# Class 1: Introduction to the environment & version control

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**2: Get you familiar with wonderful Julia package environment!**

# The very basics of Git & GitHub

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This scheme will now depict the state of our directory:

| **Project directory: Class_1** |
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| |

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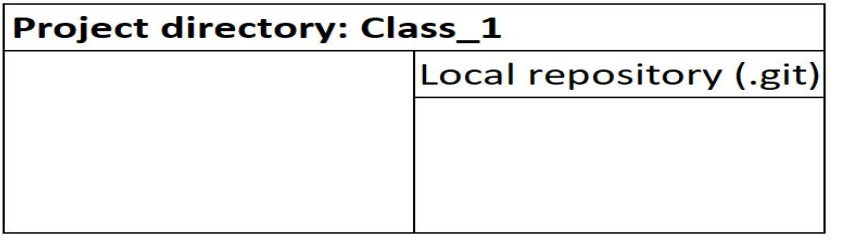

# The key concepts of Git

There are four important areas to be aware of when you are working with Git:

- Local repository <- this one you already know
- Working directory
- Staging area
- Commit history

# But before we begin...

Go to `https://github.com/` and create an account.

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- It is where you add, edit, and delete files and directories.

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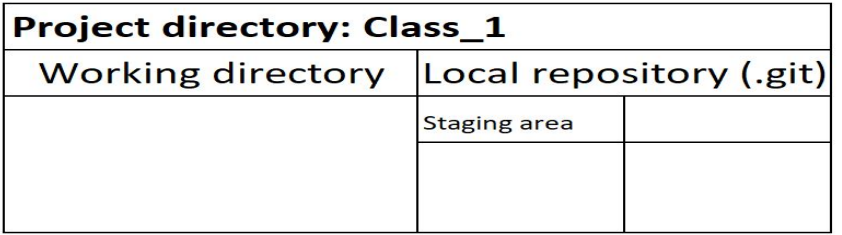

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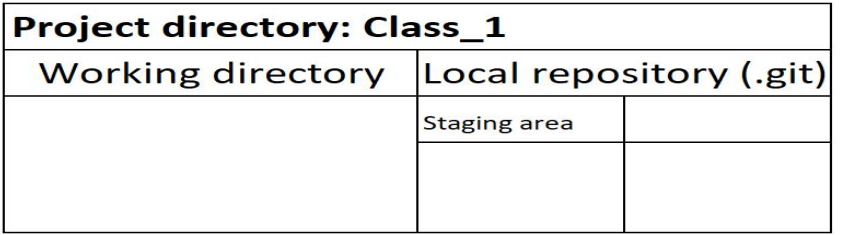

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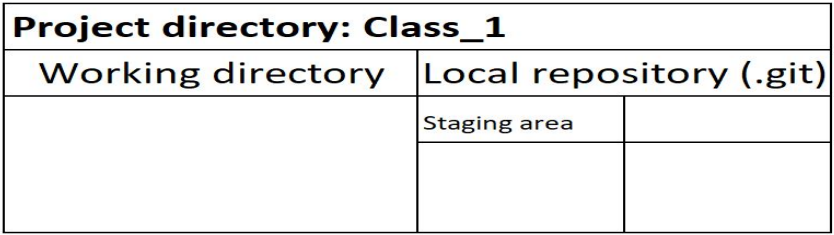

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- Untracked file is not version controlled by Git
- Once added to the staging area and committed it becomes a tracked file

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- The first_file.jl is now both in working directory & in the staging area!
- Adding files to the staging are does not move them, it *copies* them.

# Making a commit 2

To make a commit means to save a version of a project!

It is good practice to add short message to your commit

| Project directory: Class_1 | | |
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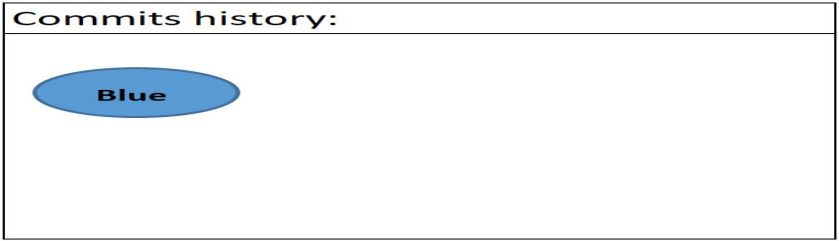
In git Branches "are movable pointers to commits". What does it mean!?

