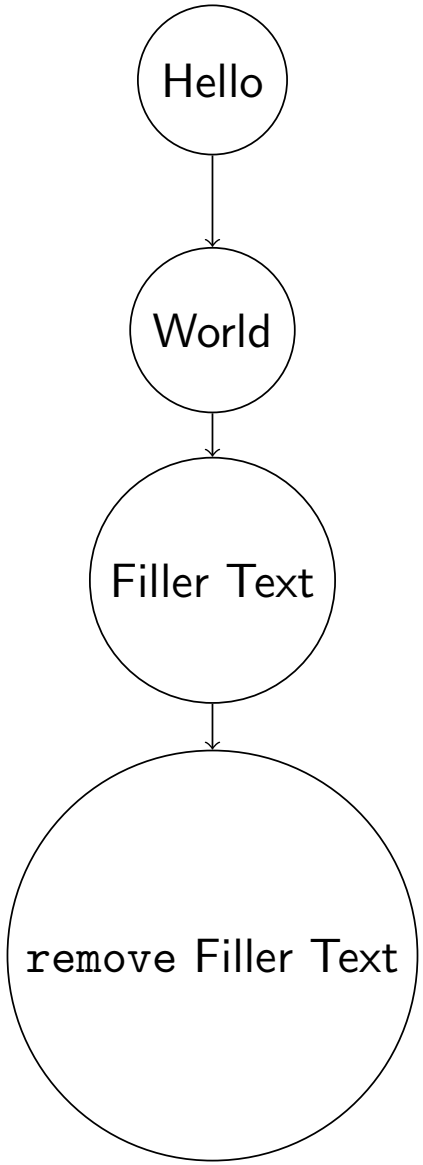
Reverts

- Expressed in terms of commits



Reverts

- Expressed in terms of commits
- Only appends to the history



Reverts

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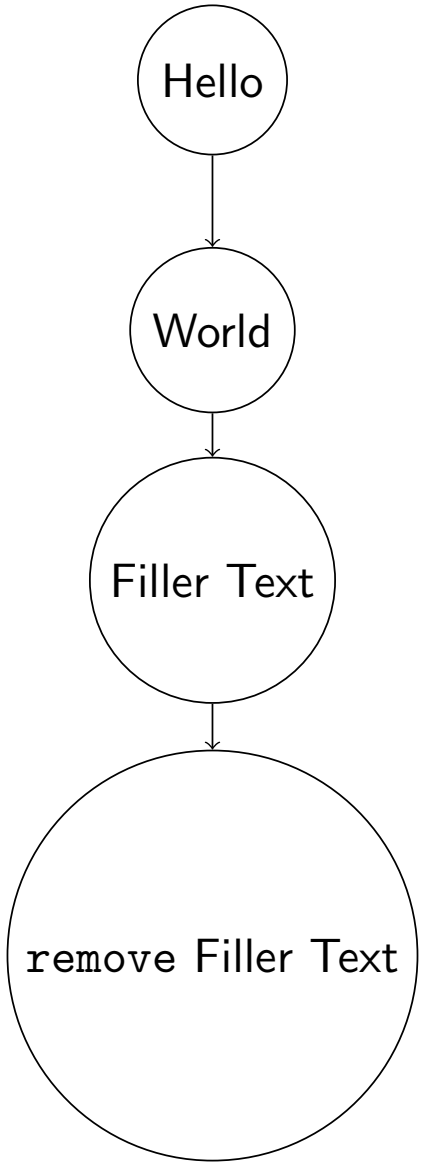
- Can revert multiple commits at once



Reverts

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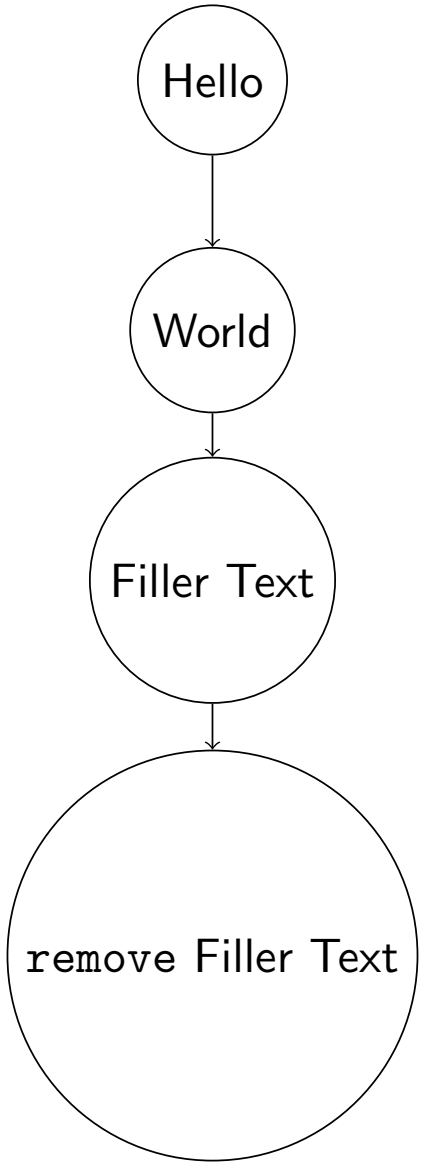
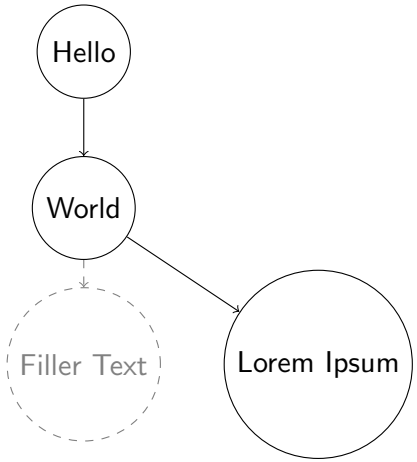
- Can revert multiple commits at once
- Don't have to revert the most recent commit



Branches and Merges

- From our previous branches slide



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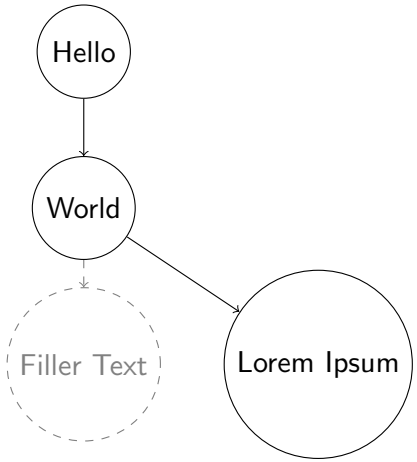

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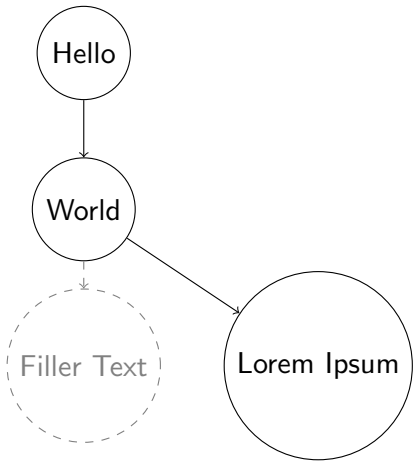

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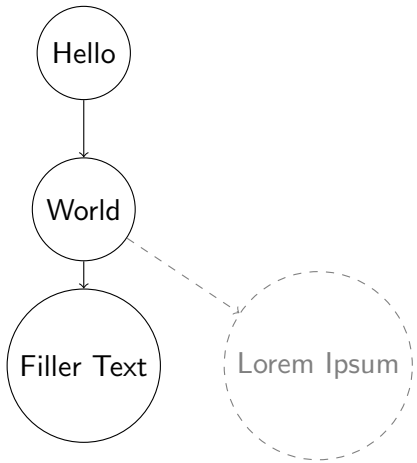

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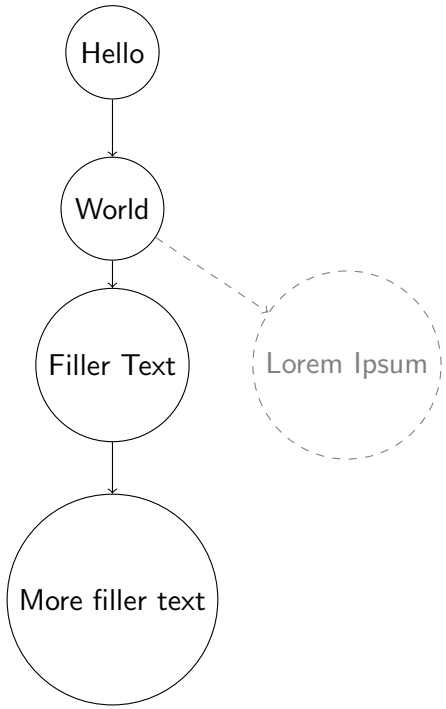

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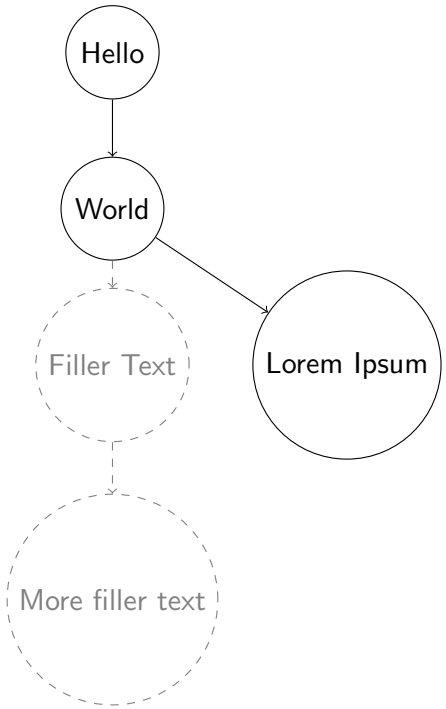

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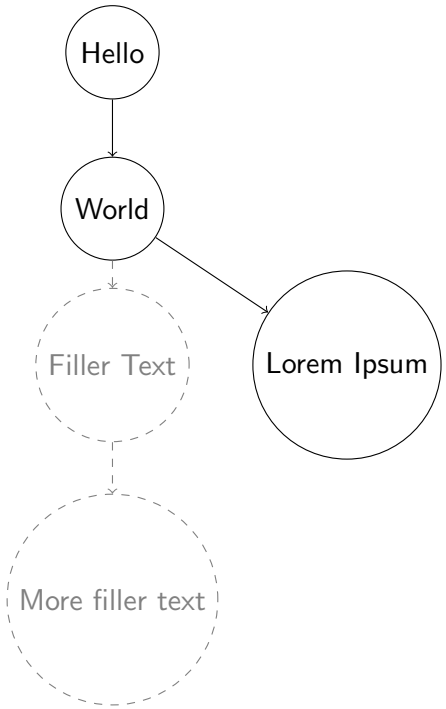
- A branch in git is just a pointer to somewhere on this graph



