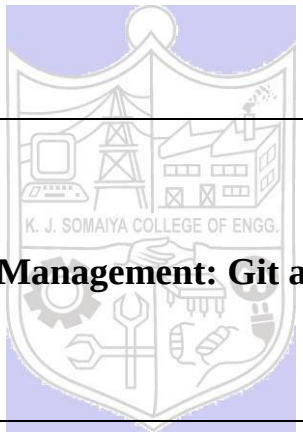

Experiment No.: 02
Title: Source Code Management: Git and GitHub

Batch: **Roll No.:** **Experiment No.:** 02

Aim: Installation and Integration of Source Code Management tools Git and GitHub

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Resources needed: Internet

Pre Requisite: Git Commands and GitHub Account

Theory:

Introduction to Git

Git is a version control system for tracking changes in computer files and coordinating work on those files among multiple people. It is primarily used for source code management in software development, but it can be used to keep track of changes in any set of files.

Git Installation

1. Download Git for Windows.
2. Extract and Launch Git Installer.
3. Server Certificates, Line Endings and Terminal Emulators.
4. Additional Customization Options.
5. Complete Git Installation Process.
6. Launch Git Bash Shell.
7. Launch Git GUI.

Git Commands:

Git Init

The git init command creates a new Git repository. It can be used to convert an existing, unversioned project to a Git repository or initialize a new, empty repository.

```
C:\Users\admin\git-demo-project>git init
Initialized empty Git repository in C:/Users/admin/git-demo-project/.git/
```

Git Add

When we create, modify or delete a file, these changes will happen in our local and won't be included in the next commit (unless we change the configurations). We need to use the git add command to include the changes of a file(s) into our next commit. The git add command doesn't change the repository and the changes are not saved until we use git commit. The git add command adds new or changed files in your working directory.

```
C:\Users\admin\git-demo-project>git add stack.py

C:\Users\admin\git-demo-project>git status
On branch master

No commits yet

Changes to be committed:
  (use "git rm --cached <file>..." to unstage)
        new file:   stack.py
```

Git Commit

A commit, or "revision", is an individual change to a file (or set of files). It's like when you save a file, except with Git, every time you save it creates a unique ID (a.k.a. the "SHA" or "hash") that allows you to keep record of what changes were made when and by who. In version control systems, a commit is an operation which sends the latest changes to the source code to the repository, making these changes part of the head revision of the repository.

```
C:\Users\admin\git-demo-project>git commit -m "Initial Commit"
[master (root-commit) 0b2f679] Initial Commit
 1 file changed, 41 insertions(+)
 create mode 100644 stack.py
```

Git- Push and Pull

Push operation: The git push command is used to upload local repository content to a remote repository. Pushing is how you transfer commits from your local repository to a remote repository. The command for push is git push remote –all.

Pull operation: The git pull command is used to fetch and download content from a remote repository and immediately update the local repository to match that content. The command is: git pull <remote>.

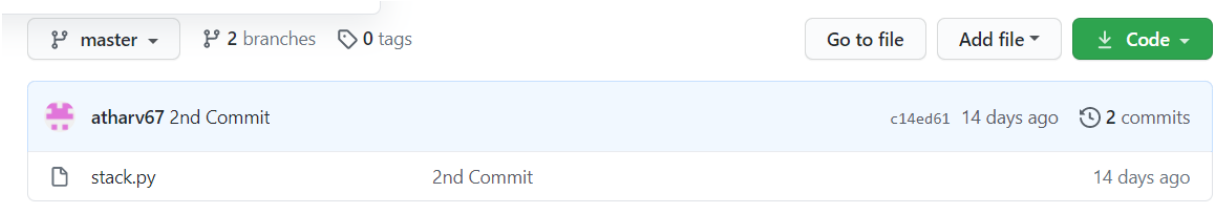
Git Clone

Git clone is a Git command line utility which is used to target an existing repository and create a clone, or copy of the target repository. In this page we'll discuss extended configuration options and common use cases of git clone. Clones a repository into a newly created directory, creates remote-tracking branches for each branch in the cloned repository (visible using git branch --remotes), and creates and checks out an initial branch that is forked from the cloned repository's currently active branch.

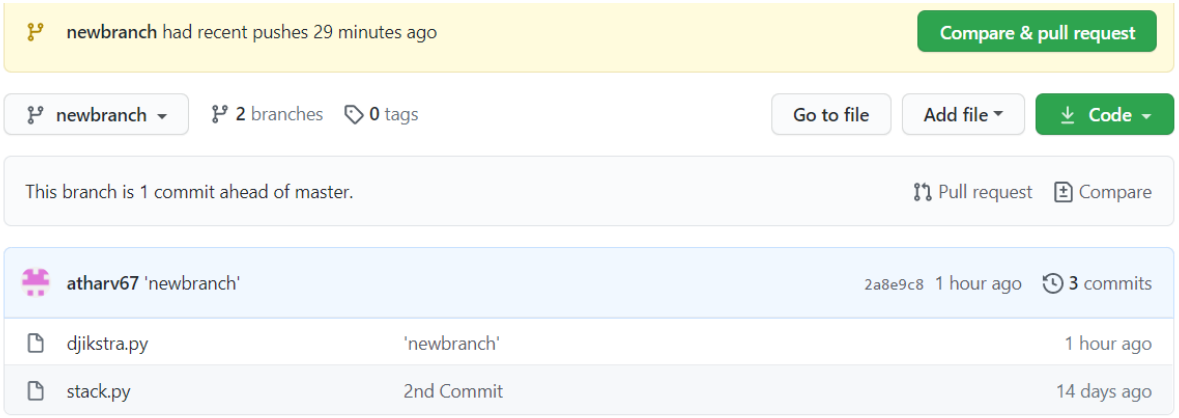
Branches: Git branches are effectively a pointer to a snapshot of your changes. When you want to add a new feature or fix a bug, no matter how big or how small, you spawn a new branch to encapsulate your changes. This makes it harder for unstable code to get merged into the main code base, and it gives you the chance to clean up your future's history before merging it into the main branch.

A branch represents an independent line of development. Branches serve as an abstraction for the edit/stage/commit process. New commits are recorded in the history for the current branch, which results in a fork in the history of the project.

Files in master branch:



The files in the master branch are merged with newbranch.



Procedure:

1. Download Git tool from official Git website: https://git-scm.com/downloads
2. Create GitHub Account https://github.com/join
3. Execute Git Commands: version, global, init, add, commit, checkout, push, pull etc.

Results: (Document with screenshots)

1. All Git commands
2. Working with branch and Master
3. Create a file on Git and Push it on GitHub
4. Pull files from GitHub

Questions:

1. What is difference between Git and GitHub
2. What is Master and Branch

Outcomes:

Conclusion: (Conclusion to be based on the Results and outcomes achieved)

Grade: AA / AB / BB / BC / CC / CD /DD

Signature of faculty in-charge with date

References:
Books/ Journals/ Websites:

1. https://guides.github.com/introduction/git-handbook/
2. Effective DevOps: Building a Culture of Collaboration, Affinity, and Tooling at Scale, Jennifer Davis, Ryn Daniels, O'Reilly Media June 2016.
3. Practical DevOps: Implement DevOps in your organization by effectively building, deploying, testing, and monitoring code,Joakim Verona, Packt Publishing, 2nd Edition,2016