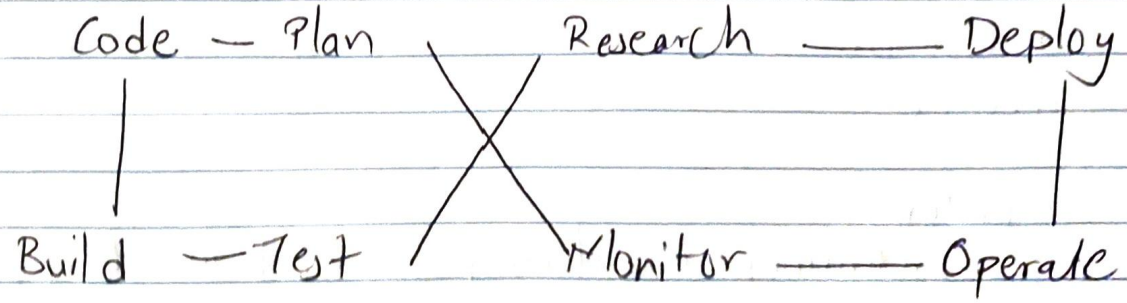
Aanya Thakur
T22 114

SEPM Experiment 1

AIM-
To understand DevOps, principles Practices and DevOps values and responsibilities

Theory
Devops is a combination of two words, Development and Operations. It is a culture to promote the development and operation process collectively
Helps increase the organization's speed to deliver applications and services. Also allows orgs to serve their customers better and complete more strongly in the market.
DevOps can also be defined as a sequence of development and IT operations with better communication and collaboration.
DevOps has become one of the most valuable business disciplines for enterprises or organizations
With the help of Devops quality and speed of the application delivery has improved to a greater extent



Build

Without devops the cost of consumption of the resources was evaluated based on the predefined individual ~~usage~~ usage with fixed hardware allocation

Devops the usage of cloud sharing the resources come into the picture and the build is independent upon us needs which is a mechanism to control resources

Code

Many good practices such as Git enable the code to be used which ensures writing the code for business, helps to track changes getting notified about the reason behind the difference in actual and expected code.

Test

Application will be ready for production after testing In the case of manual testing it consumes more time in testing and moving the code to the output The testing can be automated which decreases the time so that the time to deploy code can be reduced

Monitor.

Continuous monitoring is used to identify any risk of failure. Also it helps in tracking the system accurately so that

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Advantages

DevOps is an excellent approach for quick development and deployment of applications

Responds faster to the market changes to improve business growth.

~~Cated.~~

Escalate business profit by decreasing software delivery time and costs

Disadvantages

Devops professionals or expert developers are less available

Developing with Devops is expensive

Adoption of new technology is hard

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Deploy-
Many systems support the scheduler for automated deployment. The cloud management platform enables users to capture accurate insights and view the optimization scenario analytics on trends by the deployment of dashboards.

Operate
Devops changes the traditional approach of developing and testing seperately. The teams operate in a collaborative way where both the teams actively participate throughout the service lifecycle. The operation team interacts with developers and they come up with a monitoring plan which serves business requirements.

Release
Deployment to an environment can be done by automation. But when deployment is made to production environment, it is done by manual trigering. Many processes involved in release management commonly used to do the deployment.

Principles
Collaboration
Data Based Decision Making
Customer Centric Decision Making
Constant Improvement

Name : Aarya Thakur
T22
Roll No: 114

EXPERIMENT 2

TO UNDERSTAND VERSION CONTROL SYSTEM / SOURCE CODE MANAGEMENT, INSTALL GIT AND CREATE A GITHUB ACCOUNT

THEORY:

What Is Version Control?

A version control system, also known as source control or revision control, tracks changes made to files over time, allowing users to retrieve specific versions when needed. While it can be applied in various scenarios, it is most commonly used in software development.

What is Git?

- Git is a free and open-source distributed version control system designed to handle projects of all sizes with speed and efficiency.
- It enables collaborative software development, allowing multiple developers to modify source code while tracking changes.
- Git was initially designed and developed by Linus Torvalds for Linux kernel development in 2005.
- Every Git working directory is a full-fledged repository with complete history and version tracking, independent of network access or a central server.
- Git enables teams to work on the same files simultaneously, resolving conflicts and maintaining version history.

What Is GitHub?

GitHub is a web-based platform that hosts software development projects and integrates with Git for version control. It provides a user-friendly interface and collaborative tools to enhance project management.

- It allows developers to create, manage, and access repositories remotely.
- GitHub is essentially a collection of repositories that store project files and enable seamless collaboration.

Use of Version Control Software

- Allows users to track different versions of a project and revert changes when necessary.
- Helps in comparing versions, debugging, and recovering lost data.

- Saves changes as patch files that can be applied to previous versions. - Stores all versions on a central server, where developers can check out and update their work.

Use Cases of GitHub

1. Version Control Allows developers to revert to previous versions when changes affect the project negatively.
2. Collaboration & Code Review Enables teams to review each other's code, improving productivity and efficiency.
3. Issue Tracking Developers can assign issues to team members and track progress. 4. Open-Source Development GitHub is widely used for open-source projects, allowing public contributions.

Characteristics of Git

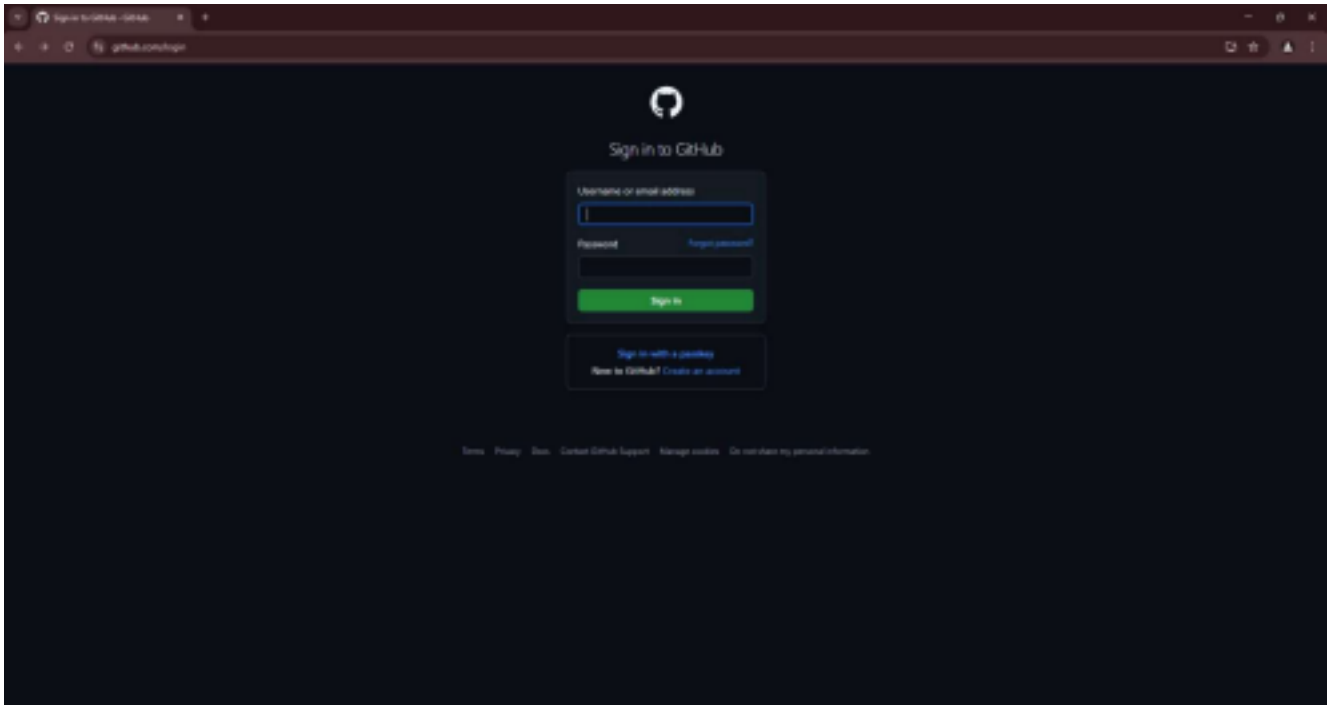
1. Strong Support for Non-Linear Development
   - Supports rapid branching and merging.
   - Changes are merged frequently.
   - Lightweight branches make development faster.
2. Distributed Development
   - Every developer gets a local copy of the repository.
   - Changes can be merged efficiently between repositories.
3. Compatibility with Existing Systems
   - Git supports CVS server emulation, allowing existing CVS clients to access Git repositories.
4. Efficient Handling of Large Projects
   - Faster and more scalable than other version control systems.
   - Fetching data from a local repository is quicker than from a remote server. 5. Data Assurance
   - Git stores history in a way that ensures integrity—old versions cannot be changed unnoticed.
6. Automatic Garbage Collection
   - Git performs automatic garbage collection when enough loose objects are created. - Can be explicitly triggered using git gc --prune.
7. Periodic Explicit Object Packing
   - Git stores objects as separate files, later compressed into a packfile. - This improves performance but is computationally expensive.

How Does Git Work?

- A Git repository is a key-value store where all objects are indexed by their SHA-1 hash.
- Objects include commits, files, tags, and tree nodes.
- Git works by taking snapshots of files at different points in time.

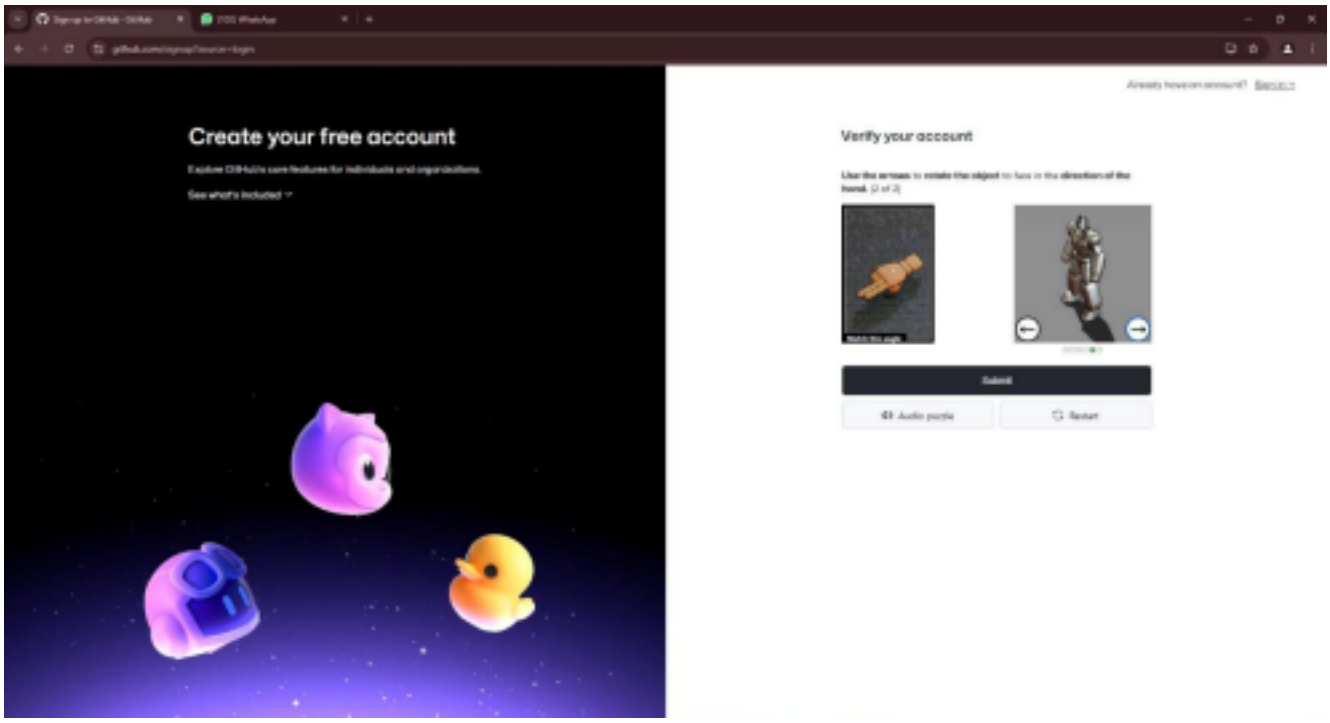
Steps to Creating a GitHub Account

1. Open a web browser and go to GitHub Signup.

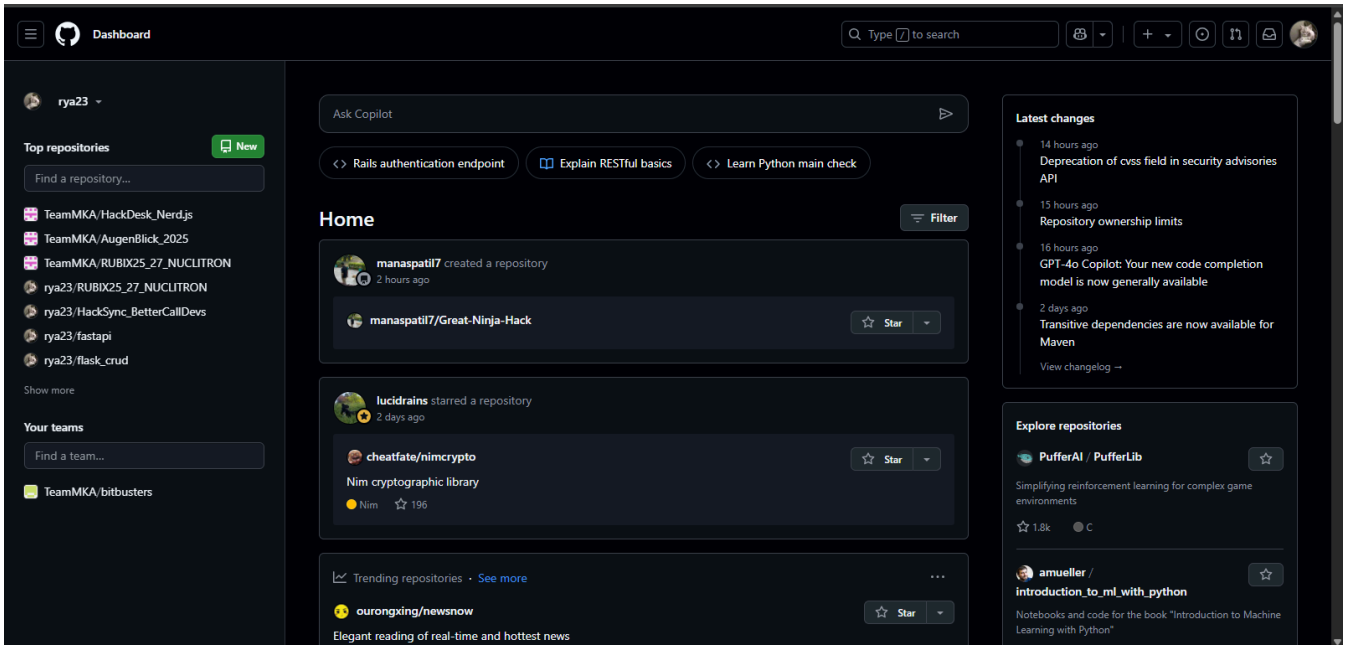


2. Enter a unique username. Provide a valid email address. Create a strong password.

3. Click "Create account". Complete the CAPTCHA verification.



4. Choose your email preferences and click "Continue".
5. Verify your email by clicking the link sent to your registered email address. 6. Set up your profile (optional) and Select Free plan



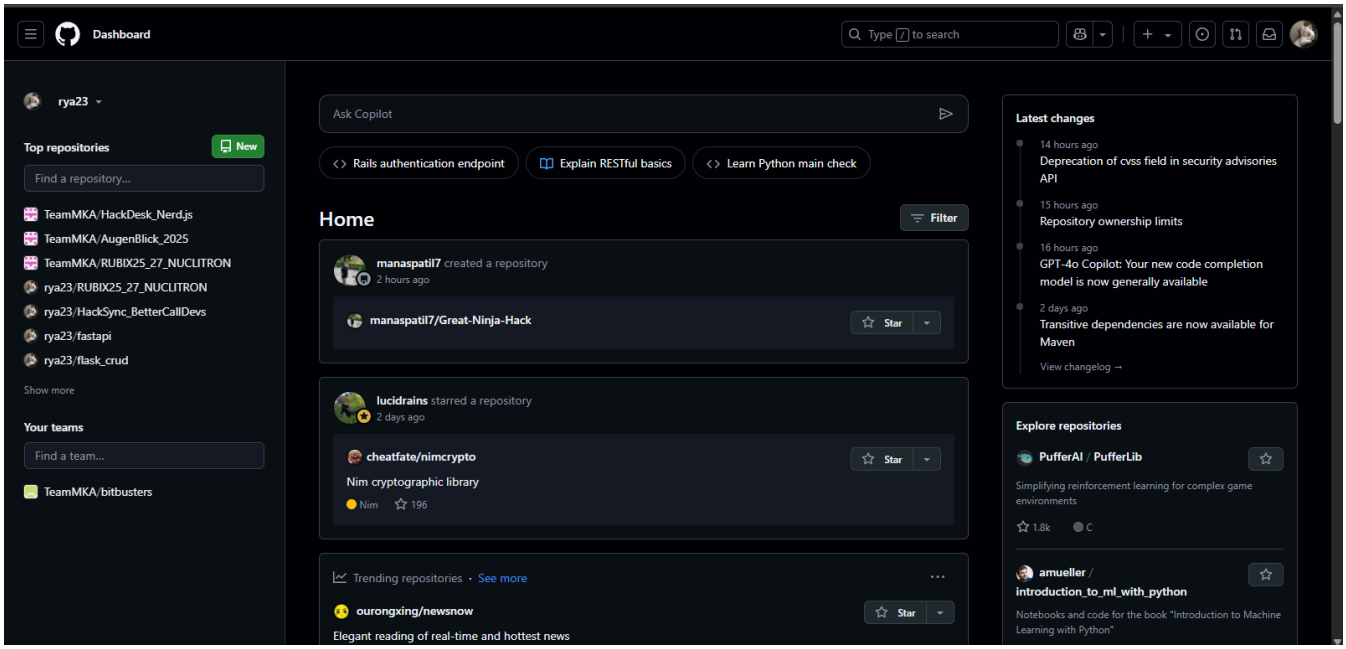
7. Your GitHub account is now ready to use!

Steps to Create a Repository on GitHub

1. Log in to GitHub:
    - Go to GitHub and sign in to your account.

2. Navigate to Repositories:

- o Click on your profile icon (top-right corner) and select "Your repositories" from the dropdown.
- o Alternatively, click on the "+" icon in the top-right corner and select "New repository".



3. Create a New Repository:

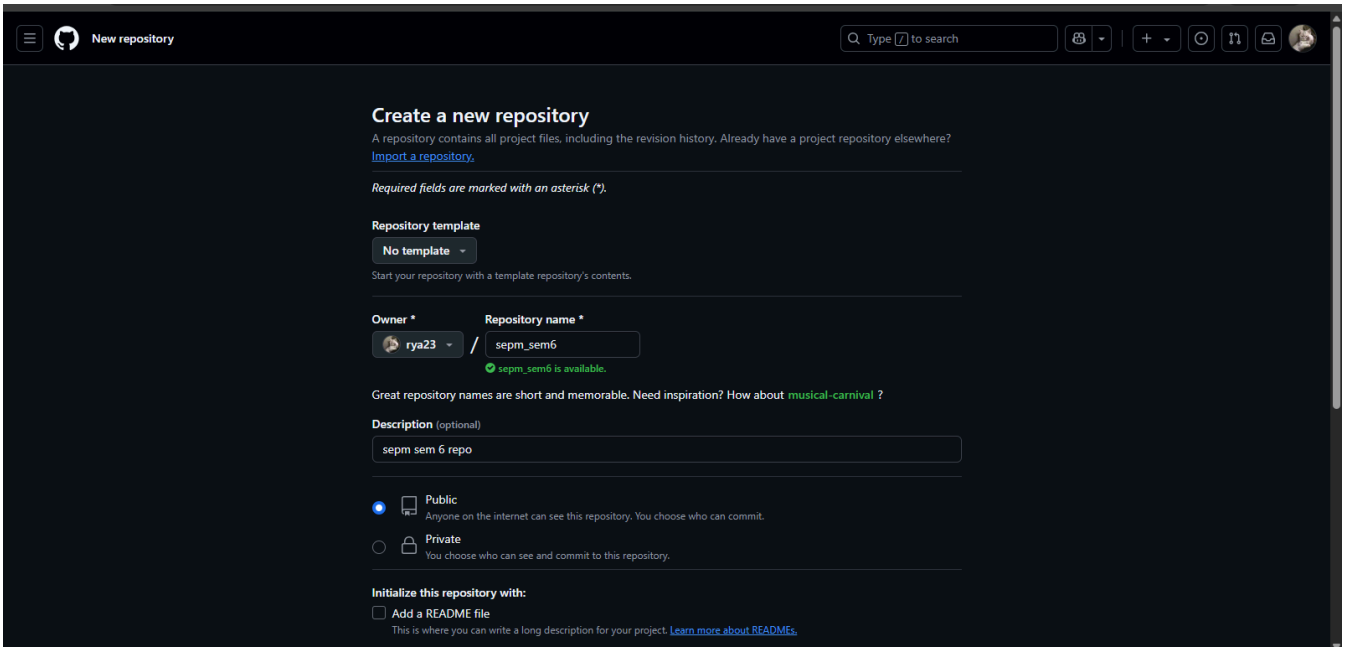
- o Enter a repository name (e.g., my-project).
- o Optionally, add a description.
- o Choose the visibility:
  - Public (anyone can see your repository).
  - Private (only you and collaborators can access it).

4. Initialize the Repository (Optional):

- o You can check "Add a README file" to include a basic introduction. o Optionally, add a .gitignore file for excluding certain files from tracking. o Choose a license if needed.

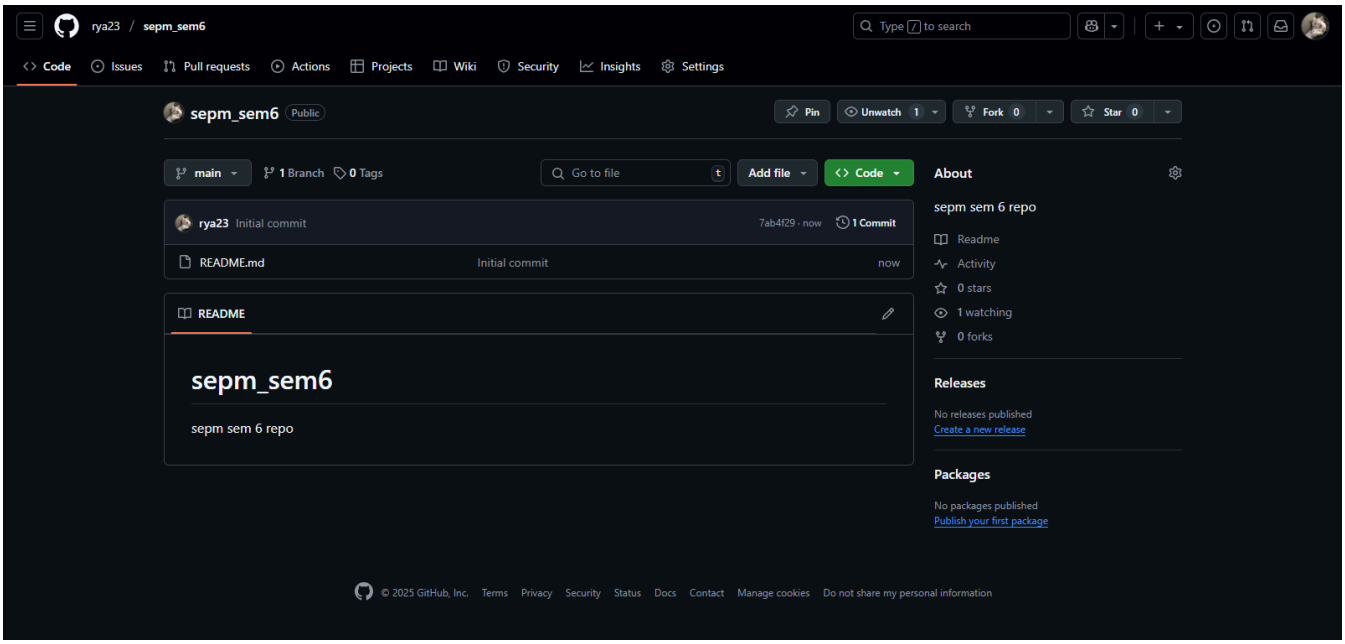
5. Create the Repository:

- o Click the "Create repository" button.



6. Set Up Locally (Optional):
   - o Copy the repository URL and use Git to clone it:
   - o git clone https://github.com/your-username/your-repository.git o
   - Navigate to the folder and start working on your project!