Branches and Merges

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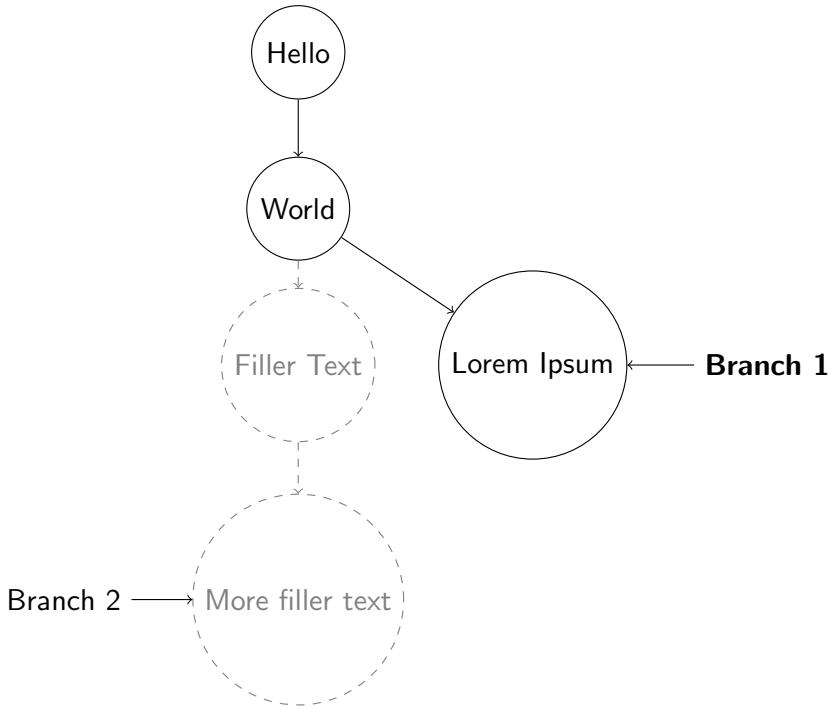

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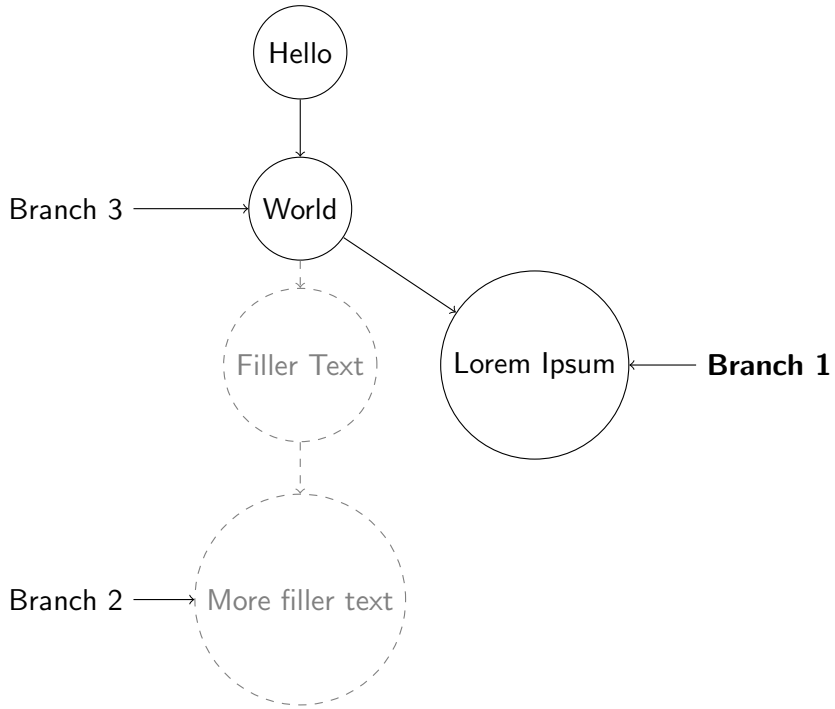

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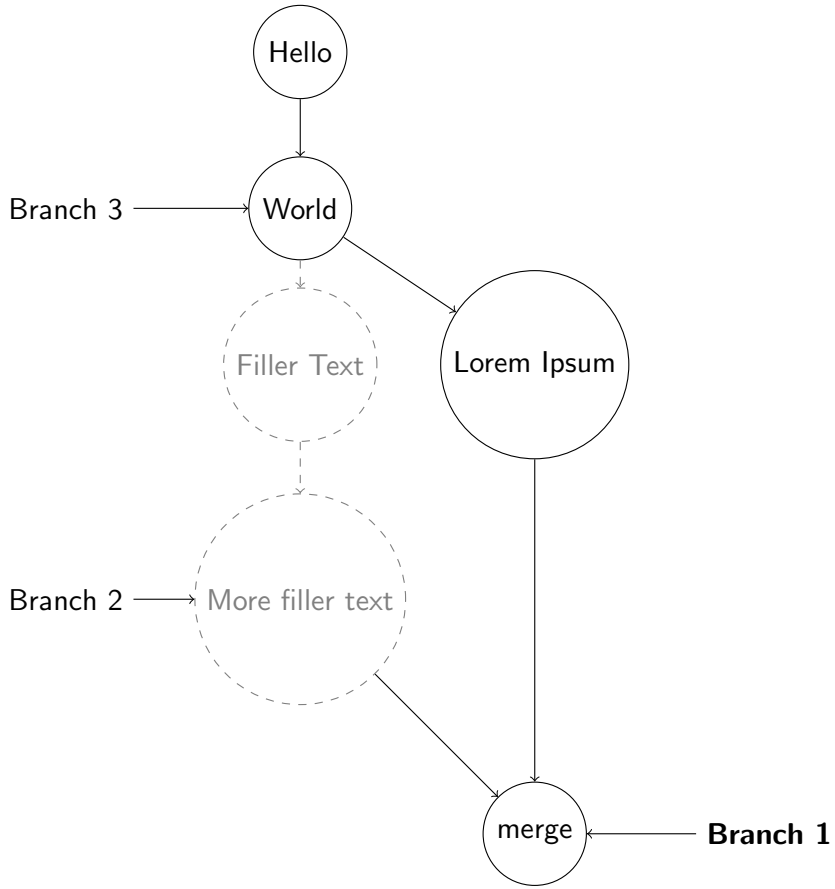

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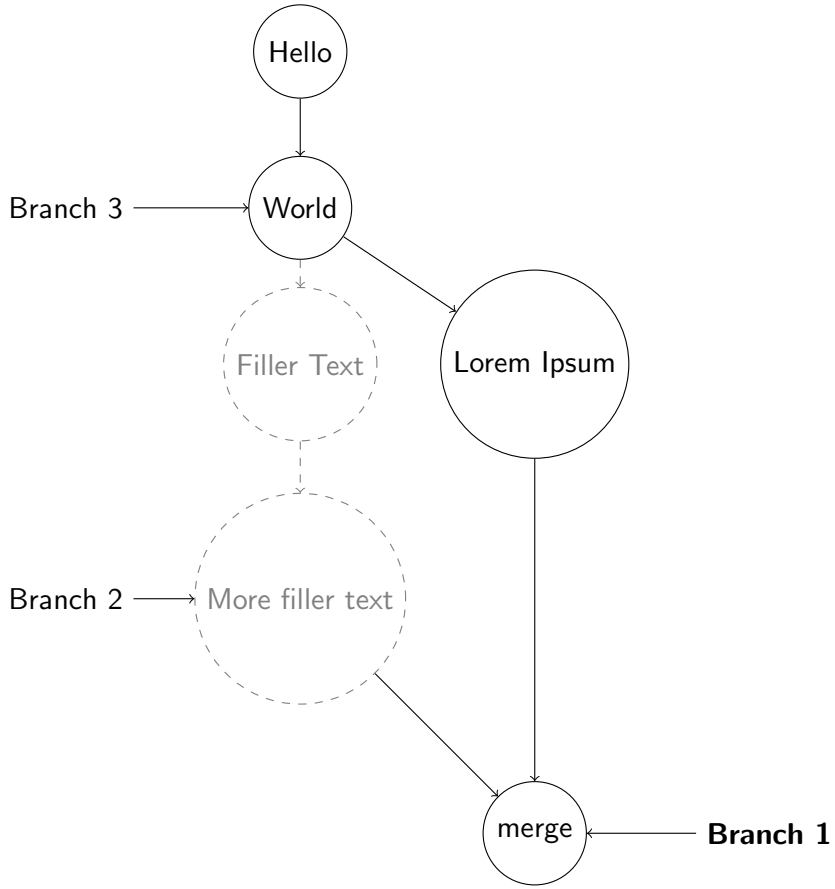
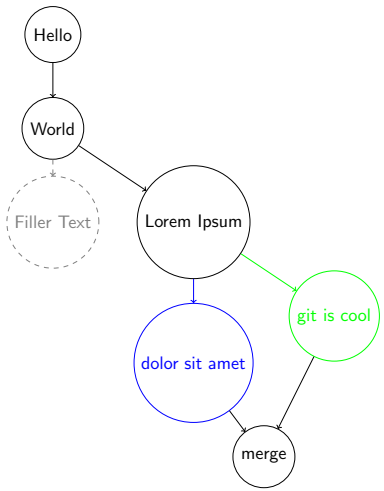
- But how? (explanation)



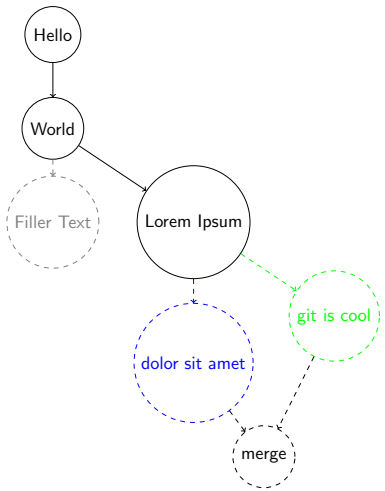
Collaborative Work

- From our previous collaboration slide...



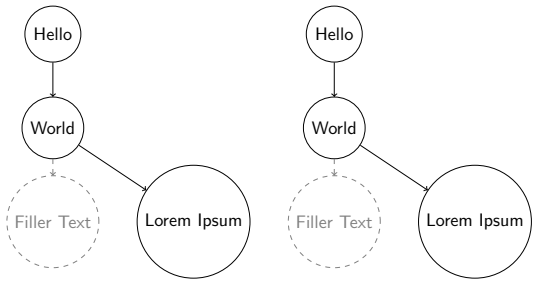
Collaborative Work

- From our previous collaboration slide...
- Going back in time...



