



INSTITUTE OF SPACE TECHNOLOGY
KICSIT, Kahuta Campus



Lab Task 1

Student Detail

Name: M. Nasarullah

Roll Number: 202101014

Program Detail

Program: BSCE-7

Course Title: SE (Lab)

Submitted to: Sir Zia Ur Rehman

DEPARTMENT OF COMPUTER ENGINEERING

Task 1: Explain the fundamentals of Git and GitHub. Read the provided material about Git and GitHub and answer the following questions:

- a. What is Git, and why is it used in software development?
- b. List three key features of Git.
- c. Explain the main purpose of GitHub.

[CLO-01, PLO-01, C-2(Understanding), Rubric (Knowledge)]

Marks	1	2	3	4
Knowledge	Student could not demonstrate knowledge about the given topic	Some concepts are demonstrated but clearly students lack deep understanding	Most of the knowledge is correct, some further understanding and improvements are Required	Demonstrated knowledge about topic well with deep understanding of concepts.

Task 2: Discuss and Learn how to install Git on a Windows machine and configure it.

- d. Task: Follow the steps outlined in the material to install Git on your Windows computer. Use the provided link to download Git for Windows.
- e. Task: After installation, open a command prompt or Git Bash and configure your name and email as instructed in the material.

[CLO-01, PLO-01, C-2(Understanding), Rubric (Knowledge)]

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Knowledge	Student could not demonstrate knowledge about the given topic	Some concepts are demonstrated but clearly students lack deep understanding	Most of the knowledge is correct, some further understanding and improvements are Required	Demonstrated knowledge about topic well with deep understanding of concepts.

Task 3: Identify essential Git commands. Read and understand the basic Git commands listed in the material.

f. Task: Practice using Git commands on your local machine. Initialize a new Git repository, add a file, make changes, stage changes, commit changes, and view the Git history.

[CLO-01, PLO-01, C-2(Understanding), Rubric (Knowledge)]

Marks	1	2	3	4
Knowledge	Student could not demonstrate knowledge about the given topic	Some concepts are demonstrated but clearly students lack deep understanding	Most of the knowledge is correct, some further understanding and improvements are Required	Demonstrated knowledge about topic well with deep understanding of concepts.

Task 4: Describe how you can Create a GitHub repository for your project.

- Task: Follow the step-by-step instructions from the material to create your GitHub repository. Provide a name, description, and choose the repository's visibility (public or private).
- Task: Optionally, initialize the repository with a README file. Explore the repository settings on GitHub.

[CLO-01, PLO-01, C-2(Understanding), Rubric (Knowledge)]

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Knowledge	Student could not demonstrate knowledge about the given topic	Some concepts are demonstrated but clearly students lack deep understanding	Most of the knowledge is correct, some further understanding and improvements are Required	Demonstrated knowledge about topic well with deep understanding of concepts.

Task 5: Discuss how you can Publish your project to GitHub.

- c. Task: Open your project in Visual Studio Code (VS Code) if you have one. If not, create a simple project or use any existing code.
- d. Task: Initialize a Git repository in your project directory using VS Code's integrated terminal. Then, make changes to your project, stage those changes, and commit them with a meaningful message.
- e. Task: Push your local code to the GitHub repository you created in Lab Task 4. Use the provided Git command in the material to perform the push operation.

[CLO-01, PLO-01, C-2(Understanding), Rubric (Knowledge)]

[CLO-01, PLO-01, C-2(Understanding), Rubric (Knowledge)]

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Knowledge	Student could not demonstrate knowledge about the given topic	Some concepts are demonstrated but clearly students lack deep understanding	Most of the knowledge is correct, some further understanding and improvements are Required	Demonstrated knowledge about topic well with deep understanding of concepts.

Lab Report: Must be submitted in next lab. Followings are the rubrics for lab report.

Marks	1	2	3	4
Lab Report	The lab report does not follow the guidelines for formatting.	Presents some sections of the lab in the correct order. Three or more sections are not in the correct order; missing heading or Title.	Presents most sections of the lab in the correct order, one or two sections may not be in the correct order; heading or title missing or not Complete.	Presents all the sections of the Lab in the correct order with correct formatting; includes correct heading, section headings and title of lab.

Task 01:

Git and GitHub are fundamental tools for version control and collaborative software development. Here's an overview of the fundamentals of Git and GitHub:

Git:

1. Version Control System (VCS): Git is a distributed version control system that tracks changes in codebase over time. It allows to save different versions of project, making it easier to collaborate and manage code.

