INSTITUTE OF SPACE TECHNOLOGY
KICSIT, Kahuta Campus

SOFTWARE ENGINEERING LAB

Lab Report 01

SUBMITTED BY: HAFIZ MOIZ ALI

SUBMITTED TO: ENGR. ZIA-UR-REHMAN

REGISTRATION NO: 202101009

SEMESTER: BSCE-VII

DEPARTMENT OF COMPUTER ENGINEERING

INSTITUTE OF SPACE TECHNOLOGY

KICSIT, KAHUTA CAMPUS

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)]

Marks	**1**	**2**	**3**	**4**
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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.

a. 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).

b. Task: Optionally, initialize the repository with a README file. Explore the repository settings on 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 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)]

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.

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.

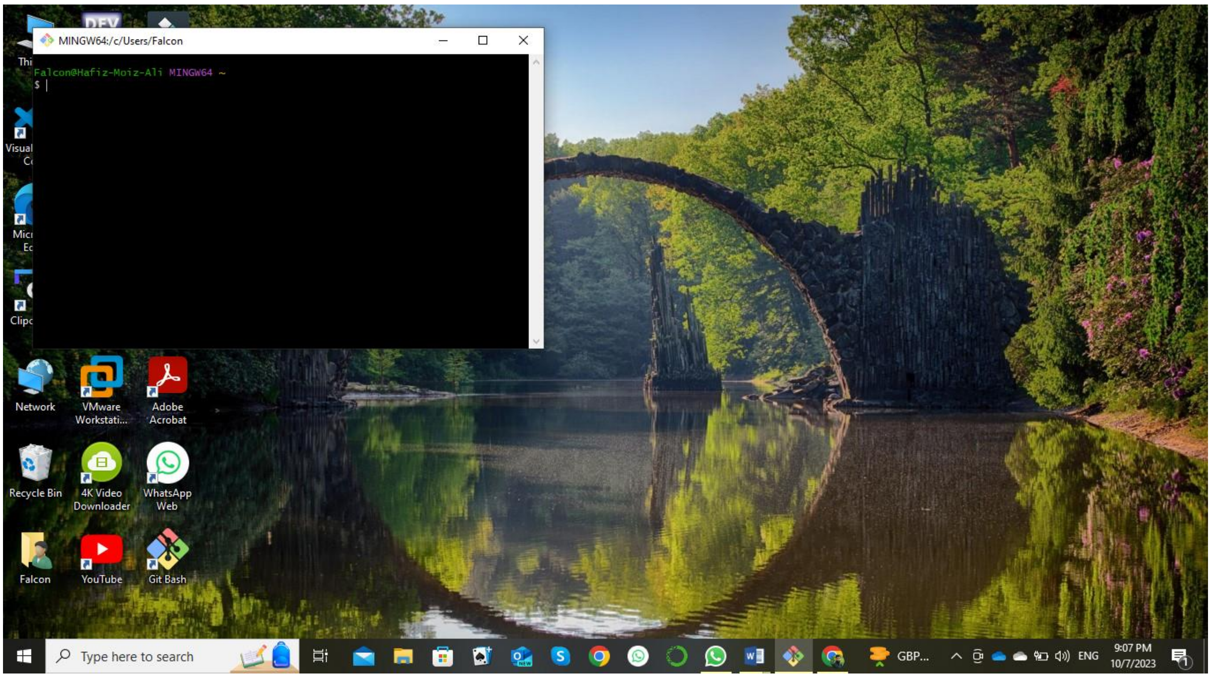
2. Branching and Merging: Git supports creating isolated branches for feature development and easily merging changes.

3. Commit History: Git maintains a detailed history of code changes, aiding in troubleshooting and project evolution tracking.