# Branches

Let us understand branches through commits history



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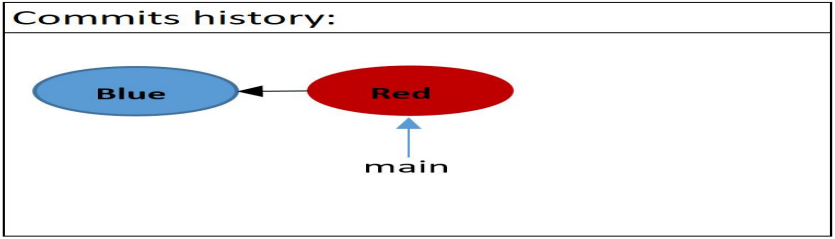

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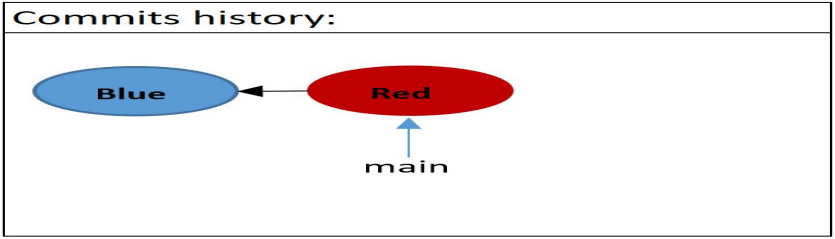


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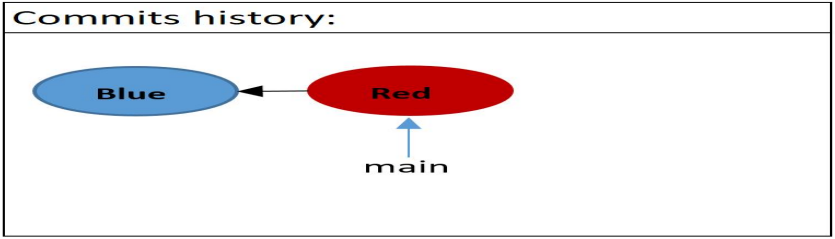


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- The main branch points to the red commit (*it is a pointer*).

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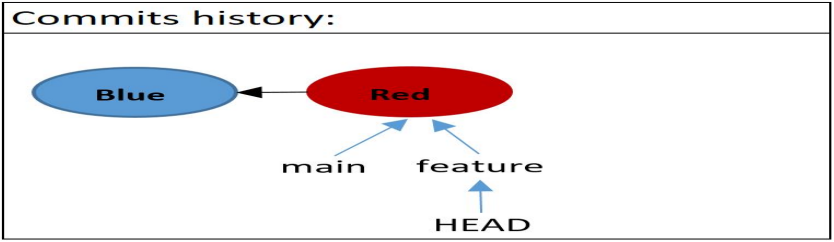


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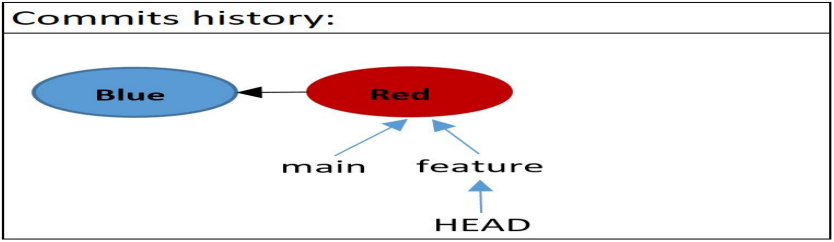


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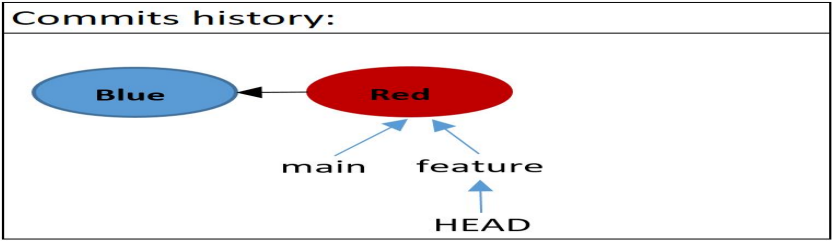


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- One can see it inspecting the HEAD file in .git folder!