2. Local Repository: In Git, every project has a local repository on computer. This repository stores all the files and the complete history of changes made to those files.

3. Commits: A commit is a snapshot of project at a particular point in time. Each commit has a unique identifier and includes changes made since the last commit.

4. Branches: Git allows to create branches, which are separate lines of development. Branches are used for tasks such as feature development, bug fixes, and experiments. The main branch, often named "master" or "main," represents the stable version of the project.

5. Merging: Merging is the process of combining changes from one branch into another. This is typically done to incorporate new features or bug fixes from feature branches into the main branch.

6. Pull and Push: Git provides commands to pull changes from a remote repository to local repository (pull) and push changes from your local repository to a remote repository (push). This facilitates collaboration with others.

GitHub:

GitHub is a web-based platform that complements Git by providing additional features and a central location for hosting Git repositories. Here are the fundamentals of GitHub:

- 1. Remote Repository Hosting:** GitHub allows you to host your Git repositories in the cloud. This makes it easy for multiple developers to collaborate on the same project, even if they are not in the same physical location.
- 2. Pull Requests:** GitHub's pull request (PR) feature is used to propose and discuss changes made in a branch. It enables a structured code review process, allowing collaborators to review, comment on, and suggest changes before merging the code into the main branch.
- 3. Issues and Bug Tracking:** GitHub includes an issue tracking system that allows you to create, assign, and track issues and bugs in your projects. It integrates with pull requests and can be used for project management.
- 4. Collaboration:** GitHub provides tools for collaboration, such as wikis, project boards, and team management. These features help streamline teamwork and project organization.
- 5. Forks:** You can fork a repository on GitHub to create a copy of someone else's project in your account. This allows you to make changes independently and potentially contribute back to the original project through pull requests.
- 6. GitHub Pages:** GitHub Pages allows you to host websites directly from your GitHub repository, making it easy to showcase your projects or documentation.

In summary, Git is the version control system that manages the history and changes in your code, while GitHub is a web-based platform that provides a centralized location for hosting Git repositories and offers collaboration tools for teams of developers. Together, they are widely used in software development to streamline version control, collaboration, and project management.

a) What is Git, and why is it used in software development?

Git is a distributed version control system (VCS) used in software development to manage and track changes in source code and other project files. It is a fundamental tool for developers and teams working on software projects.

b) List three key features of Git.

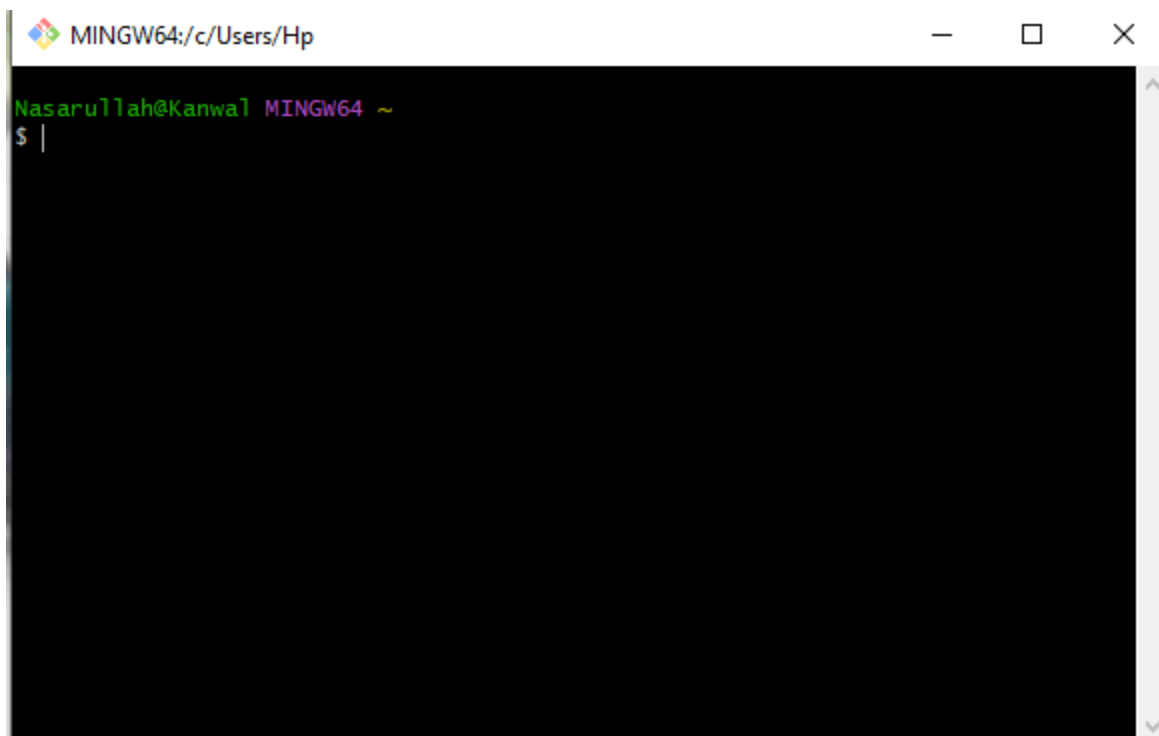
Here are three key features of Git in a shorter format:

- 1. Distributed Version Control:** Git allows multiple developers to work offline and independently, syncing changes when necessary.
- 2. Branching and Merging:** Git supports creating isolated branches for feature development and easily merging changes.
- 3. Commit History:** Git maintains a detailed history of code changes, aiding in troubleshooting and project evolution tracking.

c) Explain the main purpose of GitHub.

GitHub primarily serves as a web-based platform for hosting and managing Git repositories. It's designed to facilitate collaborative software development by providing tools for version control, code collaboration, code review, issue tracking, project management, and documentation. Developers and teams use GitHub to work together efficiently, share and review code changes, track and resolve issues, and manage the entire software development lifecycle.

Task 2:



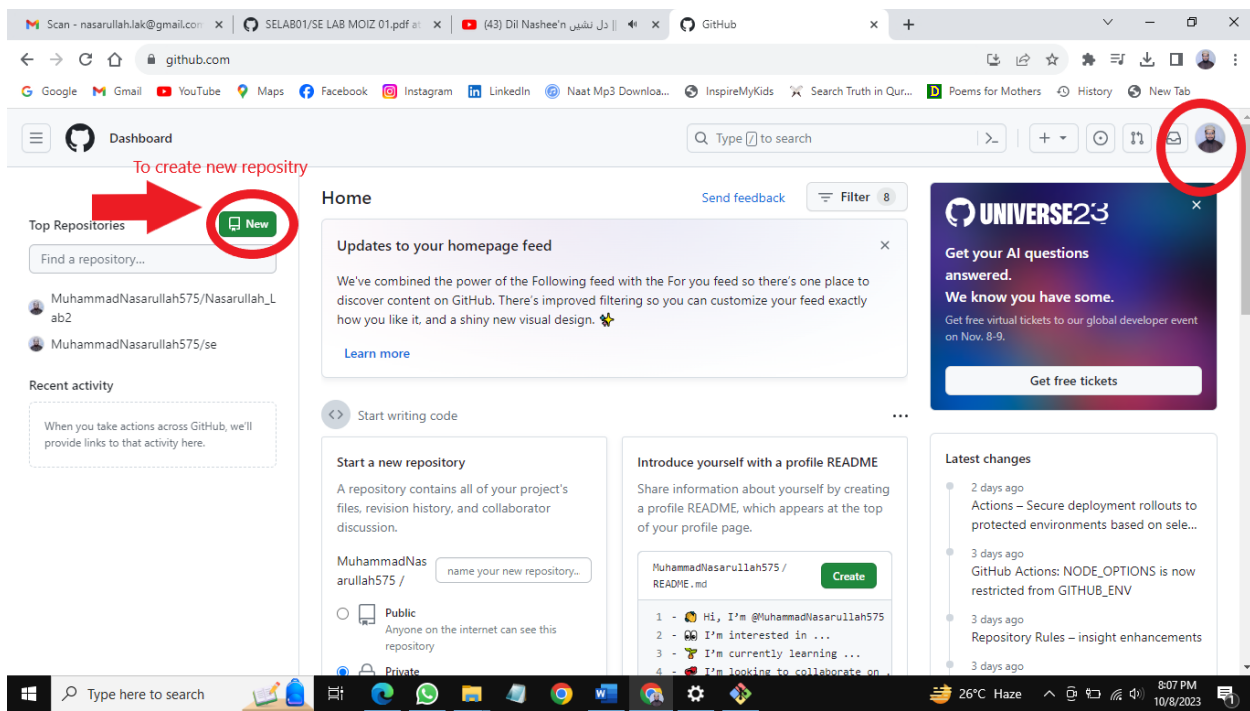
```
MINGW64:/c/Users/Hp
Nasaru11ah@Kanwal MINGW64 ~
$ |
```

```
MINGW64:/c/Users/Hp
Nasarullah@Kanwal MINGW64 ~
$ git config --global user.name "Nasarullah"

Nasarullah@Kanwal MINGW64 ~
$ git config --global user.email "nasarullah.lak@gmail.com"

Nasarullah@Kanwal MINGW64 ~
$ |
```