Collaborative Work

- From our previous collaboration slide...
- Going back in time...
- Git is a **distributed** version control system



Collaborative Work

- From our previous collaboration slide...
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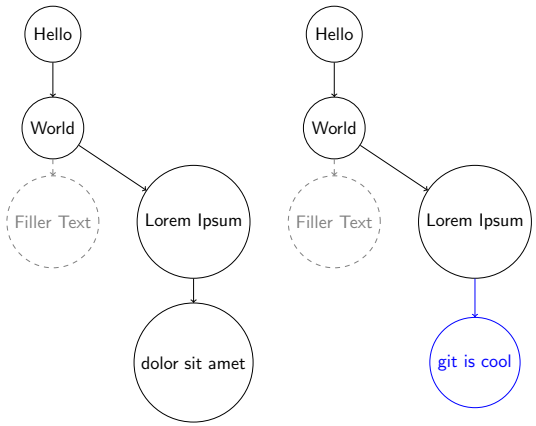
- Git is a **distributed** version control system
- Then you can each do your own work



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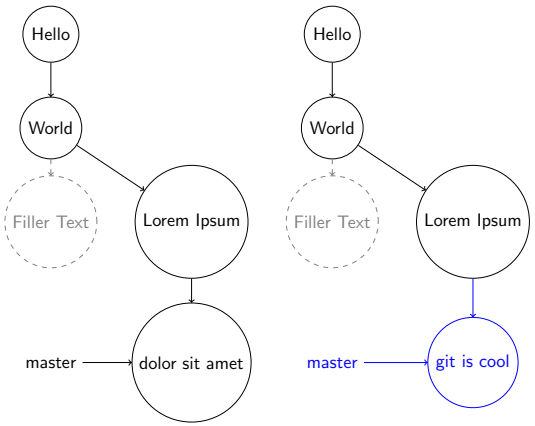

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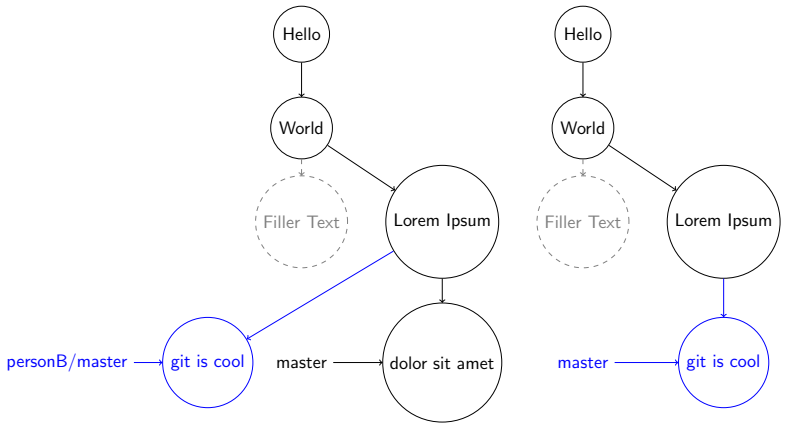

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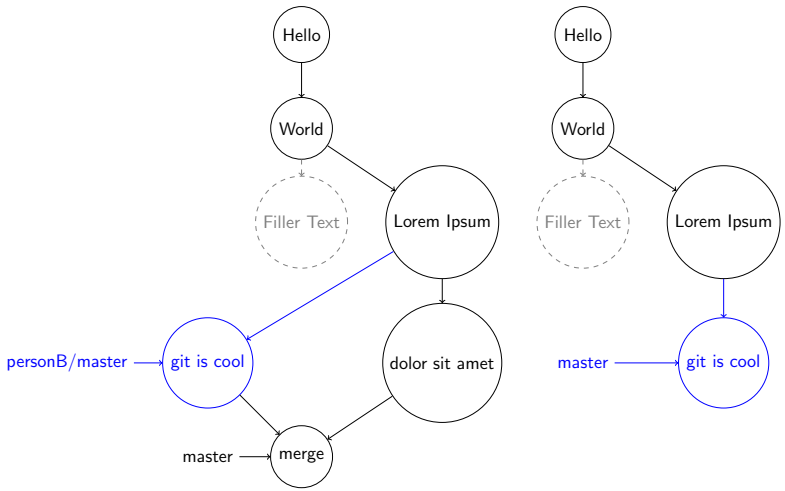
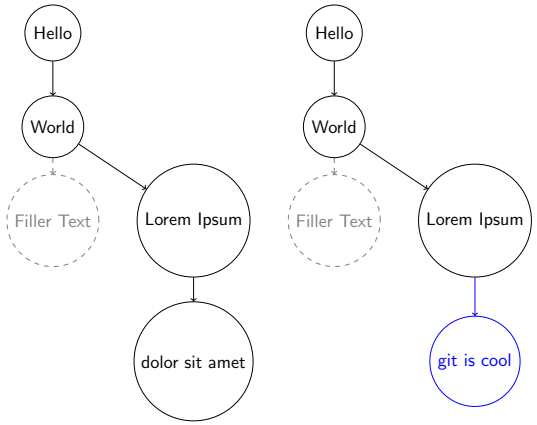
- Going back in time...
- Git is a **distributed** version control system
- Then you can each do your own work
- How to merge your work with someone else's
- Git allows you to **fetch** someone else's history into your history
- From there, it's just another branch that you can merge



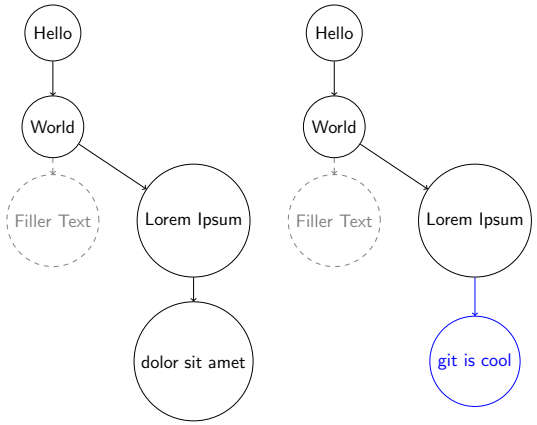
Collaborative Work II

- From our previous collaborative work slide



Collaborative Work II

- From our previous collaborative work slide
- Fetch-only collaboration is painful



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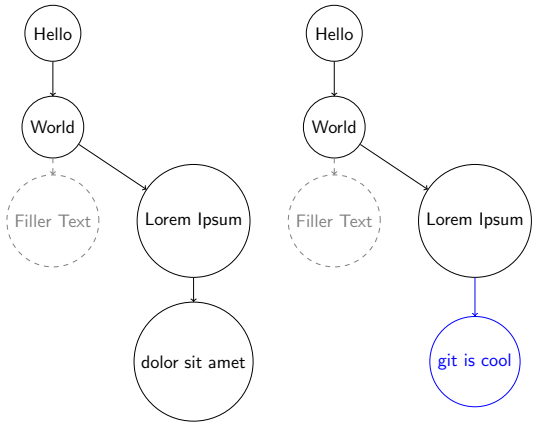

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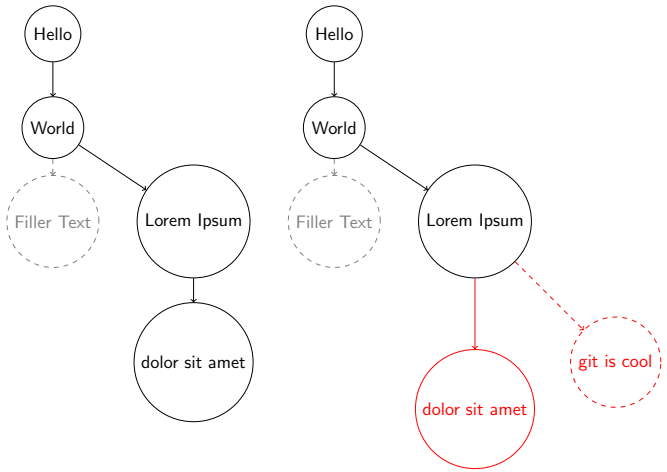

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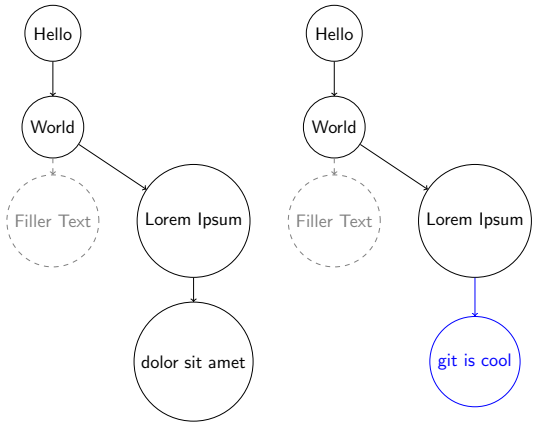

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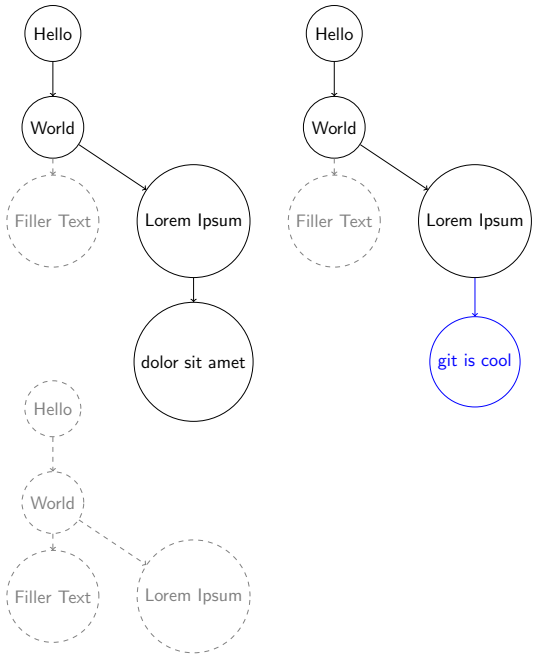

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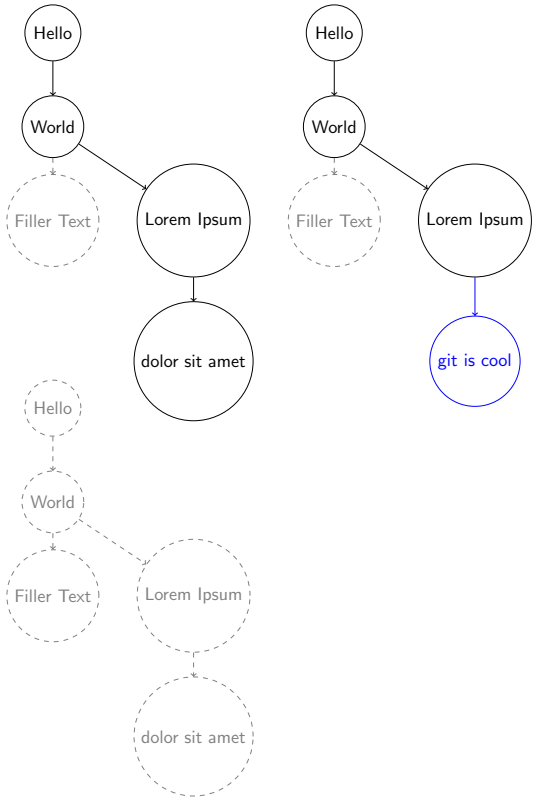