# Branches - "a versions of a project"

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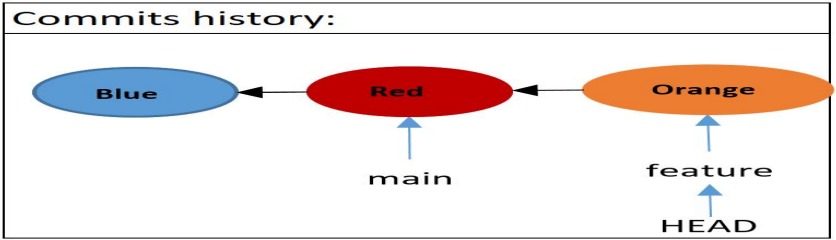

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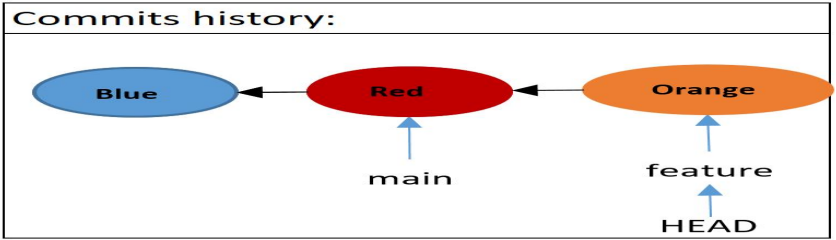


- The "feature" branch is now one commit ahead of main.
- We can switch between the branches!
- It changes the HEAD pointer to point to the branch you are switching onto.
- It populates the staging area with all the files that are part of the relevant commit.

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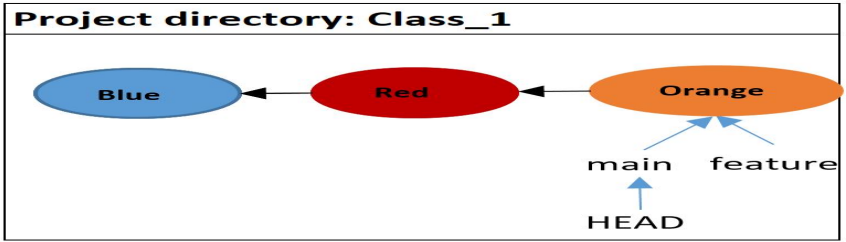
An example of a fast-forward merge:



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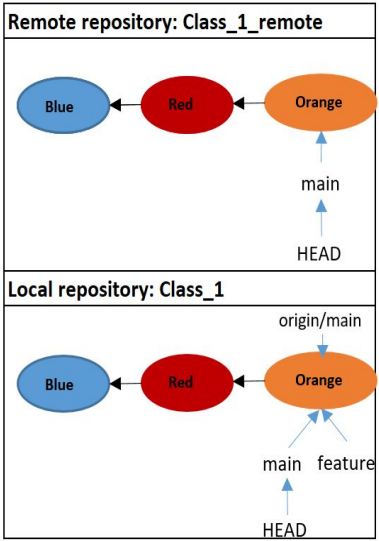

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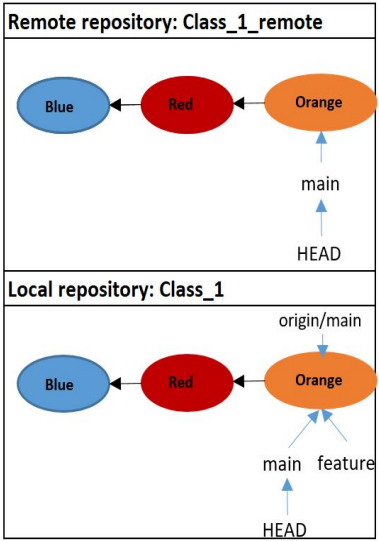

