

GITHUB ESSENTIALS FOR CODING AND VERSION CONTROL

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Welcome

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- Data Services Workshops

Resources

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Why Use GitHub

- Track Changes
- Collaborate
- Backup and remote access
- Branching and Test Environments
- Open-Sources
- Integration and Testing

Agenda

- Version Control
- Overview of Git, GitHub, and GitHub Desktop.
- Setting up GitHub Desktop
- Creating and Cloning a Repository
- Adding files to a Repository
- Branching and Merging
- Collaboration and Project Management

Version Control

- Records changes to a file or set of files over time
- Tracks and manages changes in code or documents
- Allows collaboration without overwriting previous work
- Easy recovery if something goes wrong
- View the entire lifecycle of a project

What is GIT

Git is a distributed version control system that tracks changes in files, allowing multiple people to collaborate on a project while maintaining a complete history of revisions.



git

<https://git-scm.com/>

What is GITHUB

GitHub is a cloud-based platform that hosts Git repositories, enabling collaboration, version control, and project management for developers and teams.



<https://github.com/>

What is GITHUB DESKTOP

GitHub Desktop is a user-friendly graphical interface that simplifies the use of Git and GitHub without requiring command-line knowledge.



<https://desktop.github.com>

Configure Github Desktop

1. Open Github Desktop
2. File > Options (PC) ||| GitHub Desktop > Preferences (MAC)
3. Sign in to GitHub
4. Integrations
5. GIT

Create a Repository

ReadME file

provides an overview of a project, typically including:

1. Project Title: Clear and descriptive.
2. Description: Brief summary of the project and its purpose.
3. Installation Instructions: Steps to install and set up the project locally.
4. Usage: How to run or use the project.
5. Contributing: Guidelines for contributing to the project.
6. License: Information about the project's license.

Markdown Syntax

Activity: Create a ReadME File

1. Click on Add a Readme in your Repository in GitHub.com
2. Past the following markdown code

```
1 # My Python Dice Game
2
3 This is a simple Python program that simulates rolling a variety of dic
```

Create a New File on GitHub.com

1. Click on Add File
2. Name File - dice_roll.csv
3. Paste into file

```
1 Roll_ID,Dice_Type,Num_Rolls,Modifier,Rolls>Total
2 1,d20,1,2,[18],20
3 2,d6,3,-1,[4, 2, 5],10
4 3,d8,2,0,[6, 3],9
5 4,d10,4,1,[7, 9, 5, 6],28
6 5,d20,1,-2,[12],10
```

Create a New File on Computer

1. Navigate to the repository folder on your computer.

- Click on Show in Explorer (PC)
- Click on Show in Finder (MAC)

2. Create a New File

- Click on the Start menu and type “Notepad” in the search bar. (PC)
- Open Finder and type “TextEdit” in the search bar. (MAC)

Activity: Create a Python Script

1. Copy and Paste the code into Notepad or TextEditor - for MAC – *go to the “File” menu*
2. Save file as `dice_roll.py` to the folder for your repository

```
1 import random
2
3 def roll_dice(num_dice=1, num_sides=6):
4     """Simulates rolling 'num_dice' dice with 'num_sides' sides."""
5     return [random.randint(1, num_sides) for _ in range(num_dice)]
6
7 # Example: Rolling 2 six-sided dice
8 rolls = roll_dice(num_dice=2)
9 print("Rolled dice:", rolls)
```


Activity: Commit Changes

1. Open GitHub Desktop
2. Staging Changes - select the files to change
3. Committing Changes - add message
4. Commit to _____
5. Push Origin

Branches

branches allow developers to work on features or fixes in isolation without affecting the main codebase. The default branch is usually called main or master.

1. Click on the Current Branch dropdown at the top of the application.
2. Select New Branch from the dropdown menu.
3. Enter a name for the branch (e.g., dnd_test) and click Create Branch.

Activity: Create a New Branch

1. Create a new branch
2. Select dnd_test branch on Github
3. Edit dice_roll.py file

```
1 import random
2
3 def roll_dnd_dice(dice_type='d20', num_
4     """Roll a D&D style dice. Returns a list of results."/>
```

Pull Requests

A pull request is a way to propose changes to a repository. It allows contributors to review and discuss code changes before integrating them into the main codebase.

The repository owner or team members can then approve, request changes, or reject the pull request.

Merge Branches

1. Switch to branch you want to merge into
2. Go to the top menu and click Branch > Merge into Current Branch.

View History

The History tab is essential for tracking project evolution, reviewing past changes, and collaborating effectively within teams by providing a clear and accessible view of the repository's commit history.

Cloning a Repository

The History tab is essential for tracking project evolution, reviewing past changes, and collaborating effectively within teams by providing a clear and accessible view of the repository's commit history.

Activity: Create a clone of

<https://github.com/rfordatascience/tidytuesday>

Forking a Repository

Forking creates a copy of a repository in your own GitHub account. It allows you to make changes to the project without affecting the original repository.

Adding Collaborators

You can granted access to users which will allow them to contribute to a GitHub repository. They can help manage and enhance the project by making code contributions, suggesting changes, and collaborating on development tasks.

Activity: Collaborate on a Repository

1. Enter your GitHub us
2. Accept invitation at C
3. **One Volunteer:** Add f
4. Push Origin

5. Click New Pull Request

```
1 import pandas as pd
2
3 # Read the dataset
4 df = pd.read_csv('data/dic
5
6 # Display the dataset
```

Project Management

A GitHub Project is a tool that enables teams to manage and track their work within a GitHub repository. It provides a structured way to organize tasks, features, and issues, facilitating collaboration and project management.

1. Click **Projects** tab
2. Start New Project

Conclusion

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