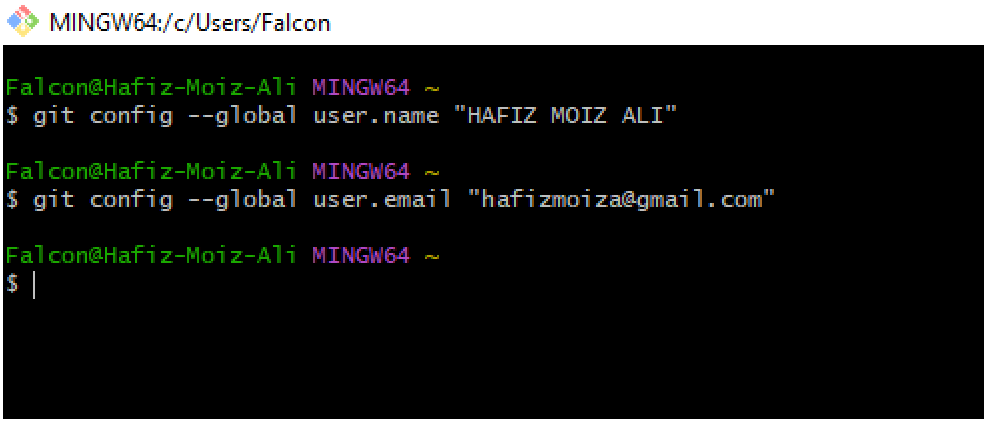
c) Explain the main purpose of GitHub.

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 02:



```
Falcon@Hafiz-Moiz-Ali MINGW64 ~
$ |
```



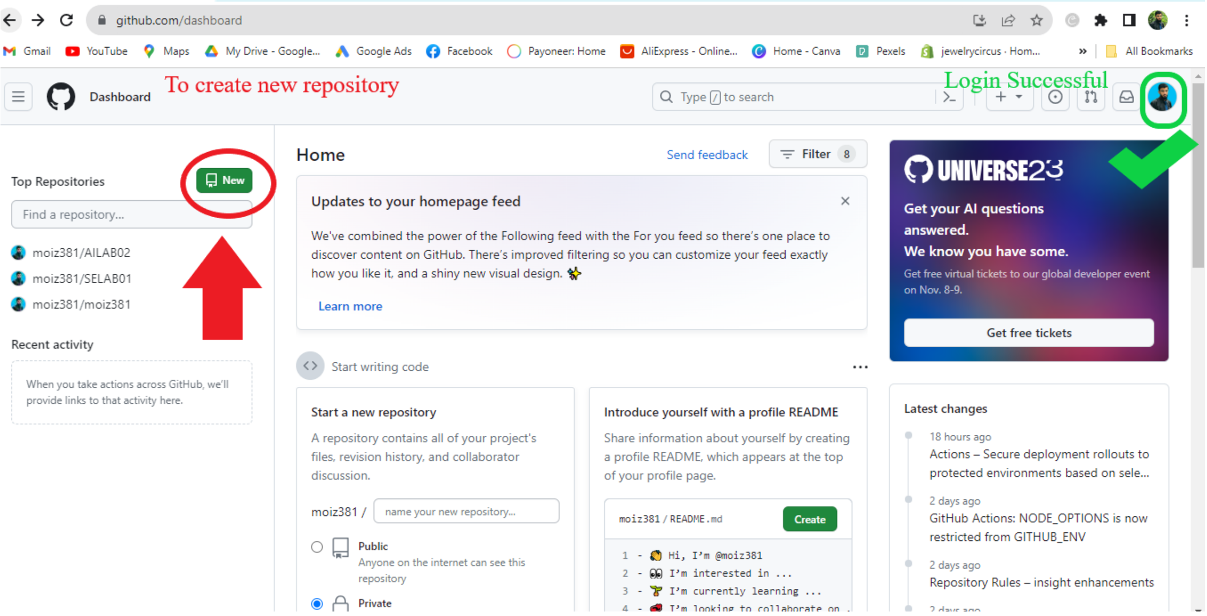
```
Falcon@Hafiz-Moiz-Ali MINGW64 ~
$ git config --global user.name "HAFIZ MOIZ ALI"

Falcon@Hafiz-Moiz-Ali MINGW64 ~
$ git config --global user.email "hafizmoiza@gmail.com"

Falcon@Hafiz-Moiz-Ali MINGW64 ~
$ |
```

Task 3:

Login to Github and creating new repository



To create new repository

Login Successful

When you take actions across GitHub, we'll provide links to that activity here.

