Experiment no: 2

Aim: To understand Version Control System / Source Code Management, install git and create a GitHub account.

Theory:

A Version Control System (VCS) is a tool that helps developers manage changes to source code over time. It allows multiple people to collaborate on the same project, tracks changes made to files, and provides mechanisms for reverting to previous versions, branching, merging, and much more.

Source Code Management (SCM) is often used interchangeably with VCS. It involves managing and tracking the source code of a project, which allows for easy collaboration and ensures that every change made can be documented and reversed if needed.

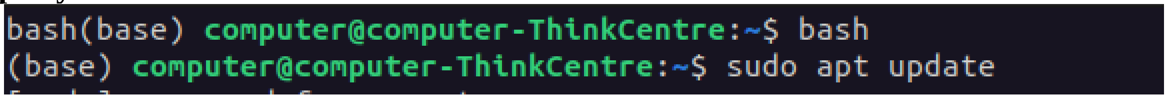
Key concepts:

1. Repository (Repo): A project directory where your source code is stored. A repository can be local (on your computer) or remote (on a server or GitHub).
2. Commit: A snapshot of the changes made to the code. Each commit has a unique identifier (hash) and a message describing the changes.
3. Branch: A copy of the code that allows you to work on a separate task or feature without affecting the main codebase.
4. Merge: Combining changes from two branches into one.
5. Clone: Creating a local copy of a remote repository.
6. Push and Pull: Push is sending changes from your local repository to the remote one, and Pull is fetching the latest changes from the remote repository to your local one.

Steps to install git and create a GitHub account:

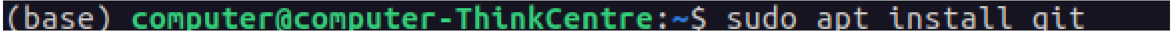
1. Open your terminal

2.

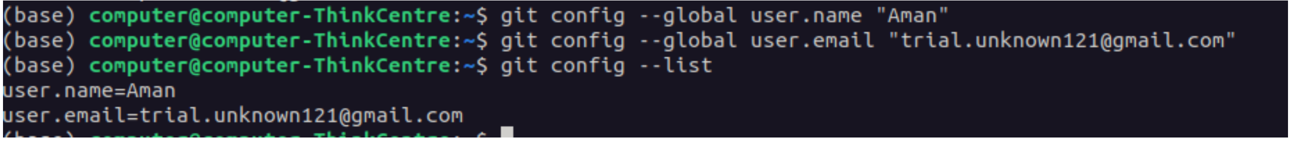


```
bash(base) computer@computer-ThinkCentre:~$ bash
(base) computer@computer-ThinkCentre:~$ sudo apt update
```

Setting up Git after installation:



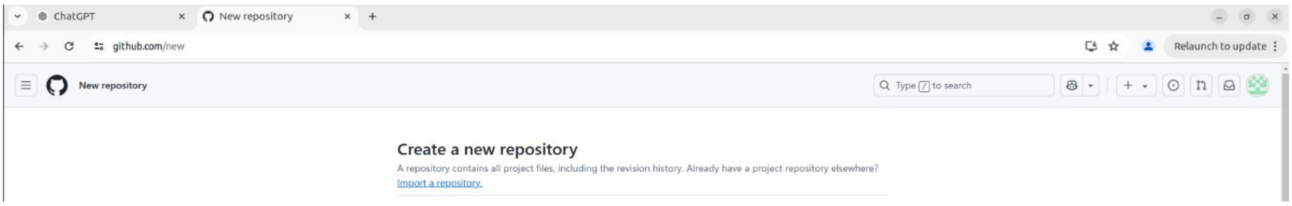
```
(base) computer@computer-ThinkCentre:~$ sudo apt install git
```



```
(base) computer@computer-ThinkCentre:~$ git config --global user.name "Aman"
(base) computer@computer-ThinkCentre:~$ git config --global user.email "trial.unknown121@gmail.com"
(base) computer@computer-ThinkCentre:~$ git config --list
user.name=Aman
user.email=trial.unknown121@gmail.com
```

3. Creating a GitHub Account:

- Go to https://github.com and click on Sign Up.
- Fill in the required details (username, email, and password).
- Follow the instructions to verify your email address and complete the registration.
- Once registered, you can log in to GitHub.



Create a new repository

A repository contains all project files, including the revision history. Already have a project repository elsewhere? Import a repository.