Now your repository is ready to use! ��



Name : Aarya Thakur
T22
Roll No: 114

EXPERIMENT – 3

AIM - To Perform various GIT operations on local and Remote repositories using GIT Cheat- Sheet

```
15L@203-06 MINGW64 ~/Desktop/aarya-git (master) $
git config --global user.name "aarya"

15L@203-06 MINGW64 ~/Desktop/aarya-git (master)
$ git config --global user.email aarya48.shah@gmail.com

15L@203-06 MINGW64 ~/Desktop/aarya-git (master)
$ git config --global --list
user.name=aarya
user.email=aarya48@gmail.com

15L@203-06 MINGW64 ~/Desktop/aarya-git (master)
$ mkdir git-demo-project

15L@203-06 MINGW64 ~/Desktop/aarya-git (master)
$ cd git-demo-project

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git init
Initialized empty Git repository in C:/Users/15L/Desktop/aarya-git/git-demo-
project/.git/

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ ls -a
./ ../ .git/

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ rm -rf .git/

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ rm -rf .git

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ ls -al
total 0
drwxr-xr-x 1 15L 197121 0 Jan 23 13:40 ./
drwxr-xr-x 1 15L 197121 0 Jan 23 13:39 ../

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git init
```

```
Initialized empty Git repository in C:/Users/15L/Desktop/aarya-git/git-demo-
project/.git/

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git add .

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git status
On branch master

No commits yet

Changes to be committed:
   (use "git rm --cached <file>..." to unstage)
         new file:       sample.txt


15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git commit -m "first commit"
[master (root-commit) d489bcf] first commit
 1 file changed, 0 insertions(+), 0 deletions(-)
 create mode 100644 sample.txt

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git status
On branch master
Untracked files:
   (use "git add <file>..." to include in what will be committed)
         index.html

nothing added to commit but untracked files present (use "git add" to track)

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git add .

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git status
On branch master
Changes to be committed:
   (use "git restore --staged <file>..." to unstage)
         new file:       index.html


15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git commit -am "express commit"
[master bef012b] express commit
 1 file changed, 0 insertions(+), 0 deletions(-)
 create mode 100644 index.html
```

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master) $
git status On branch master nothing to commit, working tree clean

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git log
commit bef012be210dc3856730420ce2228425d43e58f5 (HEAD -> master)
Author: aarya <aarya48.shah@gmail.com>
Date: Tue Jan 23 13:43:06 2024 +0530

    express commit

commit d489bcf61da3943db131c6d0274d9eac00737319
Date: Tue Jan 23 13:41:06 2024 +0530
Author: aarya <aarya48.shah@gmail.com>

    first commit

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ nano index.html

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git status
On branch master
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
        modified: index.html

no changes added to commit (use "git add" and/or "git commit -a")

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git log
commit bef012be210dc3856730420ce2228425d43e58f5 (HEAD -> master)
Author: aarya <aarya48.shah@gmail.com>
Date: Tue Jan 23 13:43:06 2024 +0530

    express commit

commit d489bcf61da3943db131c6d0274d9eac00737319
Date: Tue Jan 23 13:41:06 2024 +0530
Author: aarya <aarya48.shah@gmail.com>

    first commit

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)

```
$ touch teststatus

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git status
On branch master
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
        modified:   index.html

Untracked files:
  (use "git add <file>..." to include in what will be committed)
        teststatus

no changes added to commit (use "git add" and/or "git commit -a")

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git checkout -- teststatus
error: pathspec 'teststatus' did not match any file(s) known to git

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git checkout --index.html
error: unknown option `index.html'
usage: git checkout [<options>] <branch>
   or: git checkout [<options>] [<branch>] -- <file>...

    -b <branch>           create and checkout a new branch
    -B <branch>           create/reset and checkout a branch
    -l                    create reflog for new branch
    --guess               second guess 'git checkout <no-such-branch>' (default)
    --overlay             use overlay mode (default)
    -q, --quiet           suppress progress reporting
    --recurse-submodules[=<checkout>]
                          control recursive updating of submodules
    --progress            force progress reporting
    -m, --merge           perform a 3-way merge with the new branch
    --conflict <style>    conflict style (merge, diff3, or zdiff3)
    -d, --detach          detach HEAD at named commit
    -t, --track[=(direct|inherit)]
                          set branch tracking configuration
    -f, --force           force checkout (throw away local modifications)
    --orphan <new-branch>
                          new unparented branch
    --overwrite-ignore    update ignored files (default)
    --ignore-other-worktrees
                          do not check if another worktree is holding the given ref
    -2, --ours            checkout our version for unmerged files
    -3, --theirs          checkout their version for unmerged files
```

```
    -p, --patch           select hunks interactively
    --ignore-skip-worktree-bits
                          do not limit pathspecs to sparse entries only
    --pathspec-from-file <file>
                          read pathspec from file
    --pathspec-file-nul   with --pathspec-from-file, pathspec elements are separated
with NUL character


15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git add index.html
warning: in the working copy of 'index.html', LF will be replaced by CRLF the next
time Git touches it

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git status
On branch master
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        modified:   index.html

Untracked files:
  (use "git add <file>..." to include in what will be committed)
        teststatus


15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git add teststatus

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git status
On branch master
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        modified:   index.html
        new file:   teststatus


15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git commit -am "express commit"
[master 298a0e6] express commit
 2 files changed, 1 insertion(+)
 create mode 100644 teststatus

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git status
On branch master
nothing to commit, working tree clean
```

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master) $
git log commit 298a0e6689dd8b9d98ebc4e5413441e244b1036d (HEAD ->
master) Author: aarya <aarya48.shah@gmail.com>

Date: Tue Jan 23 13:48:37 2024 +0530

    express commit

commit

bef012be210dc3856730420ce2228425d43e58f5
Date: Tue Jan 23 13:43:06 2024 +0530
Author: aarya <aarya48.shah@gmail.com>

    express commit

commit

d489bcf61da3943db131c6d0274d9eac00737319
Date: Tue Jan 23 13:41:06 2024 +0530
Author: aarya <aarya48.shah@gmail.com>

    first commit

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git log --oneline
298a0e6 (HEAD -> master) express commit
bef012b express commit
d489bcf first commit

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git remote add origin https://github.com/aarya-tsec/SEPM.git

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ rm -rf ^C

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ rm -rf https://github.com/aarya-tsec/SEPM.git

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git remote add origin https://github.com/aarya-tsec/EXP3.git
error: remote origin already exists.

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git origin
git: 'origin' is not a git command. See 'git --help'.

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git show origin
fatal: ambiguous argument 'origin': unknown revision or path not in the working tree.
Use '--' to separate paths from revisions, like this:

```
'git <command> [<revision>...] -- [<file>...]'

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git remote show origin
* remote origin
    Fetch URL: https://github.com/aarya-tsec/SEPM.git
    Push  URL: https://github.com/aarya-tsec/SEPM.git
    HEAD branch: (unknown)

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git remote remove origin

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git remote show origin
fatal: 'origin' does not appear to be a git repository
fatal: Could not read from remote repository.

Please make sure you have the correct access rights
and the repository exists.

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git remote add origin https://github.com/aarya-tsec/EXP3.git

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git remote show origin
* remote origin
    Fetch URL: https://github.com/aarya-tsec/EXP3.git
    Push  URL: https://github.com/aarya-tsec/EXP3.git
    HEAD branch: (unknown)

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (master)
$ git branch -M main

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (main)
$ git push -u origin main
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
Delta compression using up to 20 threads
Compressing objects: 100% (5/5), done.
Writing objects: 100% (8/8), 691 bytes | 691.00 KiB/s, done.
Total 8 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/aarya-tsec/EXP3.git
 * [new branch]      main -> main
branch 'main' set up to track 'origin/main'.

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (main)
$ git pull
Already up to date.
```

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (main) $
git pull remote: Enumerating objects: 5, done. remote: Counting
objects: 100% (5/5), done. remote: Compressing objects: 100% (2/2),
done. remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (3/3), 957 bytes | 239.00 KiB/s, done. From
https://github.com/aarya-tsec/EXP3

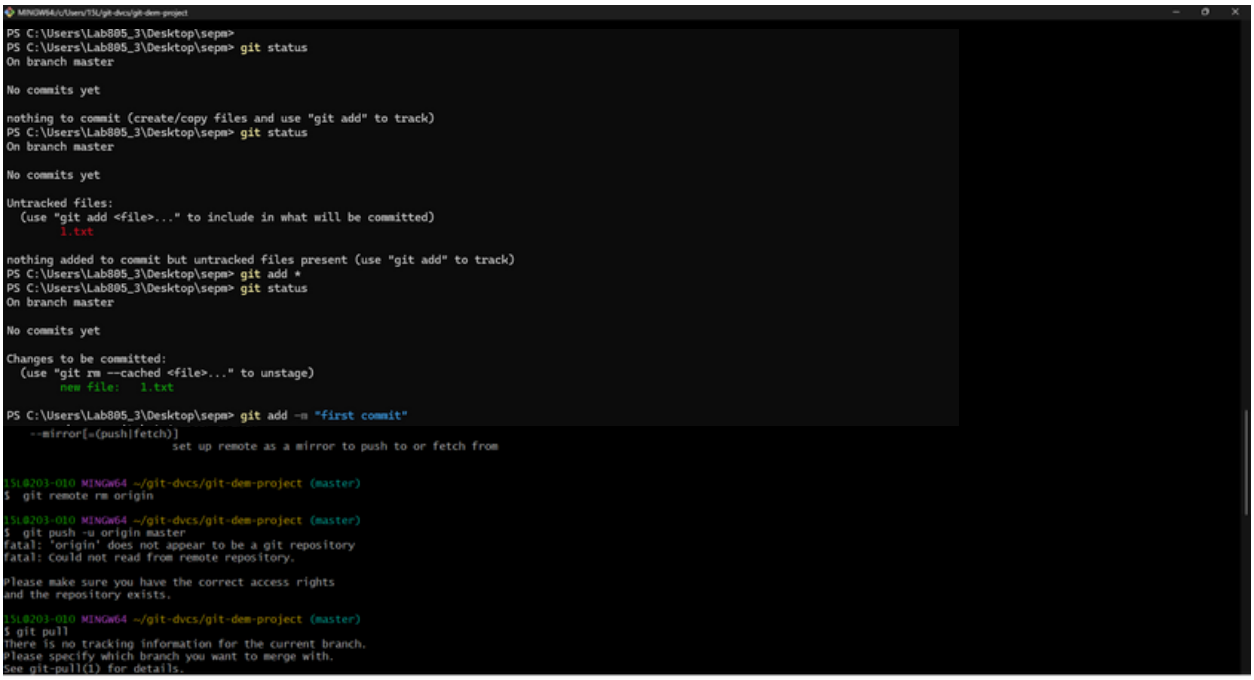
298a0e6..7242627 main -> origin/main
Updating 298a0e6..7242627
Fast-forward
index.html | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (main)
$ git log --oneline origin/main
7242627 (HEAD -> main, origin/main) Update index.html
298a0e6 express commit
bef012b express commit
d489bcf first commit

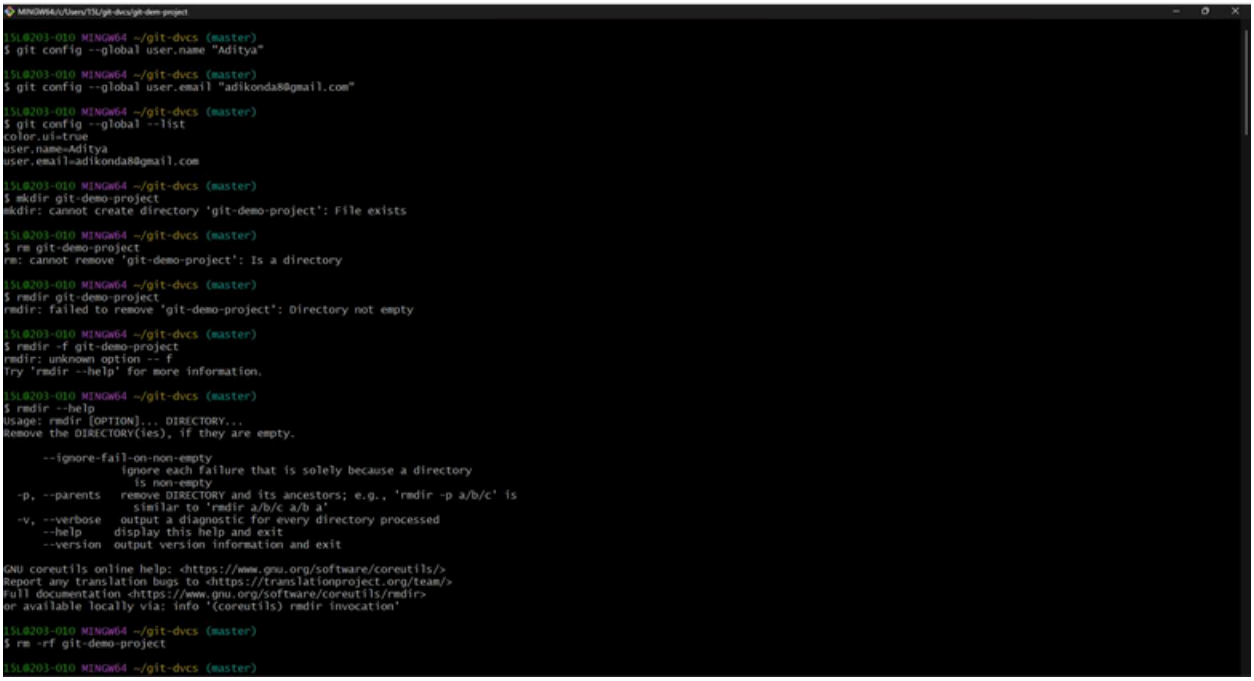
15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (main)
$ $ git fetch
bash: $: command not found

15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (main)
$ git fetch

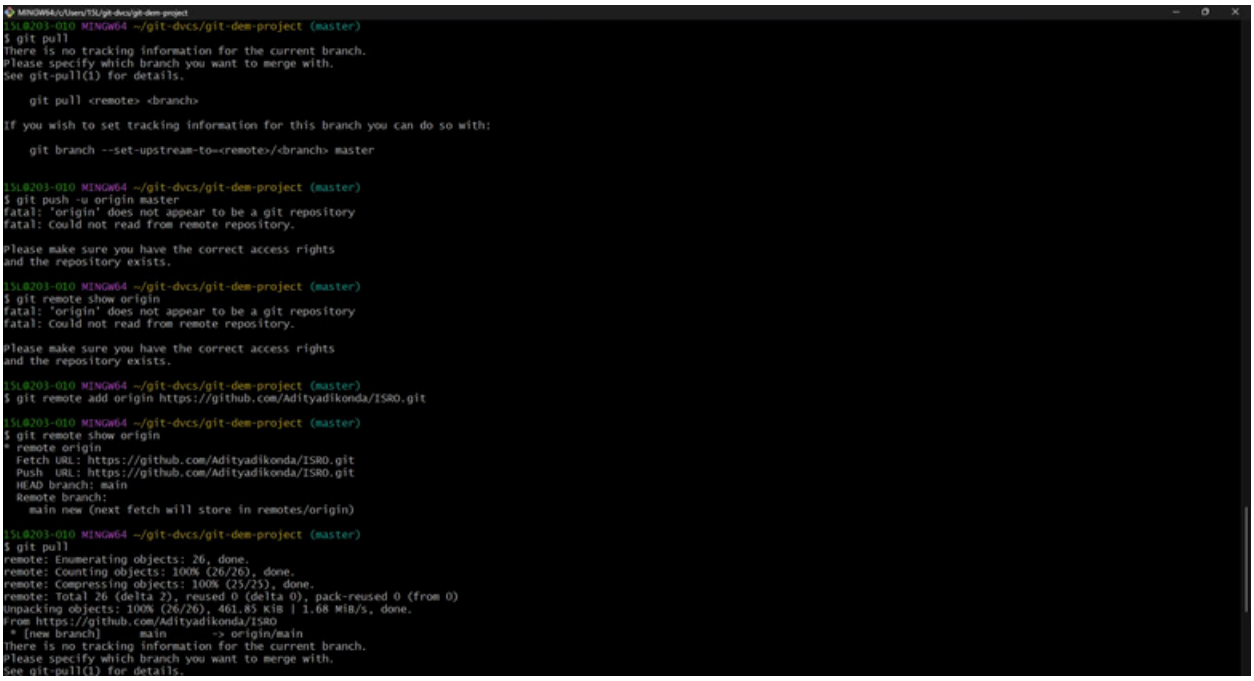
15L@203-06 MINGW64 ~/Desktop/aarya-git/git-demo-project (main)
$ git merge origin/main
Already up to date.



```
MINGW64:/c/Users/15L/git-dvcs/git-dem-project
PS C:\Users\Lab805_3\Desktop\sepm>
PS C:\Users\Lab805_3\Desktop\sepm> git status
On branch master

No commits yet

nothing to commit (create/copy files and use "git add" to track)
PS C:\Users\Lab805_3\Desktop\sepm> git status
On branch master

No commits yet

Untracked files:
  (use "git add <file>..." to include in what will be committed)
        1.txt

nothing added to commit but untracked files present (use "git add" to track)
PS C:\Users\Lab805_3\Desktop\sepm> git add *
PS C:\Users\Lab805_3\Desktop\sepm> git status
On branch master

No commits yet

Changes to be committed:
  (use "git rm --cached <file>..." to unstage)
        new file:   1.txt

PS C:\Users\Lab805_3\Desktop\sepm> git add -m "first commit"
    --mirror[=(push|fetch)]
                          set up remote as a mirror to push to or fetch from


15L@203-010 MINGW64 ~/git-dvcs/git-dem-project (master)
$  git remote rm origin

15L@203-010 MINGW64 ~/git-dvcs/git-dem-project (master)
$  git push -u origin master
fatal: 'origin' does not appear to be a git repository
fatal: Could not read from remote repository.

Please make sure you have the correct access rights
and the repository exists.

15L@203-010 MINGW64 ~/git-dvcs/git-dem-project (master)
$ git pull
There is no tracking information for the current branch.
Please specify which branch you want to merge with.
See git-pull(1) for details.
```



```
MINGW64:/c/Users/15L/git-dvcs/git-dem-project

15L@203-010 MINGW64 ~/git-dvcs (master)
$ git config --global user.name "Aditya"

15L@203-010 MINGW64 ~/git-dvcs (master)
$ git config --global user.email "adikonda8@gmail.com"

15L@203-010 MINGW64 ~/git-dvcs (master)
$ git config --global --list
color.ui=true
user.name=Aditya
user.email=adikonda8@gmail.com

15L@203-010 MINGW64 ~/git-dvcs (master)
$ mkdir git-demo-project
mkdir: cannot create directory ‘git-demo-project’: File exists

15L@203-010 MINGW64 ~/git-dvcs (master)
$ rm git-demo-project
rm: cannot remove 'git-demo-project': Is a directory

15L@203-010 MINGW64 ~/git-dvcs (master)
$ rmdir git-demo-project
rmdir: failed to remove 'git-demo-project': Directory not empty

15L@203-010 MINGW64 ~/git-dvcs (master)
$ rmdir -f git-demo-project
rmdir: unknown option -- f
Try 'rmdir --help' for more information.

15L@203-010 MINGW64 ~/git-dvcs (master)
$ rmdir --help
Usage: rmdir [OPTION]... DIRECTORY...
Remove the DIRECTORY(ies), if they are empty.

      --ignore-fail-on-non-empty
                  ignore each failure that is solely because a directory
                    is non-empty
  -p, --parents   remove DIRECTORY and its ancestors; e.g., 'rmdir -p a/b/c' is
                    similar to 'rmdir a/b/c a/b a'
  -v, --verbose   output a diagnostic for every directory processed
      --help     display this help and exit
      --version  output version information and exit

GNU coreutils online help: <https://www.gnu.org/software/coreutils/>
Report any translation bugs to <https://translationproject.org/team/>
Full documentation <https://www.gnu.org/software/coreutils/rmdir>
or available locally via: info '(coreutils) rmdir invocation'

15L@203-010 MINGW64 ~/git-dvcs (master)
$ rm -rf git-demo-project

15L@203-010 MINGW64 ~/git-dvcs (master)
```



CONCLUSION:

Thus, we have successfully studied and performed various GIT operations on local and Remote repositories using GIT Cheat-Sheet.

Software Engineering & Project Management Lab Experiment No: - 04

Aim: To understand Continuous Integration, install and configure Jenkins with Maven/Ant/Gradle to setup a build Job

Theory:

Continuous Integration (CI) is a DevOps practice where code changes are automatically built, tested, and integrated into a shared repository multiple times a day. It helps in early detection of errors, reduces integration problems, and improves software quality.

Jenkins: An Overview

Jenkins is an open-source CI/CD automation tool used for building, testing, and deploying applications. It allows developers to automate software development workflows and ensures a seamless integration process. Jenkins supports various build tools like **Maven**, **Ant**, and **Gradle** to compile and package applications.

Installing and Configuring Jenkins

1. **Download and Install Jenkins**
    - Install Java (JDK) as a prerequisite.
    - Download Jenkins from the official website and install it on the server.
    - Start Jenkins and configure initial setup using an administrator password.
2. **Installing Build Tools**
    - Install **Maven**, **Ant**, or **Gradle** depending on project requirements.
    - Configure Jenkins to recognize the installed build tool.
3. **Creating a Build Job in Jenkins**
    - Navigate to **Jenkins Dashboard → New Item → Freestyle Project/Pipeline**.
    - Configure the **Git repository URL** to fetch the source code.
    - Select the **Build Tool (Maven/Ant/Gradle)** and define the build command.
    - Set up triggers (e.g., Git webhooks) for automatic build execution.
    - Save and trigger the build job to verify the setup.

Software Engineering & Project Management Lab Experiment No: - 04

Aim: To understand Continuous Integration, install and configure Jenkins with Maven/Ant/Gradle to setup a build Job

To install Jenkins following software packages are required:

1) GIT (git-scm.com)

2) Notepad++ (https://notepad-plus-plus.org/downloads/)

3) Latest Java development kit (JDK)

4) Jenkins

5) Apache Maven (Optional)

Step 1-: Install GIT

Step 2 -: Install Notepad++

Step 3 -: Install Java

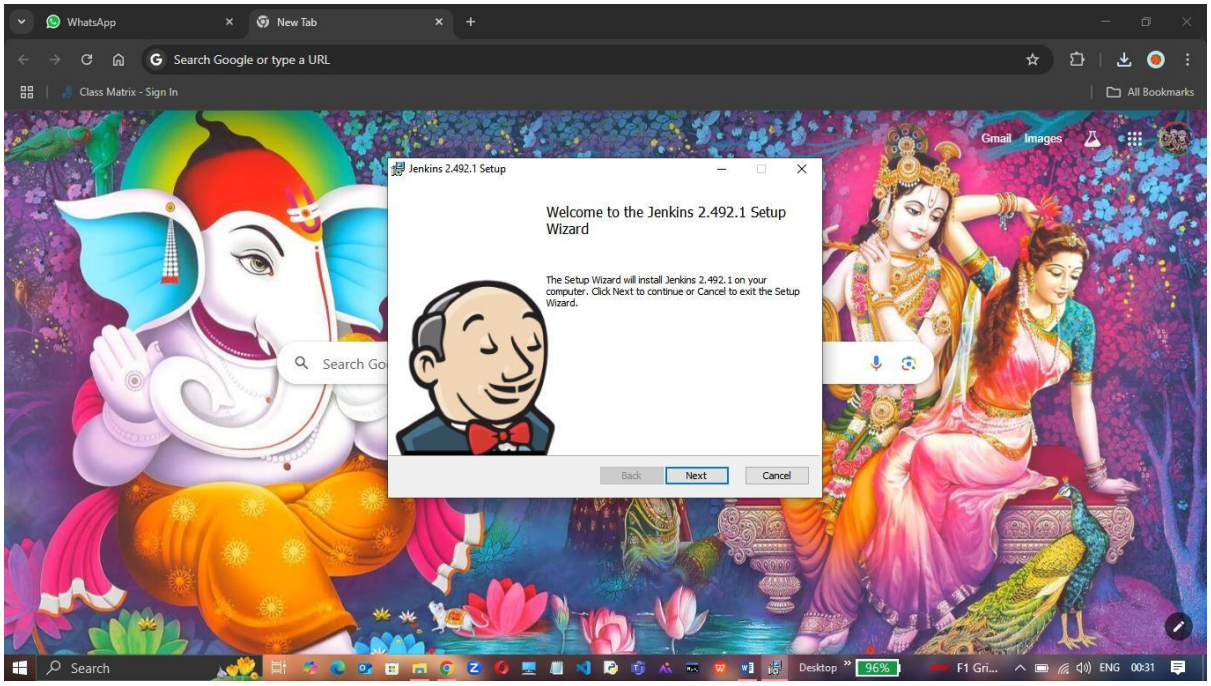
Step 4 -: Install Jenkins

Step 5 -: Install Maven

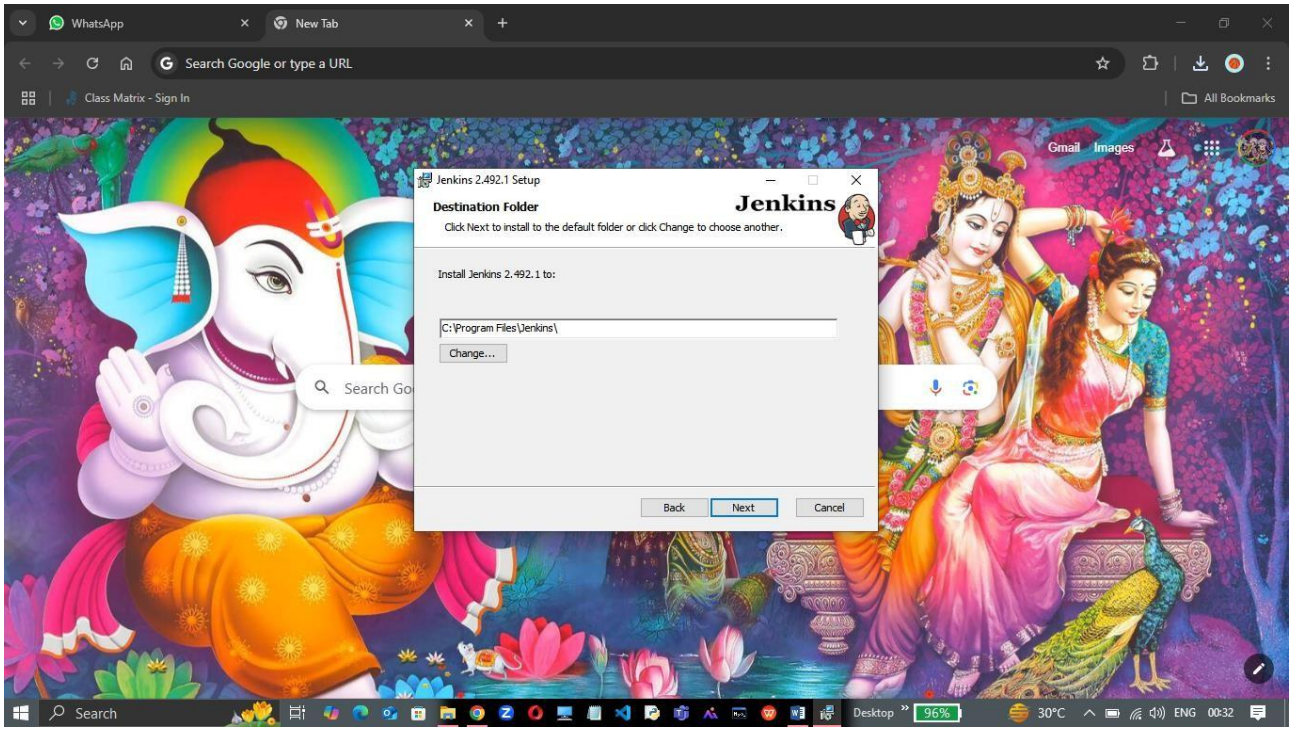
Jenkins is an open source automation tool written in Java with plugins built for Continuous Integration purpose. Jenkins is used to build and test your software projects continuously making it easier for developers to integrate changes to the project, and making it easier for users to obtain a fresh build. It also allows you to continuously deliver your software by integrating with a large number of testing and deployment technologies.