Updates to your homepage feed

We've combined the power of the Following feed with the For you feed so there's one place to discover content on GitHub. There's improved filtering so you can customize your feed exactly how you like it, and a shiny new visual design.

Get your AI questions answered.
We know you have some.
Get free virtual tickets to our global developer event on Nov. 8-9.

Start a new repository

A repository contains all of your project's files, revision history, and collaborator discussion.

moiz381 / name your new repository...

○ Public
Anyone on the internet can see this repository

● Private

Introduce yourself with a profile README

Share information about yourself by creating a profile README, which appears at the top of your profile page.

```
moiz381 / README.md
Hi, I'm @moiz381
I'm interested in ...
I'm currently learning ...
I'm looking to collaborate on ...
```

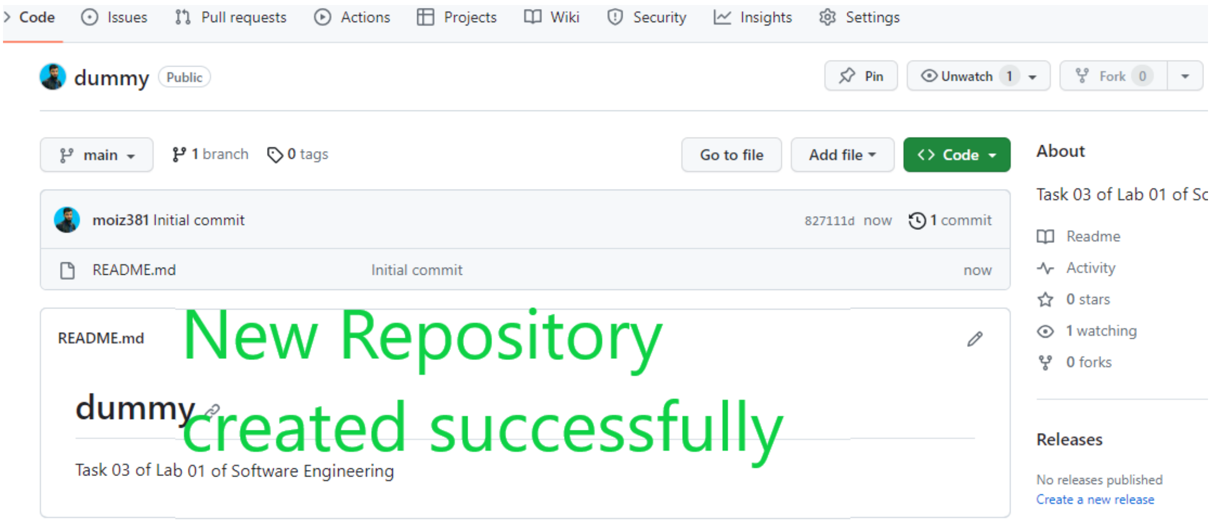
Latest changes

18 hours ago
Actions – Secure deployment rollouts to protected environments based on sele...

