

# **Effective Programming Practices for Economists**

## **Version Control and collaboration with Git and Github**

### **Pre-commit hooks**

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# What are pre-commit hooks

- We saw the importance of following style guides
- Pre-commit hooks are tools to help you automate style guides
- Examples of pre-commit hooks are:
  - The black formatter that automatically formats your code
  - The ruff linter that tells you about problems and fixes some of them
  - Line-ending fixers for better compatibility across platforms
- Save a lot of time but have a learning curve

# Activating pre-commit hooks

- Install the `pre-commit` python package
  - `conda install pre-commit`
- Open a terminal in the root of your repository
- Execute `pre-commit install`

Just needs to be done once after cloning the repository

# Configuring pre-commit hooks

```
repos:  
- repo: https://github.com/psf/black  
  rev: 23.9.1  
  hooks:  
  - id: black  
    language_version: python3.11
```

- Pre-commit hooks are configured in ``.pre-commit-config.yaml``
- Typically inherited from the project templates or copy it from another project
- Example shows just the black formatter

# A useful git command

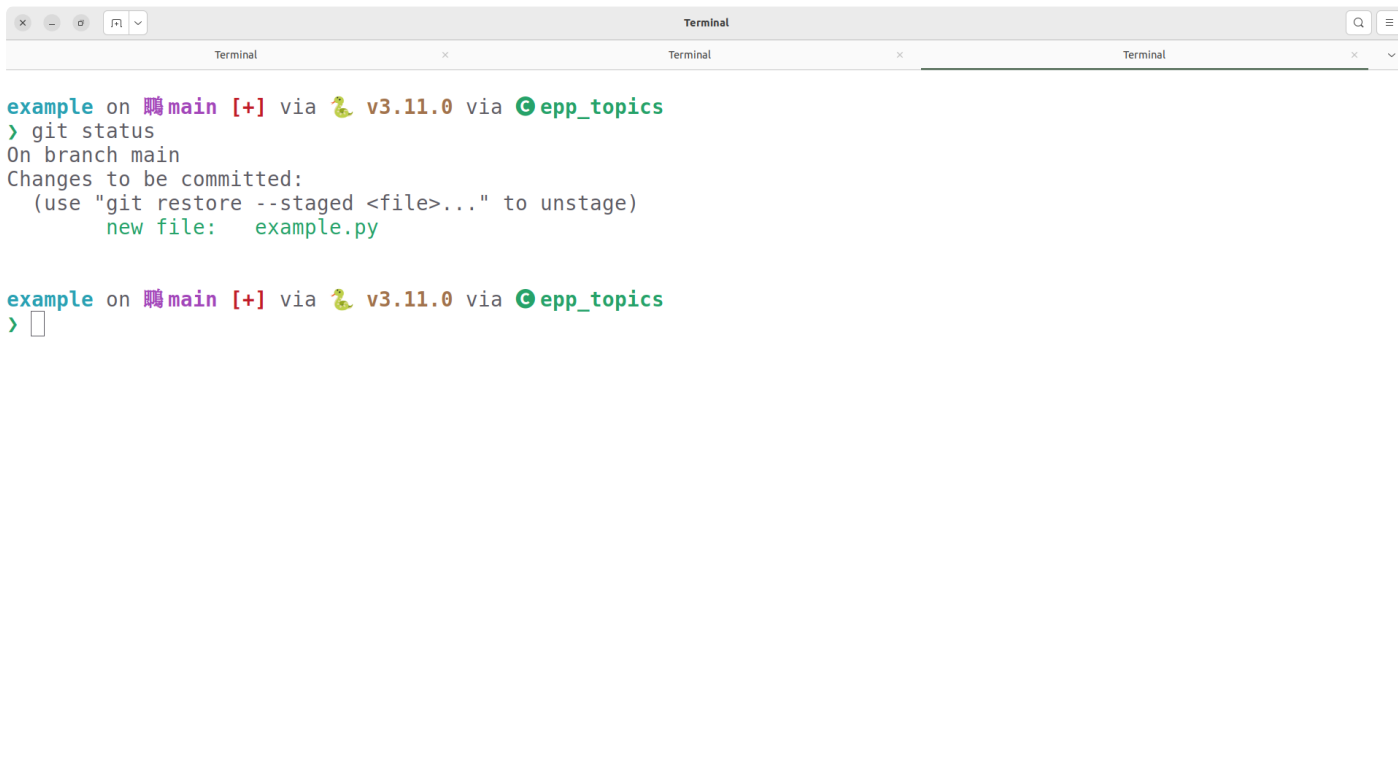
- ``git commit -am "Your message."`` stages and commits all modified files
- Does not work for untracked files
- Important because pre-commit hooks run over staged files!