Step 1-: Open https://www.jenkins.io/doc/book/installing/windows/ and install Jenkins. Open the installed .exe setup

Aim: To understand Continuous Integration, install and configure Jenkins with Maven/Ant/Gradle to setup a build Job

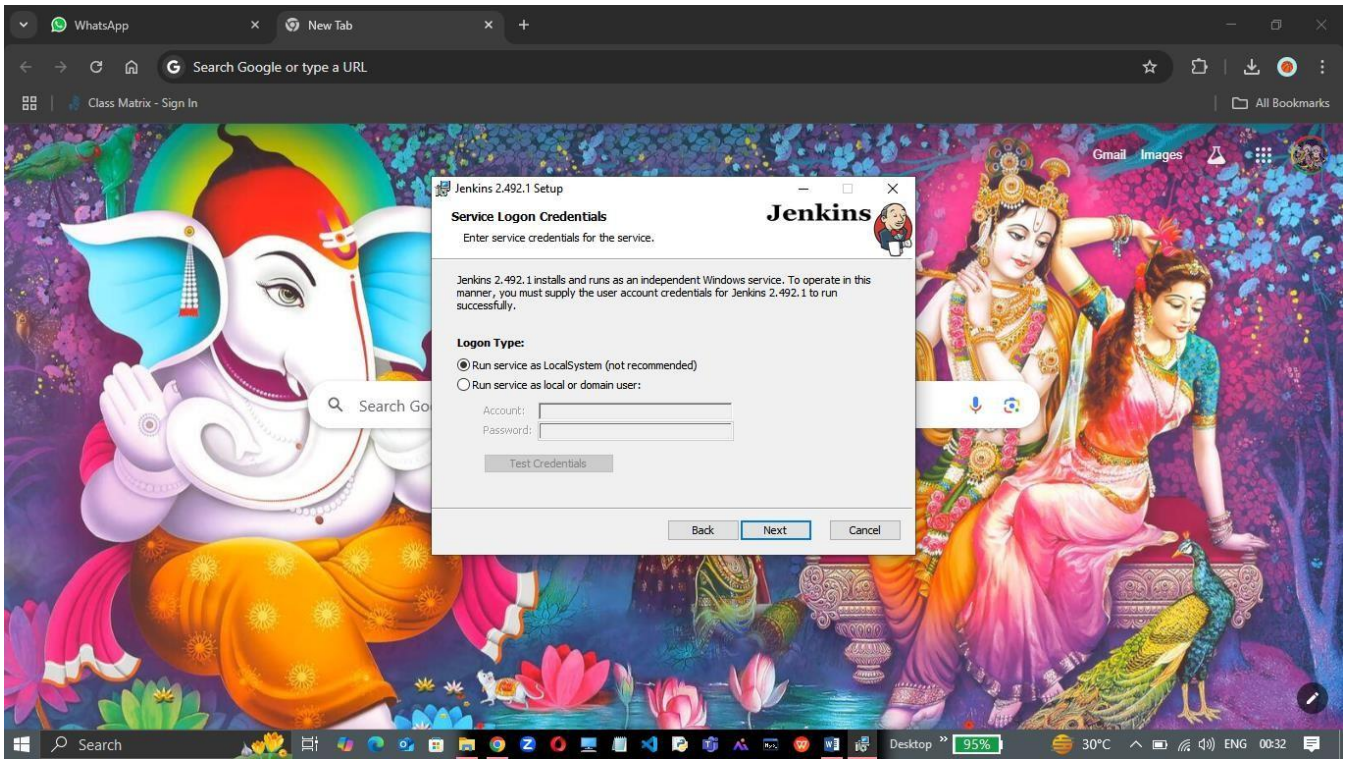


Step 2: Locate the folder where you want to install Jenkins in the location path:

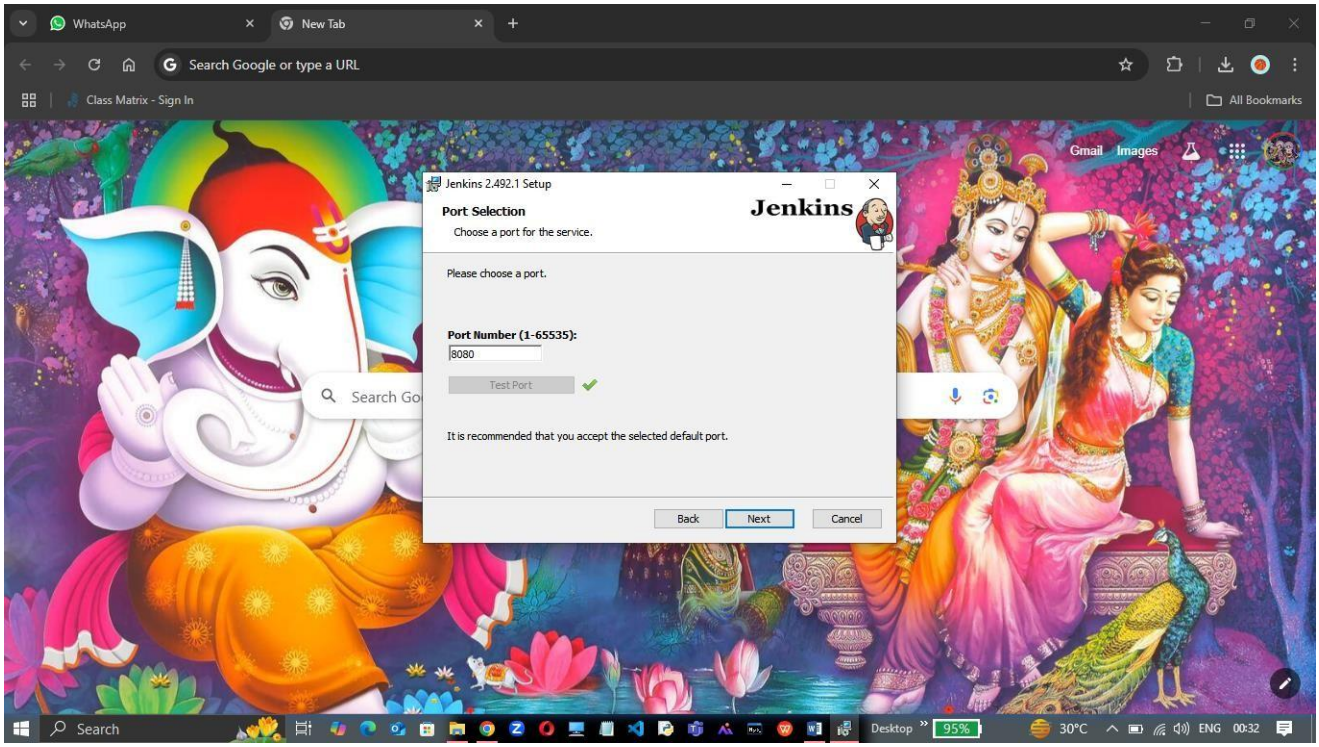


Aim: To understand Continuous Integration, install and configure Jenkins with Maven/Ant/Gradle to setup a build Job

Step 3: Select service as Local System and proceed to Next.

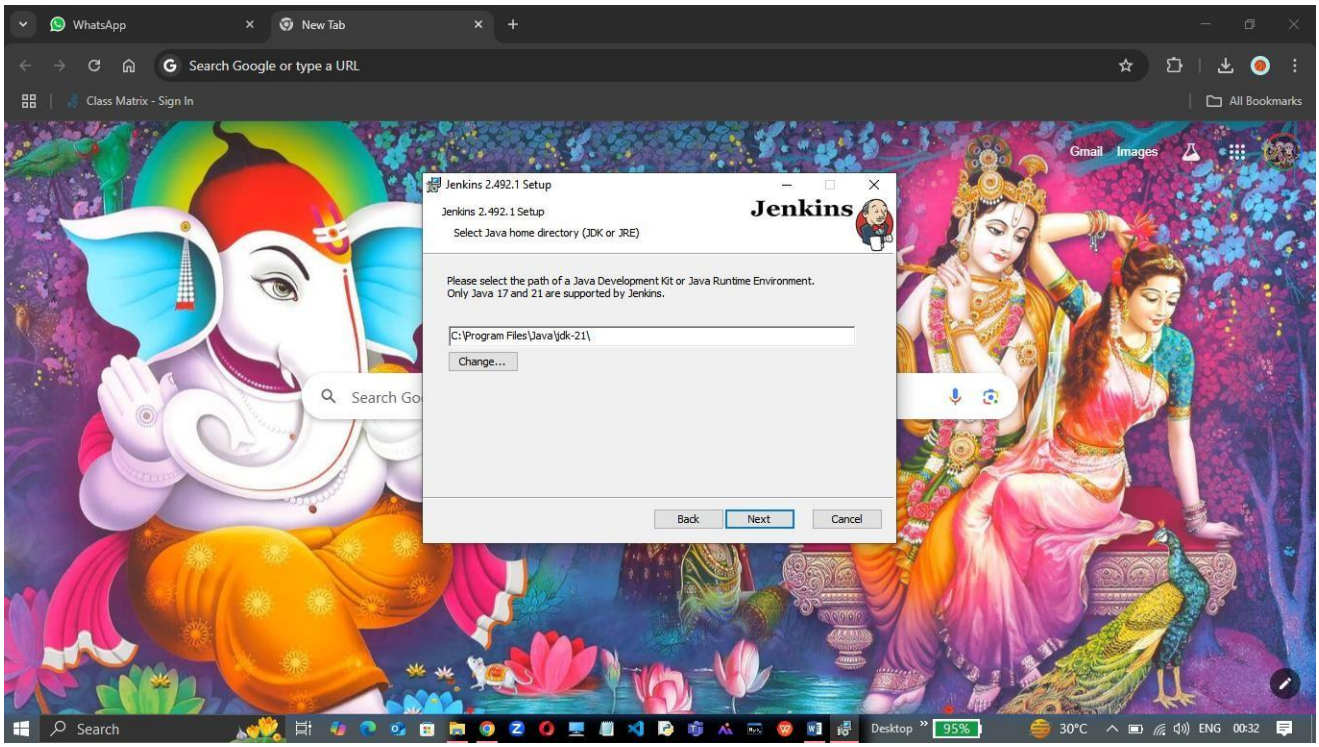


Step 4: Select the port 8080 and click Test Port button. The green tick will appear after which you can proceed to Next.

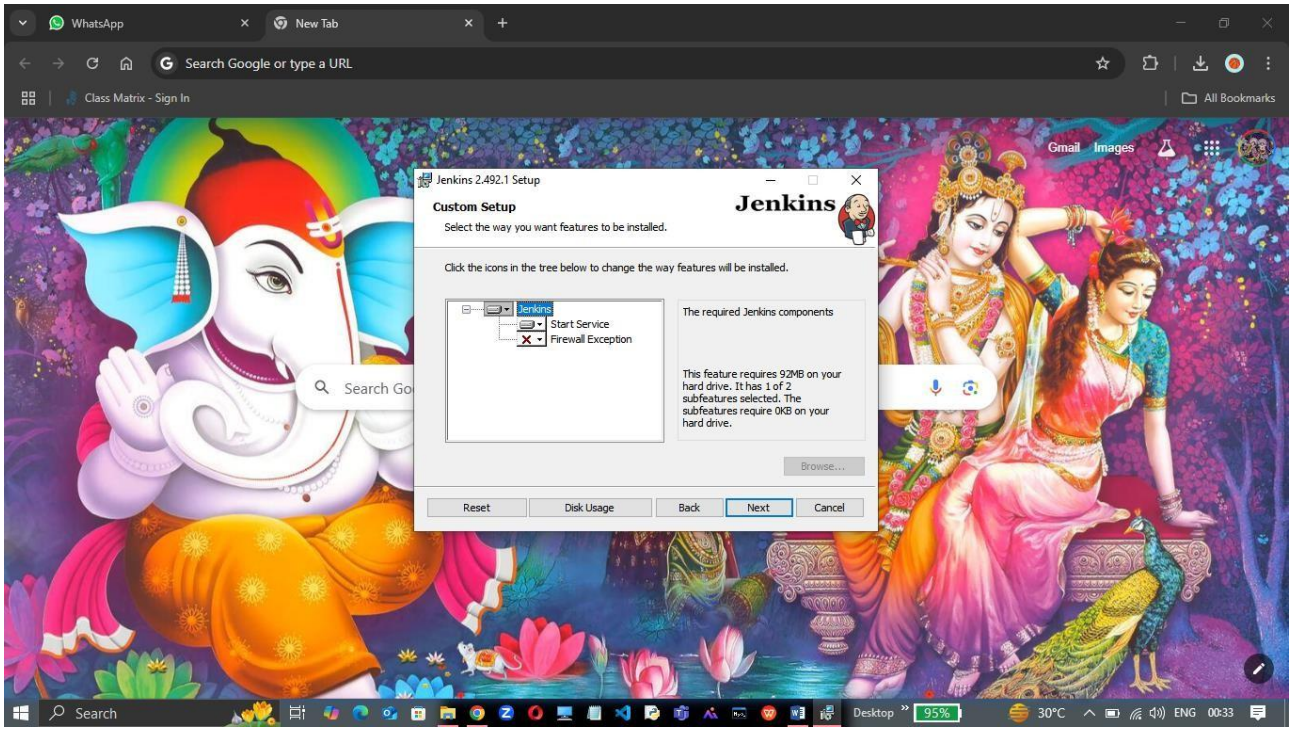


Aim: To understand Continuous Integration, install and configure Jenkins with Maven/Ant/Gradle to setup a build Job

Step 5: Locate the folder where you have installed JDK in the location path:

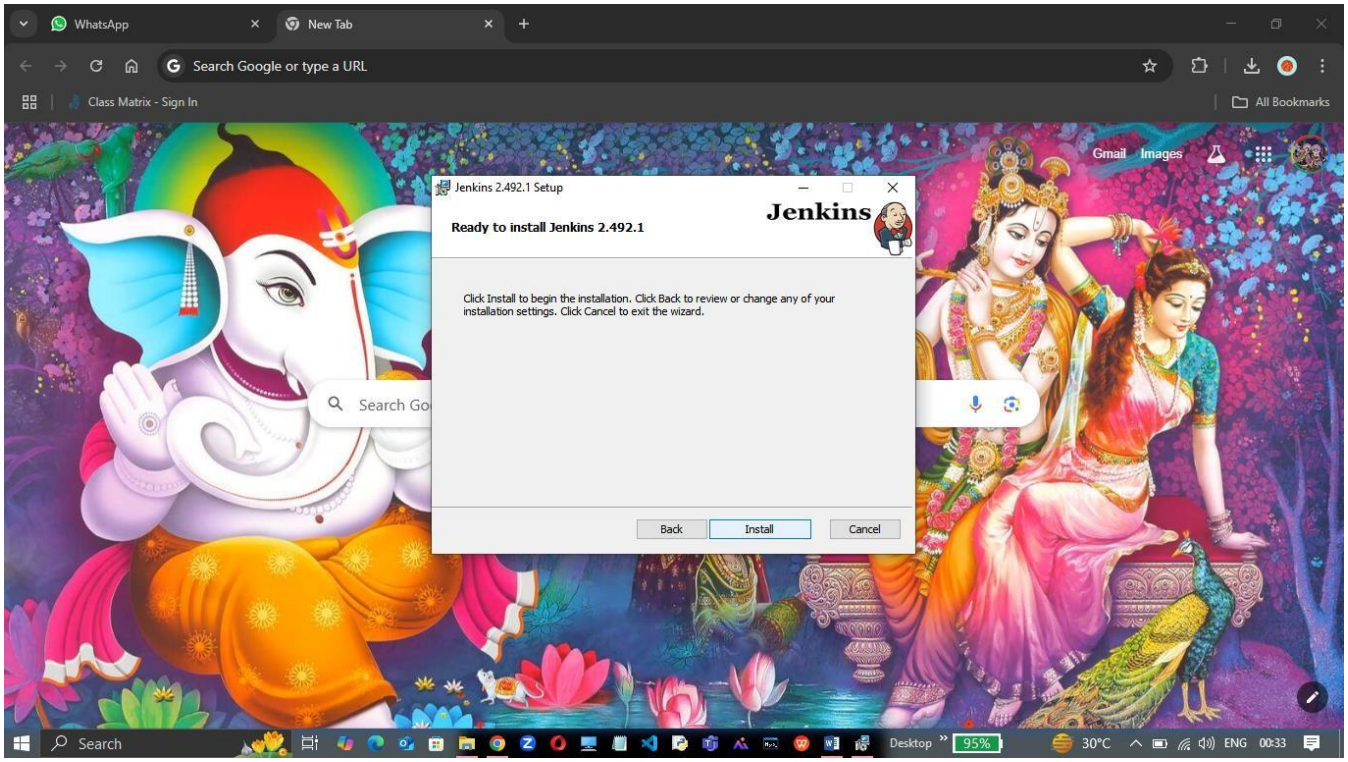


Proceed to Next

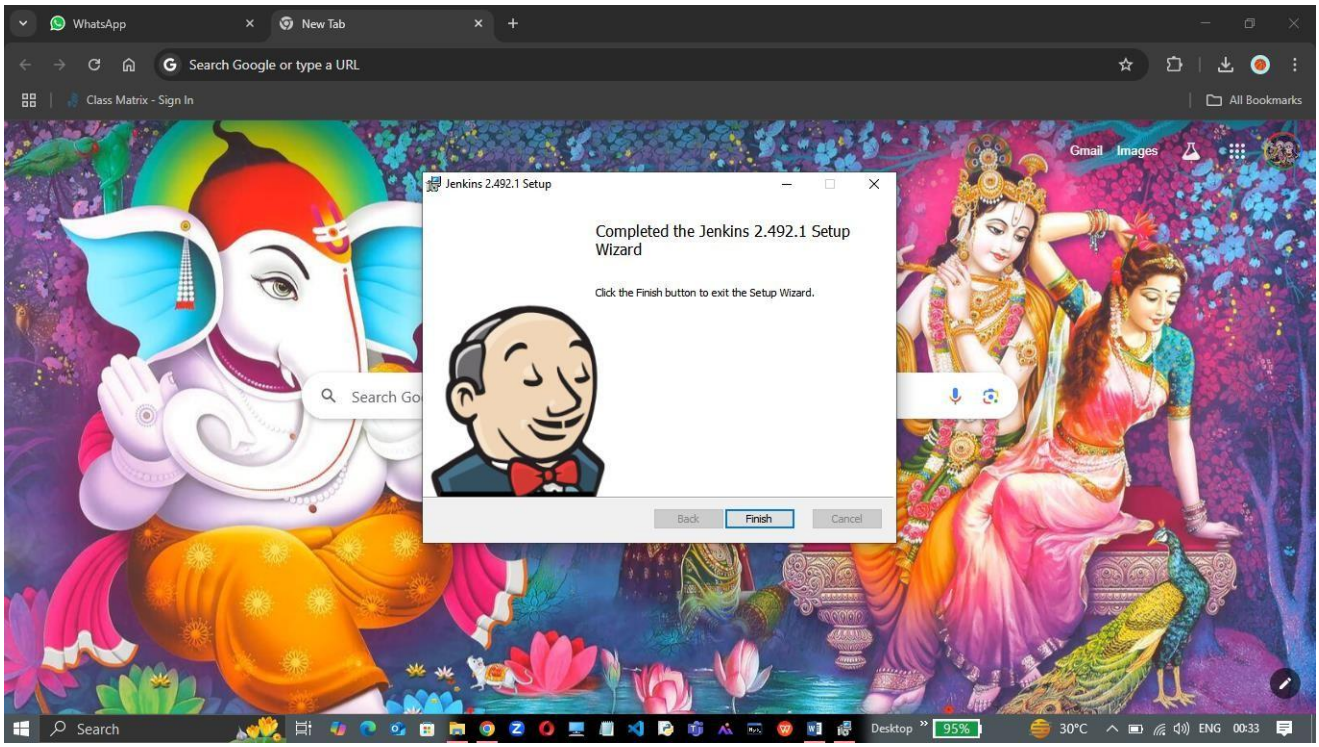


Software Engineering & Project Management Lab Experiment No: - 04

Aim: To understand Continuous Integration, install and configure Jenkins with Maven/Ant/Gradle to setup a build Job

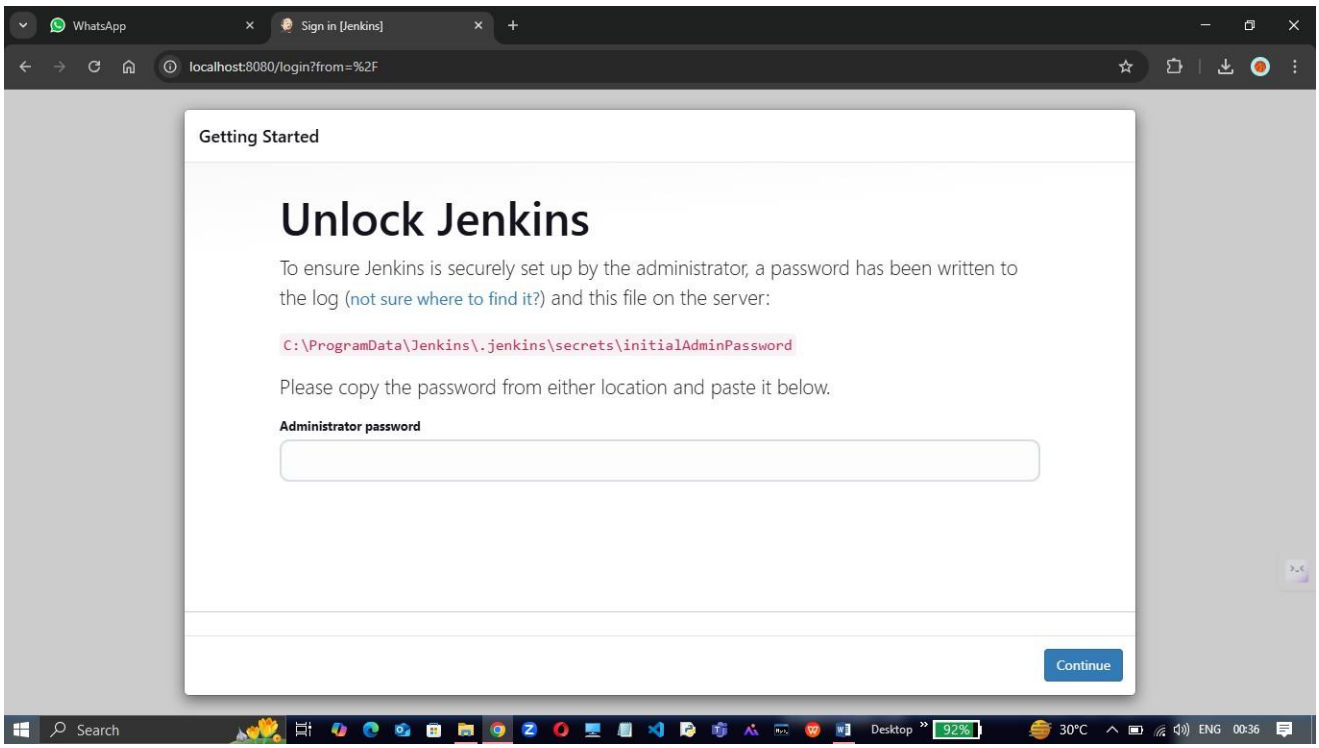


On clicking 'Install', installation is finished.

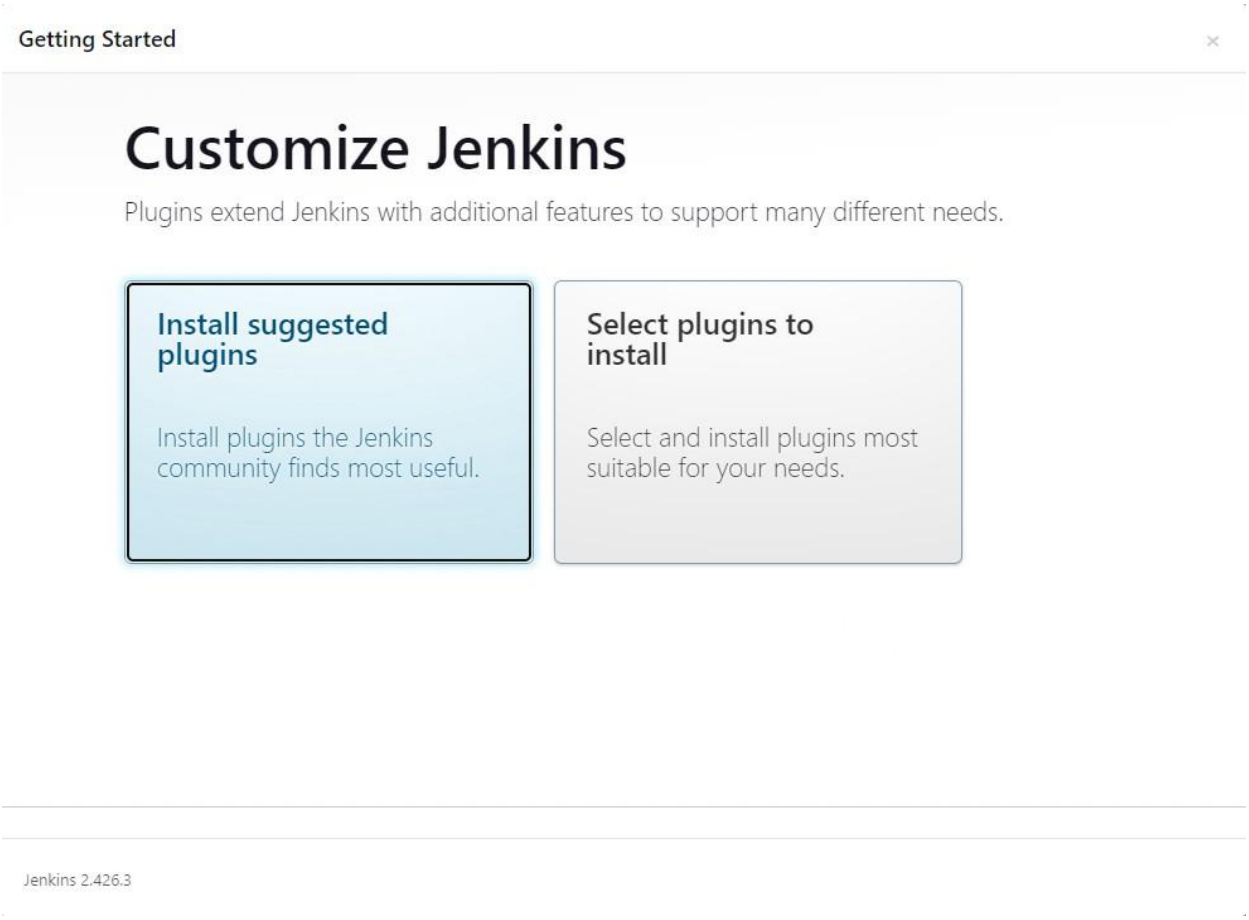


Step 6: Once Installation is done, you can test the Jenkins on http://localhost:8080 on the browser.

First time, when you open Jenkins portal it will ask to put admin default password which is stored in /var/lib/jenkins/secrets/initialAdminPassword file.



