

An Introduction to Git and GitHub

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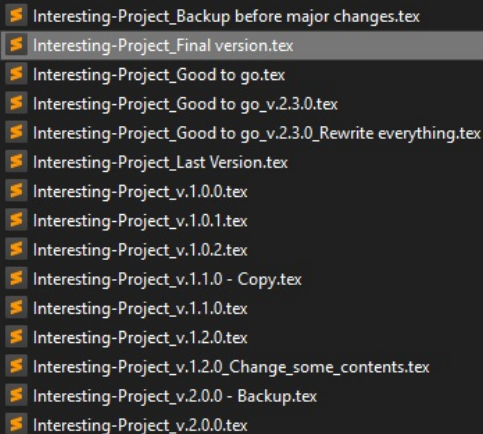
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Version Control



- Interesting-Project_Backup before major changes.tex
- Interesting-Project_Final version.tex
- Interesting-Project_Good to go.tex
- Interesting-Project_Good to go_v.2.3.0.tex
- Interesting-Project_Good to go_v.2.3.0_Rewrite everything.tex
- Interesting-Project_Last Version.tex
- Interesting-Project_v.1.0.0.tex
- Interesting-Project_v.1.0.1.tex
- Interesting-Project_v.1.0.2.tex
- Interesting-Project_v.1.1.0 - Copy.tex
- Interesting-Project_v.1.1.0.tex
- Interesting-Project_v.1.2.0.tex
- Interesting-Project_v.1.2.0_Change_some_contents.tex
- Interesting-Project_v.2.0.0 - Backup.tex
- Interesting-Project_v.2.0.0.tex

Version Control

The disadvantage of control version in this way

- Too messy, hard to find the latest (time stamps sometimes can't help)
- Cannot compare the difference between each version
-

Solution: Git

Installation

- Windows: <https://git-scm.com/downloads>
- Linux: `sudo apt-get install git`
- Mac OS:
 - ① Install Xcode from AppStore
 - ② Run Xcode
 - ③ In Xcode -> Preferences find Downloads
 - ④ Choose Command Line Tools, install it

Installation

After installation, open the terminal and input `git` to see if it is successfully installed. There should be something like this:

```
C:\Users\isaac>git
usage: git [--version] [--help] [-C <path>] [-c <name>=<value>]
       [---exec-path<path>] [--html-path] [--man-path] [--info-path]
       [-p | --paginate | -P | --no-pager] [--no-replace-objects] [--bare]
       [--git-dir<path>] [--work-tree<path>] [--namespace=<name>]
       <command> [<args>]

These are common Git commands used in various situations:

start a working area (see also: git help tutorial)
  clone      Clone a repository into a new directory
  init       Create an empty Git repository or reinitialize an existing one

work on the current change (see also: git help everyday)
  add        Add file contents to the index
  mv         Move or rename a file, a directory, or a symlink
  restore    Restore working tree files
  rm         Remove files from the working tree and from the index
  sparse-checkout  Initialize and modify the sparse-checkout

examine the history and state (see also: git help revisions)
  bisect     Use binary search to find the commit that introduced a bug
  diff       Show changes between commits, commit and working tree, etc
  grep       Print lines matching a pattern
  log        Show commit logs
  show       Show various types of objects
  status     Show the working tree status

grow, mark and tweak your common history
  branch     List, create, or delete branches
  commit     Record changes to the repository
  merge      Join two or more development histories together
  rebase     Reapply commits on top of another base tip
  reset      Reset current HEAD to the specified state
  switch     Switch branches
  tag        Create, list, delete or verify a tag object signed with GPG

collaborate (see also: git help workflows)
  fetch      Download objects and refs from another repository
  pull       Fetch from and integrate with another repository or a local branch
  push       Update remote refs along with associated objects

'git help -a' and 'git help -g' list available subcommands and some
concept guides. See 'git help <command>' or 'git help <concept>'
to read about a specific subcommand or concept.
See 'git help git' for an overview of the system.
```

GitHub

- A/the global company that provides hosting for software development version control using Git
- A website Microsoft just bought for \$7.5 billion dollar
- A website that you can goof around when you are bored at coding and don't need to worry about getting caught by your manager (she/he might be doing the same thing)

Initialize/Clone

- `git init`

Create a `.git` folder in current path, making current path a git repository

- `git clone`

From a remote repository clone to current path

Branch

Commit

Merge

Tip

- Design by module
- Sync with master branch more often
- Commit with small changes (it depends)