2 days ago
GitHub Actions: NODE_OPTIONS is now restricted from GITHUB_ENV

2 days ago
Repository Rules – insight enhancements

New repository created successfully



New Repository created successfully

moiz381 Initial commit — 827111d now — 1 commit

README.md — Initial commit — now

README.md

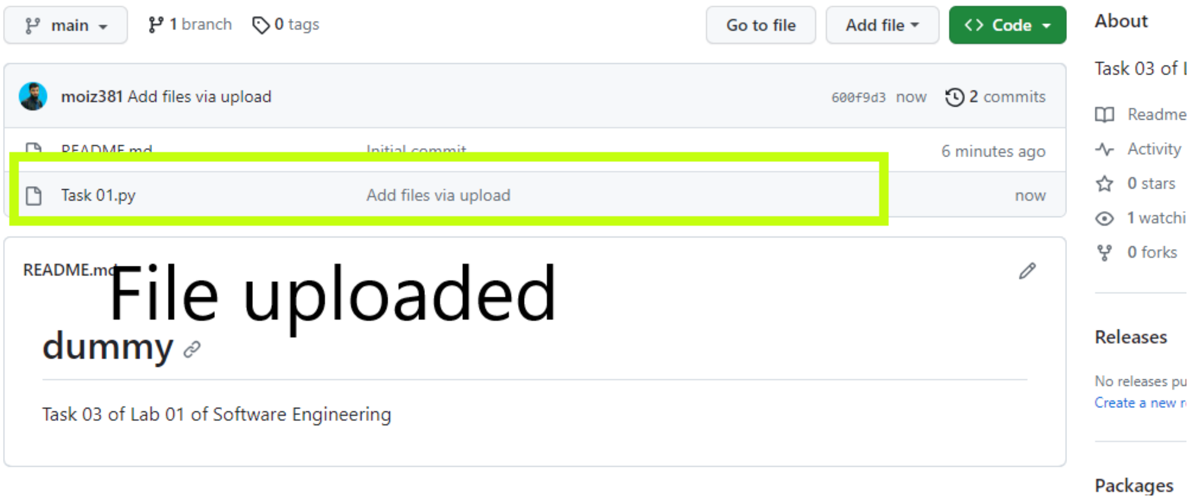
dummy

Task 03 of Lab 01 of Software Engineering

Task 03 of Lab 01 of Sc

No releases published
Create a new release

File is uploaded in the new repository



moiz381 Add files via upload 600f9d3 now 2 commits

README.md	Initial commit	6 minutes ago
Task 01.py	Add files via upload	now

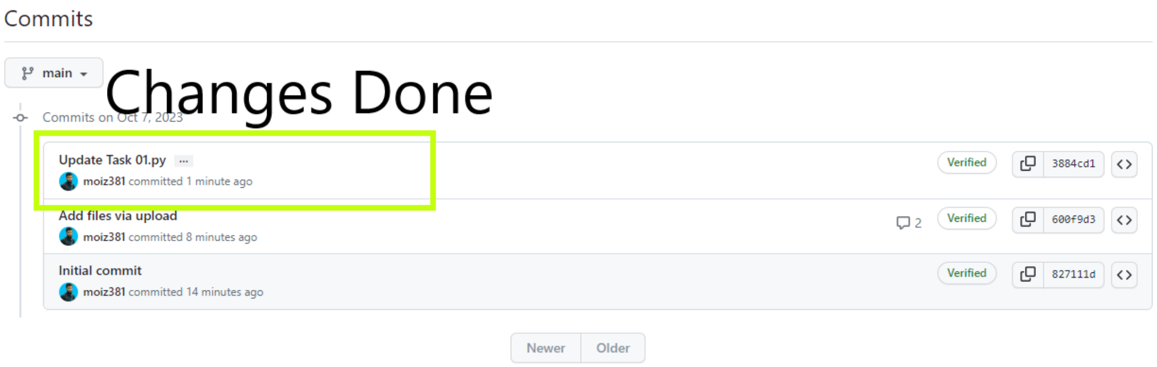
README.md

File uploaded

dummy

Task 03 of Lab 01 of Software Engineering

History showing saved changes in the repository using commit



Changes Done

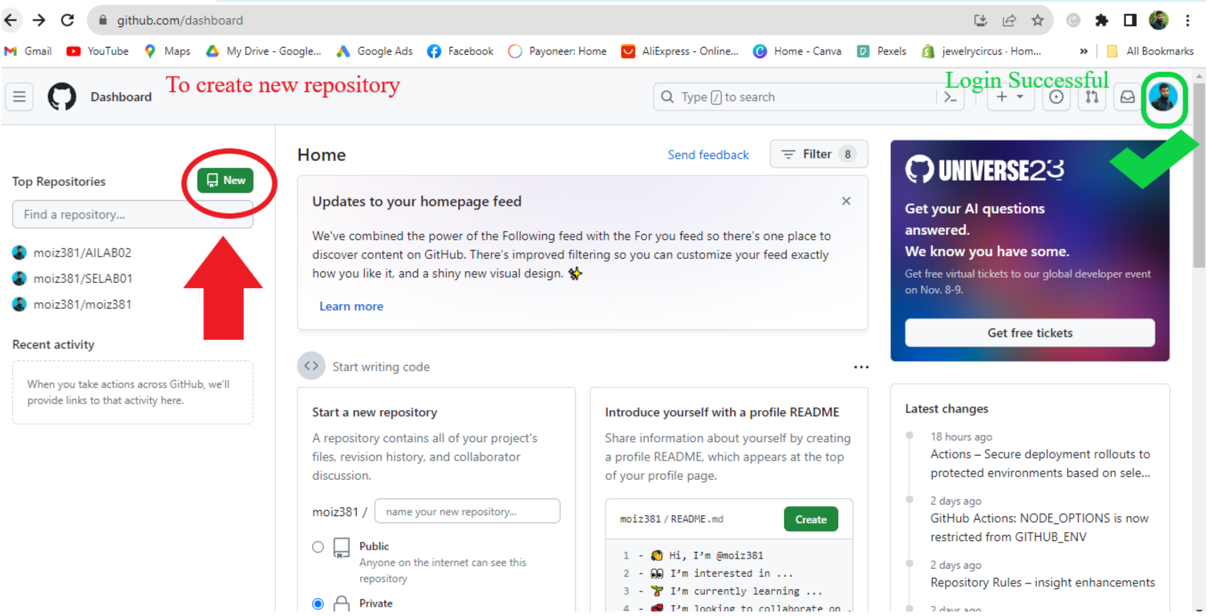
Commits on Oct 7, 2023

Update Task 01.py moiz381 committed 1 minute ago	Verified	3884cd1
Add files via upload moiz381 committed 8 minutes ago	2 Verified	600f9d3
Initial commit moiz381 committed 14 minutes ago	Verified	827111d

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:



To create new repository

Login Successful

github.com/dashboard

Dashboard

Type / to search

Top Repositories

New

Find a repository...

moiz381/AILAB02
moiz381/SELAB01
moiz381/moiz381

Recent activity

When you take actions across GitHub, we'll provide links to that activity here.

Home

Send feedback

Filter 8

Updates to your homepage feed

We've combined the power of the Following feed with the For you feed so there's one place to discover content on GitHub. There's improved filtering so you can customize your feed exactly how you like it, and a shiny new visual design.

Learn more

UNIVERSE23

Get your AI questions answered.
We know you have some.

Get free virtual tickets to our global developer event on Nov. 8-9.

Get free tickets

Start writing code

Start a new repository

A repository contains all of your project's files, revision history, and collaborator discussion.

moiz381 / name your new repository...

○ Public
Anyone on the internet can see this repository

● Private

Introduce yourself with a profile README

Share information about yourself by creating a profile README, which appears at the top of your profile page.

moiz381 / README.md

Create

```
- 👋 Hi, I'm @moiz381
- 👀 I'm interested in ...
- 🌱 I'm currently learning ...
- 💞️ I'm looking to collaborate on ...
```

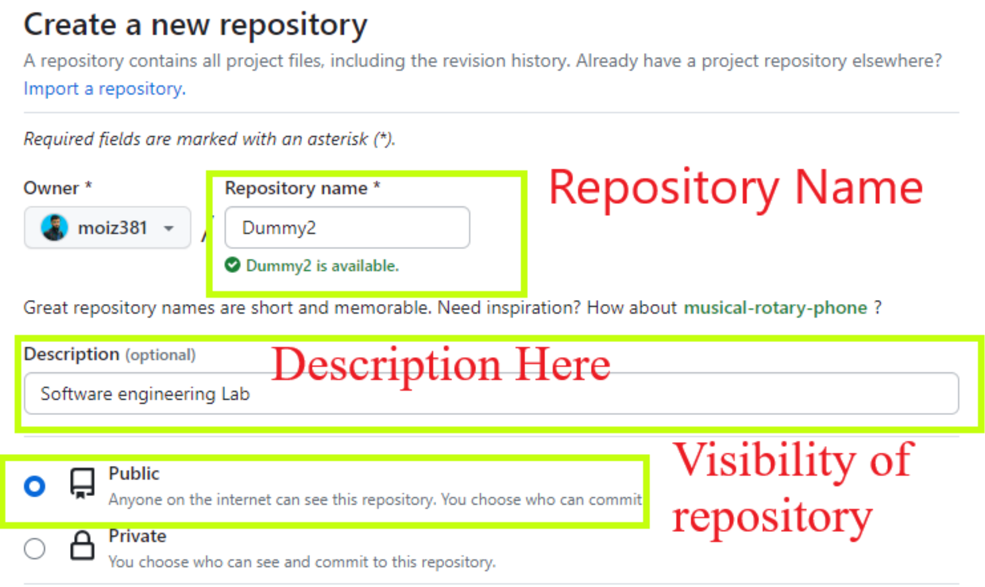
Latest changes

18 hours ago
Actions – Secure deployment rollouts to protected environments based on sele...

2 days ago
GitHub Actions: NODE_OPTIONS is now restricted from GITHUB_ENV

2 days ago
Repository Rules – insight enhancements

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:



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 * moiz381 / Repository name * Dummy2

Dummy2 is available.

Repository Name

Great repository names are short and memorable. Need inspiration? How about musical-rotary-phone ?

Description (optional): Software engineering Lab

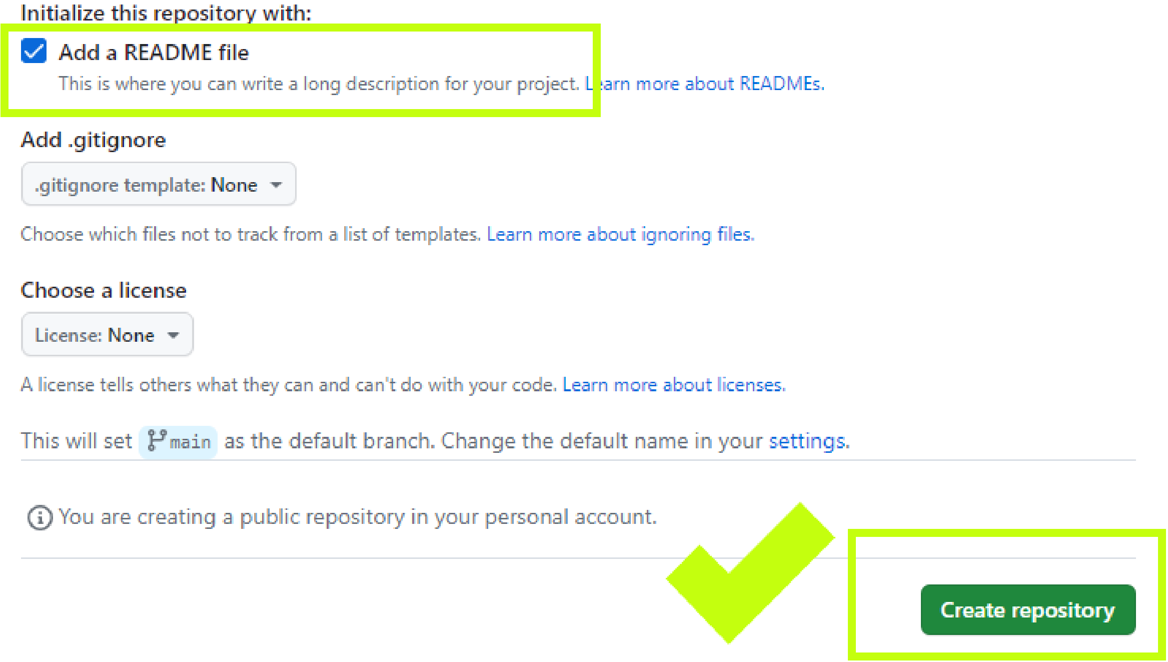
Description Here

● 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.

Visibility of repository

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

Choose which files not to track from a list of templates. Learn more about ignoring files.

Choose a license

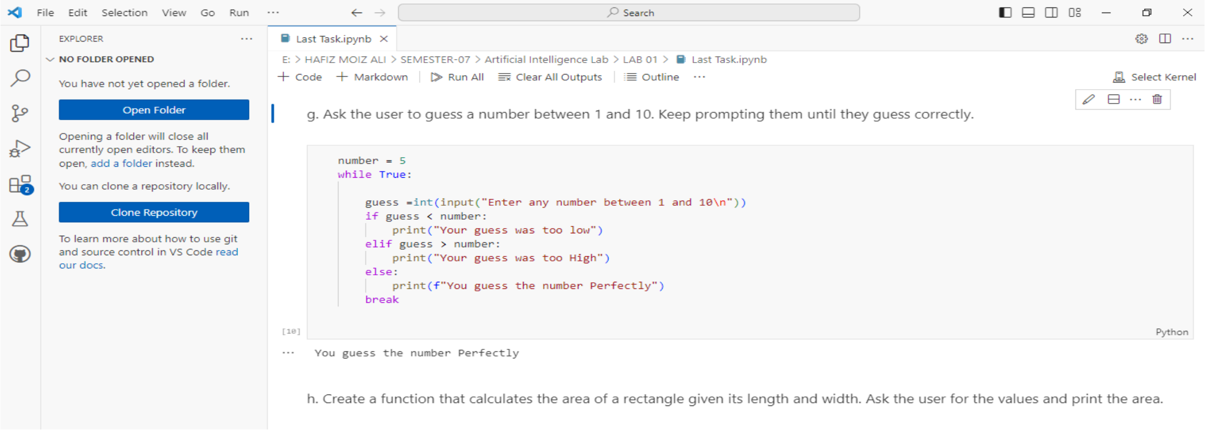
A license tells others what they can and can't do with your code. Learn more about licenses.

This will set main as the default branch. Change the default name in your settings.

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

Task 5:

VSCode File



You have not yet opened a folder.

Opening a folder will close all currently open editors. To keep them open, add a folder instead.

You can clone a repository locally.

To learn more about how to use git and source control in VS Code read our docs.

E: > HAFIZ MOIZ ALI > SEMESTER-07 > Artificial Intelligence Lab > LAB 01 > Last Task.ipynb

g. Ask the user to guess a number between 1 and 10. Keep prompting them until they guess correctly.

```python
number = 5
while True:

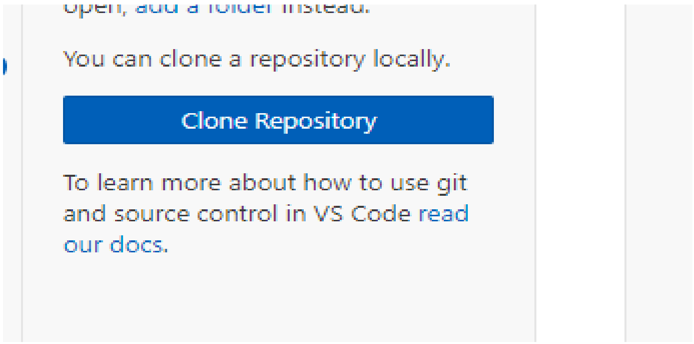
    guess =int(input("Enter any number between 1 and 10\n"))
    if guess < number:
        print("Your guess was too low")
    elif guess > number:
        print("Your guess was too High")
    else:
        print(f"You guess the number Perfectly")
    break
```

[10]

```
You guess the number Perfectly
```

h. Create a function that calculates the area of a rectangle given its length and width. Ask the user for the values and print the area.

Clone Repository



open, add a folder instead.

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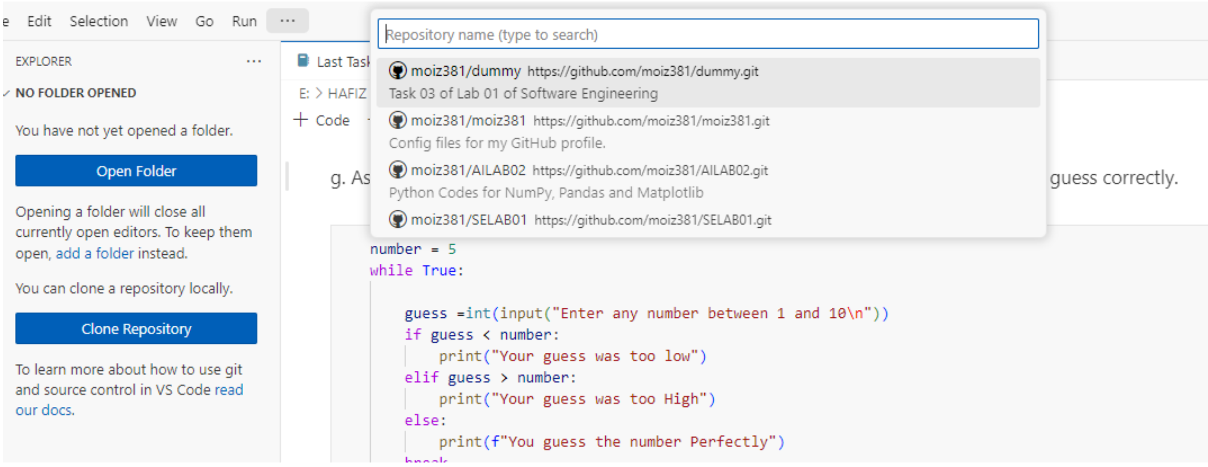
Connecting to Specific Repository



Repository name (type to search)

moiz381/dummy https://github.com/moiz381/dummy.git
Task 03 of Lab 01 of Software Engineering

moiz381/moiz381 https://github.com/moiz381/moiz381.git
Config files for my GitHub profile.

moiz381/AILAB02 https://github.com/moiz381/AILAB02.git
Python Codes for NumPy, Pandas and Matplotlib

moiz381/SELAB01 https://github.com/moiz381/SELAB01.git

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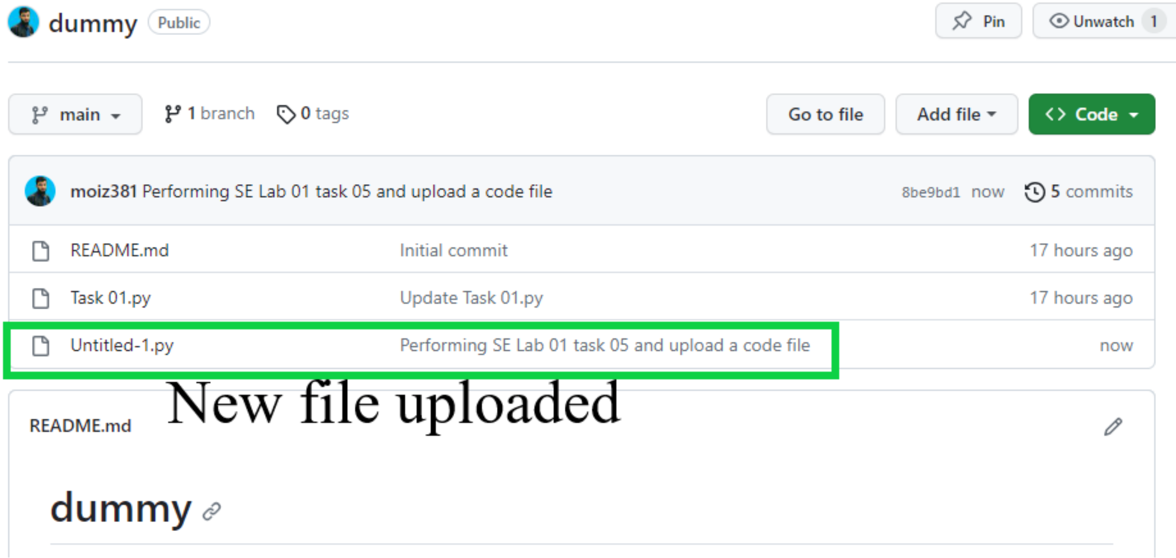
        print("Your guess was too High")
    else:
        print(f"You guess the number Perfectly")
```

Uploaded new file Done



moiz381 Performing SE Lab 01 task 05 and upload a code file 8be9bd1 now 5 commits

README.md	Initial commit	17 hours ago
Task 01.py	Update Task 01.py	17 hours ago
Untitled-1.py	Performing SE Lab 01 task 05 and upload a code file	now

New file uploaded

README.md

dummy

………The End………