Task 3:



Scan - nasarullah.lak@gmail.com x SELAB01/SE LAB MOIZ 01.pdf a x (43) Rang Elah رنڱ الـ رنڱ الـ New x MuhammadNasrullah575/Nasrullah_Lab2 x +

github.com/MuhammadNasrullah575/Nasrullah_Lab2

Google Gmail YouTube Maps Facebook Instagram LinkedIn Naat Mp3 Downloa... InspireMyKids Search Truth in Qur... Poems for Mothers History New Tab

MuhammadNasrullah575 / Nasrullah_Lab2

Type to search

<> Code Issues Pull requests Actions Projects Wiki Security Insights Settings

Nasrullah_Lab2 Public

Pin Unwatch 1 Fork 0 Star 0

main 1 branch 0 tags

Go to file Add file >> Code

MuhammadNasrullah575 Add files via upload 529daba 28 minutes ago 5 commits

Nasrullah_Lab2.pdf	Add files via upload	28 minutes ago
Nasrullah_Lab2.ipynb	Add files via upload	5 days ago
README.md	Initial commit	5 days ago
config.yaml	Add files via upload	20 hours ago

README.md

Nasrullah_Lab2

About

No description, website, or topics provided.

Readme

Activity

0 stars

1 watching

0 forks

Releases

No releases published

Create a new release

Packages

Type here to search

25°C 8:19 PM 10/8/2023

Scan - nasarullah.lak@gmail.com x SELAB01/SE LAB MOIZ 01.pdf a x (43) Rang Elah رنڱ الـ رنڱ الـ New x MuhammadNasrullah575/Nasrullah_Lab2 x +

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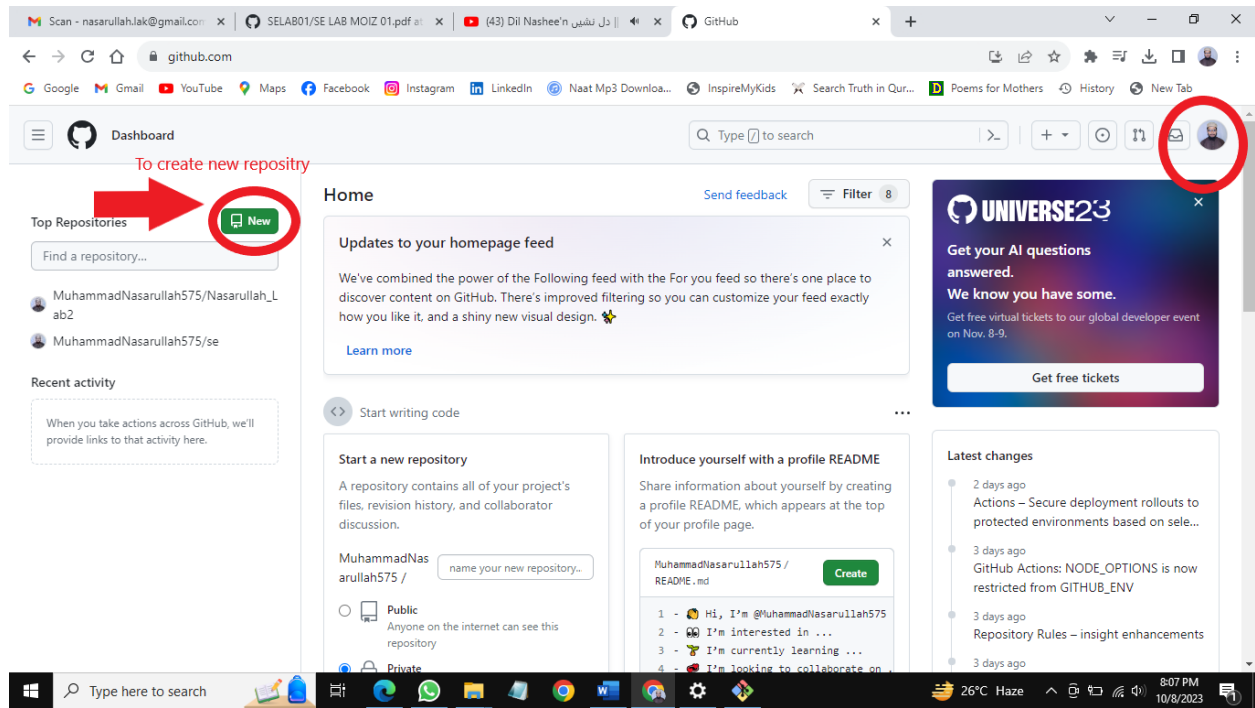
25°C 8:19 PM 10/8/2023