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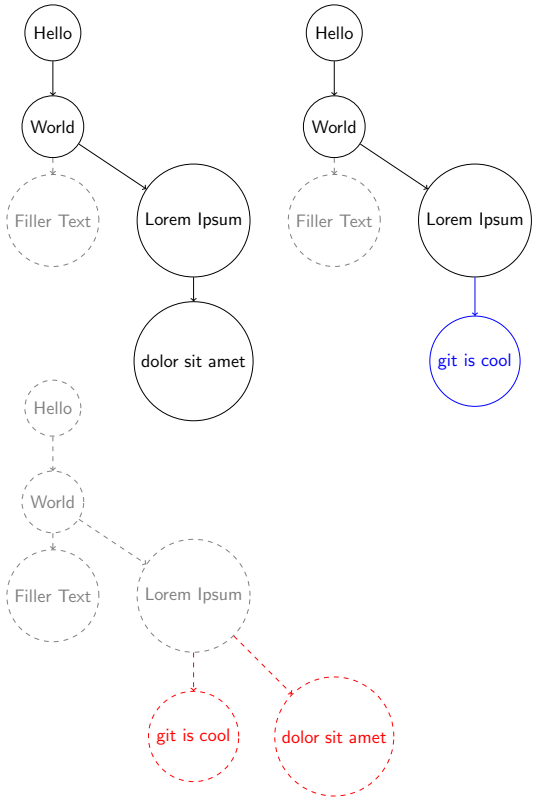

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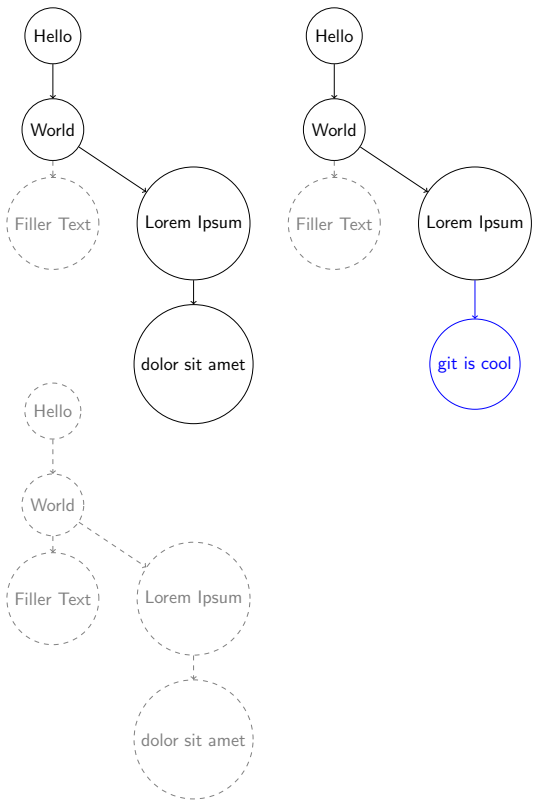

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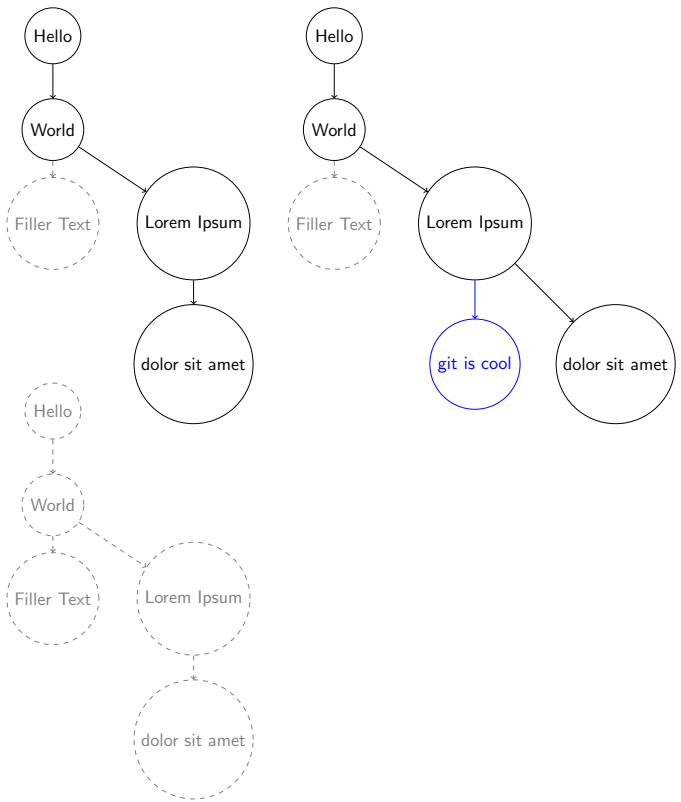

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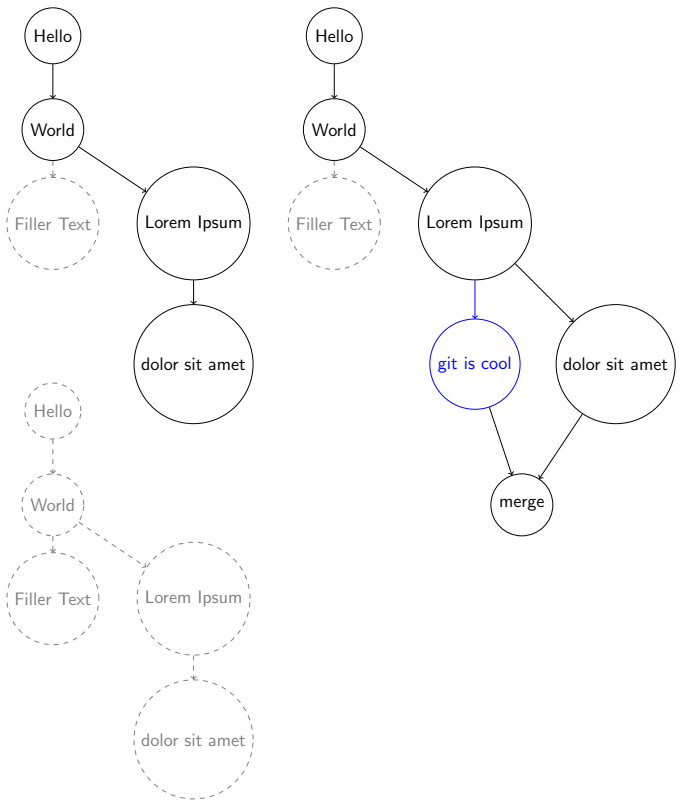

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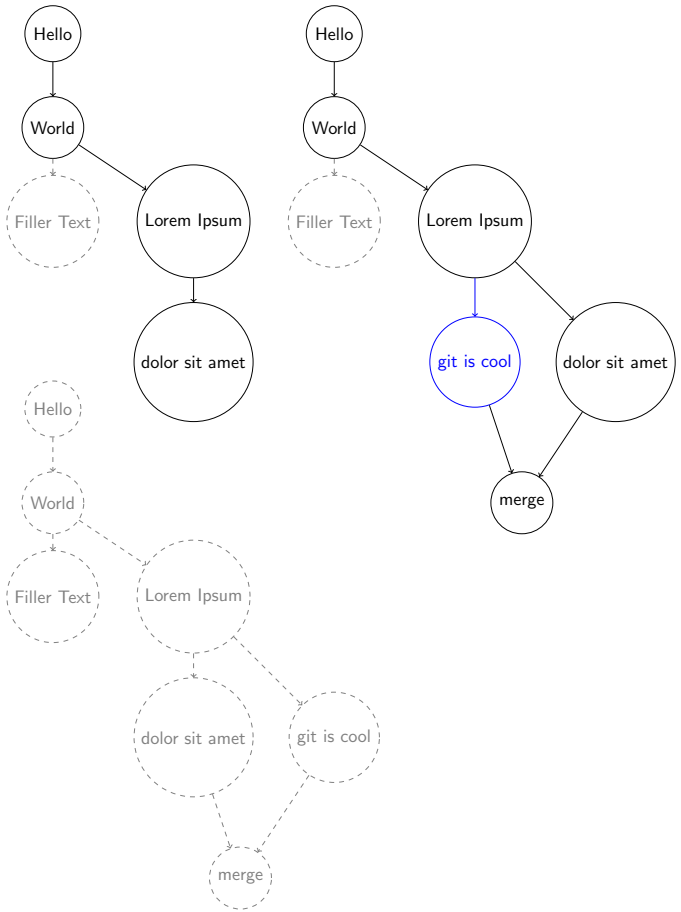

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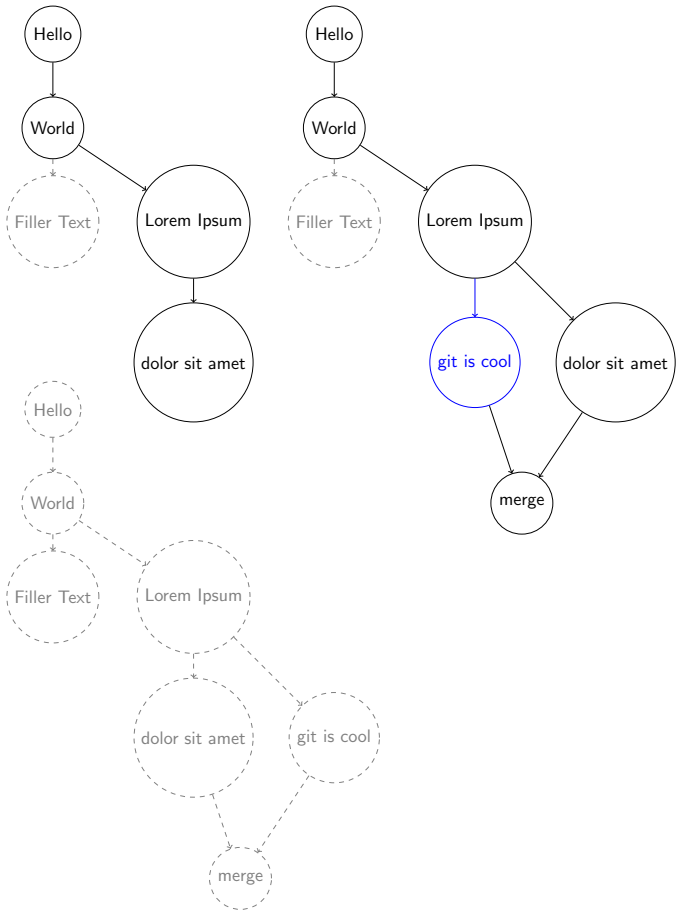
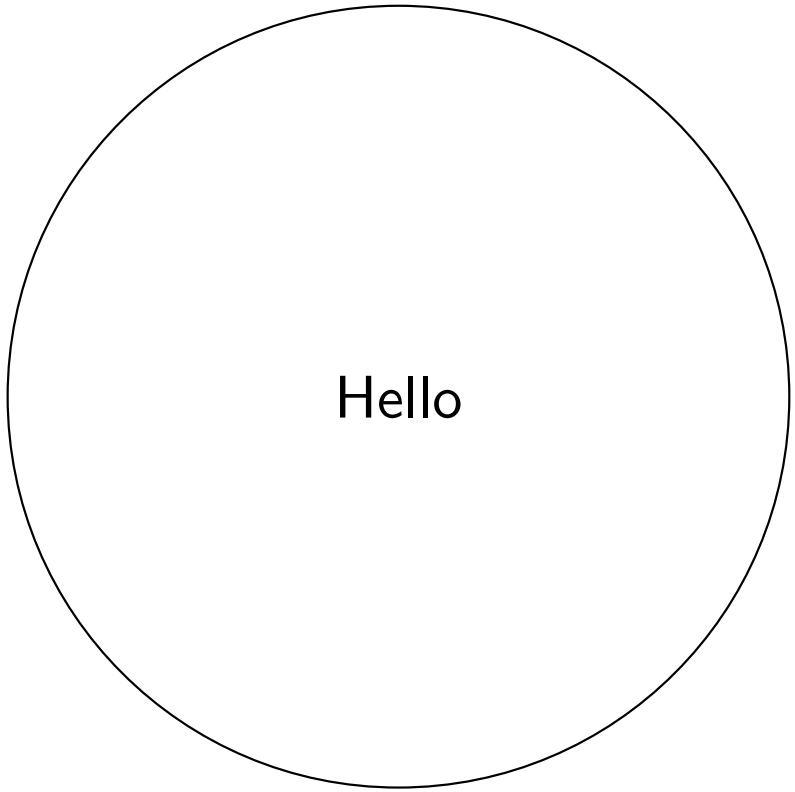
- Common servers Github, Bitbucket, Gitlab, Self-hosted



