

# INTRODUCTION TO VERSION CONTROL

University of Leicester

## RESOURCES AND SETUP

<https://uniofleicester.github.io/git-novice/>

Log in to the available Research Computing facility:

```
[ma1017@alice-login02 ~]$ cd ~  
[ma1017@alice-login02 ~]$ mkdir git-novice  
[ma1017@alice-login02 ~]$ cd git-novice  
[ma1017@alice-login02 git-novice]$ which git  
/usr/bin/git  
[ma1017@alice-login02 git-novice]$ git -v  
git version 2.39.3
```

# "FINAL".doc



FINAL.doc!



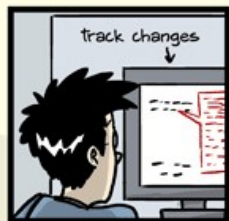
FINAL\_rev.2.doc



FINAL\_rev.6.COMMENTS.doc



FINAL\_rev.8.comments5.  
CORRECTIONS.doc



FINAL\_rev.18.comments7.  
corrections9.MORE.30.doc



FINAL\_rev.22.comments49.  
corrections.10.#@\$%WHYDID  
ICOMETOGRADSCHOOL????.doc

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WWW.PHDCOMICS.COM

"Piled Higher and Deeper" by Jorge Cham,  
<http://www.phdcomics.com>

## WHY VERSION CONTROL?

My script used to work; I changed it,  
and now it's broken.

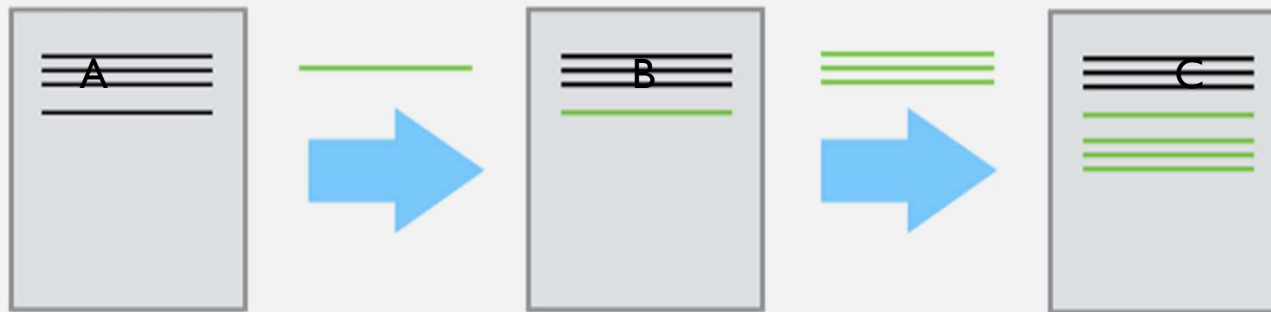
I wrote a good paragraph, decided to reword it,  
and now I want to go back.

I want to re-run an analysis from 6 months  
ago – which script version did I use?

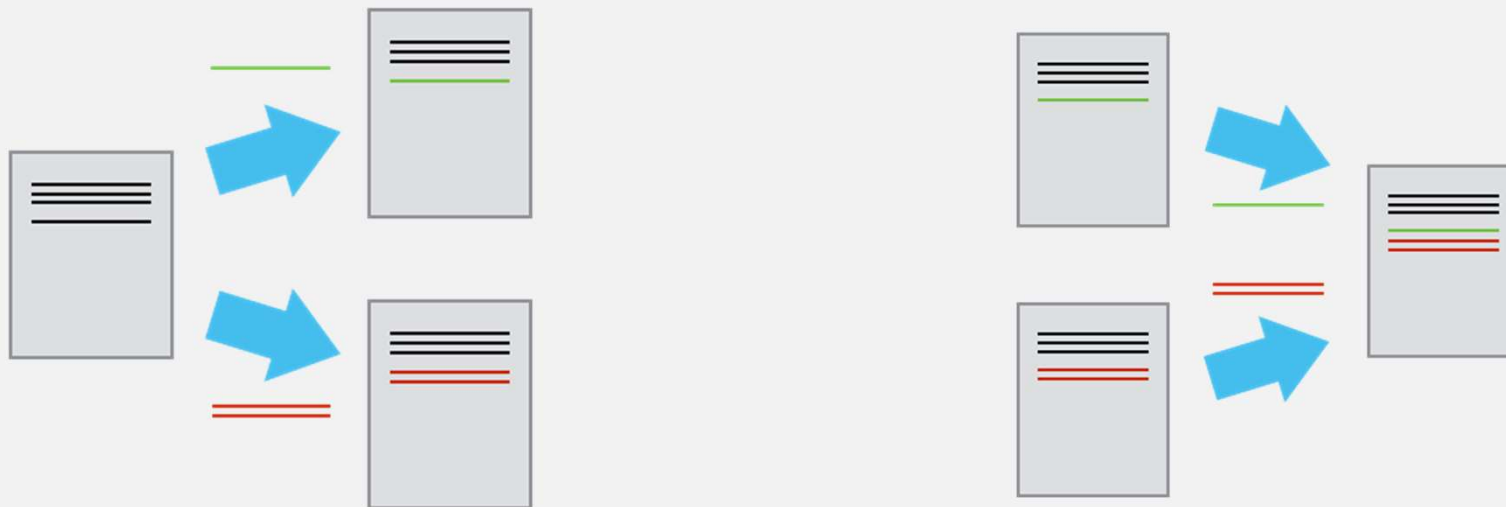
I want to share code with my colleagues.

I don't want to lose all my work if my  
laptop dies...

# HOW DOES IT WORK?



## MAKE DIFFERENT CHANGES



## WHY GIT?

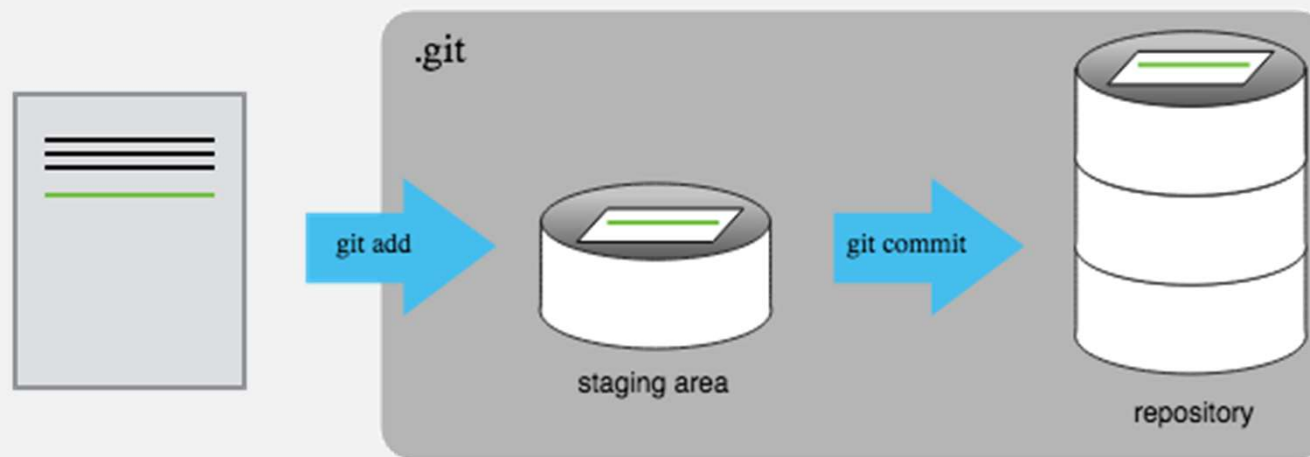
- There are many version control systems – Git, Mercurial, Subversion, etc.
  - Git is just the most popular.
- Almost everything we discuss today is relevant to all the other systems
  - It's just a different syntax.

## SETTING UP GIT

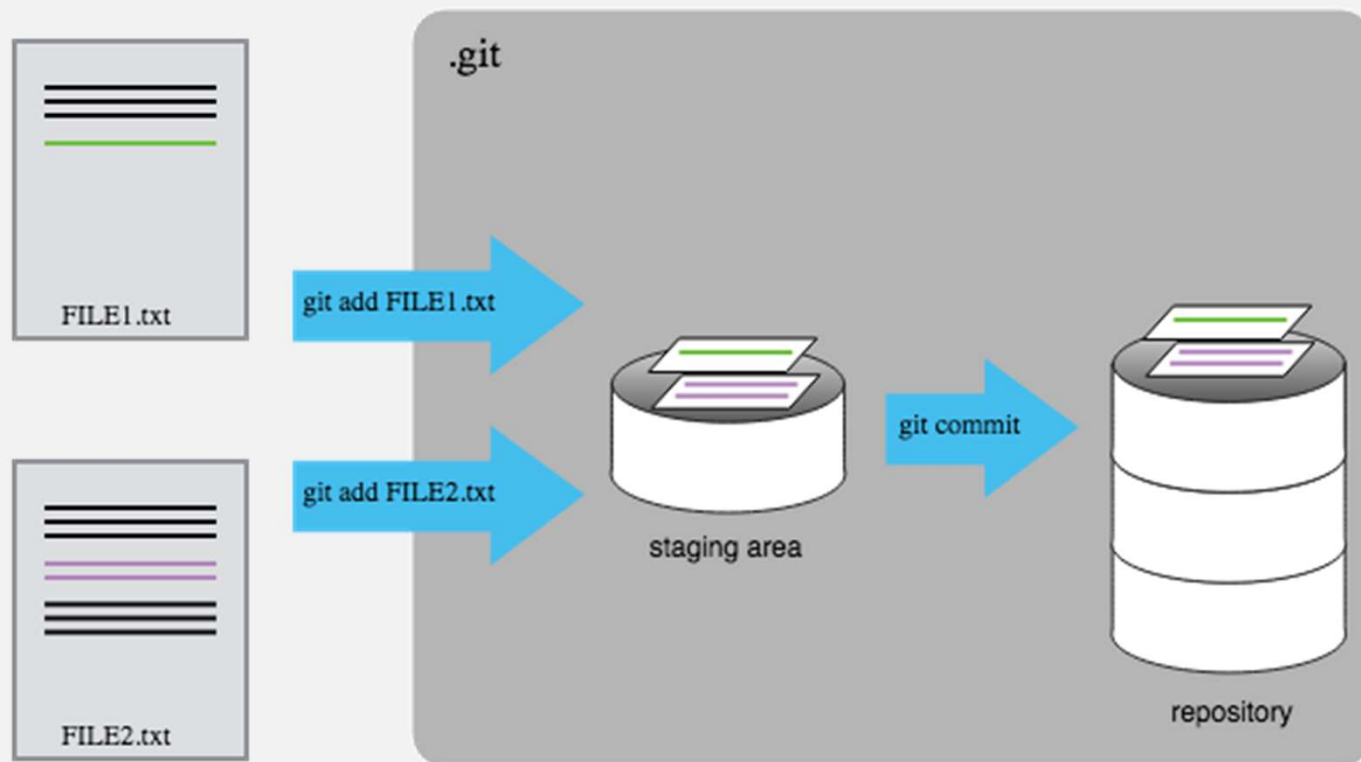
<https://uniofleicester.github.io/git-novice/>

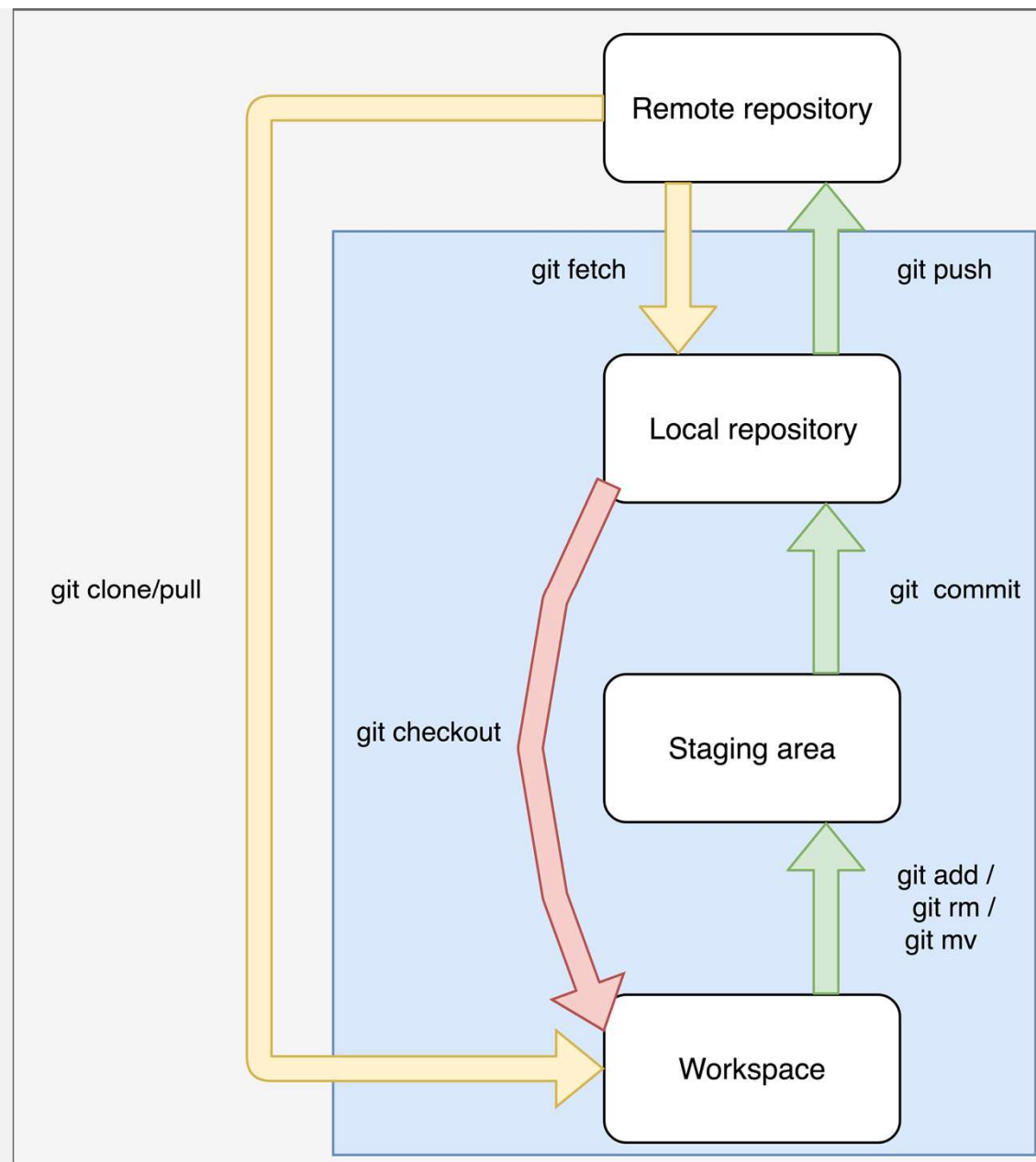


# TRACKING CHANGES



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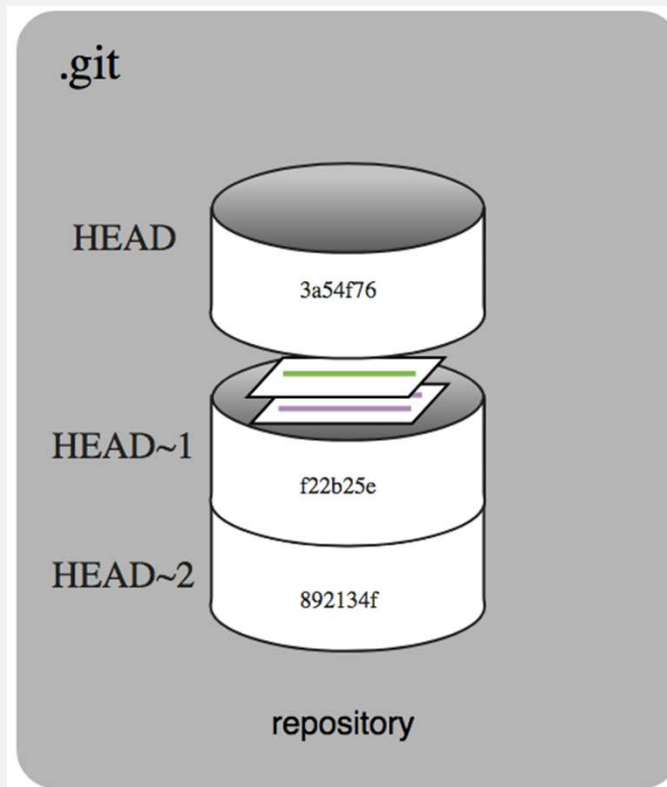




YOUR TURN!

<https://uniofleicester.github.io/git-novice/04-changes/>

# EXPLORING HISTORY



# COMPARING ACROSS HISTORY

```
subroutine temperature( temp, h2o, ttime )
  use types_mod
  implicit none
  real(kind=DP) :: temp, ttime, rh, h2o, sin, h2o_factor, exponent

  temp = 289.86_DP + 8.3_DP * sin( ( 7.2722d-5 * ttime ) - 1.9635_DP )
  temp = 298.00_DP
  rh = 23.0_DP * sin( ( 7.2722d-5 * ttime ) + 1.1781_DP ) + 66.5_DP
  h2o_factor = 10.0_DP / ( 1.38d-16 * temp ) * rh
  exponent = -1.0_DP * ( 597.3_DP - 0.57_DP * ( temp - 273.16_DP ) )
    * 18.0_DP / 1.986_DP * ( 1.0_DP / temp - 1.0_DP / 273.16_DP )
  h2o = 6.1078_DP * exp( exponent ) * h2o_factor

  return
end subroutine temperature
```

```
subroutine temperature( temp, h2o, ttime )
  use types_mod
  implicit none
  real(kind=DP) :: temp, ttime, rh, h2o, sin, h2o_factor, exponent

  temp = 289.86_DP + 8.3_DP * sin( ( 7.2722d-5 * ttime ) - 1.9635_DP )
  temp = 298.00_DP
  rh = 23.0_DP * sin( ( 7.2722d-5 * ttime ) + 1.1781_DP ) + 66.5_DP
  h2o_factor = 10.0_DP / ( 1.38d-16 * temp ) * rh
  exponent = -1.0_DP * ( 597.3_DP - 0.57_DP * ( temp - 273.16_DP ) )
    * 18.0_DP / 1.985_DP * ( 1.0_DP / temp - 1.0_DP / 273.16_DP )
  h2o = 6.1078_DP * exp( exponent ) * h2o_factor

  return
end subroutine temperature
```

git diff

```
exponent = -1.0_DP * ( 597.3_DP - 0.57_DP * ( temp - 273.16_DP ) )
    * 18.0_DP / 1.985_DP * ( 1.0_DP / temp - 1.0_DP / 273.16_DP )
```

# COMPARING ACROSS HISTORY

```
planets — -bash — 85x19
IT-4670:planets sc676$ git status
On branch master
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git checkout -- <file>..." to discard changes in working directory)

        modified:   mars.txt

no changes added to commit (use "git add" and/or "git commit -a")
IT-4670:planets sc676$ git diff mars.txt
diff --git a/mars.txt b/mars.txt
index fd46e6d..e8bc1a5 100644
--- a/mars.txt
+++ b/mars.txt
@@ -1,3 +1 @@
 Cold and dry, but everything is my favourite colour.
 -The two moons may be a problem for Wolfman.
 -But the Mummy will appreciate the lack of humidity.
IT-4670:planets sc676$
```

# COMPARING ACROSS HISTORY

```
IT-4670:planets sc676$ git status
On branch master
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
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        modified:   mars.txt

no changes added to commit (use "git add" and/or "git commit -a")
IT-4670:planets sc676$ git diff mars.txt
diff --git a/mars.txt b/mars.txt
index fd46e6d..b534541 100644
--- a/mars.txt
+++ b/mars.txt
@@ -1,3 +1,2 @@
 Cold and dry, but everything is my favourite colour.
-The two moons may be a problem for Wolfman.
-But the Mummy will appreciate the lack of humidity.
+The two moons might be a problem for Wolfman.
IT-4670:planets sc676$
```



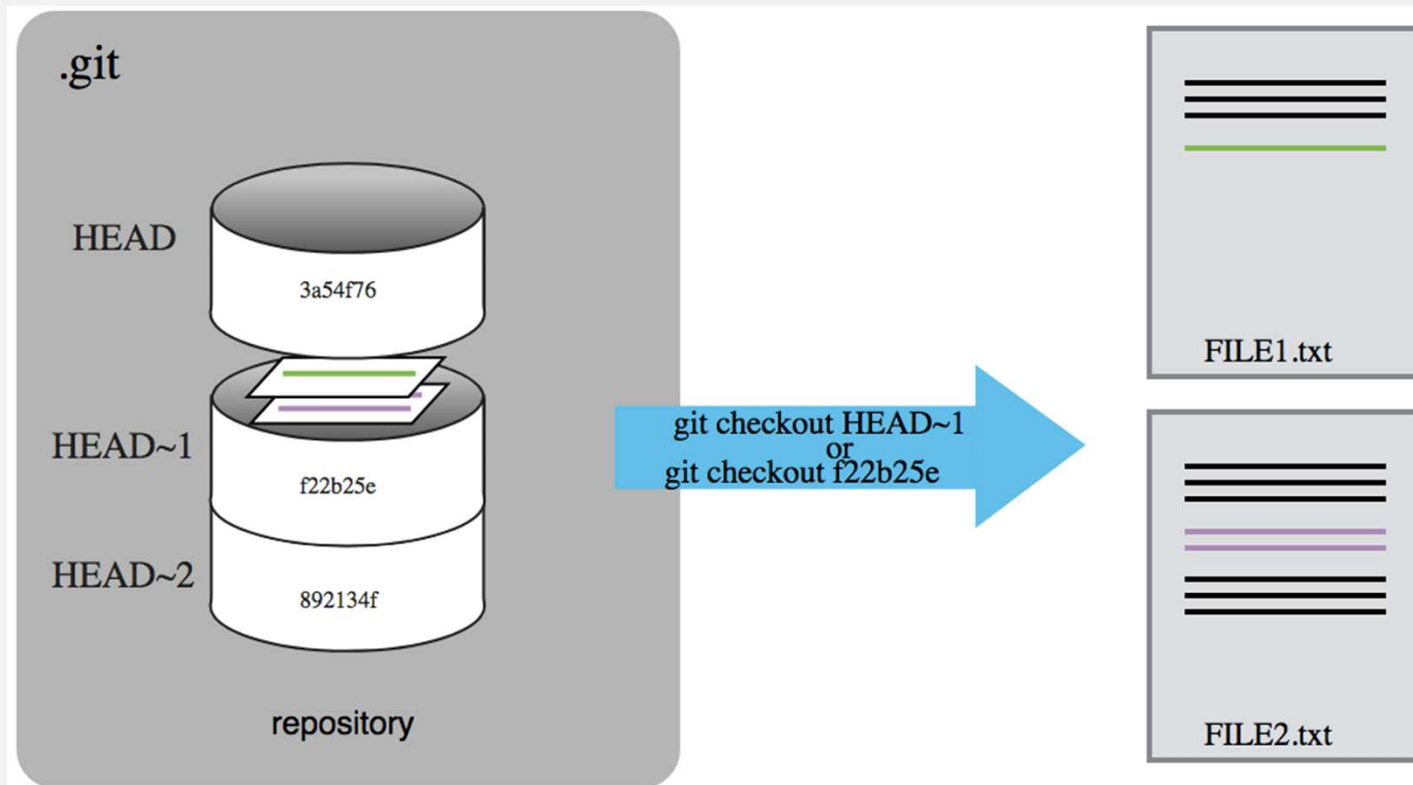
## COMPARING ACROSS HISTORY

```
planets — -bash — 83x9
[IT-4670:planets sc676$ git diff 0f787d0 2e764a3 mars.txt
diff --git a/mars.txt b/mars.txt
index e8bc1a5..e7555e7 100644
--- a/mars.txt
+++ b/mars.txt
@@ -1,2 @@
 Cold and dry, but everything is my favourite colour.
+The two moons may be a problem for Wolfman.
IT-4670:planets sc676$
```

YOUR TURN!

<https://uniofleicester.github.io/git-novice/05-history/>

# NAVIGATING THROUGH HISTORY

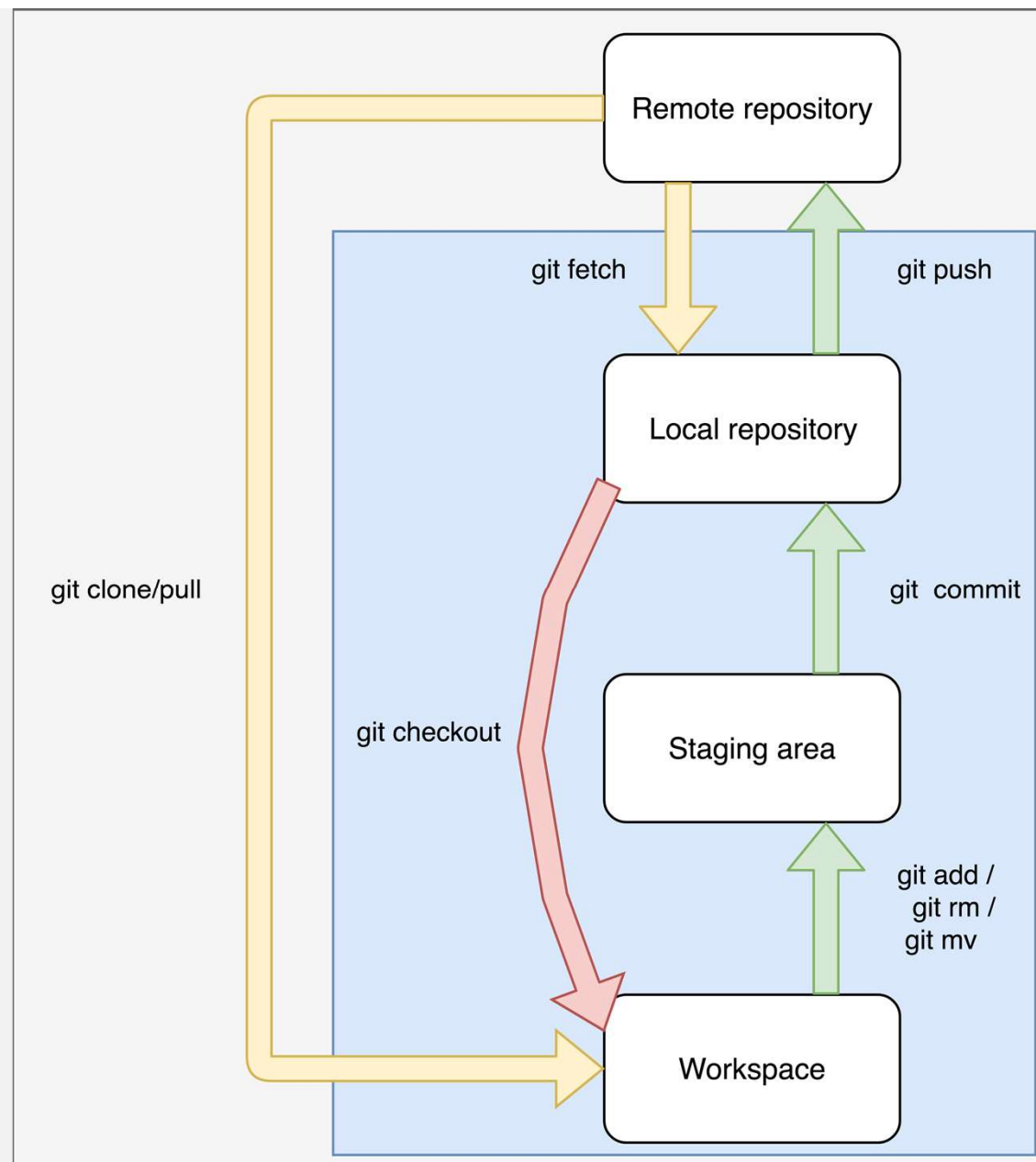


YOUR TURN!

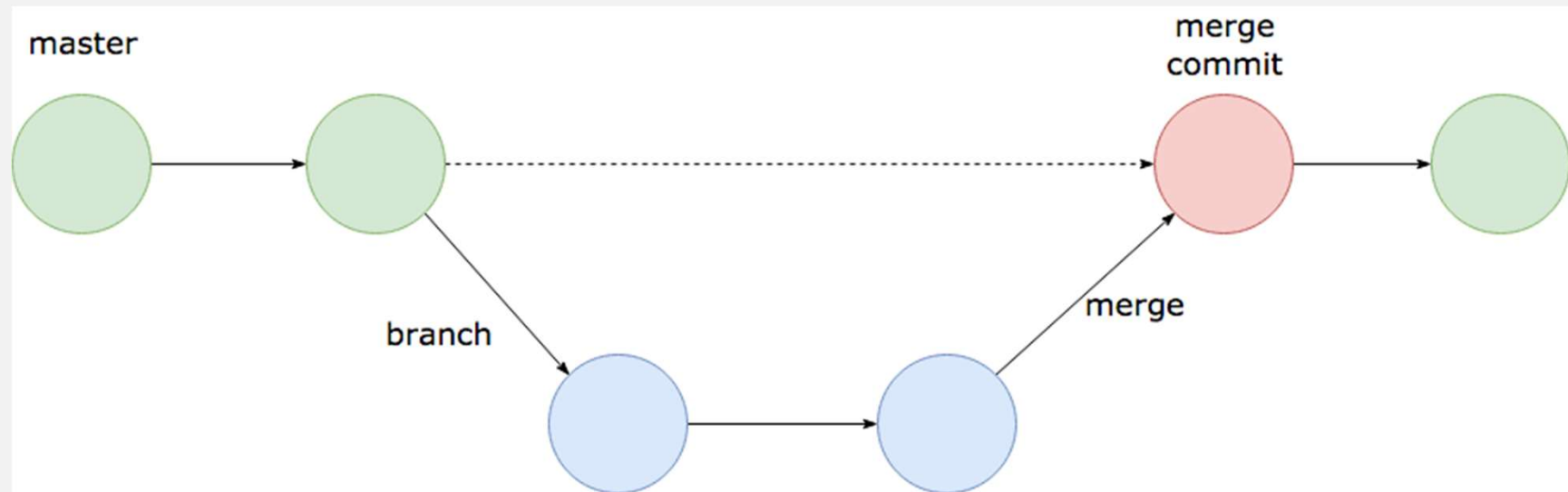
<https://uniofleicester.github.io/git-novice/06-ignore/>

## REGISTER FOR GITHUB

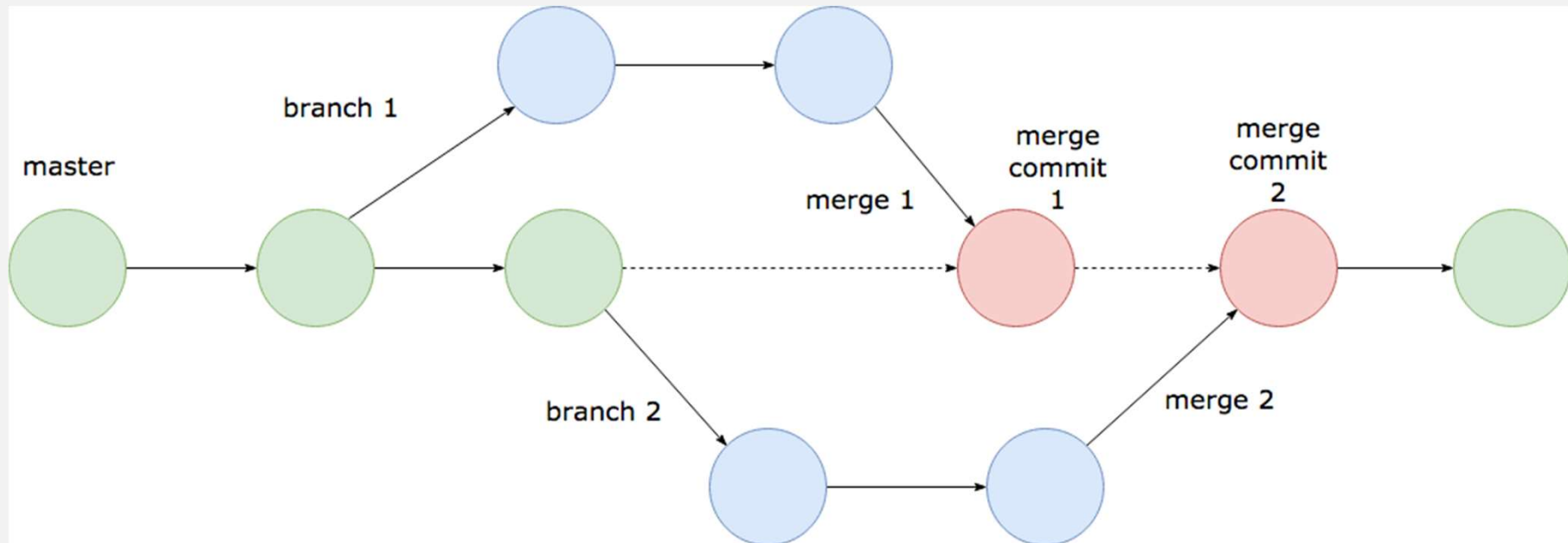
- <https://github.com/>
- Sign up for GitHub
- Verify account via email



# BRANCHING



# BRANCHING





## FEEDBACK

<https://app.onlinesurveys.jisc.ac.uk/s/leicester/introduction-to-version-control>

or

<https://bit.ly/uolrcsivc>