Step 7: On entering the password, you can continue to choose “Install Suggested Plugins”

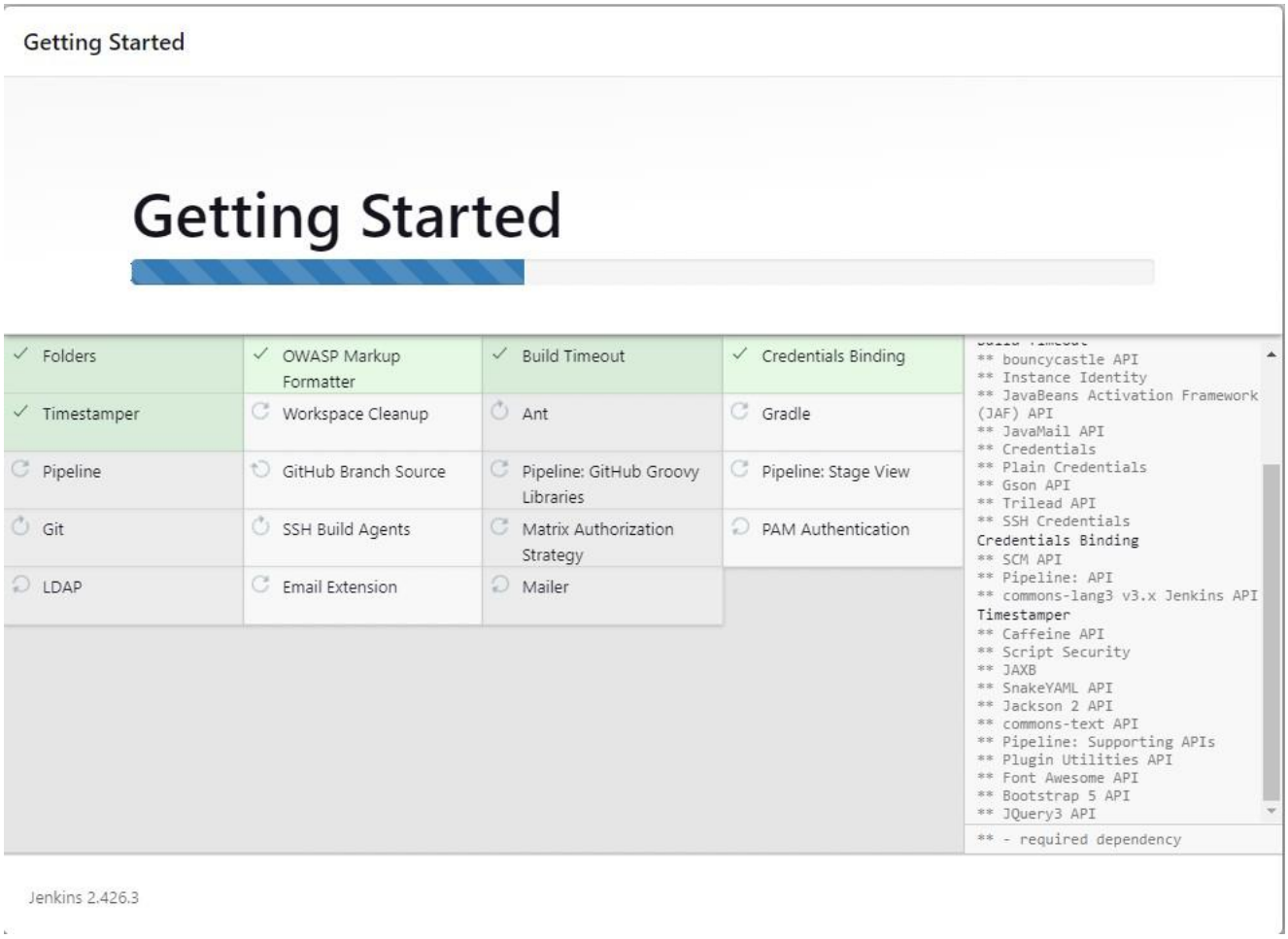


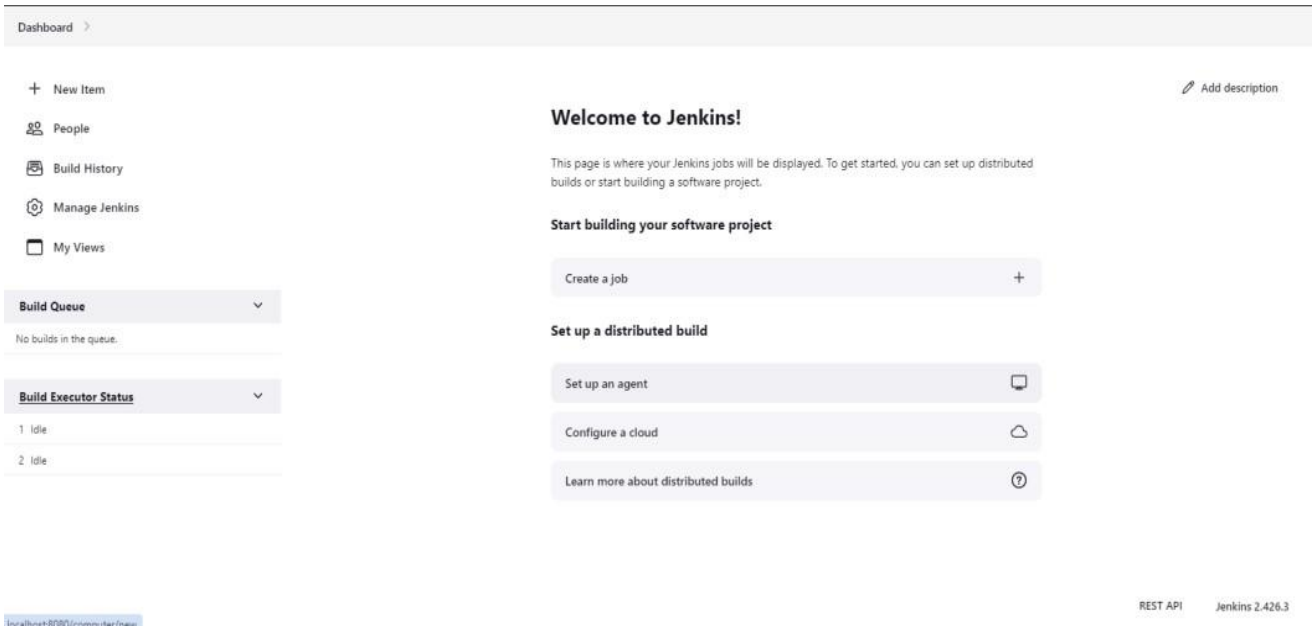
Once plugins are installed, click on next and specify the admin details along with the new password for Jenkins admin and click on finish to complete the installation.

After filling the details, click on Save & Continue, you will be redirected to the dashboard.

Software Engineering & Project Management Lab Experiment No: - 04

Aim: To understand Continuous Integration, install and configure Jenkins with Maven/Ant/Gradle to setup a build Job





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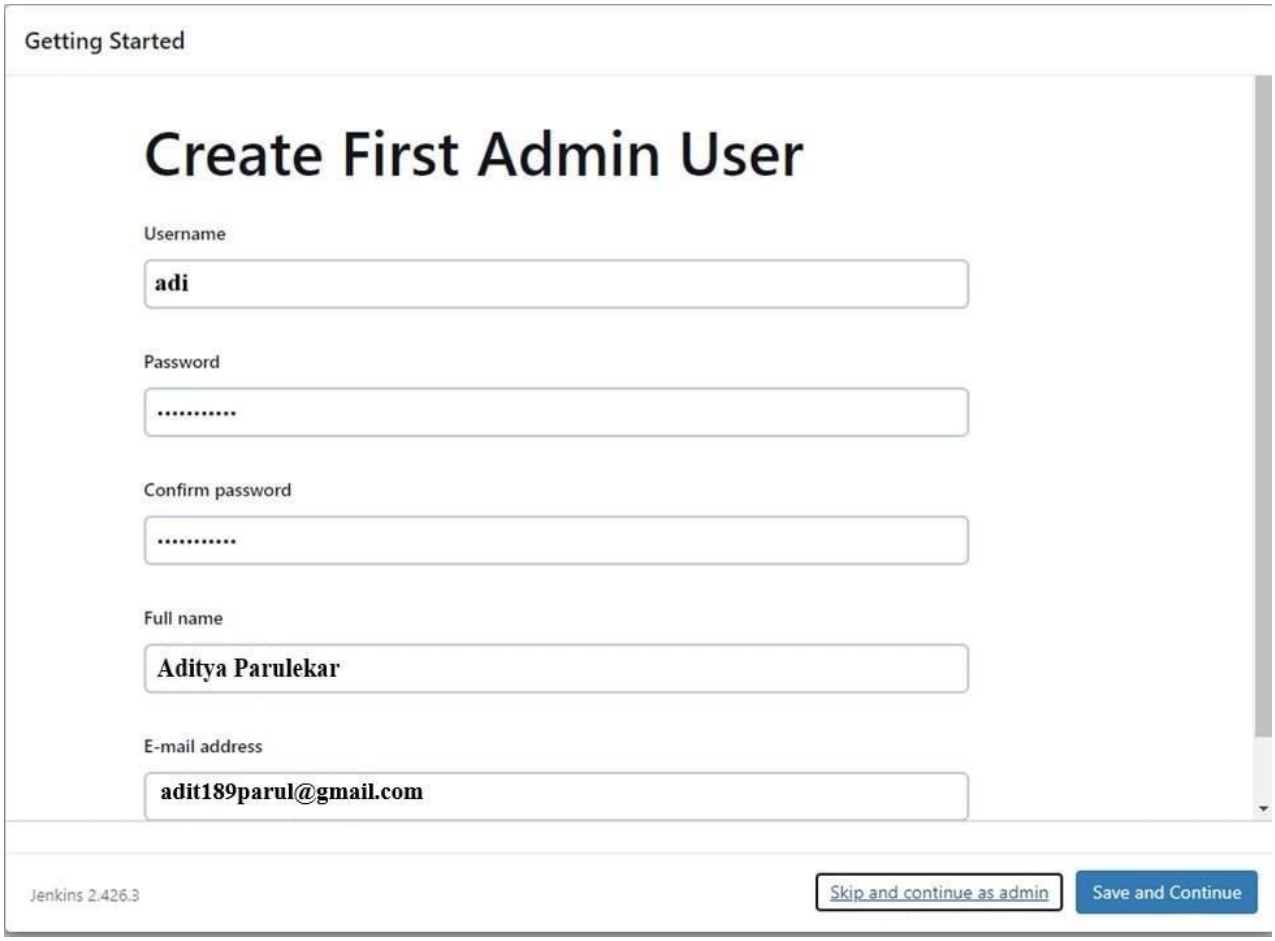

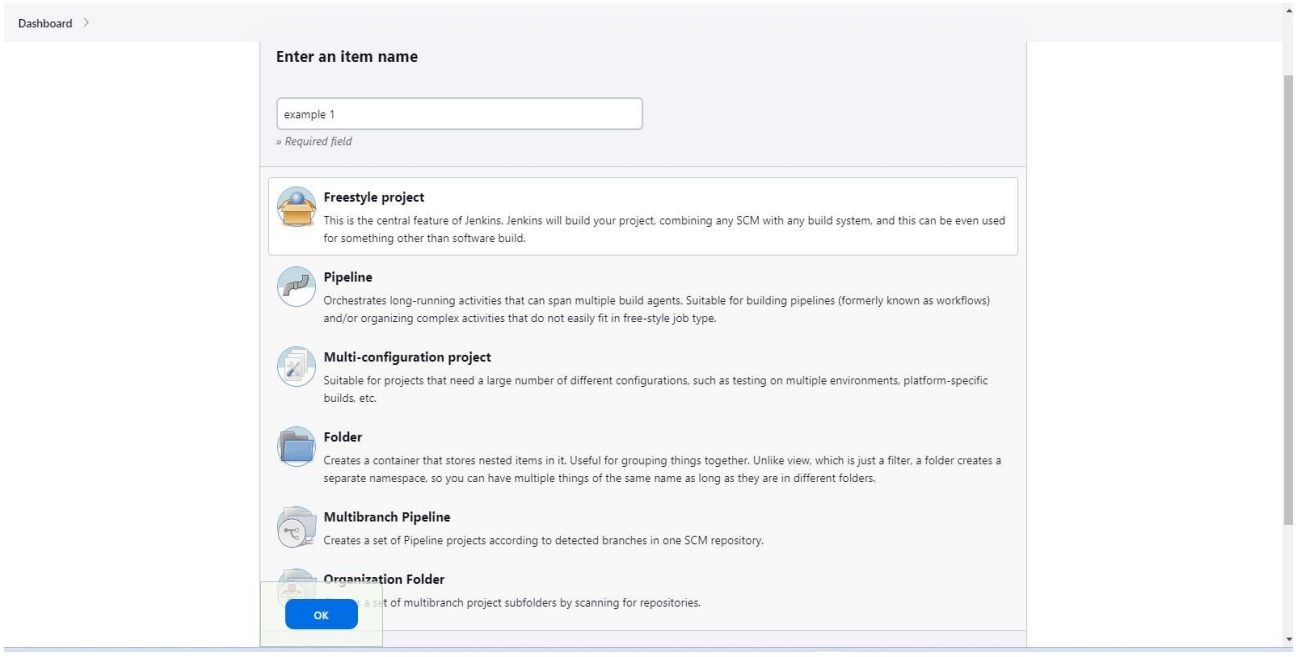

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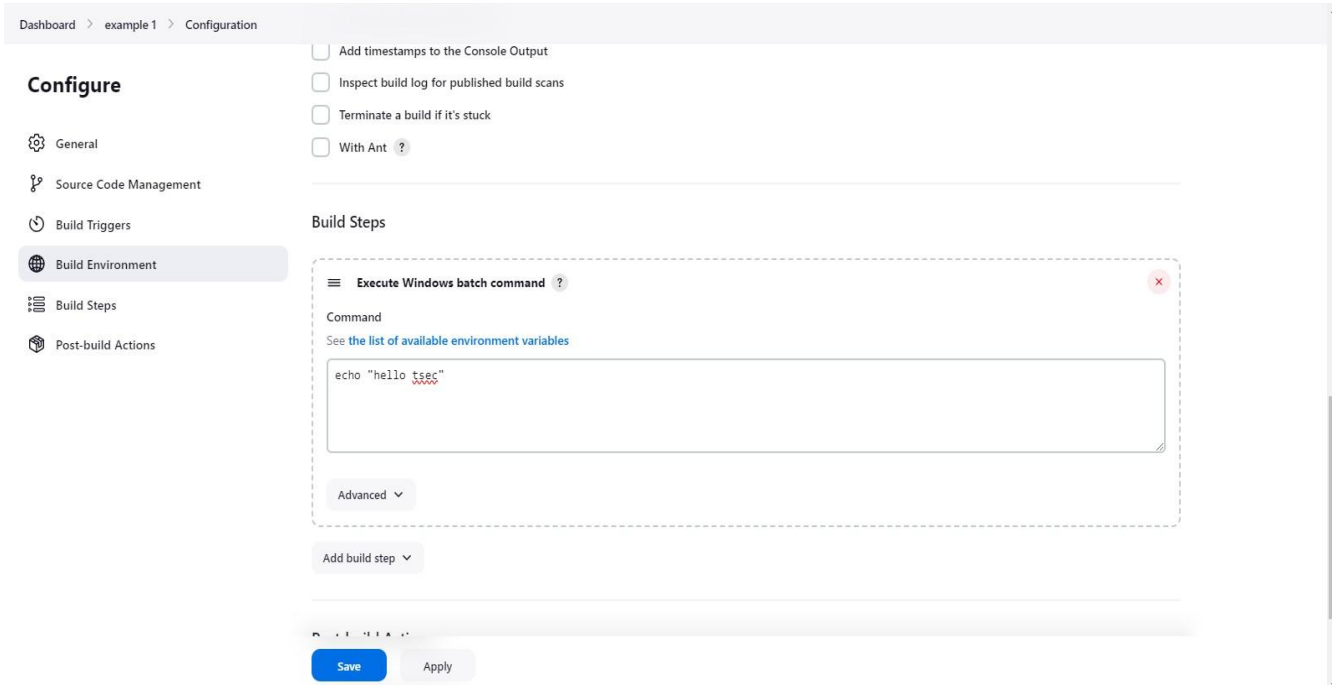

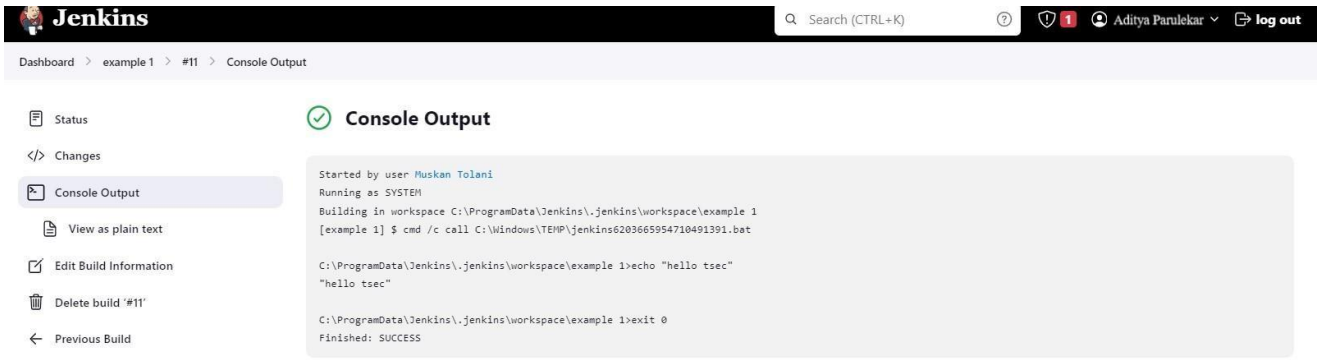

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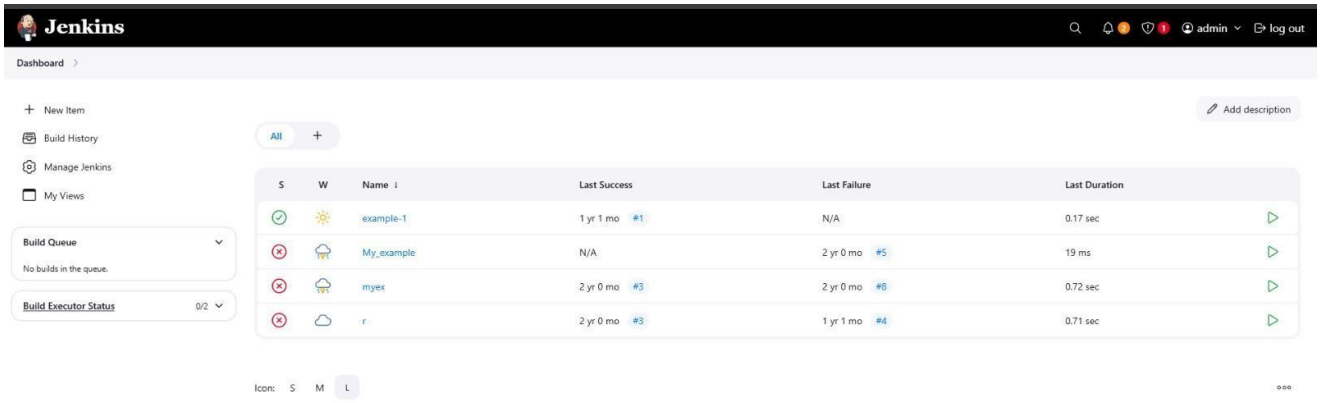

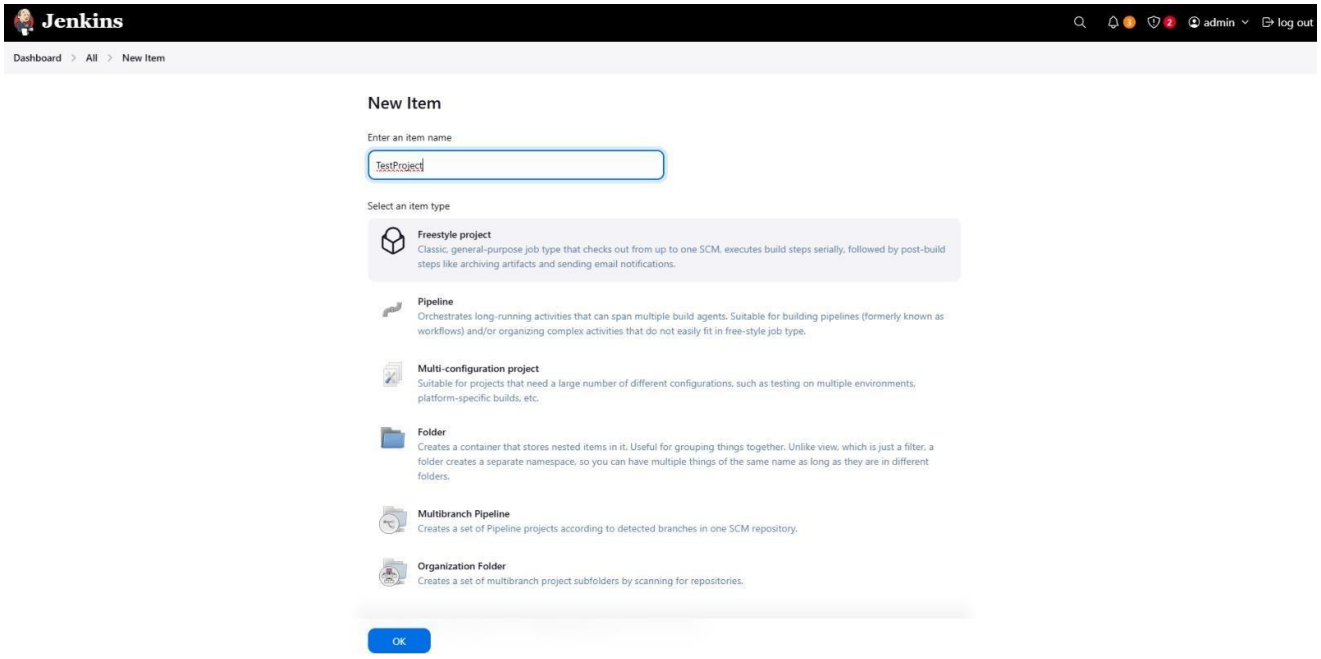

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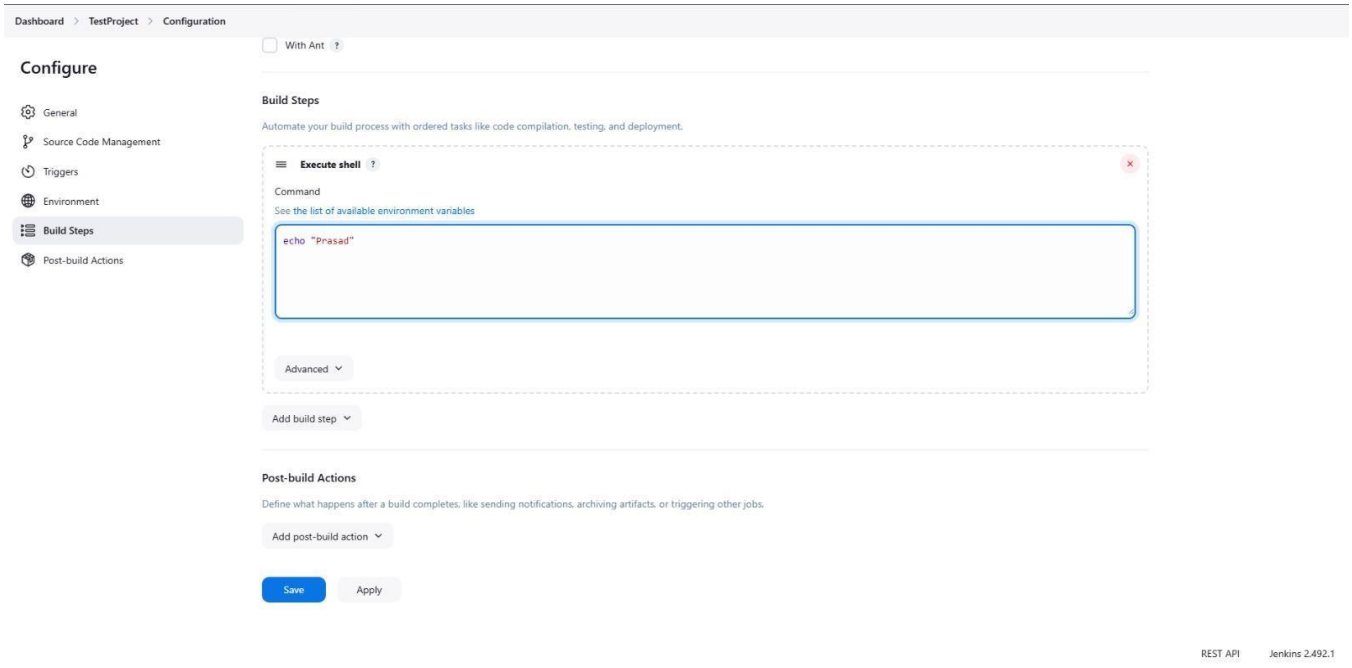

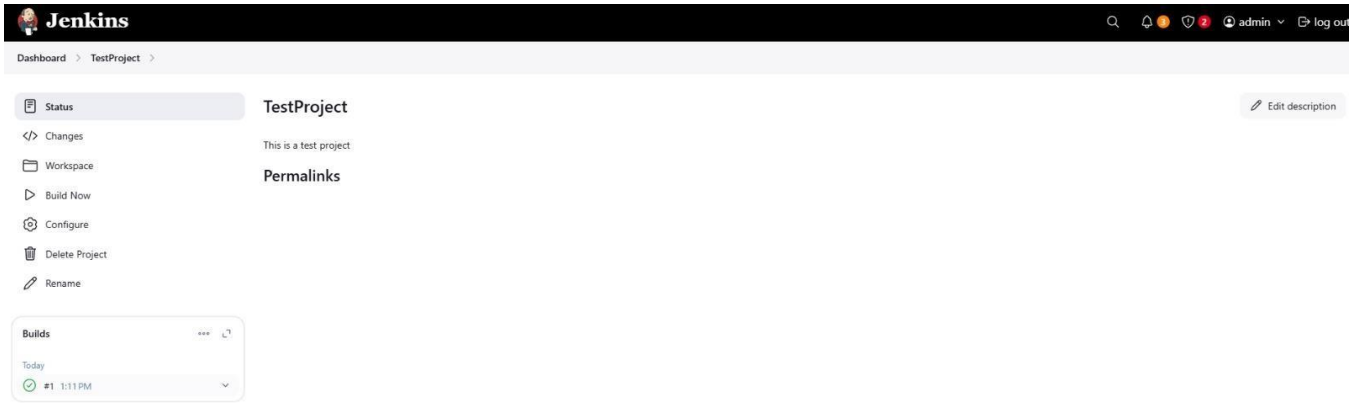

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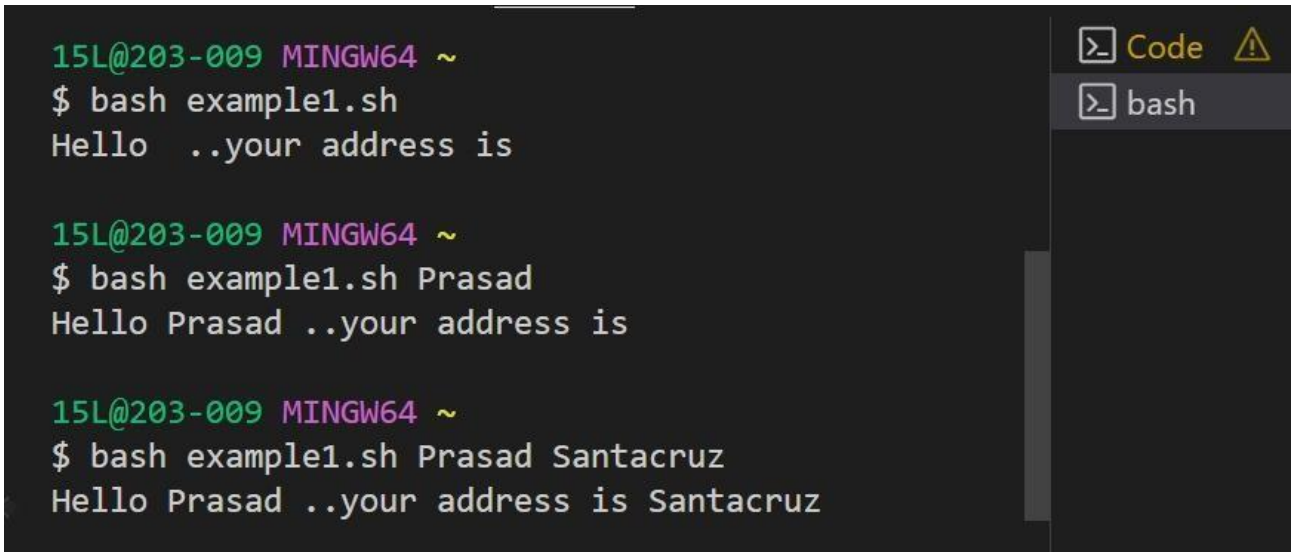