Outline

Commits

- From before, the **atomic unit** of git



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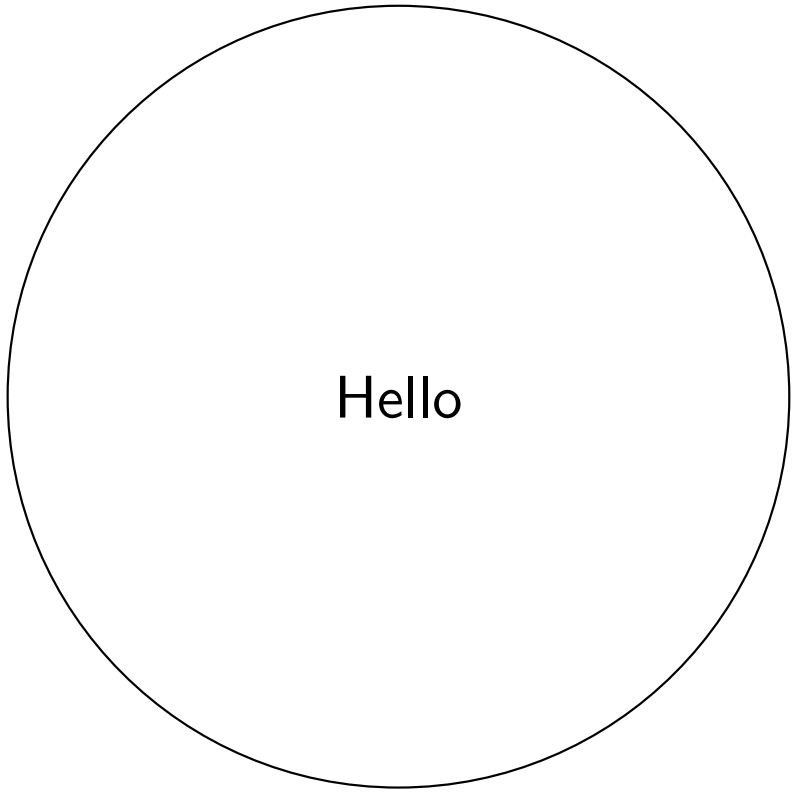

Commits

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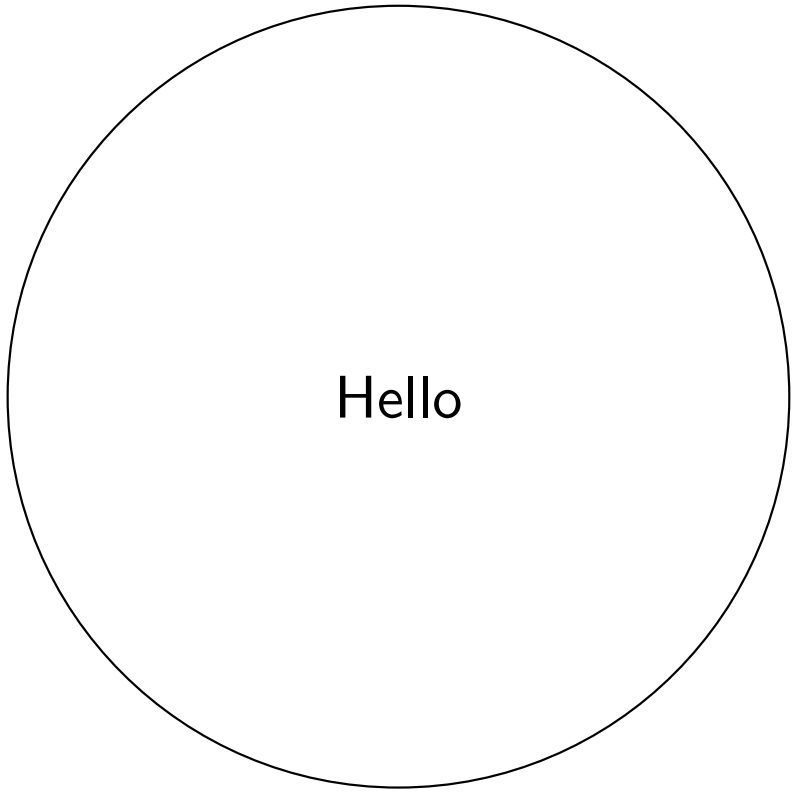
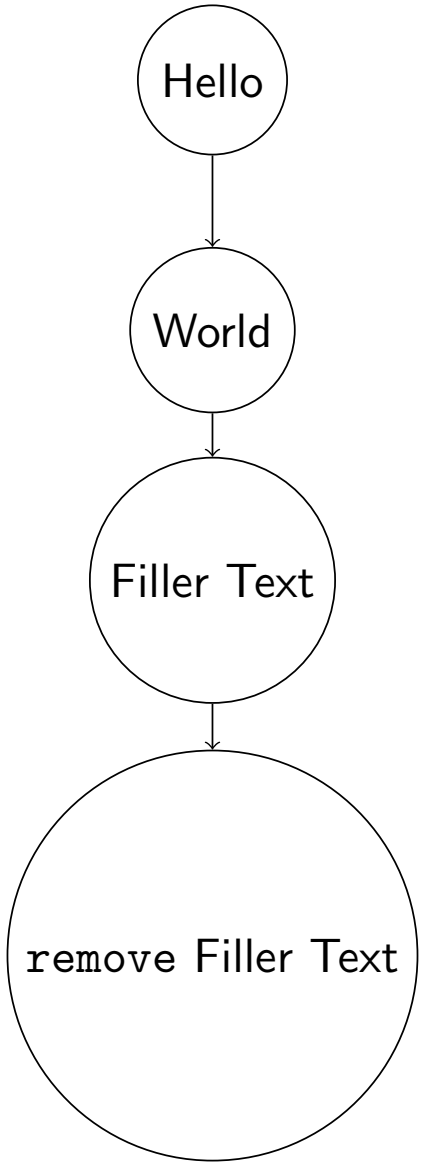
- First need to put things into a staging area
- Git can show you all your commits in a log



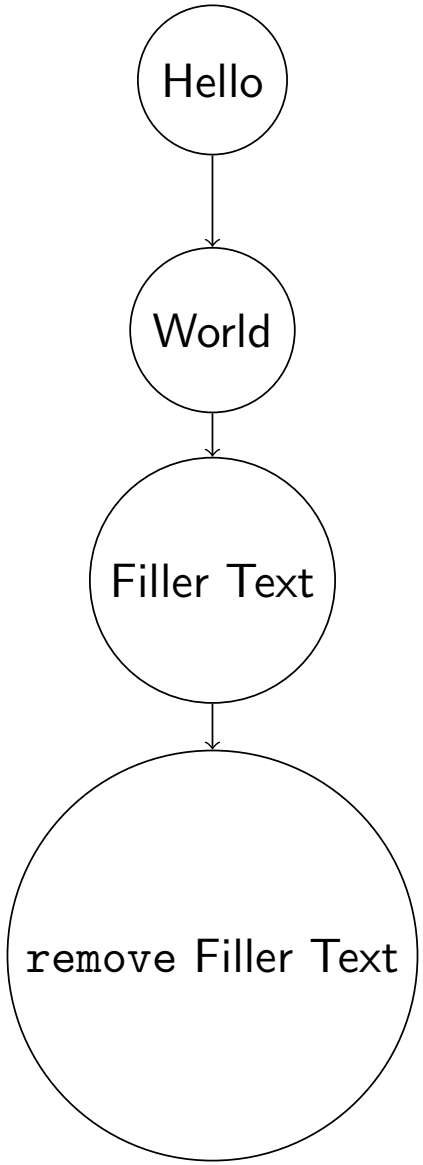
Reverts

- From before, append to history the invert of a previous commit



Reverts

- From before, append to history the invert of a previous commit
- Can revert any commit in your history