4. Linking Git with GitHub:

Generate SSH Key (to avoid entering your username and password each time you push to GitHub):

- Open Git Bash or Terminal.

- Run the following command (replace "your_email@example.com" with your GitHub email):
ssh-keygen -t rsa -b 4096 -C "your_email@example.com"

- Press Enter to accept the default file location.

- Enter a passphrase if you want (or leave it blank).

Add SSH Key to GitHub:

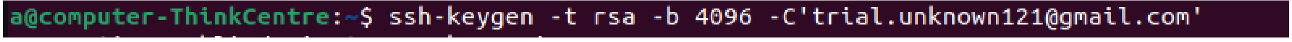
- Copy the SSH key to your clipboard:
  cat ~/.ssh/id_rsa.pub

- Log in to your GitHub account, go to Settings > SSH and GPG Keys, and click New SSH Key.
- Paste your key into the field and click Add SSH Key.

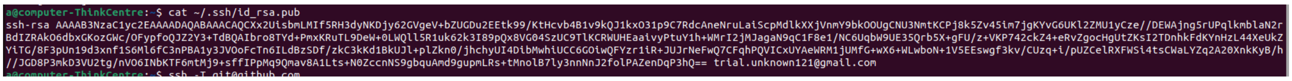
Test the connection:

ssh -T git@github.com

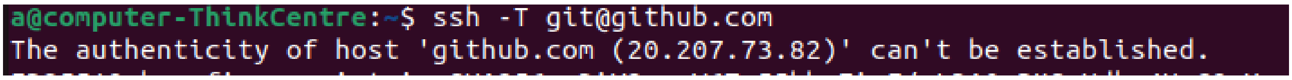
You should see a message confirming the connection.



```
a@computer-ThinkCentre:~$ ssh-keygen -t rsa -b 4096 -C'trial.unknown121@gmail.com'
```



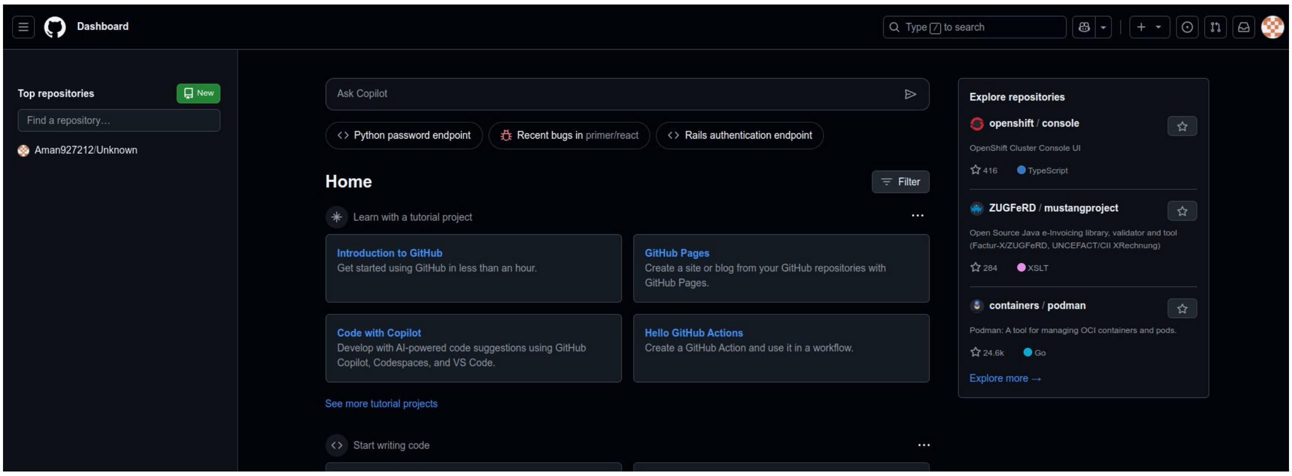
```
a@computer-ThinkCentre:~$ cat ~/.ssh/id_rsa.pub
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAACAQCXx2UisbmLMIf5RH3dyNKDjy62GVgeV+bZUGDu2EEtk99/KtHcvb4B1v9kQJ1kxO31p9C7RdcAneNruLaiScpMdlkXXjVnmY9bkOOUgCNU3NmtKCPj8k5Zv45im7jgKYvG6UKl2ZMU1yCze//DEWAjng5rUPqlkmblaN2r
BdIZRAkO6dbxGKozGWc/OFypfoQJZ2Y3+TdBQAIbro8TYd+PmxKRuTL9DeW+0LWQll5R1uk62k3I89pQx8VG04SzUC9TlKCRWUHEaaivyPtuY1h+WMrI2jMJagaN9qC1F8e1/NC6UqbW9UE35Qrb5X+gFU/z+VKP742ckZ4+eRvZgocHgUtZKsI2TDnhkFdKYnHzL44XeUkZ
YiTG/8F3pUn19d3xnf1S6Ml6fC3nPBA1y3JVOoFcTn6ILdBzSDf/zkC3kKd1BkUJl+plZkn0/jhchyUI4DibMwhiUCC6GOiwQFYzr1iR+JUJrNeFwQ7CFqhPQVICxUYAeWRM1jUMfG+wX6+WLwboN+1V5EEswgf3kv/CUzq+i/pUZCelRXFWSi4tsCWaLYZq2A20XnkKyB/h
//JGD8P3mkD3VU2tg/nVO6INbKTF6mtMj9+sffIPpMq9Qmav8A1Lts+N0ZccnNS9gbquAmd9gupmLRs+tMnolB7ly3nnNnJ2folPAZenDqP3hQ== trial.unknown121@gmail.com
a@computer-ThinkCentre:~$ ssh -T git@github.com
```



```
a@computer-ThinkCentre:~$ ssh -T git@github.com
The authenticity of host 'github.com (20.207.73.82)' can't be established.
```