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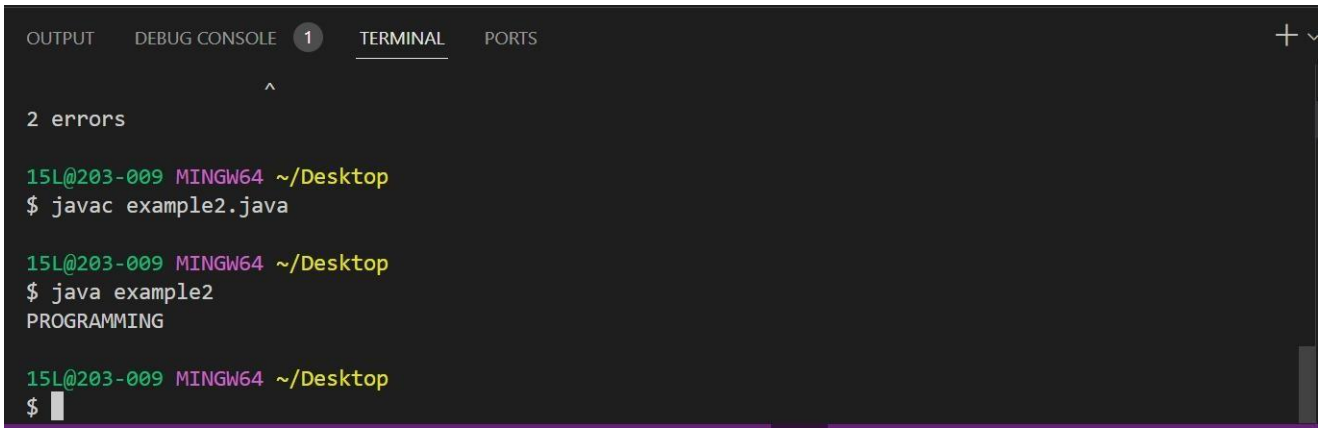

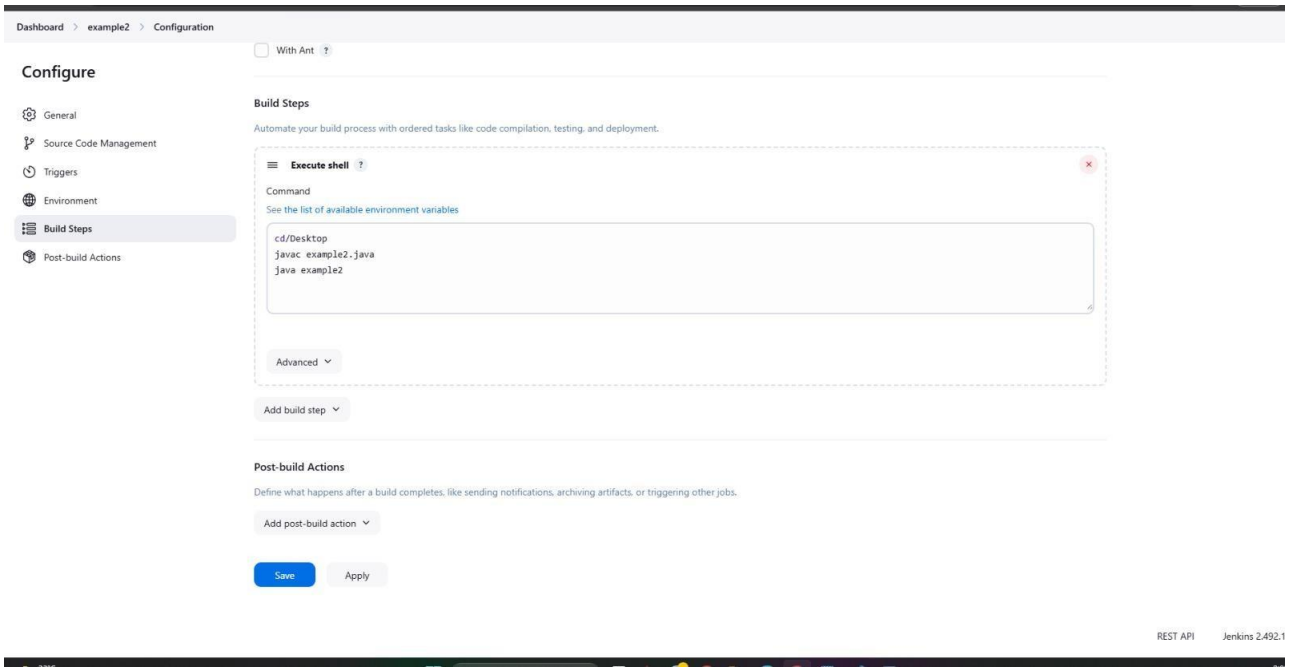

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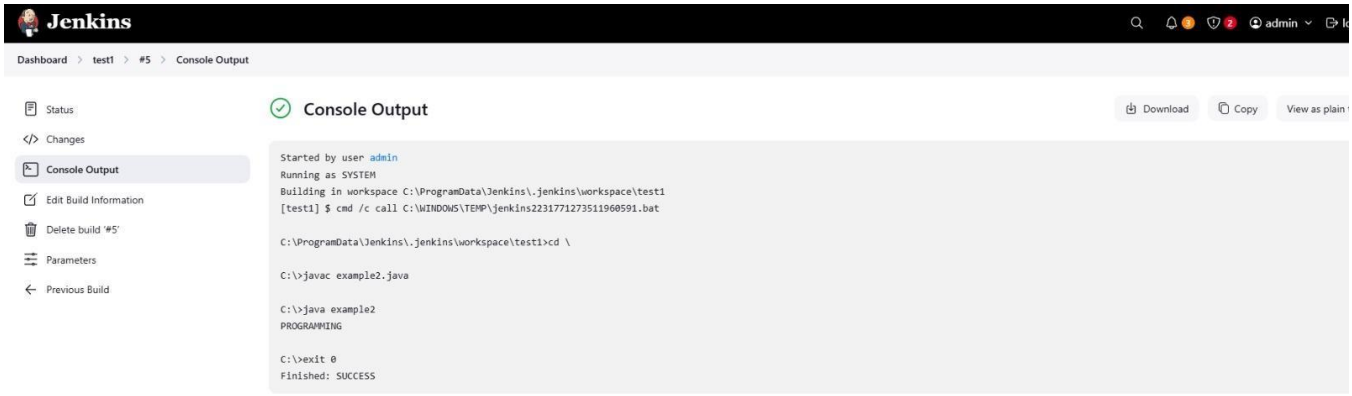

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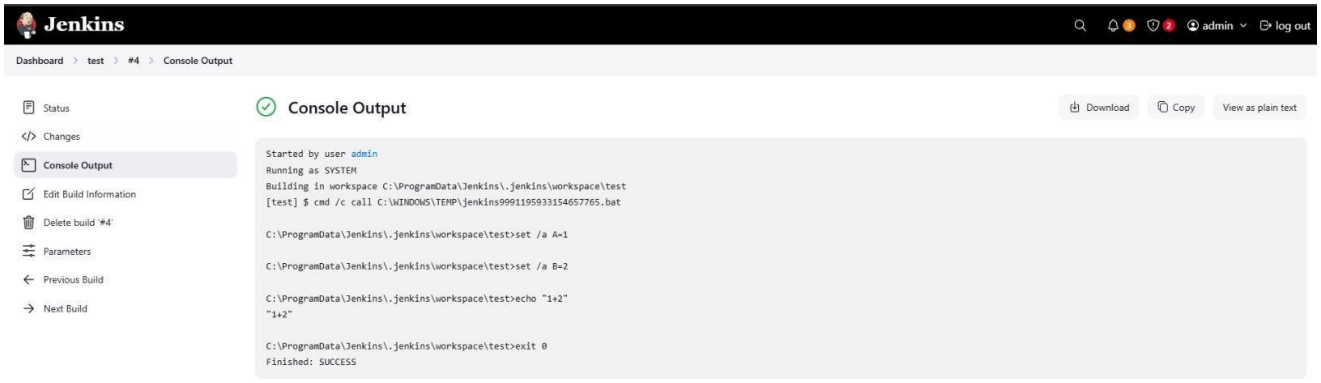

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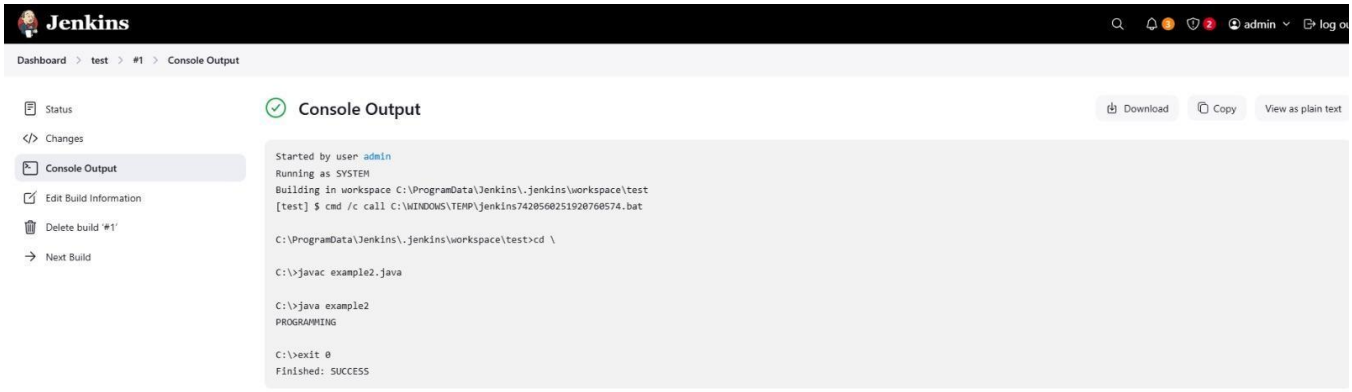


<u>Conclusion</u>: Thus, we have successfully installed and configured Jenkins with Maven/Ant/Gradle to setup a build Job and learnt about the implementation of Jenkins in open source continuous integration.

Name : Aarya Thakur
T22
Roll No: 114

Experiment No-5

Aim: Experiment 5:To Build the pipeline of jobs using Maven / Gradle / Ant in Jenkins, create a pipeline script to Test and deploy an application over the tomcat server

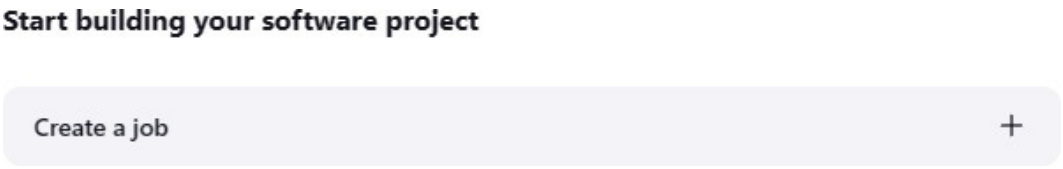
Programming in Jenkins:

Continuous Integration is a software development practice where members of a team integrate their work frequently, usually each person integrates at least daily leading to multiple integrations per day. Each integration is verified by an automated build (including test) to detect integration errors as quickly as possible.” In simple way, Continuous integration (CI) is the practice of frequently building and testing each change done to your code automatically.

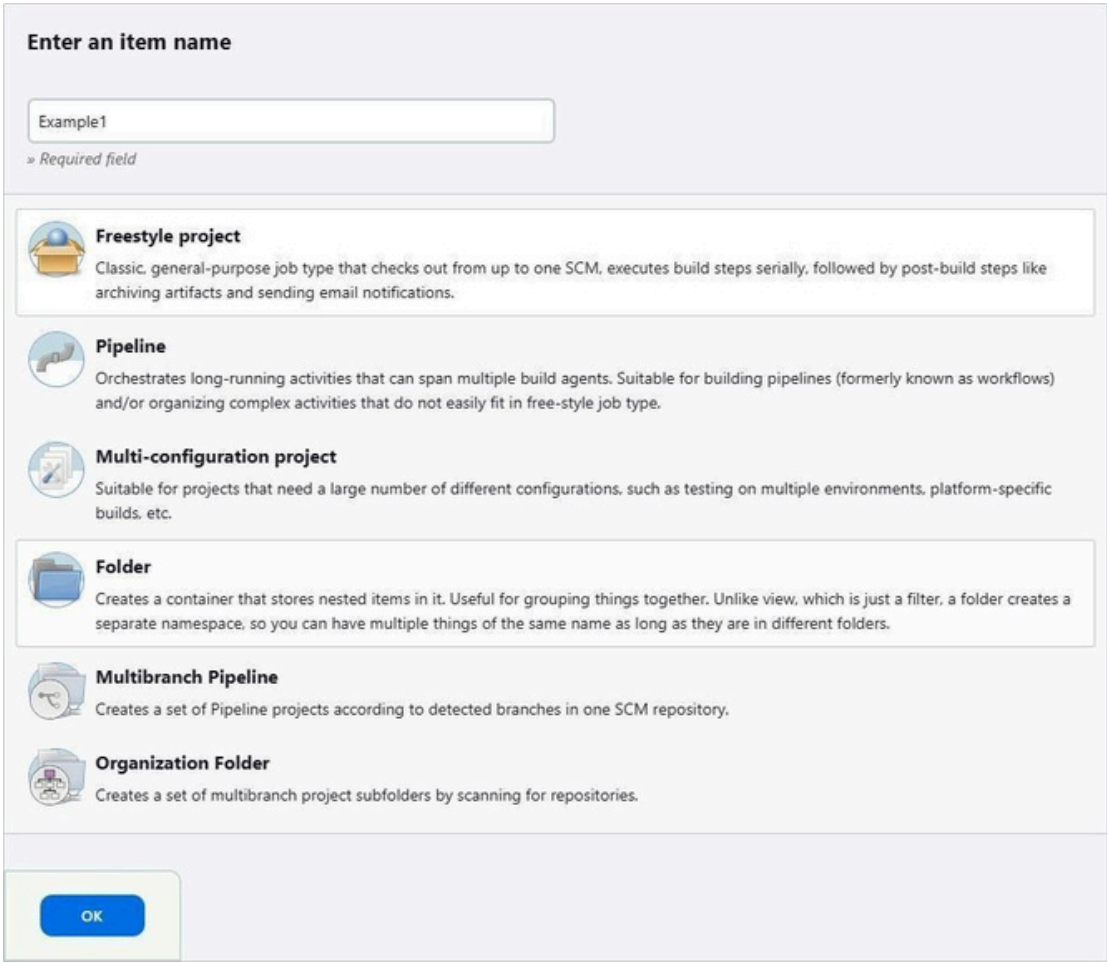
Jenkins is a self-contained, open-source automation server which can be used to automate all sorts of tasks related to building, testing, and delivering or deploying software.
Our first job will execute the shell commands. The freestyle project provides enough options and features to build the complex jobs that you will need in your projects.
Example 1

Example 1.1: Deploying a freestyle app in Jenkins

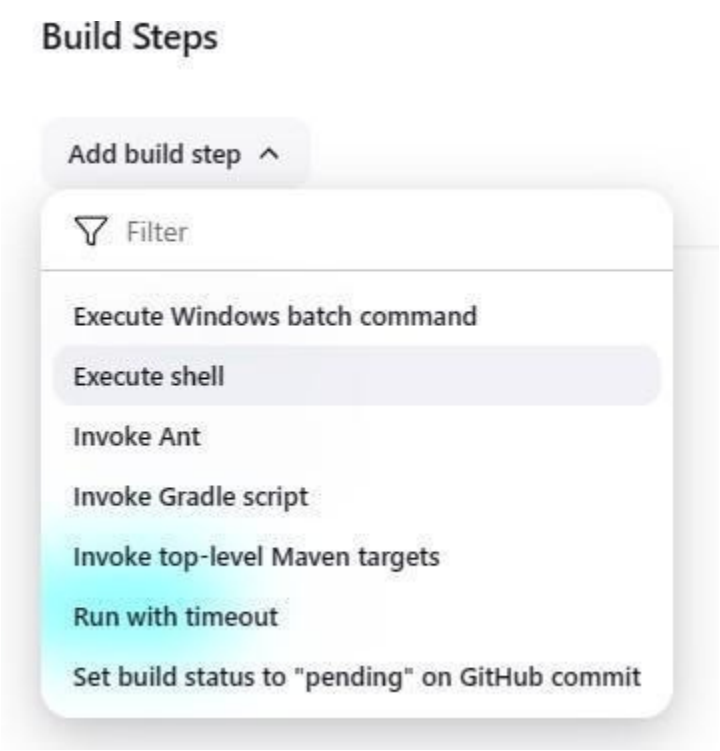
Creating a job:



Naming the job and setting it as freestyle:


Enter an item name
Example1
» Required field
Freestyle project
Classic, general-purpose job type that checks out from up to one SCM, executes build steps serially, followed by post-build steps like archiving artifacts and sending email notifications.
Pipeline
Orchestrates long-running activities that can span multiple build agents. Suitable for building pipelines (formerly known as workflows) and/or organizing complex activities that do not easily fit in free-style job type.
Multi-configuration project
Suitable for projects that need a large number of different configurations, such as testing on multiple environments, platform-specific builds, etc.
Folder
Creates a container that stores nested items in it. Useful for grouping things together. Unlike view, which is just a filter, a folder creates a separate namespace, so you can have multiple things of the same name as long as they are in different folders.
Multibranch Pipeline
Creates a set of Pipeline projects according to detected branches in one SCM repository.
Organization Folder
Creates a set of multibranch project subfolders by scanning for repositories.
OK

Selecting build type as “Execute shell”:



Entering a simple command for the shell execution:

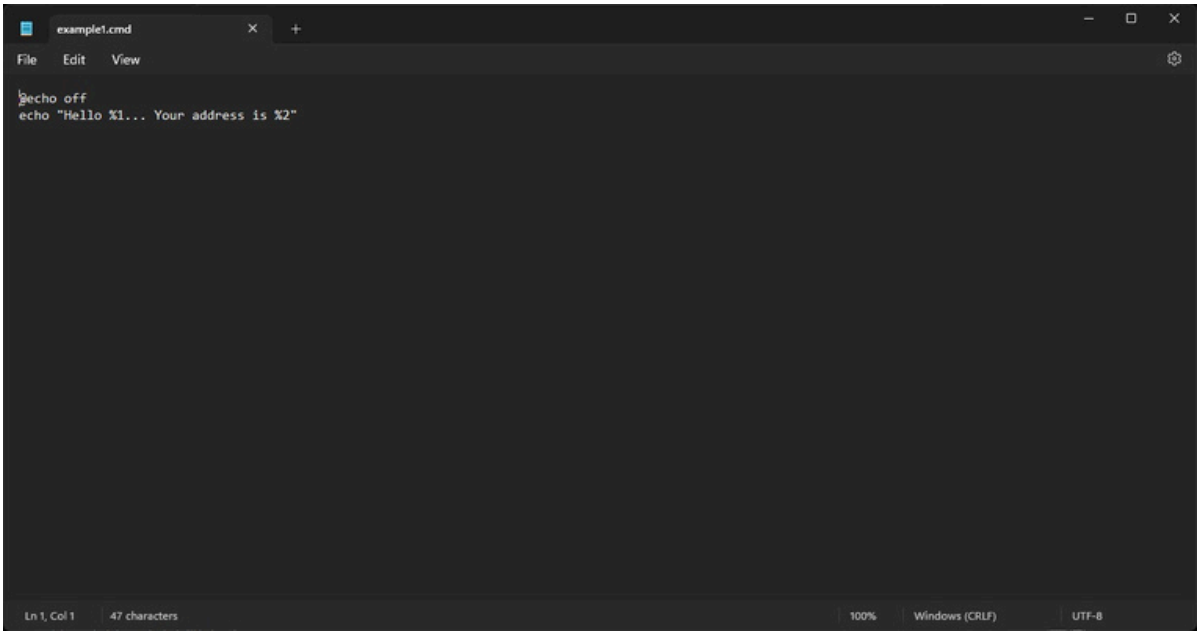
Applying and saving the project configuration:

Building the project:

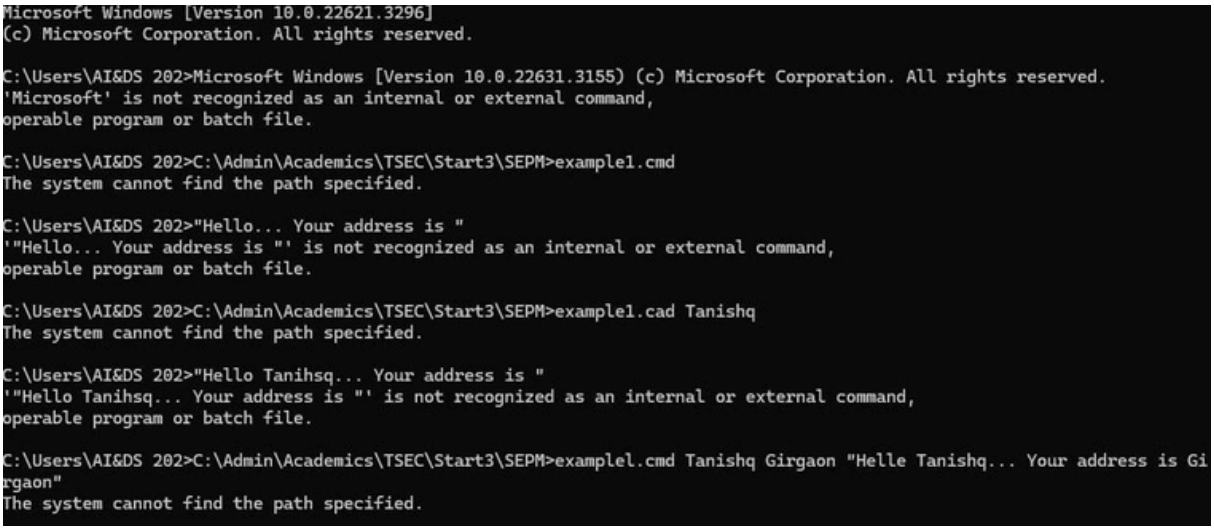
Console output (after building):

Example 1.2: Taking parameters through files

Contents of script example1.cmd:



Executing script `example1.cmd` on the terminal:



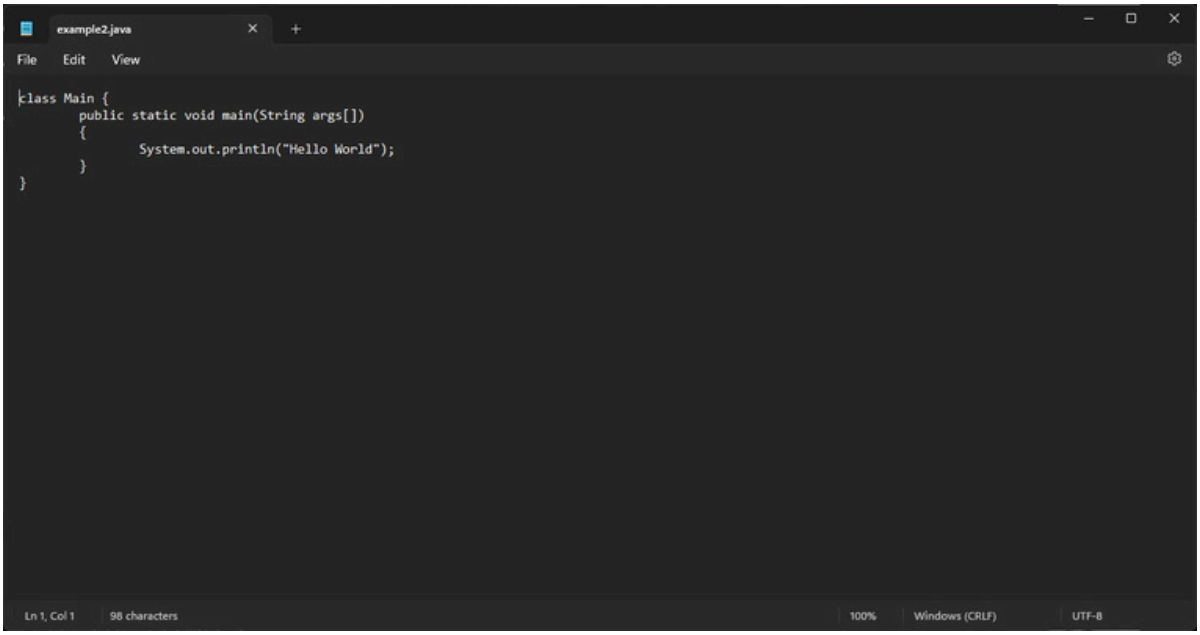
Modifying the Jenkins project to execute the script while supplying required parameters:

Console output after building the modified project:

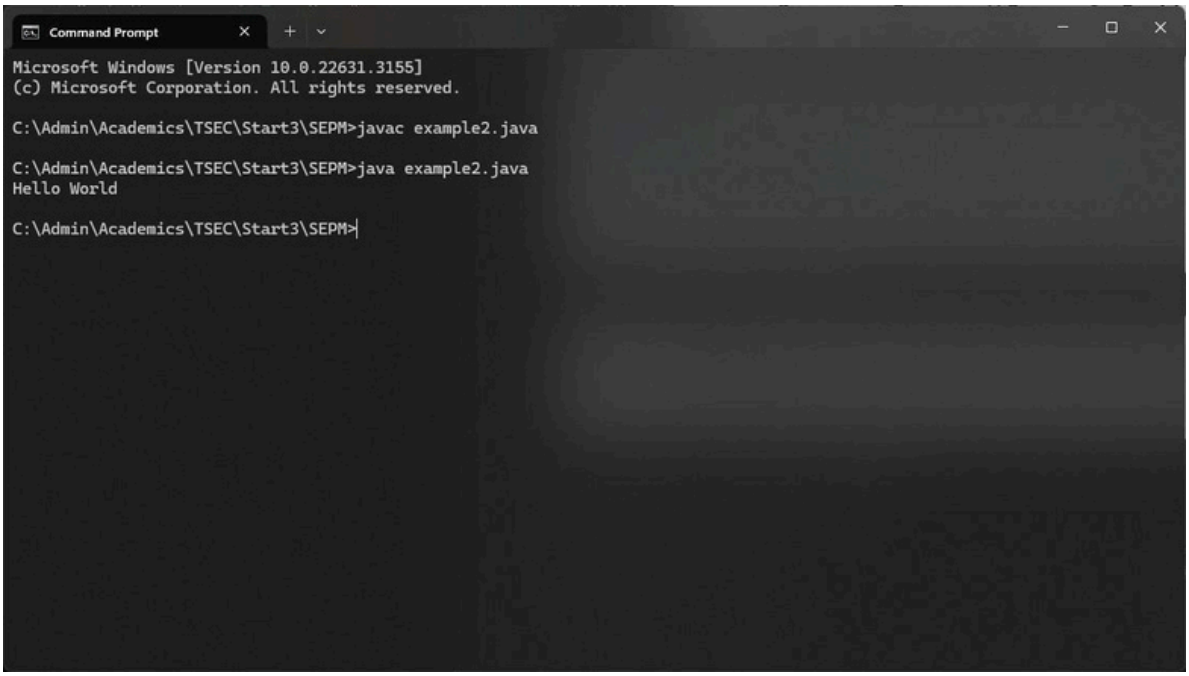
Example 2

Example 2.1: Running a Java program under Jenkins

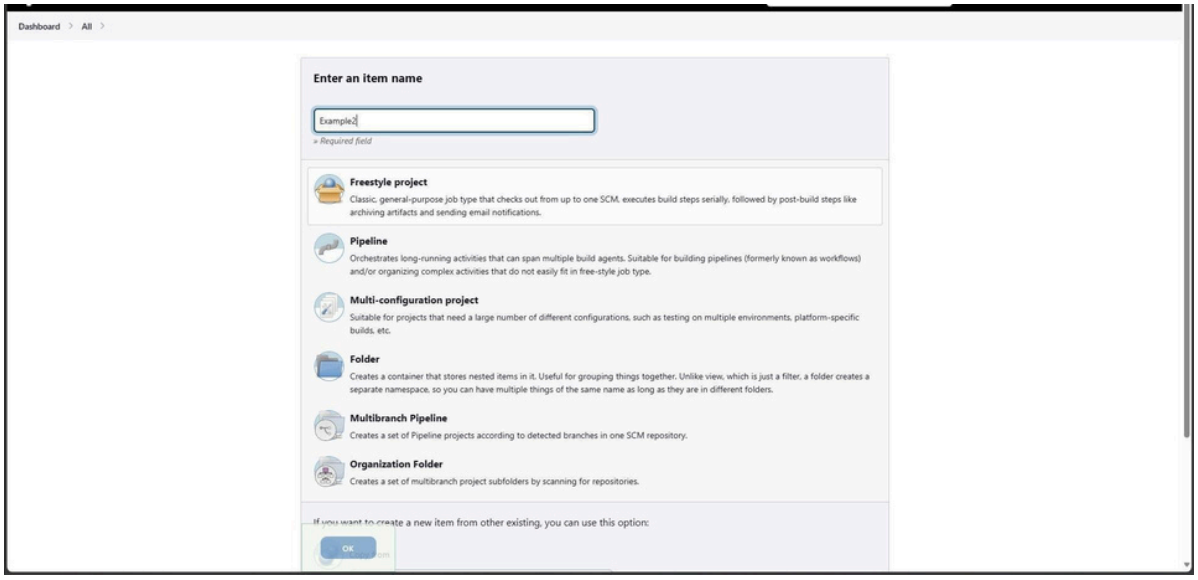
Creating a simple Java program:



Compiling and running the program on the terminal:



Creating a new freestyle project:



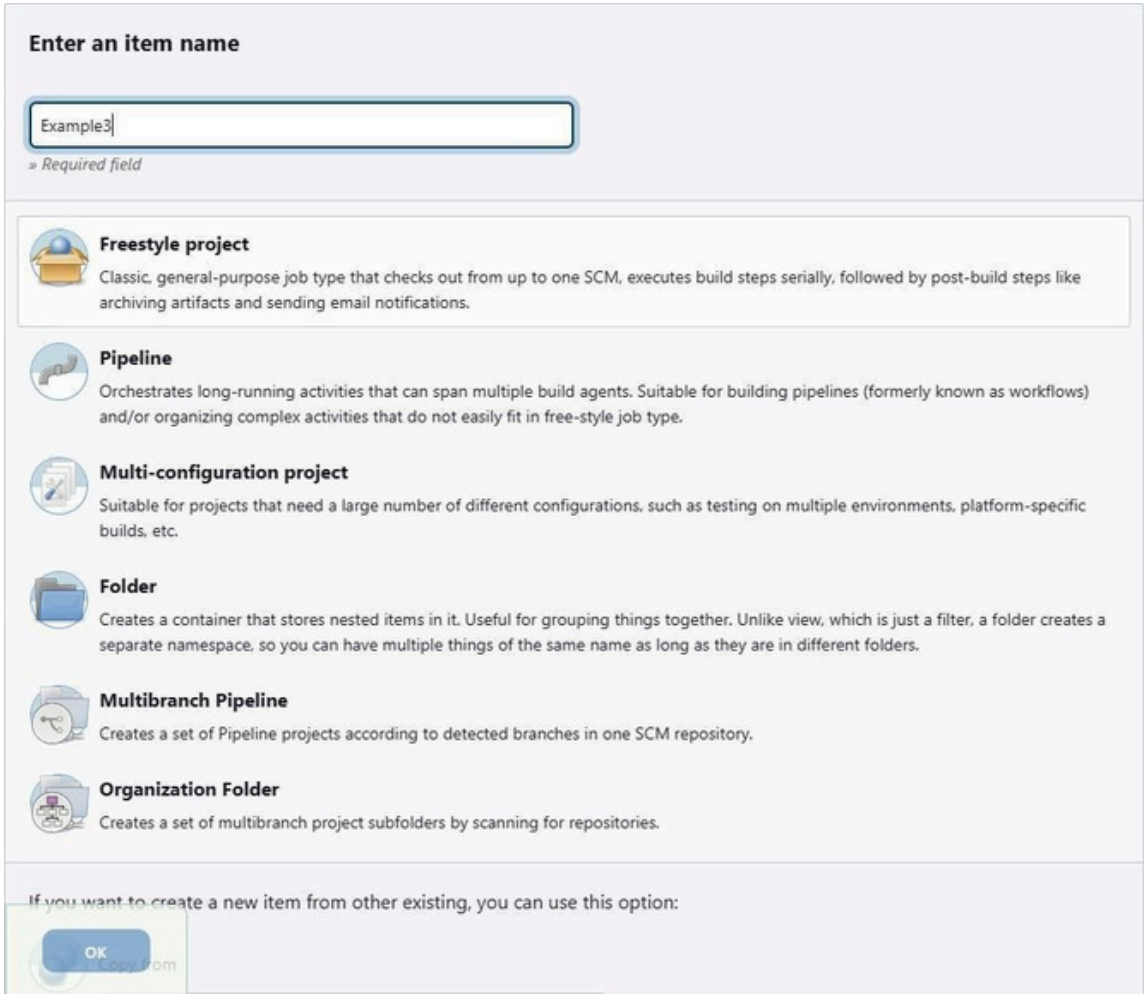
Configure new project:

Console output after building:

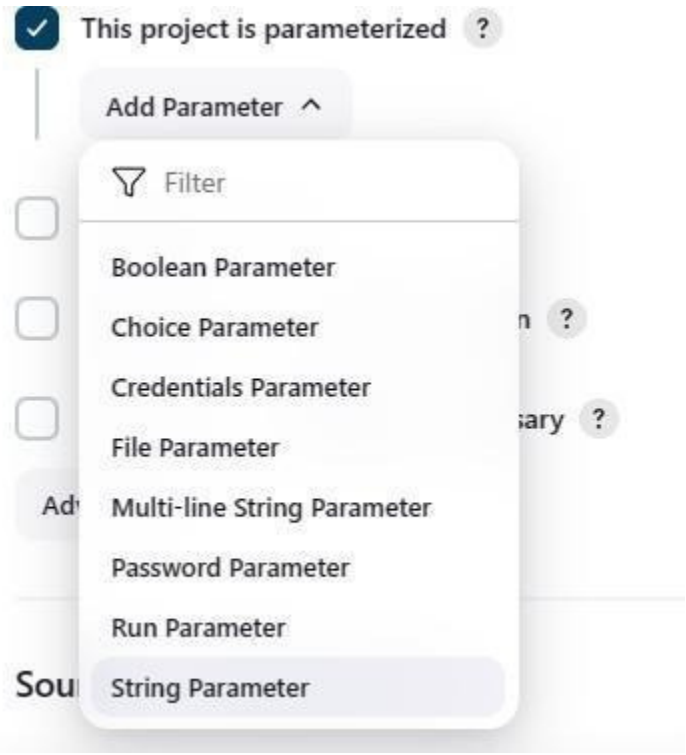
Example 3

Example 3.1: Parameterise build

Creating a new freestyle project:



Enabling parameterisation and adding a String parameter:



Configuring the string parameter as `Fname:`

Adding a choice parameter and configuring it as `City` with the following choices:

Creating a script which takes 2 arguments for name and city:

```
C:\Users\AI&DS 202>Microsoft Windows [Version 10.0.22631.3155] (c) Microsoft Corporation. All rights reserved.
'Microsoft' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\AI&DS 202>C:\Admin\Academics\TSEC\Start3\SEPH>example3.cnd
The system cannot find the path specified.

C:\Users\AI&DS 202>Hello your name is and your city is
'Hello' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\AI&DS 202>C:\Admin\Academics\TSEC\Start3\SEPH example3.cmd Tanishq
The system cannot find the path specified.

C:\Users\AI&DS 202>Hello your name is Tanishq and your city is
'Hello' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\AI&DS 202>C:\Admin\Academics\TSEC\Start3\SEPM>example3.cmd Tansishq Bandra
The system cannot find the path specified.

C:\Users\AI&DS 202>Hello your name is Tanishq and your city is Bandra
'Hello' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\AI&DS 202>C:\Admin\Academics\TSEC\Start3\SEPH
```

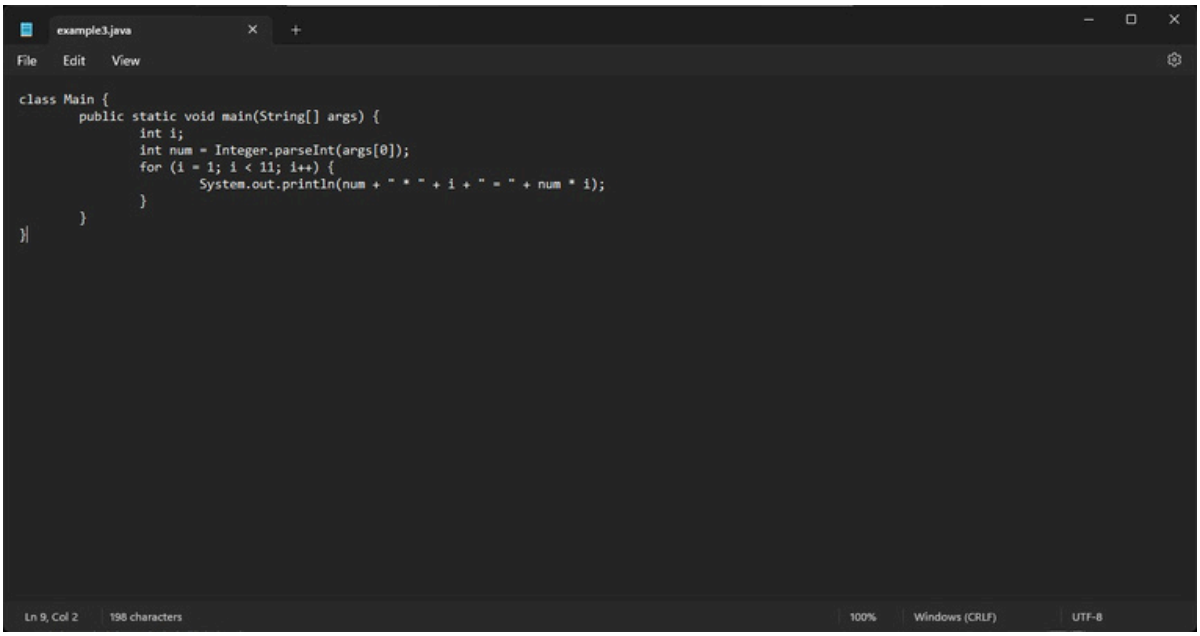
Configuring build steps:

Entering parameters for build:

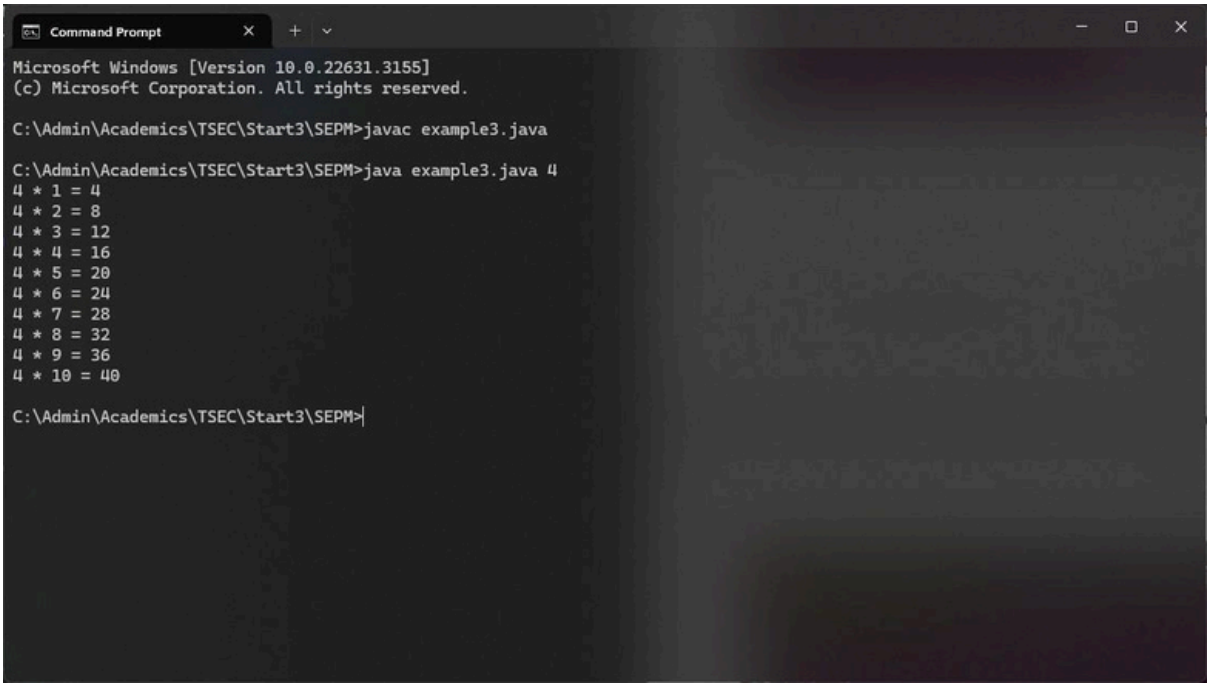
Console output after building:

Example 3.2: Running a Java program with parameters

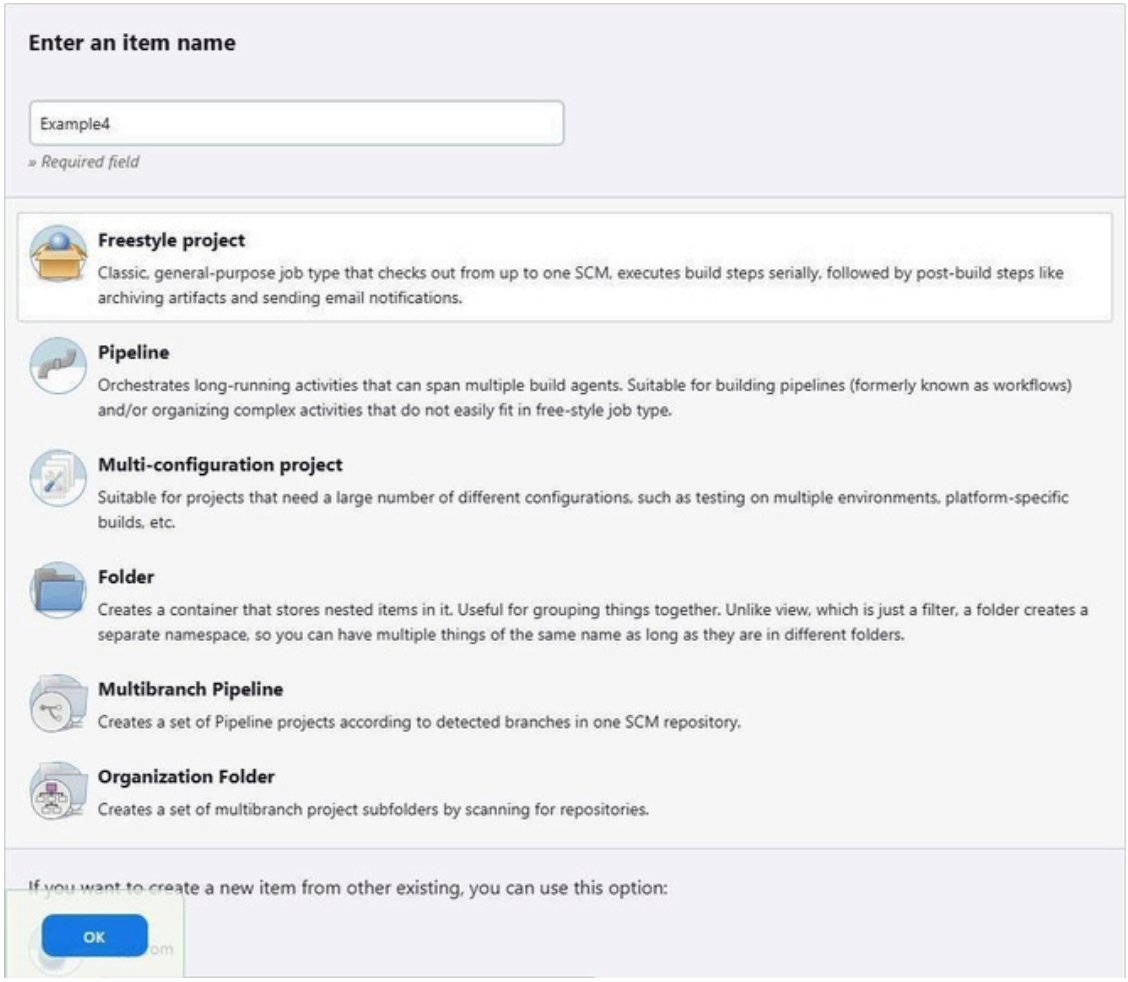
Creating a Java program with an input argument:



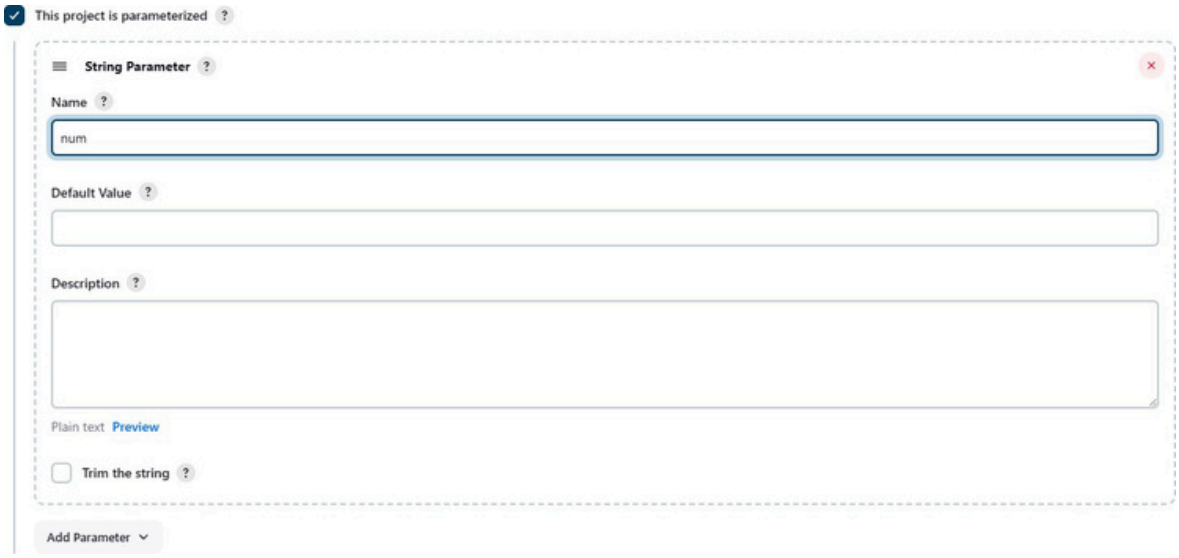
Testing the program on the terminal:



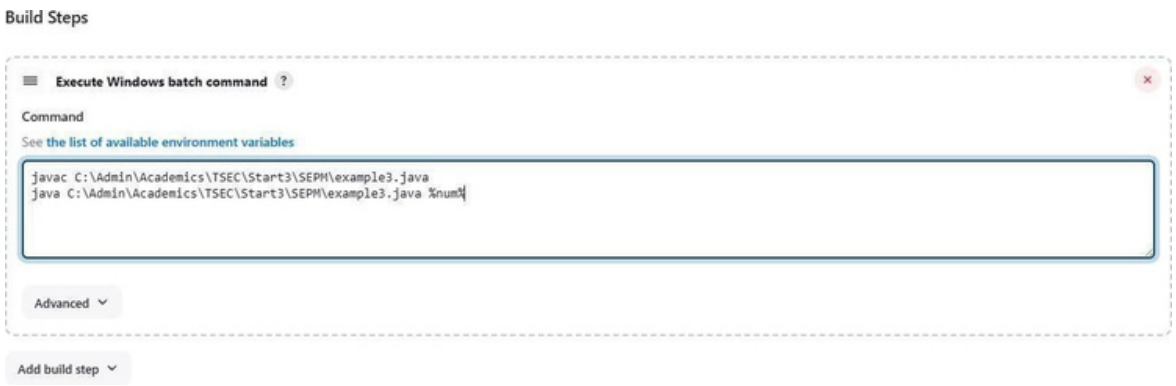
Creating a new freestyle project:



Parameterise the project by adding a string parameter as follows:



Configure the build steps:



Entering the parameter for the build:

Console output after building:

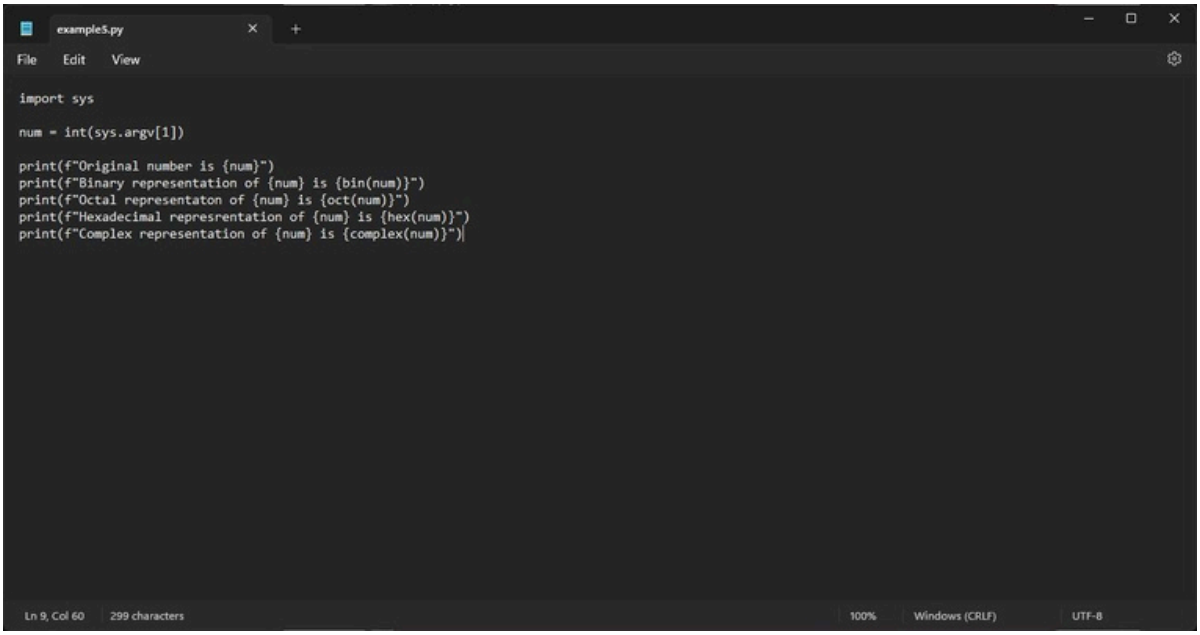
Console Output

```
Started by user Siddhant Chetlur
Running as SYSTEM
[EnvInject] - Loading node environment variables.
Building in workspace C:\ProgramData\Jenkins\.jenkins\workspace\Example4
[Example4] $ cmd /c call C:\WINDOWS\TEMP\jenkins15119185770823247708.bat

C:\ProgramData\Jenkins\.jenkins\workspace\Example4>javac C:\Admin\Academics\TSEC\Start3\SEPM\example3.java

C:\ProgramData\Jenkins\.jenkins\workspace\Example4>java C:\Admin\Academics\TSEC\Start3\SEPM\example3.java 25
25 * 1 = 25
25 * 2 = 50
25 * 3 = 75
25 * 4 = 100
25 * 5 = 125
25 * 6 = 150
25 * 7 = 175
25 * 8 = 200
25 * 9 = 225
25 * 10 = 250

C:\ProgramData\Jenkins\.jenkins\workspace\Example4>exit 0
Finished: SUCCESS
```