Branches and Merges

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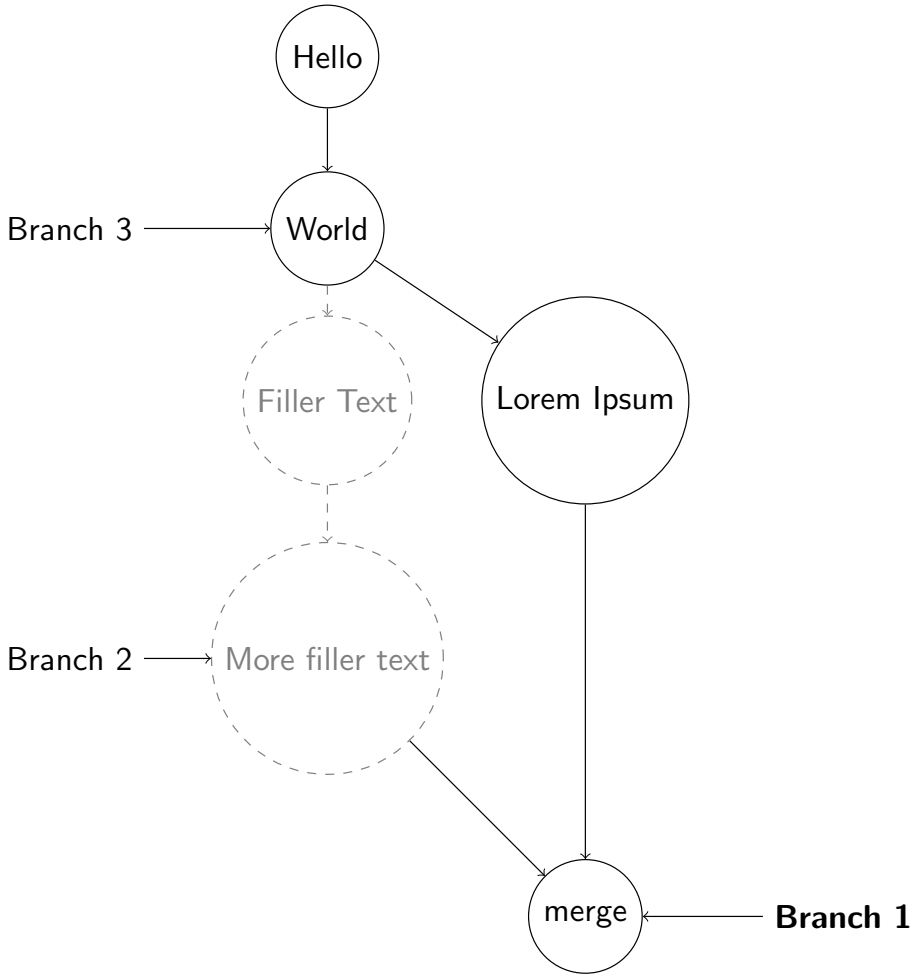
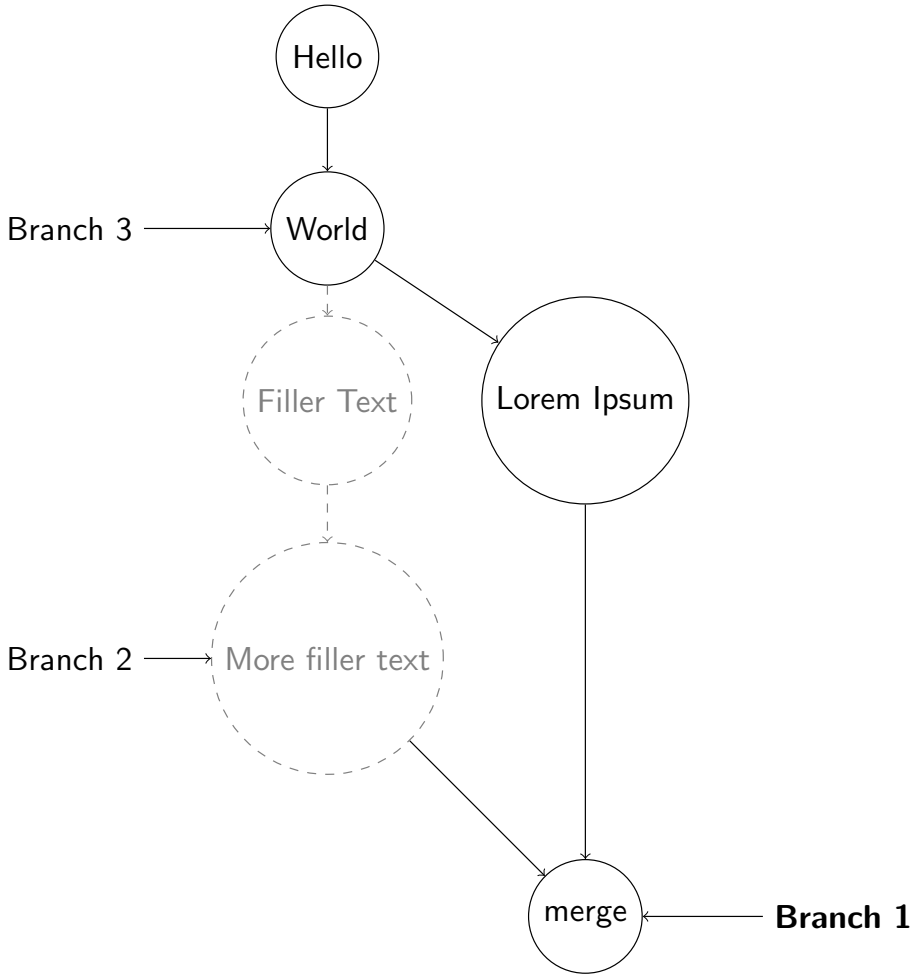


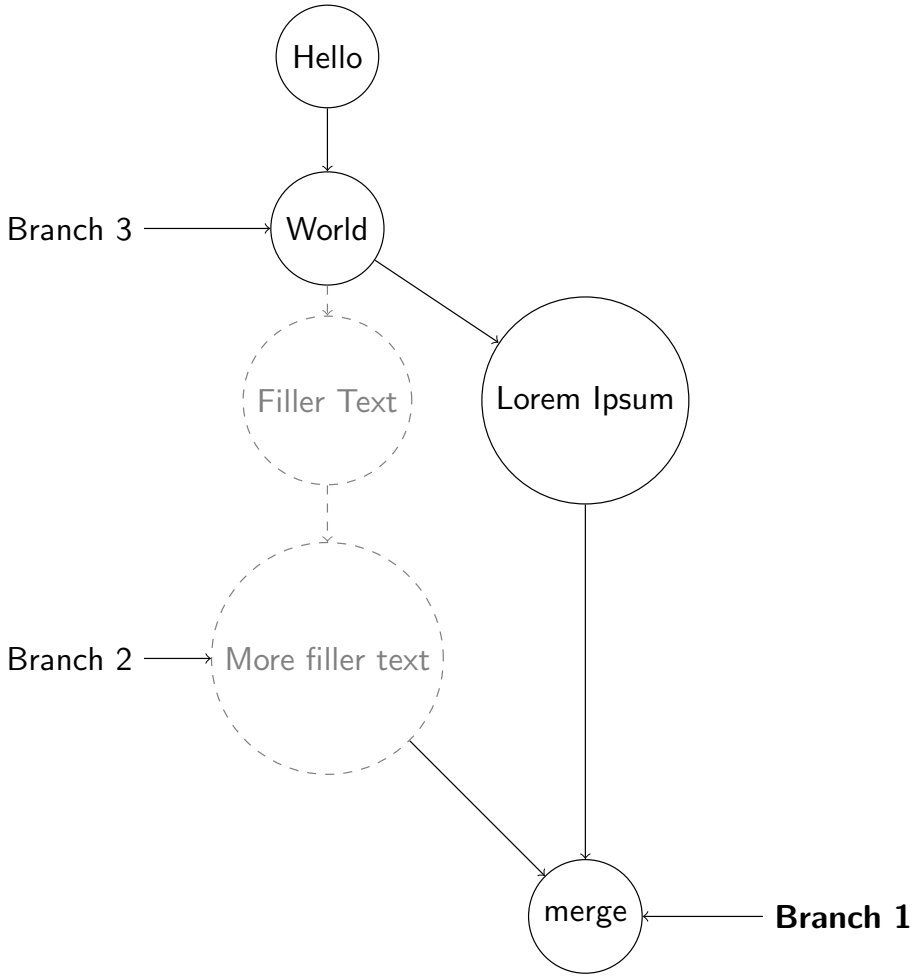
Branches and Merges

- From our previous branching slide...
- We can view all the available branches



Branches and Merges

- From our previous branching slide...
- We can view all the available branches
- We can swap between branches



Branches and Merges

- From our previous branching slide...
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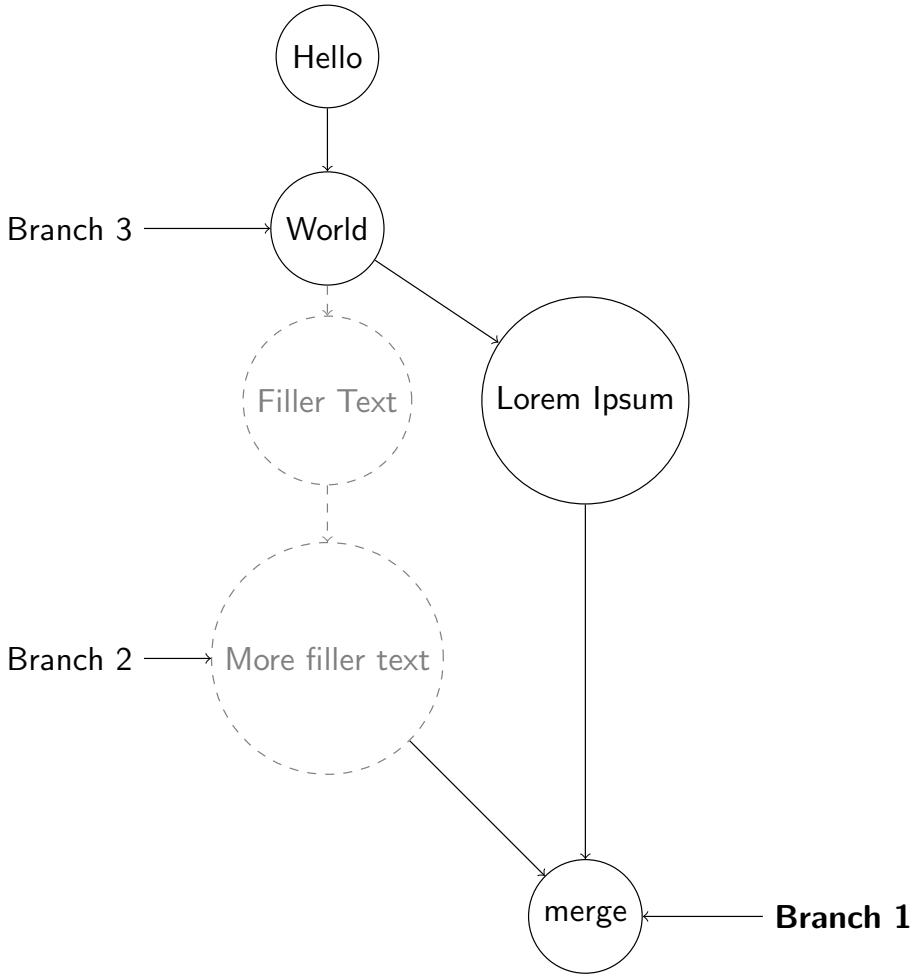
- We can swap between branches
- We can do work on branches