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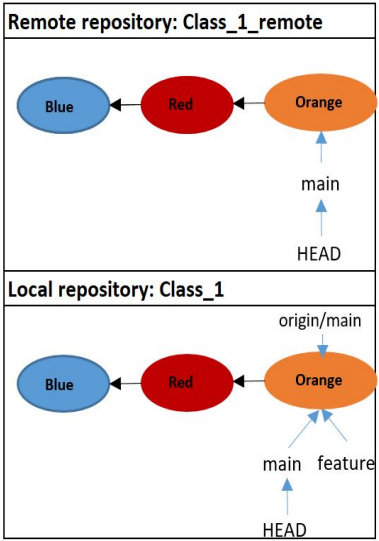

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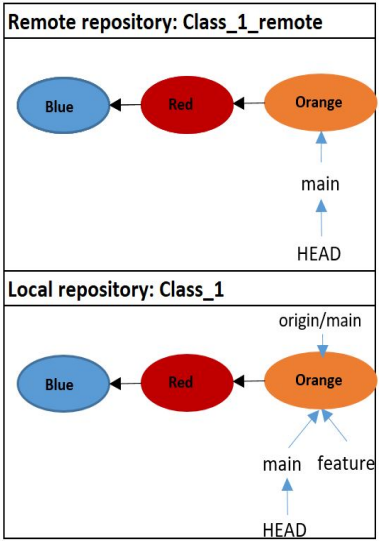

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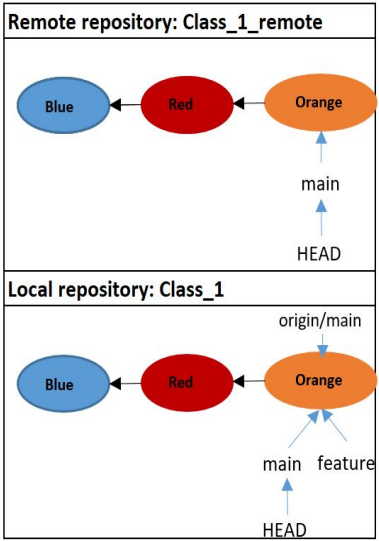
- Now let's edit our first_file.jl in the remote repository and pull the changes!



# Concept check!

**In-class excercise:**

1. Create a new file second_file.jl in our Class_1 folder, write a line of code.
2. Add the file to the staging area
3. Commit it with a proper message
4. Push those changes to the remote repository
5. Edit the second_file.jl in the remote repository
6. Pull changes from the remote repository