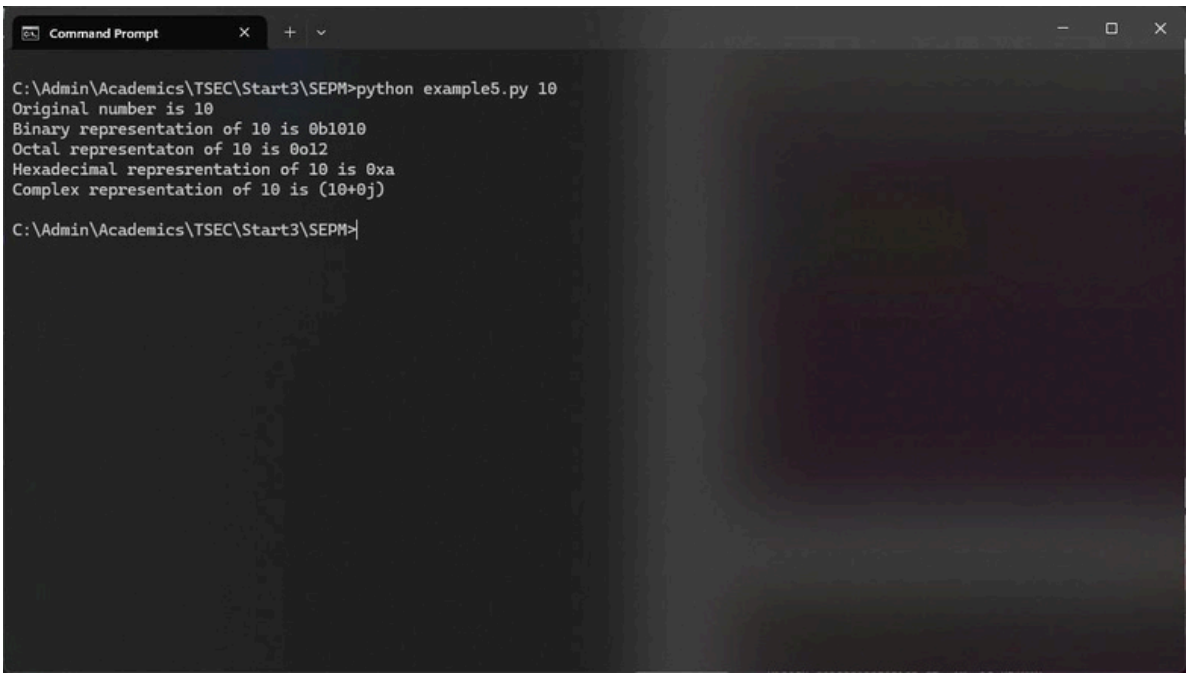
Example 5

Example 5.1: Running a Python program

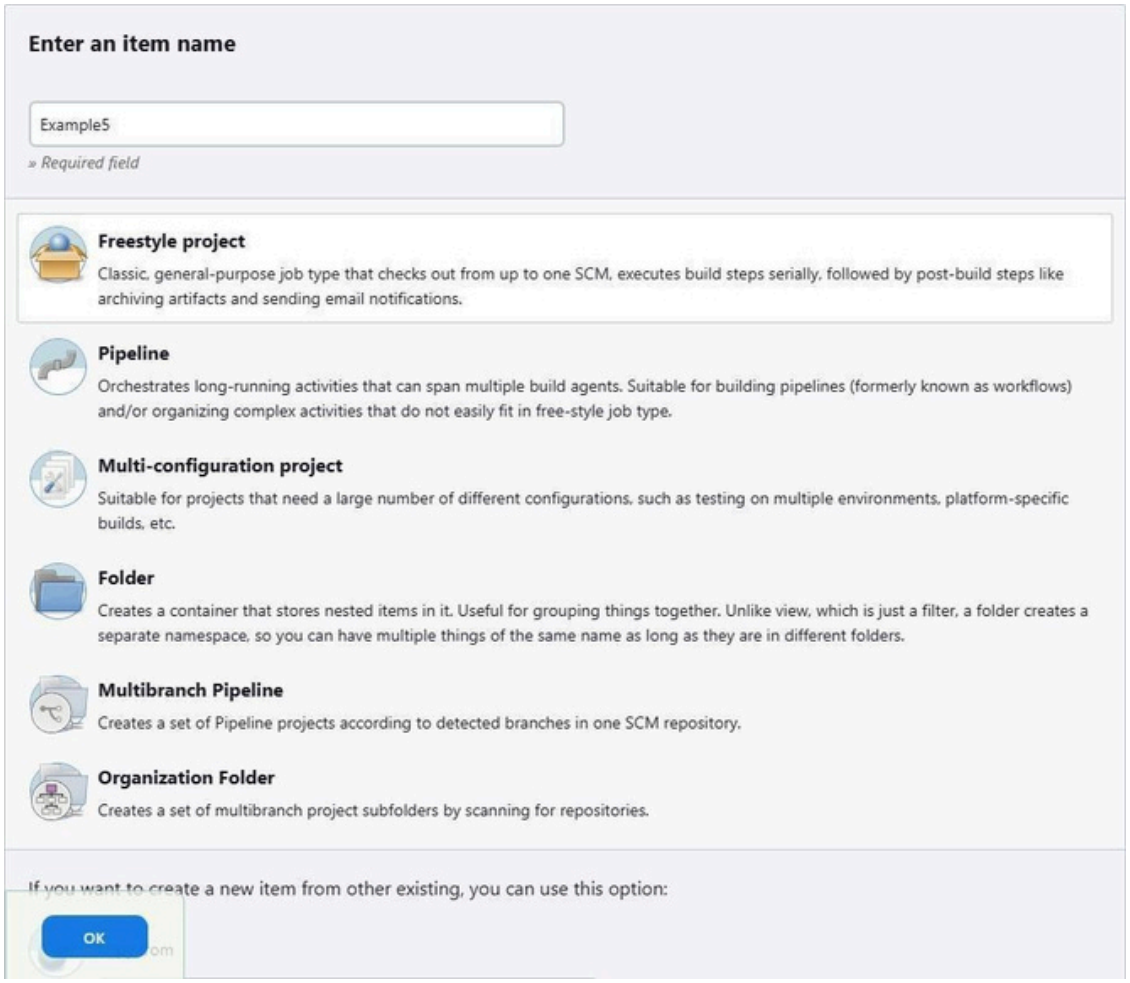
Creating a simple Python script:



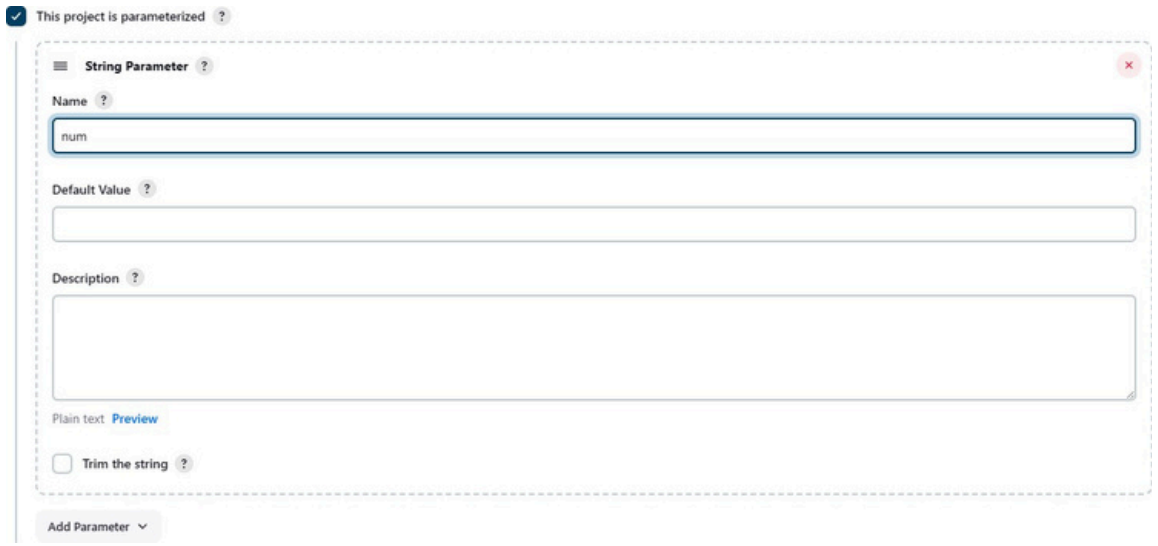
Running the Python script on the terminal:



Creating a new freestyle project:



Parameterising the project with a string parameter as follows:



Configuring the build steps:

Setting the parameter for the build:

Console output after building:

Conclusion: Thus, we have successfully studied Continuous Integration and installed, configured, and understood programming with Jenkins.

Name : Aarya Thakur
T22
Roll No: 114

EXPERIMENT 6

STUDYING AGILE METHODOLOGY AND TEST CASE MANAGEMENT USING JIRA TOOL

Theory:

1. Introduction to Agile Methodology

Agile methodology is an iterative approach to software development and project management that emphasizes flexibility, collaboration, and customer feedback. It helps teams deliver high-quality software in incremental steps rather than following a rigid plan.

1.1 Agile Manifesto

Agile is based on four core values:

1. Individuals and interactions over processes and tools.
2. Working software over comprehensive documentation.
3. Customer collaboration over contract negotiation.
4. Responding to change over following a plan.

1.2 Agile Principles

Agile follows 12 principles, including:

- Customer satisfaction through early and continuous delivery.
- Embracing changing requirements for the customer's competitive advantage.
- Delivering working software frequently.
- Close collaboration between business and development teams.
- Motivated individuals and self-organizing teams.
- Continuous attention to technical excellence.

2. Agile Frameworks

Several frameworks exist under Agile, including:

1. Scrum – A framework for iterative and incremental product development.
2. Kanban – A visual workflow management system.
3. Extreme Programming (XP) – Focuses on engineering practices.

4. Lean Software Development – Focuses on minimizing waste and maximizing value.

2.1 Scrum Framework

Scrum is one of the most popular Agile frameworks. It consists of:

- Scrum Team: Product Owner, Scrum Master, Development Team.
- Scrum Artifacts: Product Backlog, Sprint Backlog, Increment.
- Scrum Events: Sprint Planning, Daily Stand-ups, Sprint Review, Sprint Retrospective.
- Sprint Cycle: A time-boxed period (usually 2-4 weeks) where a team completes selected backlog items.

3. Introduction to Jira

Jira is a popular tool developed by Atlassian for Agile project management, issue tracking, and test case management. It helps teams plan, track, and manage software development projects efficiently. 3.1 Features of Jira

- Customizable dashboards for tracking project progress.
- Issue tracking for creating, assigning, and monitoring tasks.
- Workflow automation to improve efficiency.
- Integration with various development and testing tools.

4. Test Case Management Using Jira

Jira can be used to manage test cases effectively by integrating with testing plugins like Zephyr and Xray.

4.1 Steps to Manage Test Cases in Jira

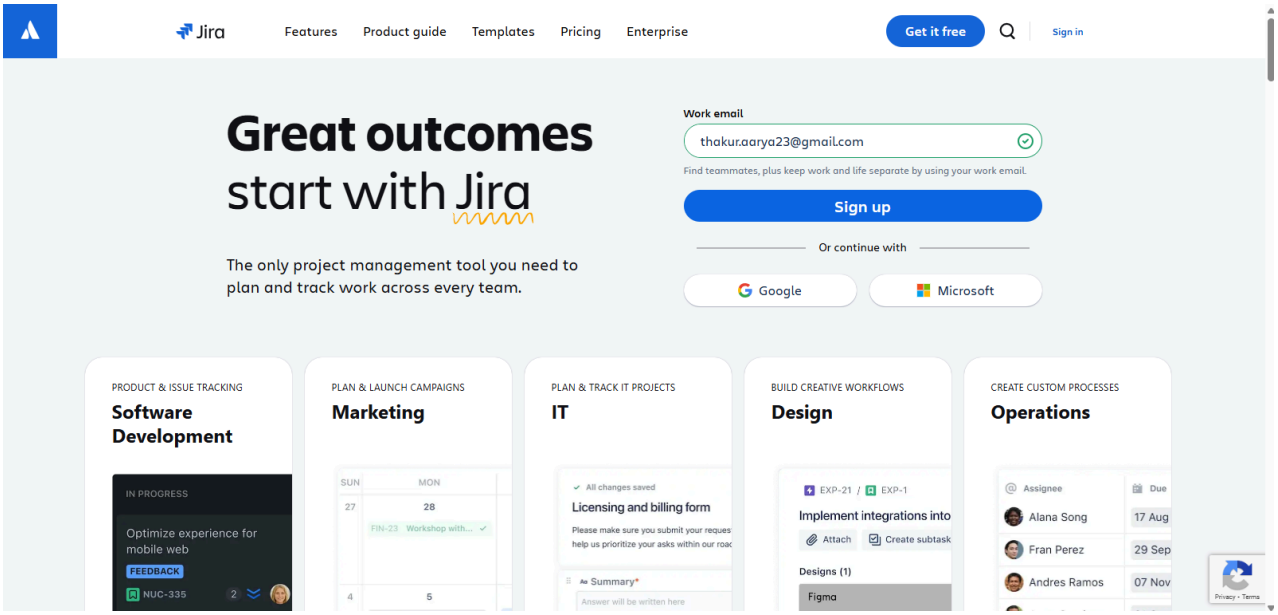
1. Creating a Test Case:
    - Navigate to the Jira project.
    - Click on Create Issue and select Test Case (if using Zephyr/Xray).
    - Define the test case with details such as Test Summary, Preconditions, Test Steps, and Expected Results.
    - Click Create to save the test case.
2. Executing a Test Case:
    - Open the created test case.
    - Click Execute and select the test cycle.
    - Update the test execution status (Pass, Fail, In Progress, Blocked).
3. Tracking Test Results:
    - Use Jira dashboards to generate reports on test execution progress.
    - Analyze defects by linking test cases to bug reports.
4. Integrating Jira with CI/CD Pipelines:

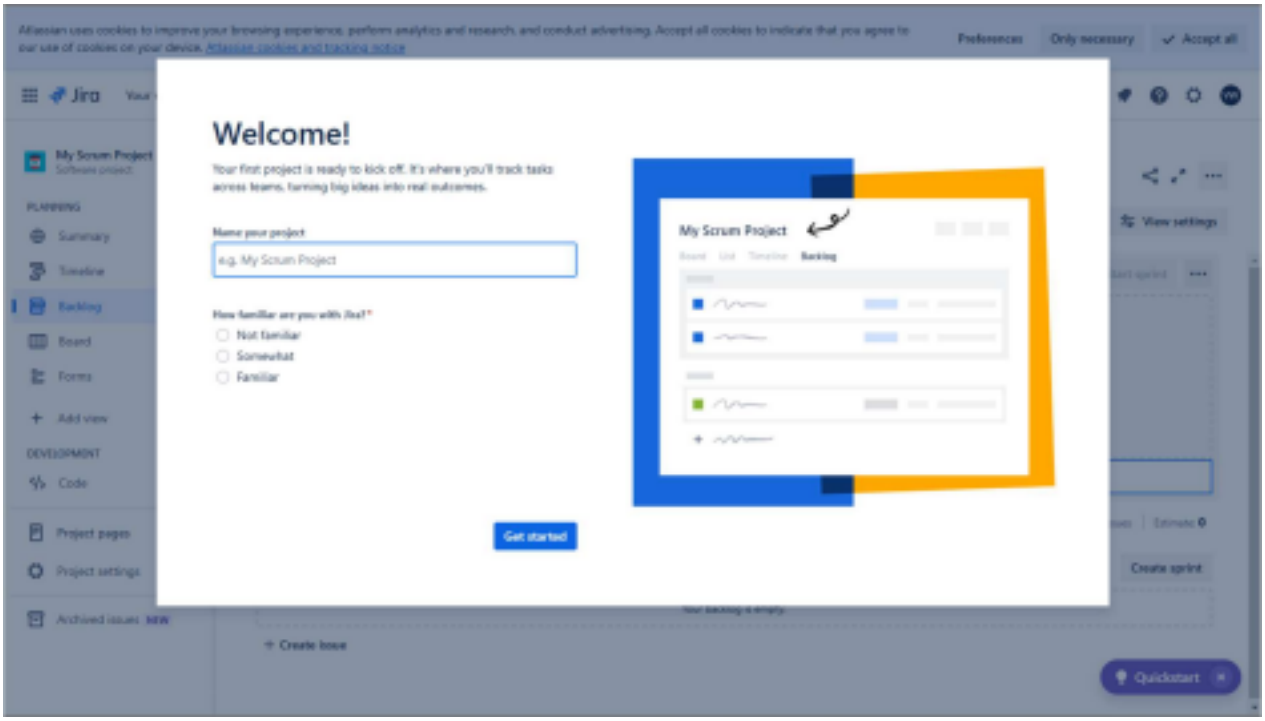
- Jira can integrate with Jenkins, Bamboo, and other DevOps tools to automate testing workflows.

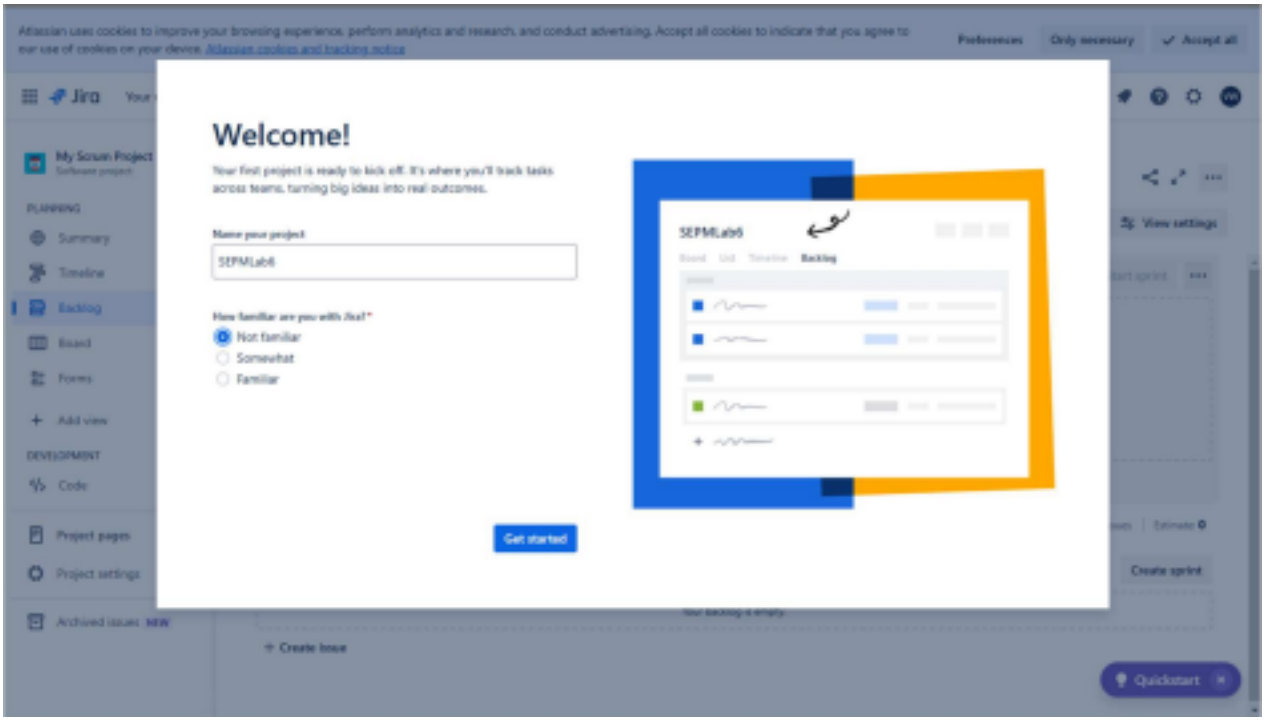
5. Benefits of Using Jira for Agile and Test Case Management

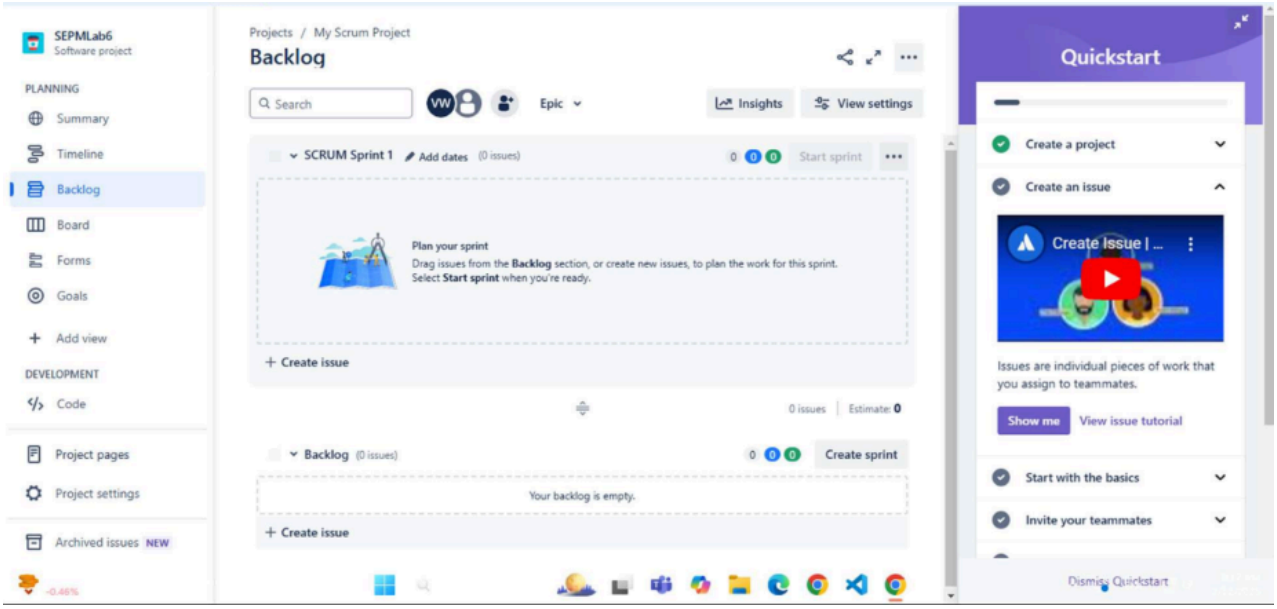
- Centralized Tracking: All tasks, sprints, and test cases are managed in one place.
- Collaboration: Teams can communicate and update task statuses in real-time.
- Customization: Jira can be tailored to fit any workflow.
- Automation: Reduces manual effort through workflow automation and integration with DevOps tools.

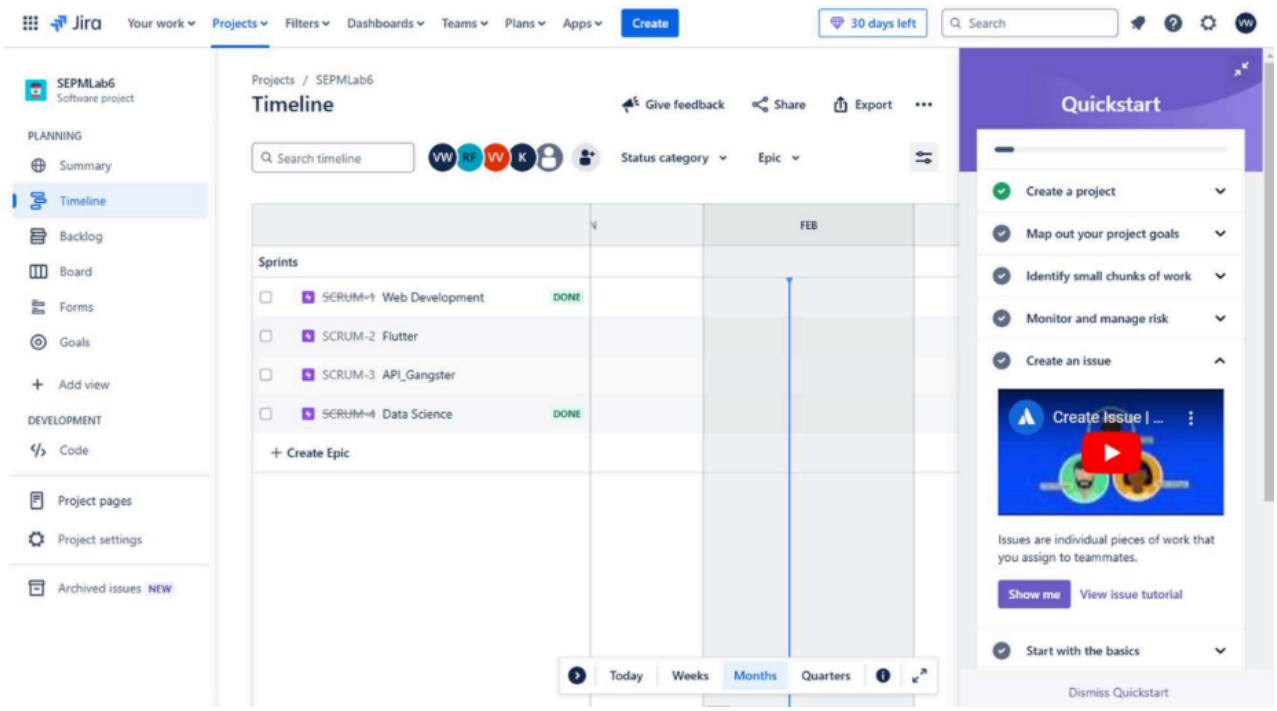
Output:

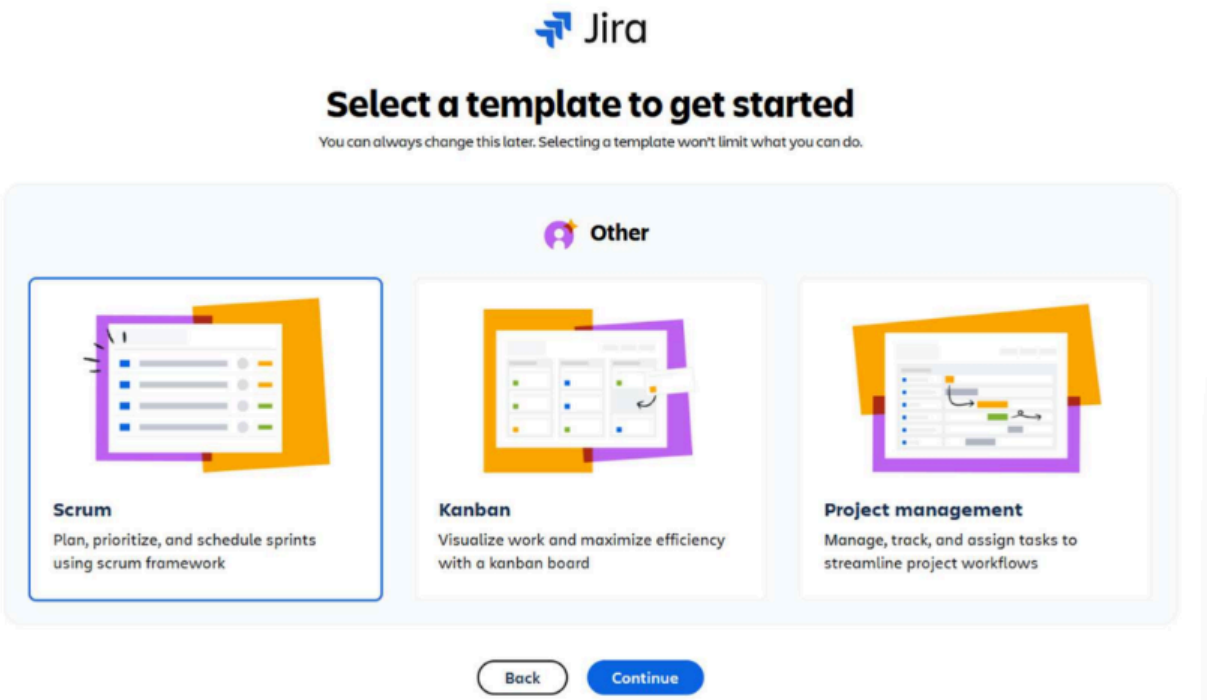



Welcome!
Your first project is ready to kick off. It's where you'll track tasks across teams, turning big ideas into real outcomes.
Name your project
e.g. My Scrum Project
How familiar are you with Jira?*
Not familiar
Somewhat
Familiar
Get started
My Scrum Project


Welcome!
Your first project is ready to kick off. It's where you'll track tasks across teams, turning big ideas into real outcomes.
Name your project
SEPMLab6
How familiar are you with Jira?*
Not familiar
Somewhat
Familiar
Get started
SEPMLab6


SEPMLab6
Software project
PLANNING
Summary
Timeline
Backlog
Board
Forms
Goals
Add view
DEVELOPMENT
Code
Project pages
Project settings
Archived issues NEW
Projects / My Scrum Project
Backlog
Search
Epic
Insights
View settings
SCRUM Sprint 1
Add dates
(0 issues)
Start sprint
Plan your sprint
Drag issues from the Backlog section, or create new issues, to plan the work for this sprint.
Select Start sprint when you're ready.
+ Create issue
0 issues
Estimate: 0
Backlog (0 issues)
Create sprint
Your backlog is empty.
+ Create issue
Quickstart
Create a project
Create an issue
Create issue | ...
Issues are individual pieces of work that you assign to teammates.
Show me
View issue tutorial
Start with the basics
Invite your teammates
Dismiss Quickstart


Jira
Your work
Projects
Filters
Dashboards
Teams
Plans
Apps
Create
30 days left
Search
SEPMLab6
Software project
PLANNING
Summary
Timeline
Backlog
Board
Forms
Goals
Add view
DEVELOPMENT
Code
Project pages
Project settings
Archived issues NEW
Projects / SEPMLab6
Timeline
Give feedback
Share
Export
Search timeline
Status category
Epic
FEB
Sprints
SCRUM-1 Web Development
DONE
SCRUM-2 Flutter
SCRUM-3 API_Gangster
SCRUM-4 Data Science
DONE
+ Create Epic
Today
Weeks
Months
Quarters
Quickstart
Create a project
Map out your project goals
Identify small chunks of work
Monitor and manage risk
Create an issue
Create issue | ...
Issues are individual pieces of work that you assign to teammates.
Show me
View issue tutorial
Start with the basics
Dismiss Quickstart



Conclusion

This experiment provided an overview of Agile methodology and how Jira is used for project and test case management. Jira enhances Agile practices by improving workflow efficiency, collaboration, and test case execution tracking, making it a valuable tool in modern software development.