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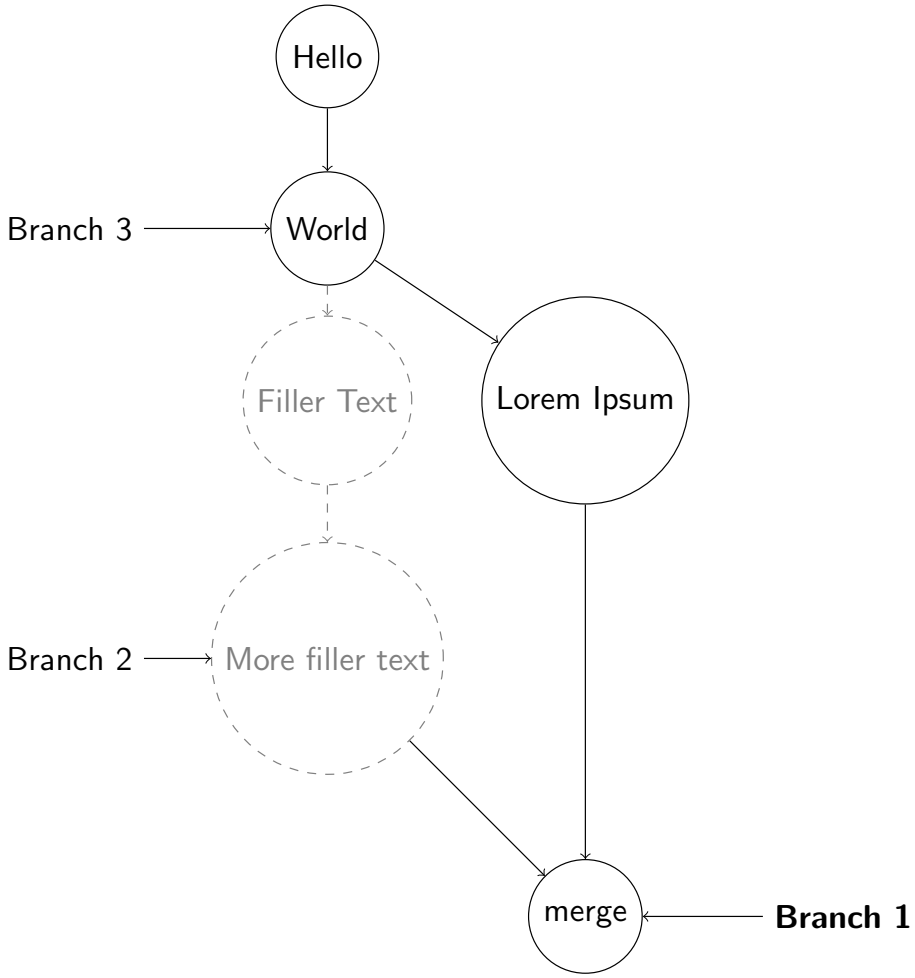
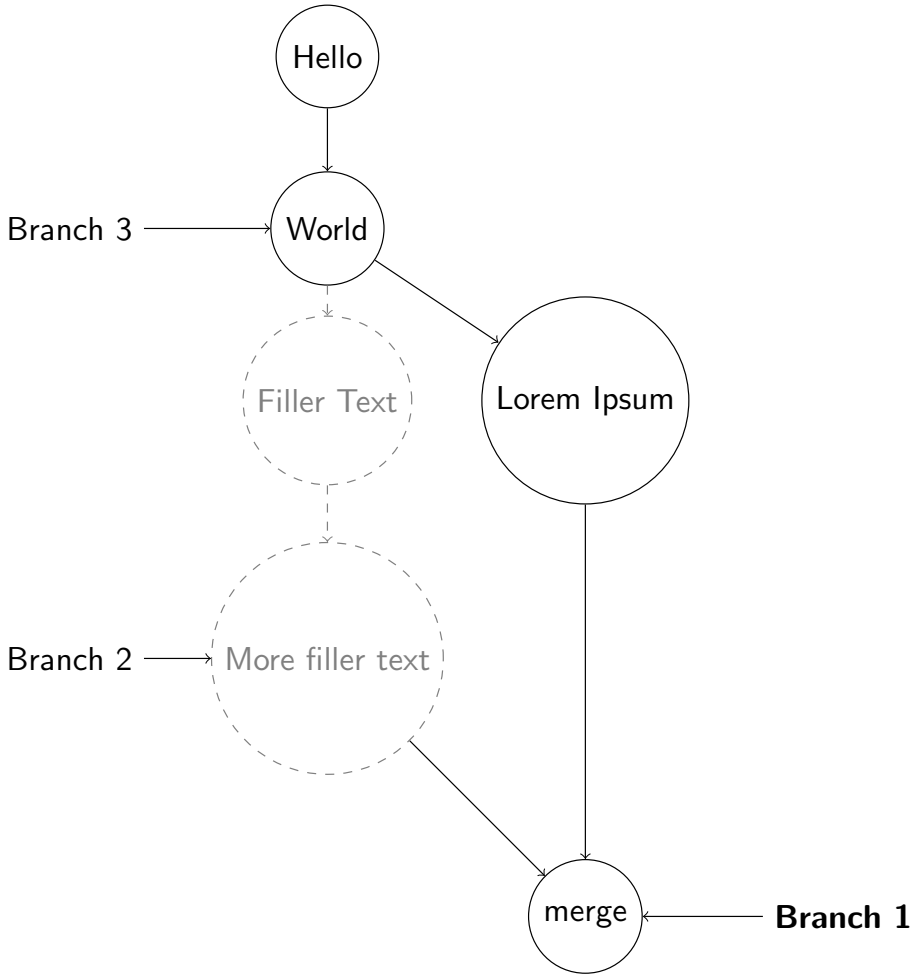


Branches and Merges

- From our previous branching slide...
- We can view all the available branches
- We can swap between branches
- We can do work on branches
- We can merge branches
- Merging doesn't always work



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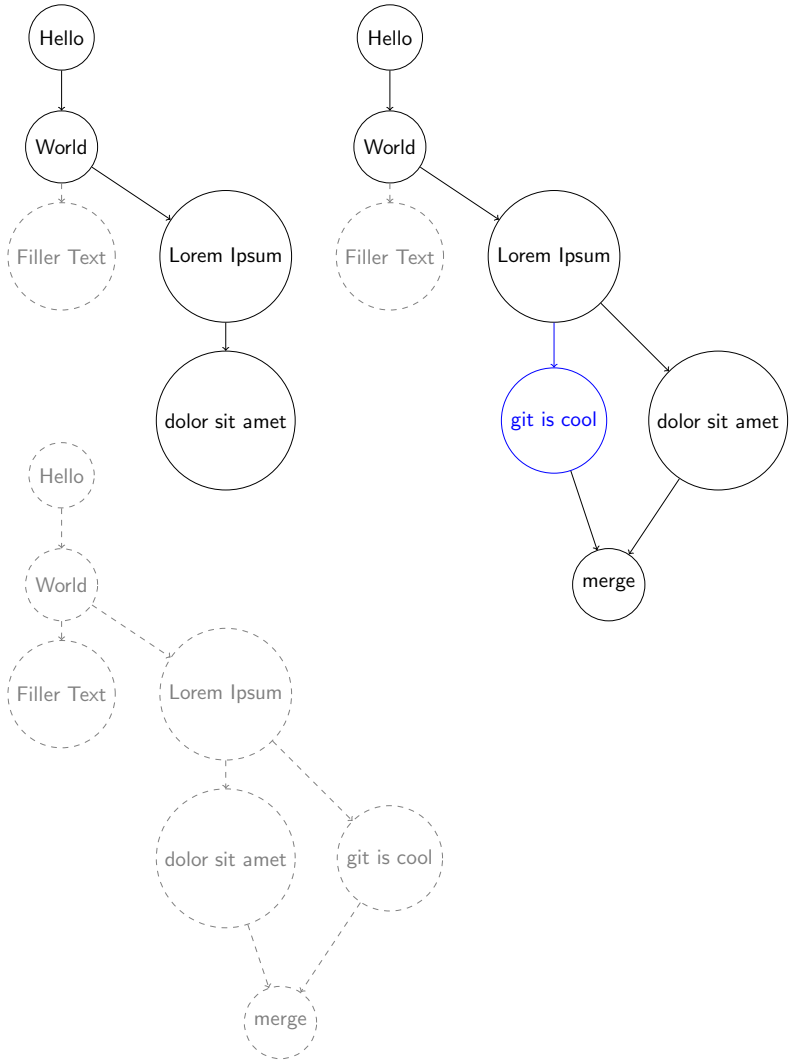
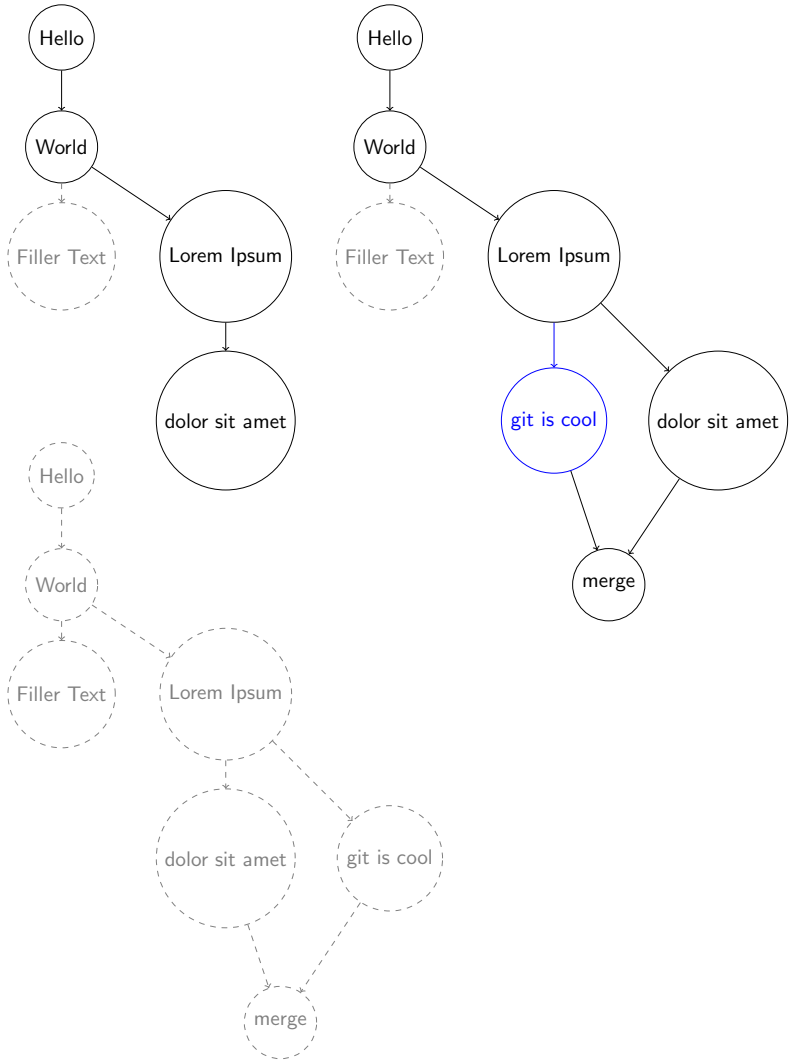


