# Assignment: Git and GitHub Practice

**Learning Outcomes:**

- Students will gain hands-on experience with Git and GitHub.
- Students will practice creating repositories, branching, merging, resolving conflicts, and collaborating.
- Students will learn how to set up and use SSH keys for secure GitHub access.
- Students will learn how to create GitHub releases using Git tags.

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## 1: Create a GitHub Repository and Clone It Locally

**Task:**

- Create a new repository on GitHub named `my-first-repo`.
- Clone the repository to your local machine.
- Create a file called `README.md` and add some content.
- Commit the changes and push them to the remote repository.

**Commands to Use:**

- git clone
- git add
- git commit
- git push

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## 2: Add an SSH Key to GitHub

**Task:**

- Generate an SSH key on your local machine if you don’t already have one.
- Add the SSH key to your GitHub account.
- Test the SSH connection to GitHub.
- Clone a repository using the SSH URL instead of HTTPS.

**Commands to Use:**

- ssh-keygen
- ssh-add
- git clone

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# 3: Branching and Merging

**Task:**

- Create a new branch called `feature-branch`.
- Switch to the branch and create a new file `feature.txt`.
- Add content, commit the changes, and push the branch to GitHub.
- Merge the branch into `main` and push changes.

**Commands to Use:**

- git branch
- git checkout
- git merge
- git push

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# 4: Resolving Merge Conflicts

**Task:**

- Create a new branch called `conflict-branch`.
- Modify the `README.md` file in both `main` and `conflict-branch`.
- Attempt to merge and resolve any conflicts.
- Commit the resolved changes and push them.

**Commands to Use:**

- git merge
- git add
- git commit
- git push

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# 5: Collaborating on GitHub

**Task:**

- Add a collaborator to your repository.
- Ask the collaborator to clone, make changes, and push them.
- Pull the collaborator's changes locally and verify updates.

**Commands to Use:**

- git clone
- git pull
- git push

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# 6: Deleting a Branch and Reverting Changes

**Task:**

- Delete a branch (e.g., `feature-branch`) from local and GitHub.
- Make a mistake in the `README.md` file and commit it.
- Use revert or reset to undo the commit.
- Push the corrected changes to GitHub.

**Commands to Use:**

- git branch
- git push
- git revert
- git reset

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# 7: Creating a GitHub Release with a Python Program

**Task:**

- Write a Python script `hello.py` that prints `"Hello, GitHub Release!"`.
- Commit and push the script to GitHub.
- Create a Git tag `v1.0.0`.
- Push the tag to GitHub.
- Use the tag to create a new release in GitHub.

**Commands to Use:**

- git add
- git commit
- git push
- git tag
- git push

Instructions:

1. Complete each scenario step-by-step.

2. Take screenshots of the commands you run and the results (e.g., terminal output, GitHub repository changes).

3. Write a brief explanation of what you did for each scenario.

4. Submit the screenshots and explanations as a PDF or document.