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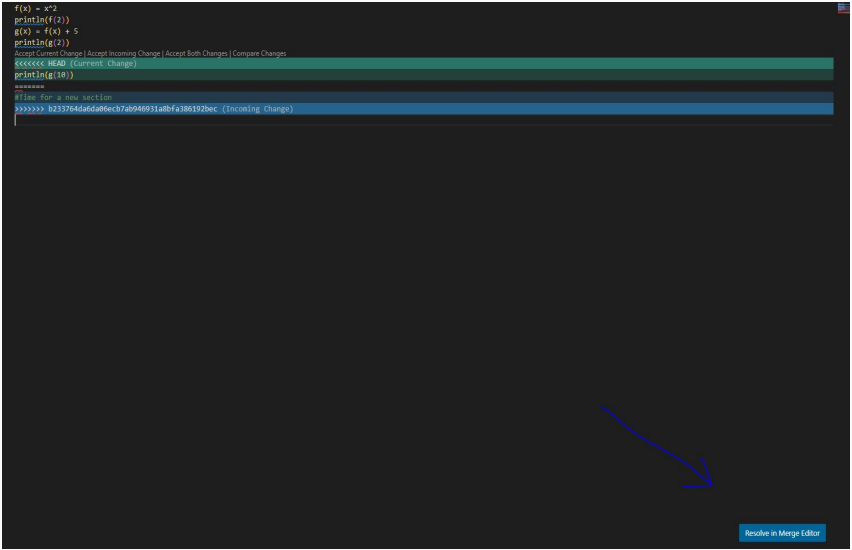
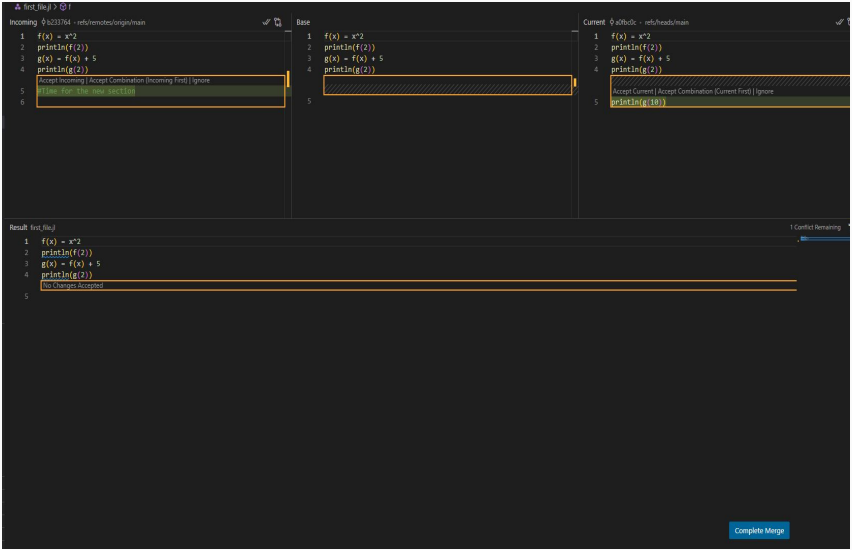
Simply click on the "Resolve in Merge Editor" button.
Then:

1. Track the number of remaining conflicts
2. Accept either current, incoming or keep the way code was written in base!

# Go into Merge Editor



# Conflict resolution view



# Concept check!

**Learn how to deal with the merge conflicts!**

1. Edit second_file.jl in the remote repository.
2. Edit the second_file.jl (in the same place) locally, commit, push.
3. Integrate the changes in the local branch of the local repository (merge).
4. Push the commit with resolved conflicts to the remote repository.

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Here we want you to clone repository with the class materials.

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It will create conflict as we update the materials (it will not be an issue for us, it will be an issue for you)

**Possible workflow:**

1. Clone official "Class materials" repository.

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**Possible workflow:**

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**Concept check:** implement those steps right now!

# Homework rules

**You have to subimt it via Github!**

1. Team-up in groups of 4/5 students
2. Create a repository for your group
3. Share the link with us via email!
4. Submit the homework in the repository

# Additional resoruces:

1. There are a ton of online tutorials: e.g. `https://swcarpentry.github.io/git-novice/`
2. This class very closely follows the "Learning Git" book by Anna Skoulikari
3. For the resources in VS code specifically, see those short clips:
   - `https://www.youtube.com/watch?v=i_23KUAEtUM`
   - `https://www.youtube.com/watch?v=HosPml1qkrg`
4. And the entire playlist!

# Setting up work environment: packages in Julia

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  - you can also just paste the whole path

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To manage the latter we will use Julia fantastic Package manager.

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The relevant information about libraries and its dependencies is stored in the:

- Project.toml
- Manifest.toml

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- If you want to add new package write "add XYZ" (e.g. Plots)
- If you cloned the repo and want to download all the required packages use the "instantiate" command.

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Let's test "instantiate" command with the "Example" package.
`https://github.com/JuliaLang/Example.jl/blob/master/src/Example.jl`

## Some other useful commands:

- status
  - Displays where the file managing the dependencies in this environment is located (Project.toml).
  - Displays which packages are installed in this environment.
- remove XYZ removes XYZ package from the environment.
- help in package manager mode gives you all the commands with short description
- "Backspace" KEY will return you from package manager to Julia REPL.

Let us now experiment with package manager in Julia!