5. Creating a New Repository on GitHub:

- Log in to your GitHub account.
- In the top-right corner, click the + icon and select New repository.
- Name your repository, choose public or private, and click Create repository.



Get started using GitHub in less than an hour.

Create a site or blog from your GitHub repositories with GitHub Pages.

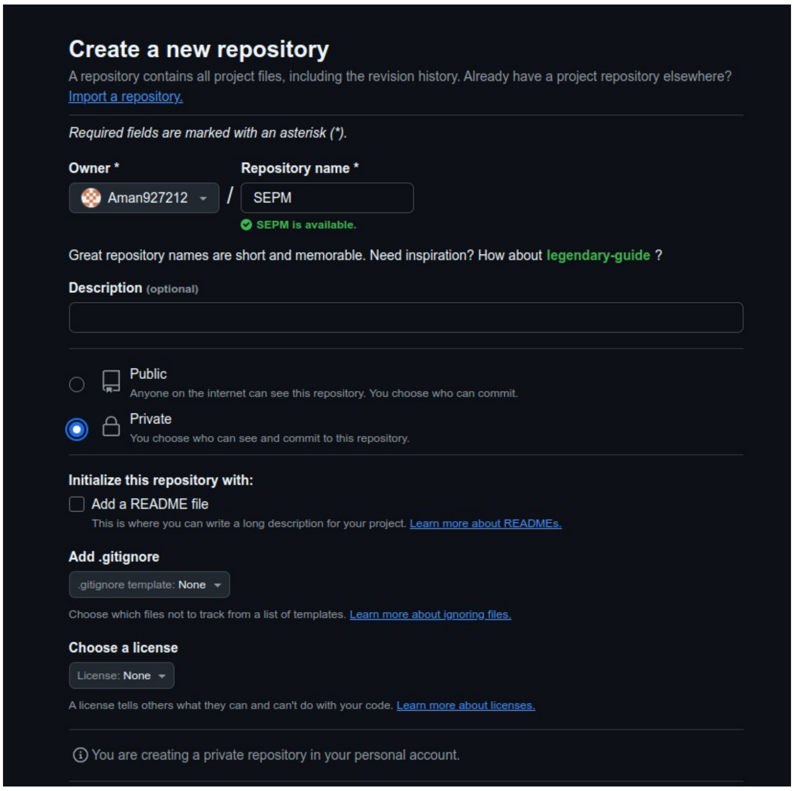
Develop with AI-powered code suggestions using GitHub Copilot, Codespaces, and VS Code.

Create a GitHub Action and use it in a workflow.

OpenShift Cluster Console UI

Open Source Java e-Invoicing library, validator and tool (Factur-X/ZUGFeRD, UNCEFACT/CII XRechnung)

Podman: A tool for managing OCI containers and pods.



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 * Aman927212 / **Repository name *** SEPM

SEPM is available.

Great repository names are short and memorable. Need inspiration? How about legendary-guide ?

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

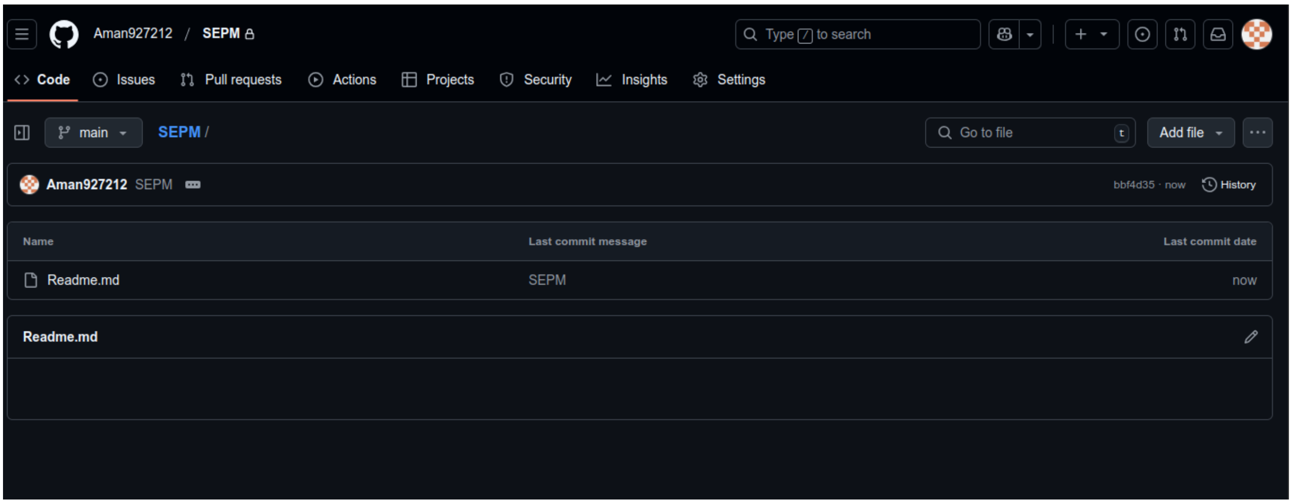
Choose which files not to track from a list of templates. Learn more about ignoring files.

Choose a license

License: None

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

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



Aman927212 SEPM bbf4d35 · now

Name	Last commit message	Last commit date
Readme.md	SEPM	now

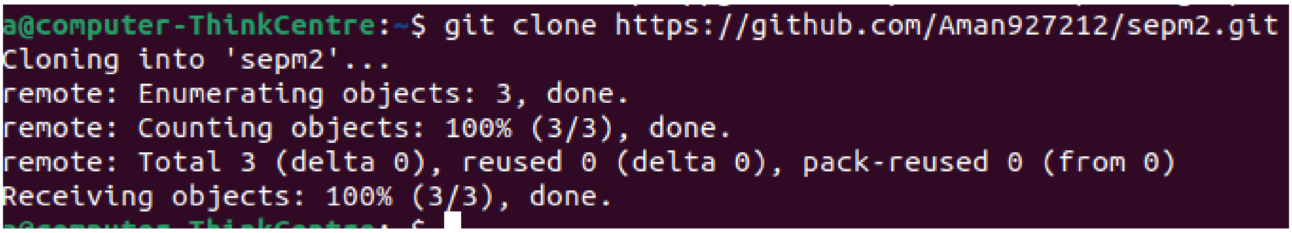
Readme.md

6. Cloning the Repository to Your Local Machine:

•Go to your new repository page on GitHub.

•Click the green Code button, and copy the URL (either HTTPS or SSH).

•Open Git Bash or Terminal and run the following command (replace with your repository's URL)A



```
a@computer-ThinkCentre:~$ git clone https://github.com/Aman927212/sepm2.git
Cloning into 'sepm2'...
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
Receiving objects: 100% (3/3), done.
a@computer-ThinkCentre:~$
```

7. Making Changes, Committing, and Pushing:

After editing files in your repository locally, use the following commands:

- **Check status:**

```
git status
```

- **Add changes to the staging area:**

```
git add .
```

- **Commit the changes with a message:**

```
git commit -m "Your commit message"
```

- **Push the changes to GitHub:**

```
git push origin main
```

Conclusion:

By following these steps, you can install Git, create a GitHub account, and start using version control to manage your projects efficiently. Git and GitHub are essential tools for modern software development and allow for effective collaboration and code management.