File uploaded in new repository

Task 4:

Steps for creating new GitHub repository:

1. Go to the internet explorer and search for GitHub.com and Signup to the GitHub by using your correct information.
2. After successful login, open the dashboard on the GitHub and look for the new icon in the dashboard to create new repository as shown in the given figure:



3. Click on the New icon and after that the setting of the new repository will be open .
4. Type name of your as in this case is “Dummy2” and in the description box write the description of the repository.
5. Now, set the repository’s visibility to public to make it visible to everyone as shown in the given figure:

Scan - nasarullah.lak@gmail.com x SELAB01/SE LAB MOIZ 01.pdf at x (44) Rang Elah رنگ الہ New Ho x New repository x +

github.com/new

Google Gmail YouTube Maps Facebook Instagram LinkedIn Naat Mp3 Downloa... InspireMyKids Search Truth in Qur... Poems for Mothers History New Tab

Create a new repository

A repository contains all project files, including the revision history. Already have a project repository elsewhere? [Import a repository.](#)

Required fields are marked with an asterisk (*).

Owner * MuhammadNasrullah575 / Repository name *

Great repository names are short and memorable. Need inspiration? How about [literate-octo-eureka](#) ?

Description (optional)

☒ **Public**
Anyone on the internet can see this repository. You choose who can commit.

☐ **Private**
You choose who can see and commit to this repository.

Initialize this repository with:

☐ **Add a README file**
This is where you can write a long description for your project. [Learn more about READMEs.](#)

Add .gitignore
.gitignore template: None

Choose which files not to track from a list of templates. [Learn more about ignoring files.](#)

6. To add a readme file in the repository click on add readme file and after all setting click on create repository.

Initialize this repository with:

☐ **Add a README file**

This is where you can write a long description for your project. [Learn more about READMEs.](#)

Add .gitignore

.gitignore template: None

Choose which files not to track from a list of templates. [Learn more about ignoring files.](#)

Choose a license

License: None

A license tells others what they can and can't do with your code. [Learn more about licenses.](#)

i You are creating a public repository in your personal account.

Create repository

Task 5:

The screenshot shows a Jupyter Notebook titled "Example 01 : Numpy". The notebook content includes a text instruction: "Take 2 lists and multiply both you'll see that error occurs repeat the process but by converting them to array by numpy.array()". Below this, a code cell contains the following Python code:

```
pip install numpy
```

```
[1]: Requirement already satisfied: numpy in c:\users\hp\appdata\local\programs\python\python311\lib\site-packages (1.24.3) Note: you may need to restart the kernel to use updated packages.
```

```
[notice] A new release of pip is available: 23.1.2 -> 23.2.1
[notice] To update, run: python.exe -m pip install --upgrade pip
```

```
import numpy as np

l1 = [1,2,3]
l2 = [4,5,6]

A1 = np.array(l1)
A2 = np.array(l2)

print(f"{A1} * {A2} = {A1*A2}")
```

The bottom status bar of the VS Code window shows "Cell 1 of 168", "25°C", and the date "10/8/2023".

SOURCE CONTROL

In order to use git features, you can open a folder containing a git repository or clone from a URL.

Search (Ctrl+Shift+F)

Open Folder

Clone Repository

To learn more about how to use git and source control in VS Code [read our docs.](#)

Repository name (type to search)

- MuhammadNasarullah575/Nasarullah_Lab2 <https://github.com/MuhammadNasarullah575/Nasar...>
- MuhammadNasarullah575/se <https://github.com/MuhammadNasarullah575/se.git>

Than finally the file is uploaded