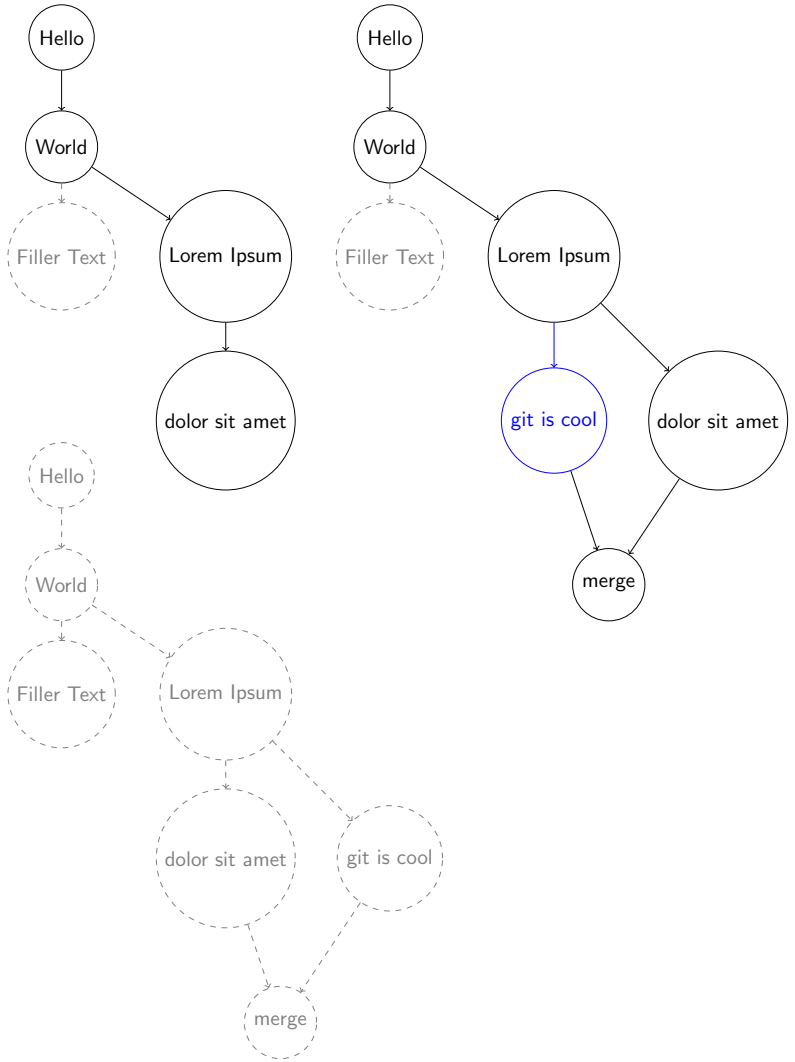
Collaborative Work

- From our previous collaborative work slide...
- We can clone a repository from somewhere else



Collaborative Work

- From our previous collaborative work slide...
- We can clone a repository from somewhere else
- We can push to a repository



Collaborative Work

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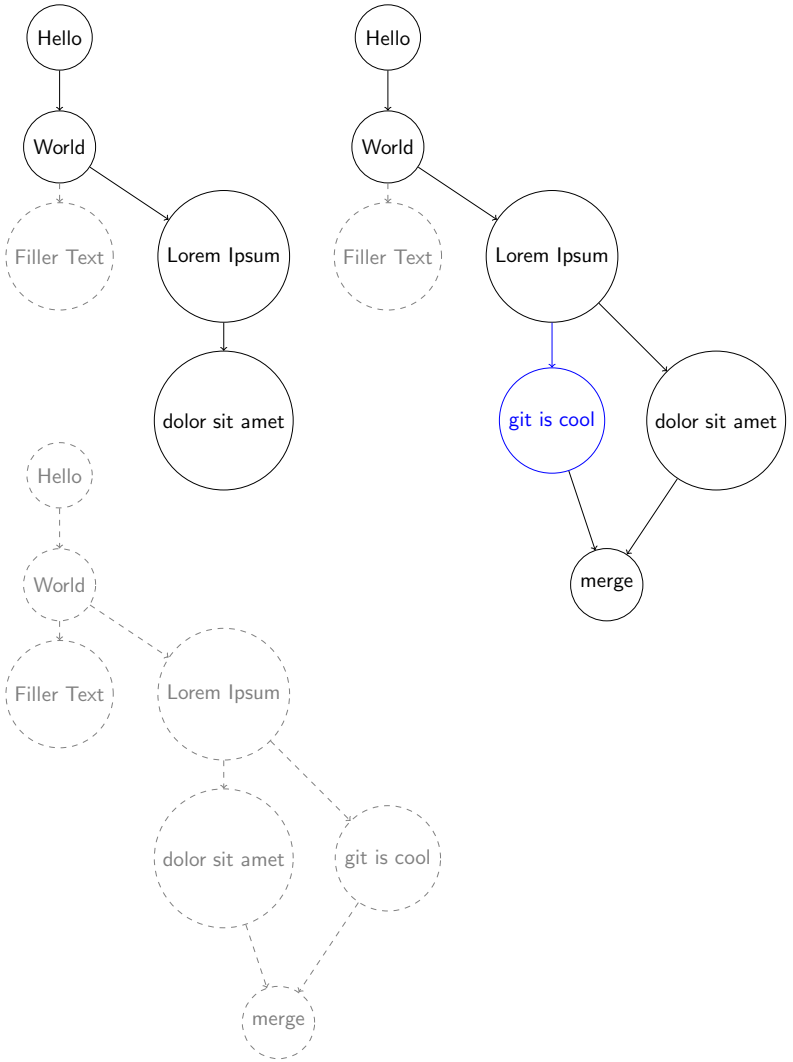
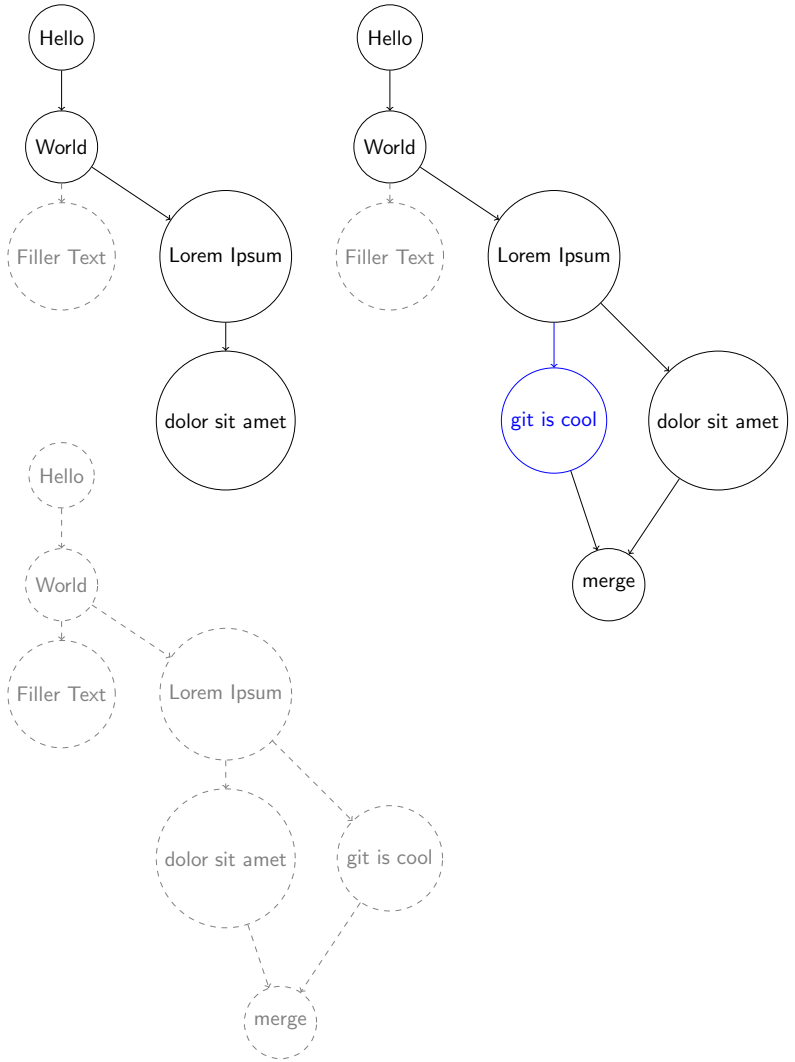
- We can clone a repository from somewhere else
- We can push to a repository
- We can fetch from a repository



Collaborative Work

- From our previous collaborative work slide...
- We can clone a repository from somewhere else
- We can push to a repository
- We can fetch from a repository
- We can merge the remote work in with our own



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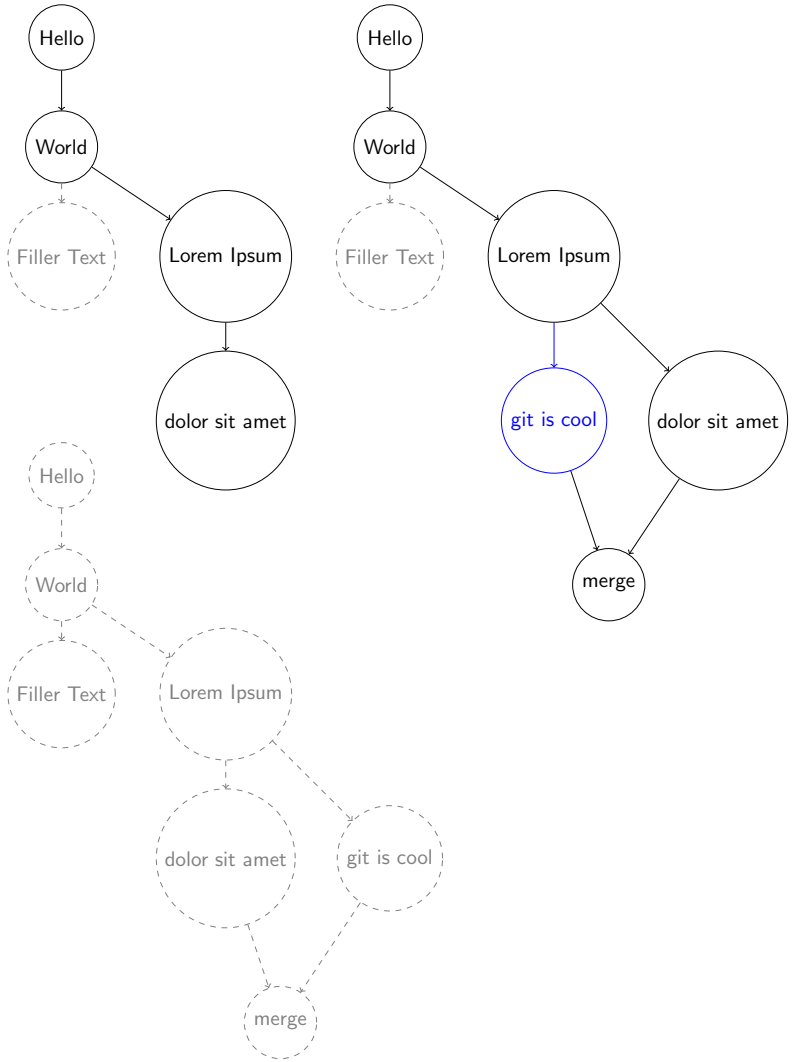
- We can push to a repository
- We can fetch from a repository
- We can merge the remote work in with our own
- We can use **pull** to combine these two processes



Outline

Flaws with Git

There are none

Flaws with Git

- Has issues with files that aren't plain text

Flaws with Git

- Has issues with files that aren't plain text
- Can get slower as you start dealing with huge files

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- In house version control

For Help

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- `#projects` on slack

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- Can you set up a git server?
- What goes on inside git? Read the original source for git 1.0

Grand Finale

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Thanks for coming :realheart: