



Digital

Collaborating with Git

Team work makes the dream work

Presented by:
Joe Wilson and Helen Richardson



Objectives

- Why should you collaborate using Git
- Working with Branches
 - Branch Naming
 - Working with Branches
 - Creating a Branch
 - Changing Branches
 - Merging Branches
 - Updating
 - Pull Requests
 - Merge Conflicts
 - General Guidelines
- Exploring GitHub and the Open Source Community

	COMMENT	DATE
○	CREATED MAIN LOOP & TIMING CONTROL	14 HOURS AGO
○	ENABLED CONFIG FILE PARSING	9 HOURS AGO
○	MISC BUGFIXES	5 HOURS AGO
○	CODE ADDITIONS/EDITS	4 HOURS AGO
○	MORE CODE	4 HOURS AGO
○	HERE HAVE CODE	4 HOURS AGO
○	AAAAAAA	3 HOURS AGO
○	ADKFJSLKDFJSDKLFJ	3 HOURS AGO
○	MY HANDS ARE TYPING WORDS	2 HOURS AGO
○	HAAAAAAAAAANDS	2 HOURS AGO

AS A PROJECT DRAGS ON, MY GIT COMMIT MESSAGES GET LESS AND LESS INFORMATIVE.

"Merge branch 'asdfasjkfdlas/alkdjf' into sdkjfls-final"

Why should you collaborate using Git?

Collaborating with others on a project can sometimes get messy.

Changes can be tangled together and hard work might be overwritten accidentally and lost.

Git allows you to create branches and separate out those changes.

Any new changes are first made to the branches, keeping the main branch clean and stable.

Once the changes have been made, reviewed and approved, they can be merged safely into the main branch.

This model of using branches with a shared repository is called the **Shared Repository Model**.

Different ways to collaborate and write code

Remote Repository Hosting Platforms

- **GitHub**
- GitLab
- Bitbucket



Integrated Development Environments

- **Posit Cloud (formally RStudio Cloud)**
- RStudio Desktop
- VS Code
- PyCharm



Naming your branch

It is good to have an agreed scheme in your team and your repositories.
We typically advise:

**<branch type>/<project id>-<initials>-<ticket number>-<brief
description>**

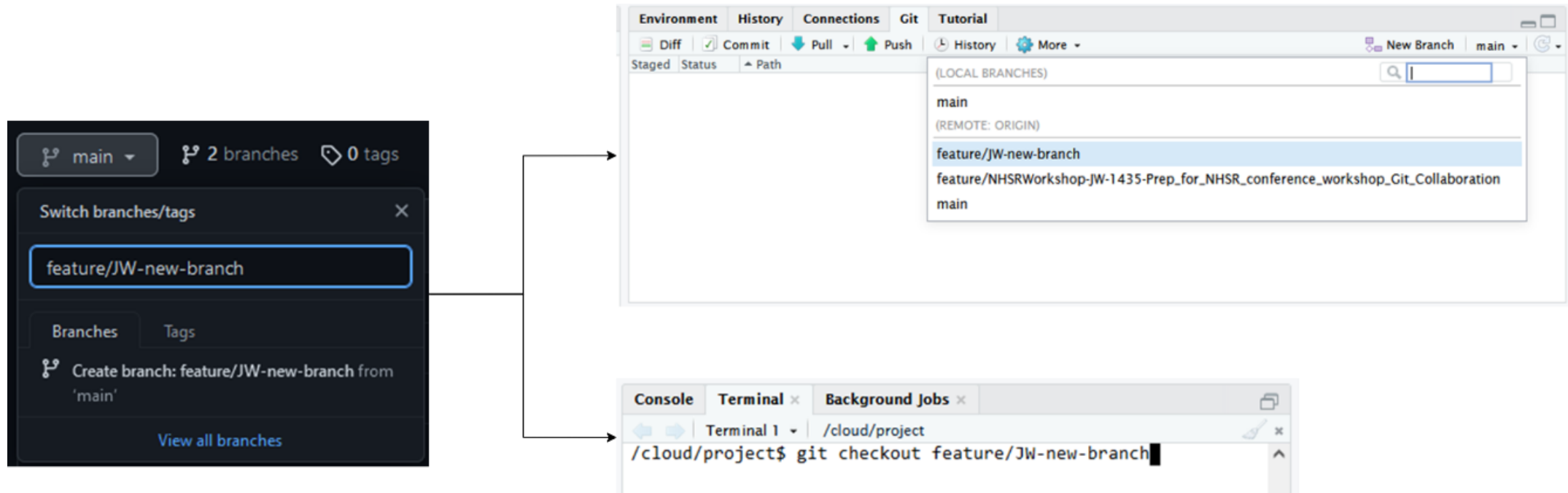
`feature/JW-123-example_feature`

Preface your branch names with the type of branch it is going to be.
Typically the types you will have are:

- **feature/ - for adding new features**
- **release/ - for preparing or preserving a batch of changes for delivery**
- **hotfix/ - for emergency fixes to your main branch (if it is protected)**

Creating a branch

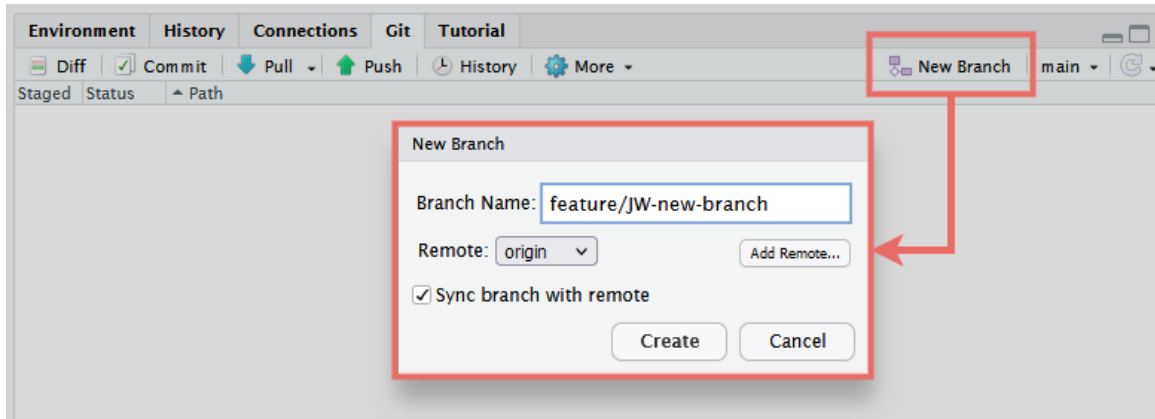
We can do this remotely via GitHub and pull it in to our local repository.



Creating a branch

We can also create the branch locally and then push it up to GitHub from R-Studio. We can do this using the UI or the Terminal/Shell.

Using the UI



Using the Terminal

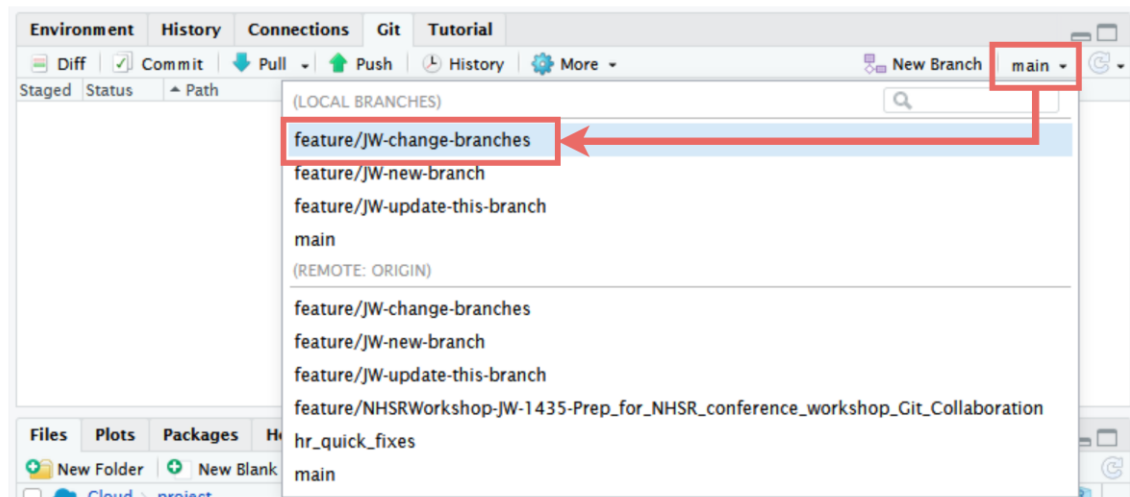
```
git checkout --branch feature/JW-  
new-branch
```

```
git push --set-upstream origin  
feature/JW-new-branch
```

Changing branch

It is useful to know how to change between branches. Again this can be done via the UI or the Terminal.

Using the UI

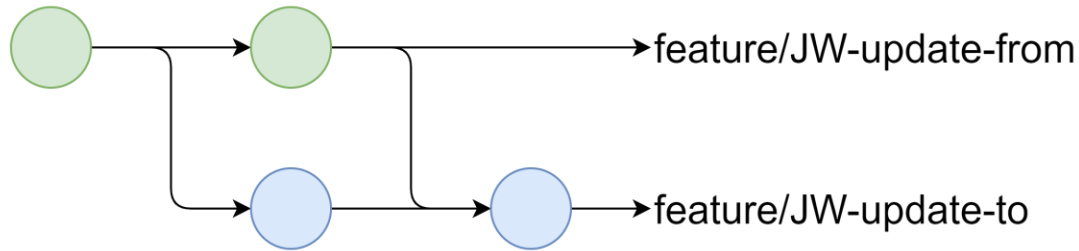


Using the Terminal

```
git checkout feature/JW-change-branches
```


Updating your branch (Merging)

As you collaborate and work on multiple branches in your project's repository, you might want to ensure that your branch is updated with changes from other branches. This allow us to prevent future conflicts or resolve current conflicts.



We can merge branches together in the terminal:

```
git checkout feature/JW-update-from  
git pull  
git checkout feature/JW-update-to  
git merge feature/JW-update-from
```

Commands to run before
merging to ensure that you
are working with the latest
version

Pull Requests (Merging)

Pull Requests can also be called Merge Requests and can be an important part of the collaborative process.

Pull Requests are normally used when you want to merge your changes into the main branch.

Pull Requests allow you to assign a reviewer, allowing someone to peer review your code. Make sure to update your branch before you make your Pull Request.

GitHub will show a warning if there is a conflict occurring and a merge cannot take place safely.

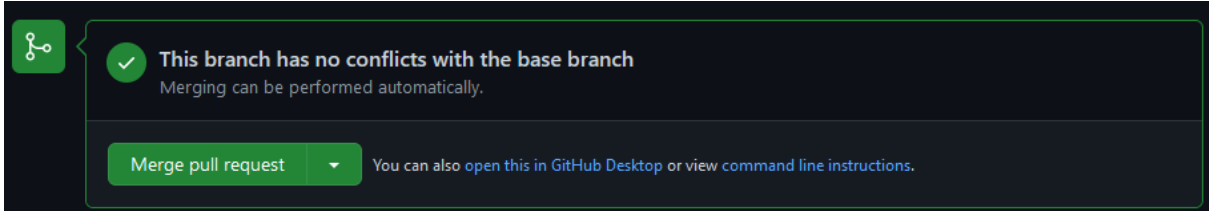


Reviewers

Request up to 15 reviewers

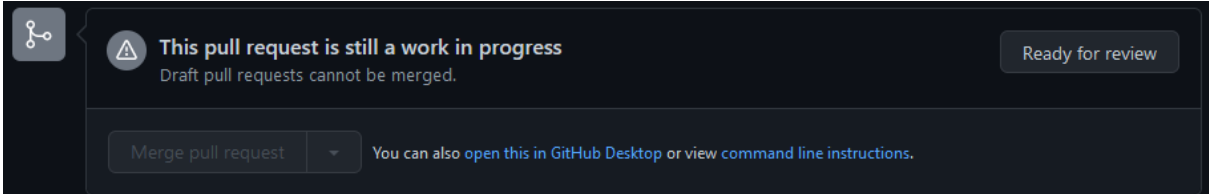
helen

✓  helrich Helen Richardson



✓ This branch has no conflicts with the base branch
Merging can be performed automatically.

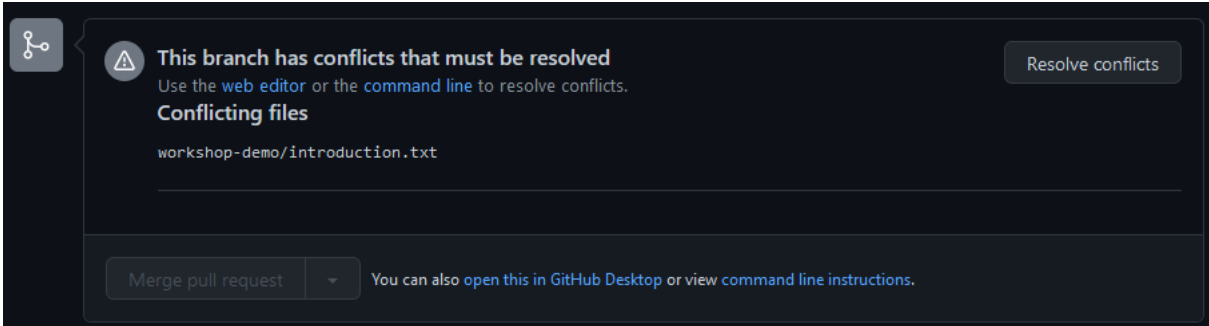
Merge pull request You can also [open this in GitHub Desktop](#) or view [command line instructions](#).



⚠ This pull request is still a work in progress
Draft pull requests cannot be merged.

Merge pull request You can also [open this in GitHub Desktop](#) or view [command line instructions](#).

Ready for review



⚠ This branch has conflicts that must be resolved
Use the [web editor](#) or the [command line](#) to resolve conflicts.

Conflicting files

workshop-demo/introduction.txt

Merge pull request You can also [open this in GitHub Desktop](#) or view [command line instructions](#).

Resolve conflicts

Questions

And then 5-10 min
break

Merge Conflicts

While Git is an extremely powerful tool, it needs human intervention to resolve situations where there are conflicting changes.

Conflicts are usually caused by the same lines being changed on both branches.

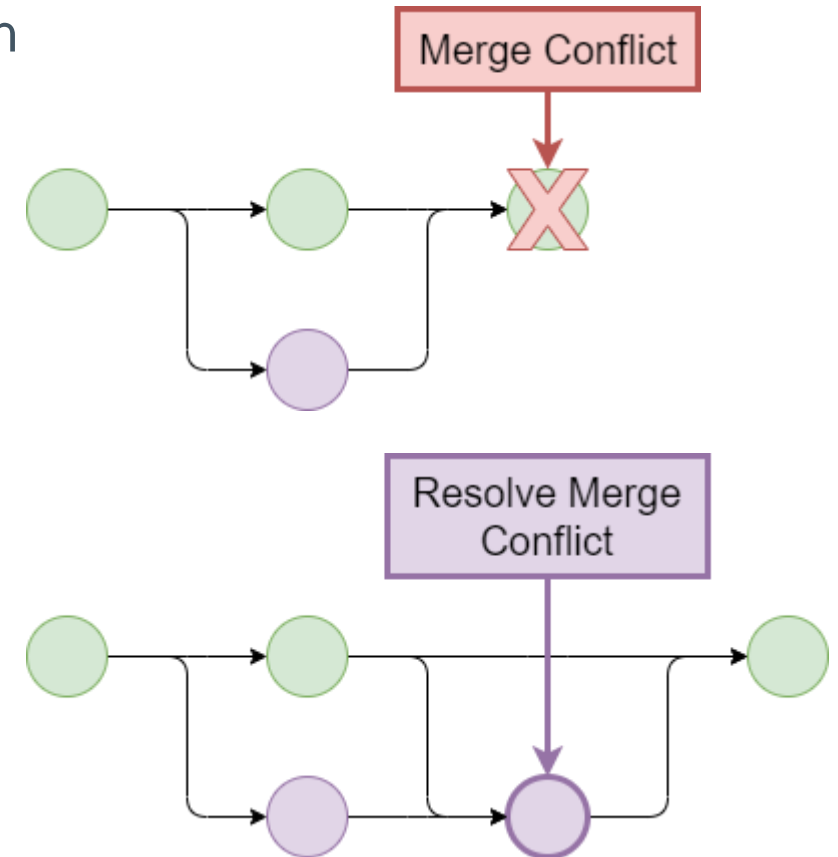
It will attempt to automatically merge the branches, like it did when we updated our branches, but when it encounters a conflict it will stop auto-merging and show a CONFLICT error, highlighting the files where conflicts are occurring.

```
Auto-merging practice/temperatures_function.py
```

```
CONFLICT (content): Merge Conflict in  
practice/temperatures_function.py
```

```
Automatic merge failed; fix conflicts and then  
commit the result.
```

Git will clearly mark the conflicting changes in the files and still automatically merge non-conflicting changes.



Viewing the Merge Conflicts

Different editors give us different tools for handling these merge conflicts, though the principles remain the same.

Open the file(s) listed in the CONFLICT error and scroll to find the conflict. The conflict will be marked by these strange lines:

```
<<<<<<< HEAD
My name is Joe and I work for NHS Digital.
=====
I am a imposter and I work at Imposter Inc
>>>>>>> feature/JW-conflicting-branch
```

The top bit above the double line is what we have in our branch, represented by the `<<<<<<< HEAD` statement.

The bottom bit is the same line but saved in the branch we are merging from, represented by the `>>>>>>> feature/JW-conflicting-branch` statement.

Resolving Merge Conflicts

To resolve the merge conflict, delete the line which you do not wish to keep, as well as anything to do with marking the conflict. So if we wanted to keep only what we had on the source branch, we would delete as so:

```
<<<<<<< HEAD
```

```
My name is Joe and I work for NHS Digital.
```

```
=====
```

```
I am a imposter and I work at Imposter Inc
```

```
>>>>>>> feature/JW-conflicting-branch
```

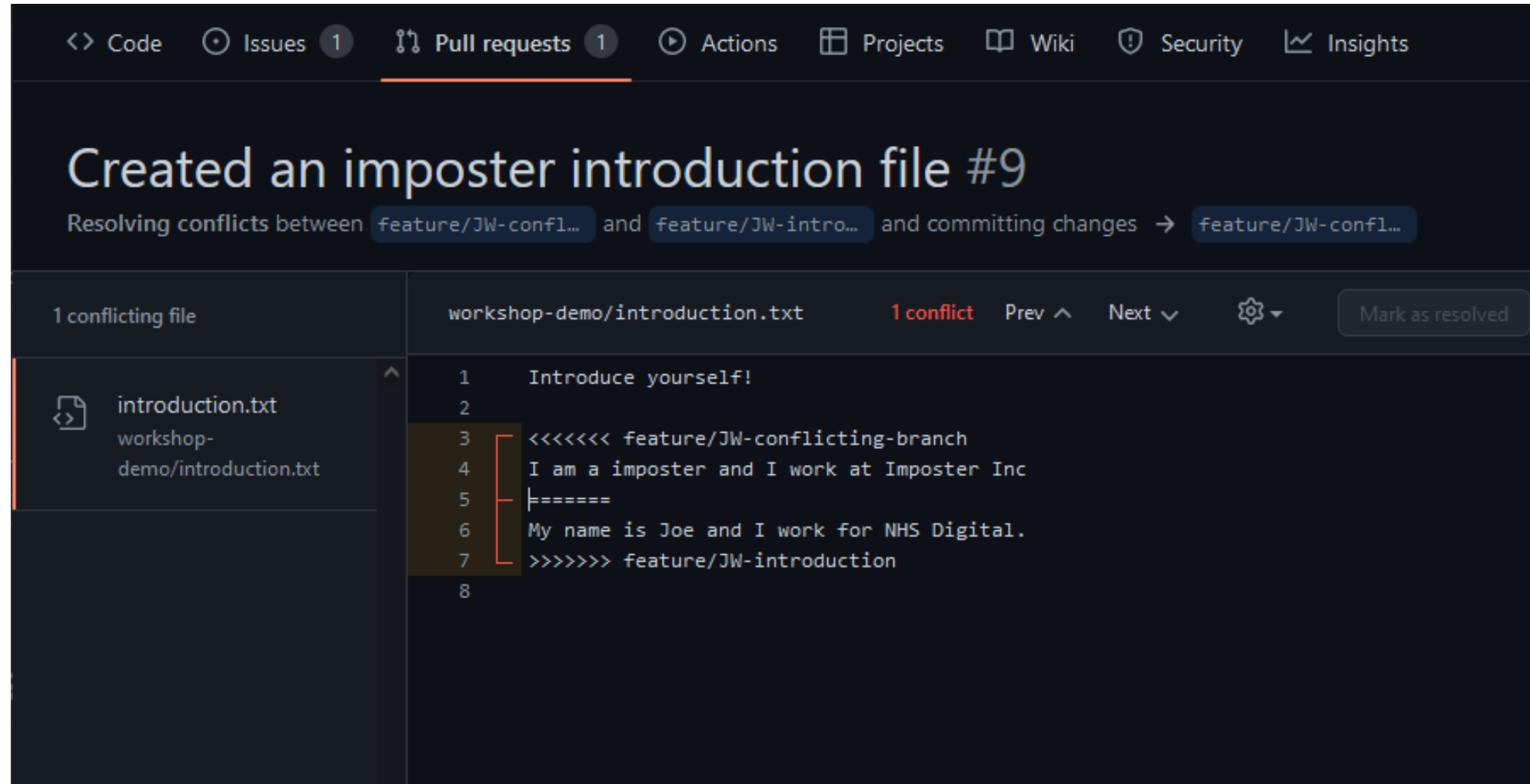
Then once all conflicts are resolved we can stage and commit our merge.

If we wanted to cancel the merge, we can do so simply with the following command:

```
git merge --abort
```



Resolving Merge Conflicts - GitHub



The screenshot shows the GitHub web interface for resolving a merge conflict. The top navigation bar includes links for Code, Issues (1), Pull requests (1), Actions, Projects, Wiki, Security, and Insights. The main heading is "Created an imposter introduction file #9". Below this, it states "Resolving conflicts between feature/JW-conf1... and feature/JW-intro... and committing changes → feature/JW-conf1...".

The conflict resolution interface shows "1 conflicting file". On the left, a file tree lists "introduction.txt" under "workshop-demo/". The main area displays the file content with line numbers 1 through 8. Lines 3 through 7 are highlighted in a dark blue background, indicating the conflicting section. The content of these lines is:

```
1   Introduce yourself!
2
3   <<<<<< feature/JW-conflicting-branch
4   I am a imposter and I work at Imposter Inc
5   |======
6   My name is Joe and I work for NHS Digital.
7   >>>>>> feature/JW-introduction
8
```

At the top right of the conflict resolution area, there is a "Mark as resolved" button. Navigation controls "Prev ^" and "Next v" are also visible.

Questions

And then 5-10 min
break

General Guidelines

The main branch of your repository should be kept in a good stable state.

Developers should create feature branches from the main branch and work on them.

Feature branches should be short lived. This prevents challenges when merging later.

Pull requests should be used and reviews completed by your collaborators when merging back into the main branch.

Once a Pull Request is approved and the feature branch merged into the main branch, the feature branch should be trimmed and deleted.

Exploring GitHub and the Open Source Community

Hopefully, you now have some knowledge and curiosity to start your own Git Collaboration journey.

As well as creating your own repositories, you can also explore other repositories published publicly:

- You can explore the code bases, cloning the repository to your local system (although you probably won't have permissions to contribute)
- Raise issue if you spot any problems
- Fork the repository so you have your own copy to alter and use.
- Use the code as a package in another project.

Check out these interesting repositories:

[nhs-r-community](#) / [git training](#)

[NHSDigital](#) / [rap-community-of-practice](#)

[nhs-r-community](#) / [NHSRdatasets](#)

[NHSDigital](#) / [Smoking-Drinking-and-Drug-Use-Report-Code](#)

[NHSDigital](#) / [nhsuk-react-components](#)



If that doesn't fix it, git.txt contains the phone number of a friend of mine who understands git. Just wait through a few minutes of 'It's really pretty simple, just think of branches as...' and eventually you'll learn the commands that will fix everything.

Useful Resources

- [NHS Digital RAP CoP](#)
- [GitHub Cheat Sheet](#)
- [Git Docs](#)
- [VS Code Source Control Documentation](#)
- [How to use Git with R and RStudio](#)
- [Atlassian Git Tutorials – Bitbucket orientated](#)

Disclaimer: NHS Digital is not affiliated or responsible for any external websites or companies

Get in contact with us

NHS Digital RAP Squad



datascience@nhs.net



[NHS-R Slack Channel](#)



[Gov Data Science
Slack Channel](#)

Helen Richardson

github.com/helrich



Joe Wilson

github.com/josephwilson8-nhs



Thank You



@nhsdigital



company/nhs-digital



digital.nhs.uk