# A badly formatted python file

```
def clean_data(raw):
    df = pd.DataFrame(index=raw.index)
    df["coding_genius"]=clean_agreement_scale(raw['Q001'])
    df['learned_a_lot']=clean_agreement_scale(
        raw['Q002'])
    df['favorite_language'] = clean_favorite_language(raw['Q003'])
    return df

def clean_agreement_scale(sr):
    sr = sr.replace({'-77': pd.NA, '-99':pd.NA})
    categories = ['strongly disagree',
        'disagree',
        'neutral', 'agree',
        'strongly agree'
    ]
    dtype = pd.CategoricalDtype(categories=categories,
        ordered=True)
    return sr.astype(dtype)
```


# Git status

A screenshot of a terminal window with three tabs, all labeled 'Terminal'. The active tab shows the output of the 'git status' command. The prompt is 'example on 主 main [+] via 3.11.0 via epp\_topics'. The output indicates the current branch is 'main' and lists 'example.py' as a new file to be committed. The prompt is then followed by a cursor.

```
example on 主 main [+] via 3.11.0 via epp_topics
> git status
On branch main
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
    new file:   example.py

example on 主 main [+] via 3.11.0 via epp_topics
> 
```

# First commit fails



```
example on 主 main [+] via v3.11.0 via epp_topics
> git commit -am "Add example.py."
black..... failed
- hook id: black
- files were modified by this hook

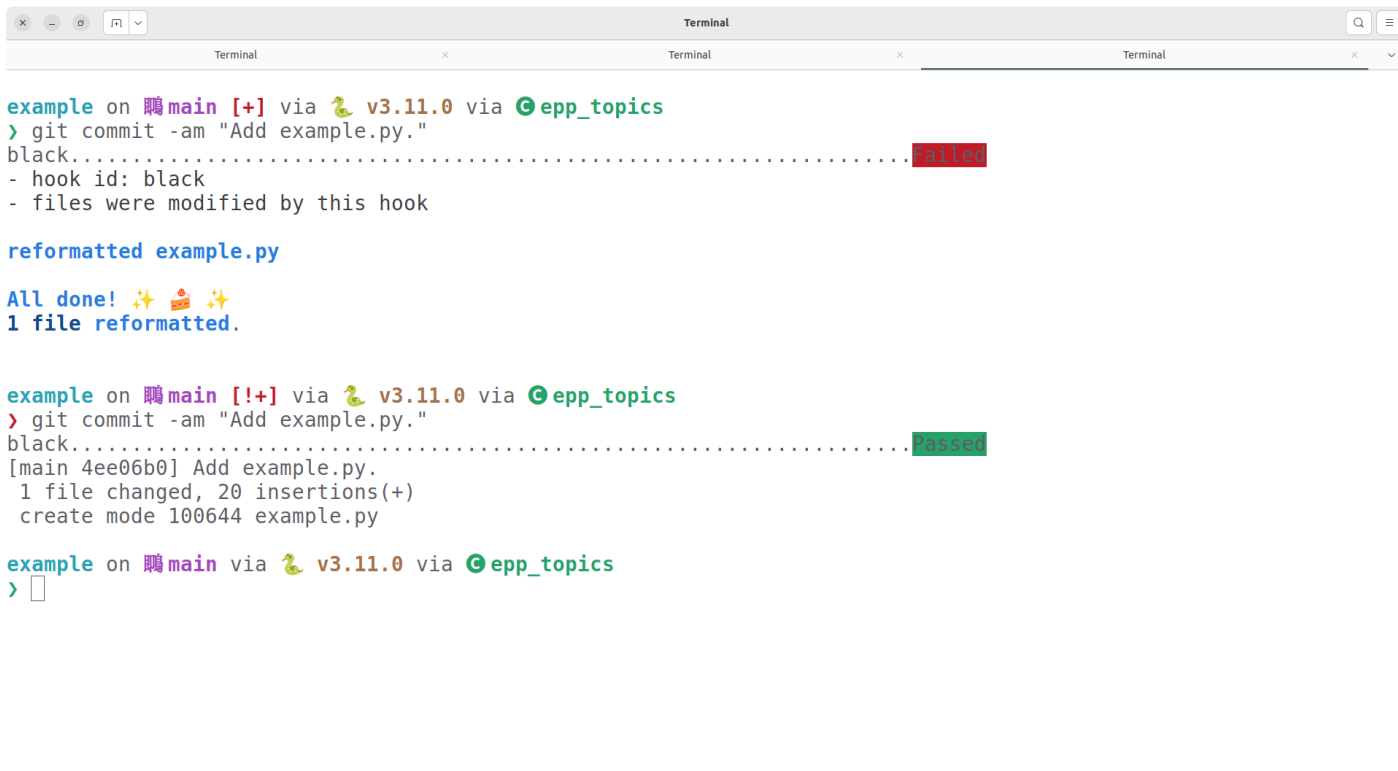
reformatted example.py

All done! ✨ 🍰 ✨
1 file reformatted.

example on 主 main [!+] via v3.11.0 via epp_topics
> 
```



# Second commit works



```
example on 鸚 main [+] via 🐍 v3.11.0 via Ⓞ epp_topics
> git commit -am "Add example.py."
black..... Failed
- hook id: black
- files were modified by this hook

reformatted example.py

All done! ✨ 🍰 ✨
1 file reformatted.

example on 鸚 main [!+] via 🐍 v3.11.0 via Ⓞ epp_topics
> git commit -am "Add example.py."
black..... Passed
[main 4ee06b0] Add example.py.
1 file changed, 20 insertions(+)
create mode 100644 example.py

example on 鸚 main via 🐍 v3.11.0 via Ⓞ epp_topics
> 
```