Name : Aarya Thakur
T22
Roll No: 114

Experiment 7

Aim: To Create Scrum Board for Scrum Master using JIRA Tool.

Theory:

To create a Scrum Board for a Scrum Master using the JIRA tool, you need to follow these steps:

Create a Scrum Project in JIRA:

Log in to your JIRA account and select a template from the library, choosing the Scrum template.

Once the project is created, you will land on the empty backlog, also known as the product backlog, containing a list of potential work items for the project

Create User Stories or Tasks in the Backlog:

In JIRA, work items like user stories, tasks, and bugs are referred to as "issues." Create user stories using the quick create option on the backlog.

User stories describe work items in a non-technical language from a user's perspective, following the format: "As a {type of user}, I want {goal} so that I {receive benefit}"

Prioritize User Stories in the Backlog:

After creating user stories, prioritize them by ranking or dragging and dropping them in the order they should be worked on.

The product owner usually prioritizes user stories, and the development team estimates the effort required to complete each story

Create a Scrum Board in JIRA:

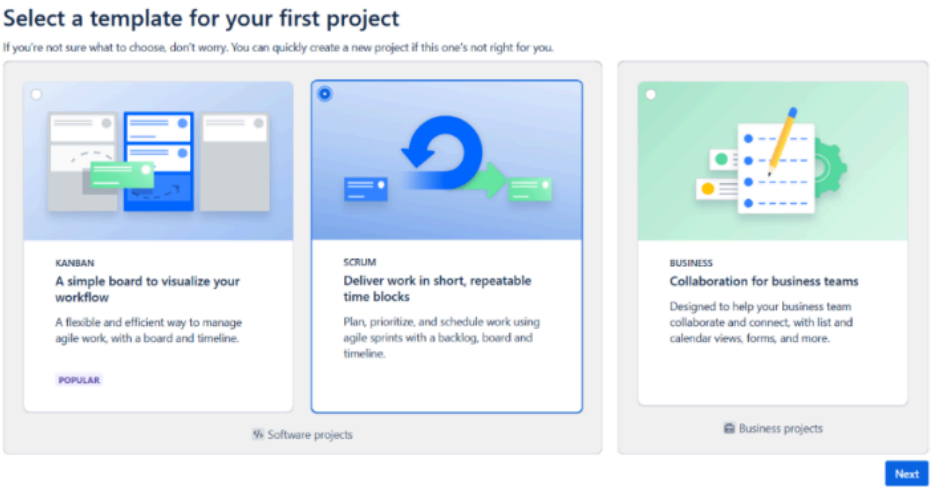
Click on Search > View all boards and then Create board.

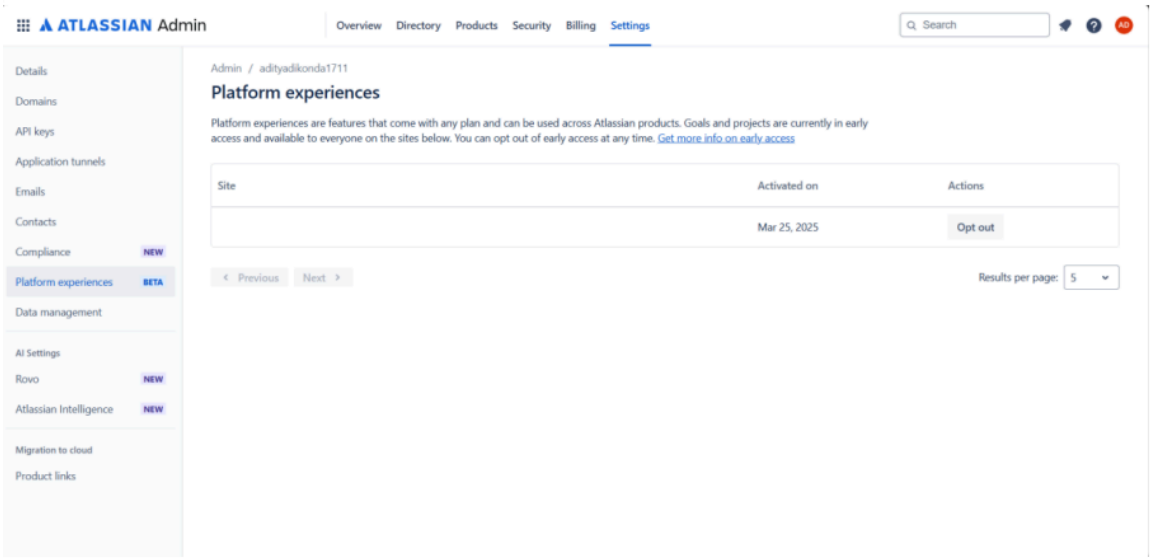
Select the board type as Scrum and choose whether to start with a new project

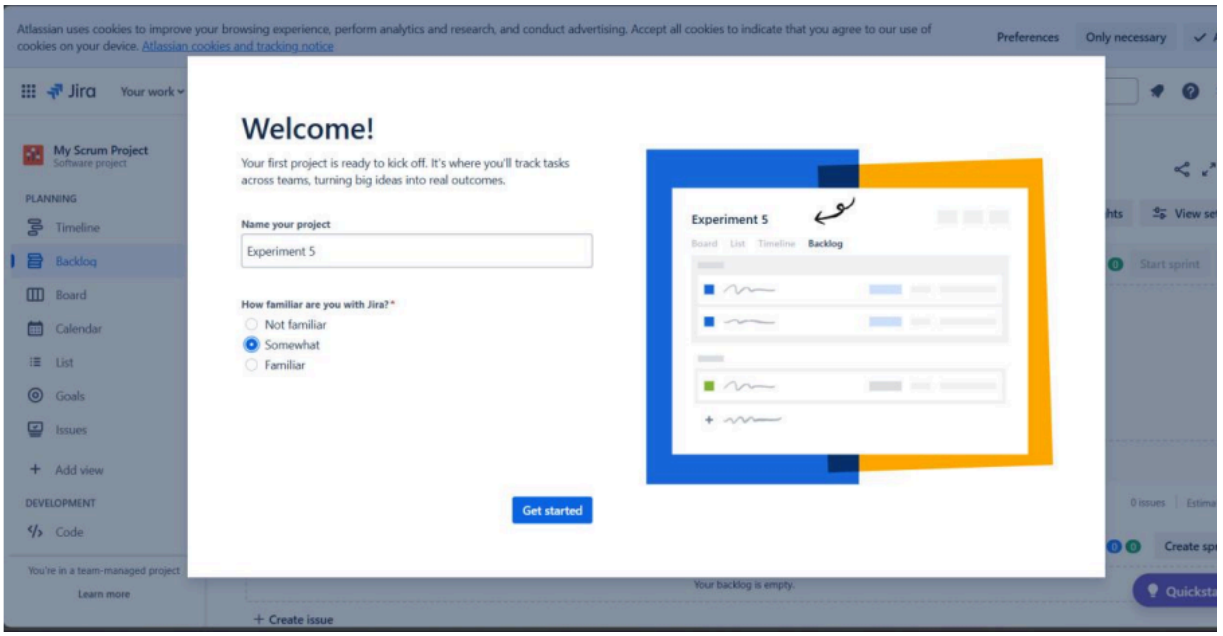
template or add the board to existing projects.
Configure columns and quick filters to reflect your team's process and focus on specific issues quickly

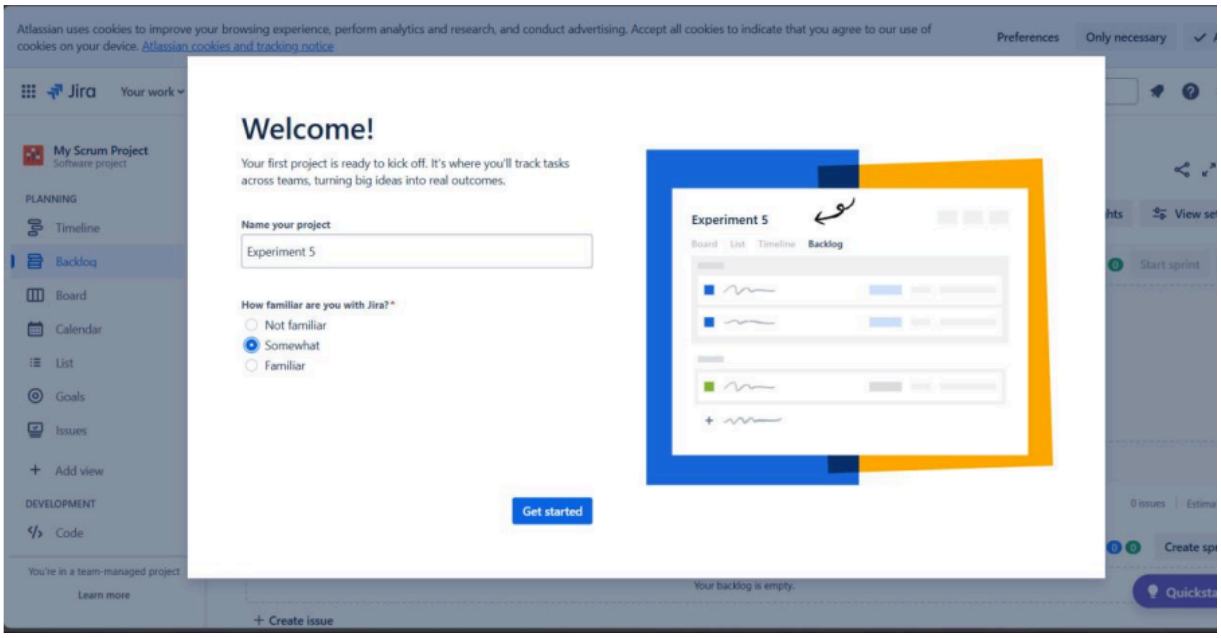
Navigate Between Boards:
Use the board switcher located in the left-hand menu under the project name to move between different boards in JIRA

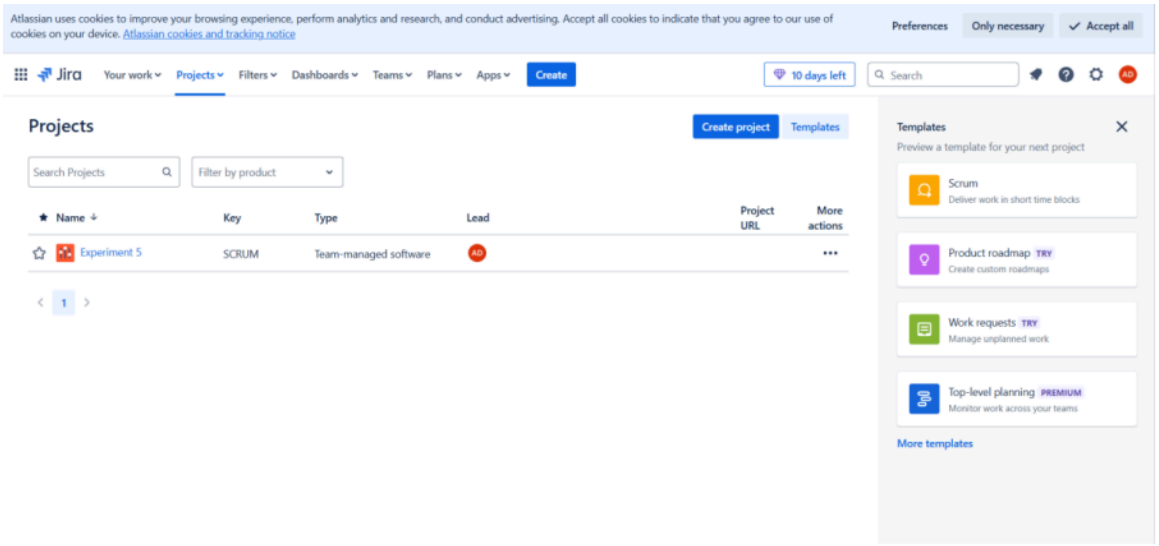
By following these steps, a Scrum Master can effectively create a Scrum Board in JIRA, enabling efficient management of tasks, user stories, and sprints within the agile project management framework.

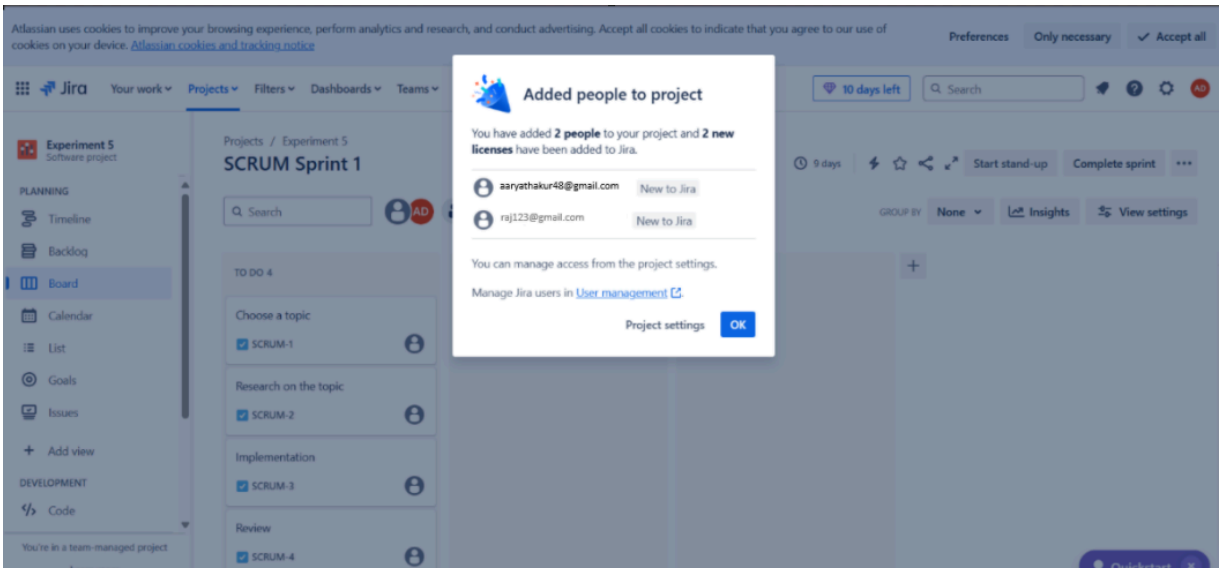


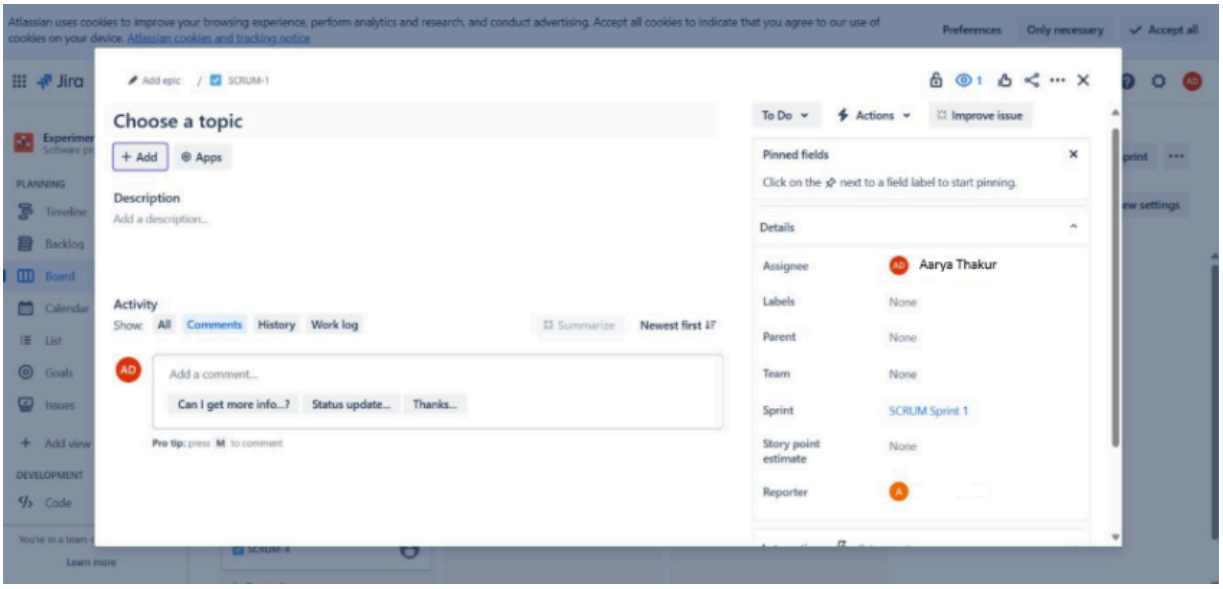


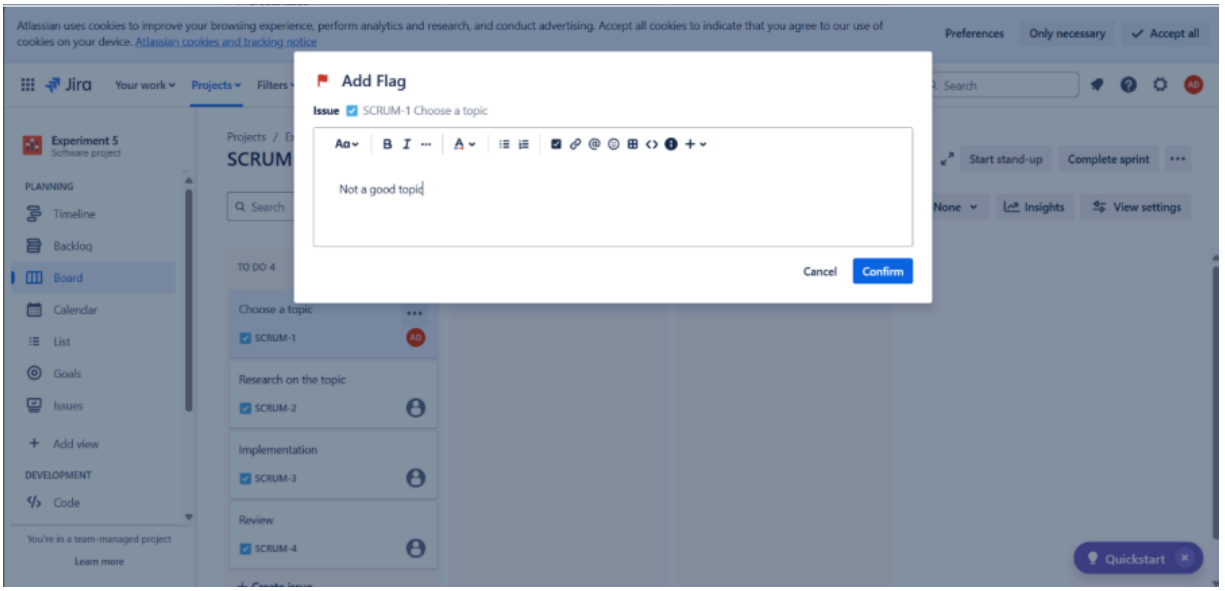

Atlassian uses cookies to improve your browsing experience, perform analytics and research, and conduct advertising. Accept all cookies to indicate that you agree to our use of cookies on your device. Atlassian cookies and tracking notice
Preferences
Only necessary
Jira
Your work
My Scrum Project
Software project
PLANNING
Timeline
Backlog
Board
Calendar
List
Goals
Issues
Add view
DEVELOPMENT
Code
You're in a team-managed project
Learn more
Welcome!
Your first project is ready to kick off. It's where you'll track tasks across teams, turning big ideas into real outcomes.
Name your project
Experiment 5
How familiar are you with Jira?*
Not familiar
Somewhat
Familiar
Get started
Experiment 5
Board
List
Timeline
Backlog
Start sprint
0 issues
Create sp
Your backlog is empty.
Create issue
Quicksta

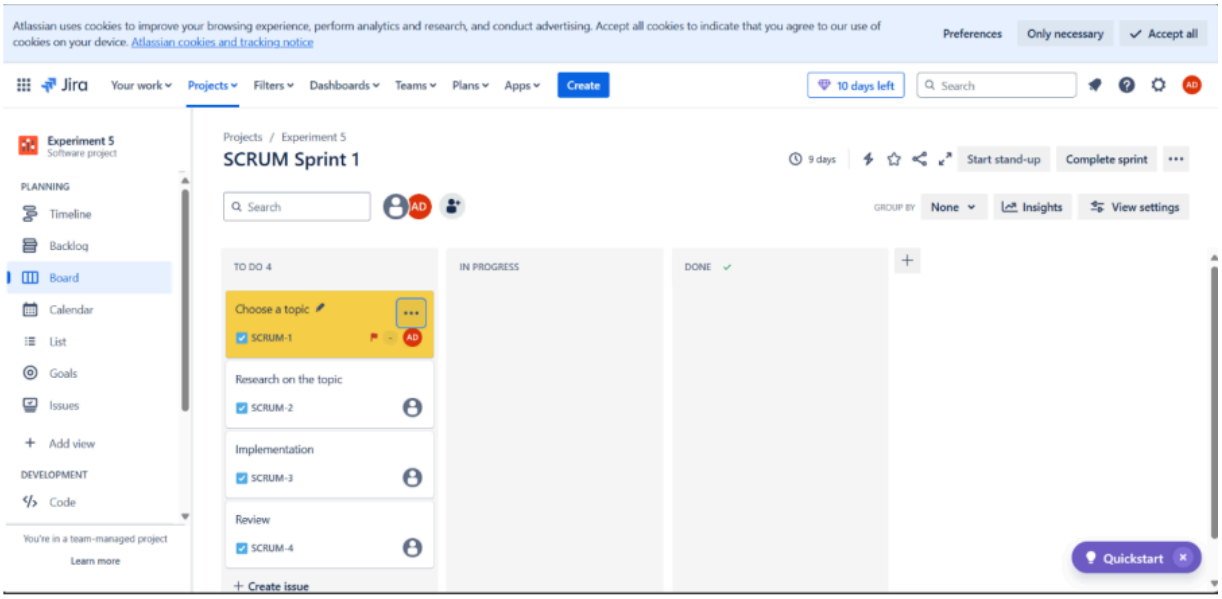

Atlassian uses cookies to improve your browsing experience, perform analytics and research, and conduct advertising. Accept all cookies to indicate that you agree to our use of cookies on your device. Atlassian cookies and tracking notice
Preferences
Only necessary
Jira
Your work
My Scrum Project
Software project
PLANNING
Timeline
Backlog
Board
Calendar
List
Goals
Issues
Add view
DEVELOPMENT
Code
You're in a team-managed project
Learn more
Welcome!
Your first project is ready to kick off. It's where you'll track tasks across teams, turning big ideas into real outcomes.
Name your project
Experiment 5
How familiar are you with Jira?*
Not familiar
Somewhat
Familiar
Get started
Experiment 5
Board
List
Timeline
Backlog
Start sprint
0 issues
Create sp
Your backlog is empty.
Create issue
Quicksta

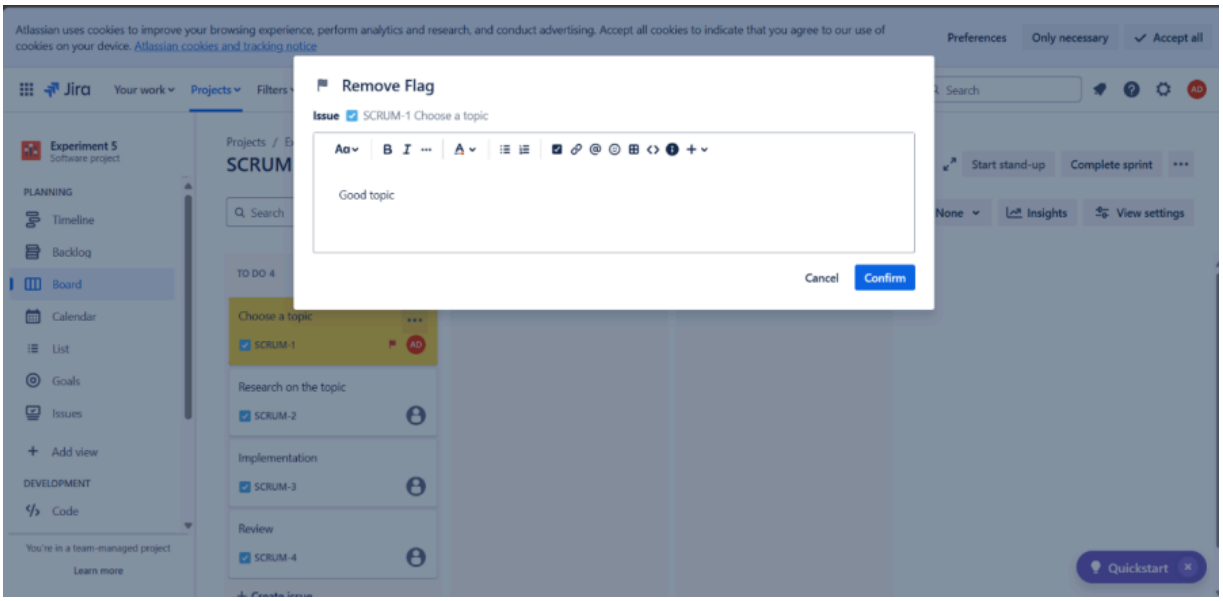

Atlassian uses cookies to improve your browsing experience, perform analytics and research, and conduct advertising. Accept all cookies to indicate that you agree to our use of cookies on your device. Atlassian cookies and tracking notice
Preferences
Only necessary
Accept all
Jira
Your work
Projects
Filters
Dashboards
Teams
Plans
Apps
Create
10 days left
Search
Projects
Create project
Templates
Search Projects
Filter by product
Name
Key
Type
Lead
Project URL
More actions
Experiment 5
SCRUM
Team-managed software
AD
1
Templates
Preview a template for your next project
Scrum
Deliver work in short time blocks
Product roadmap TRY
Create custom roadmaps
Work requests TRY
Manage unplanned work
Top-level planning PREMIUM
Monitor work across your teams
More templates

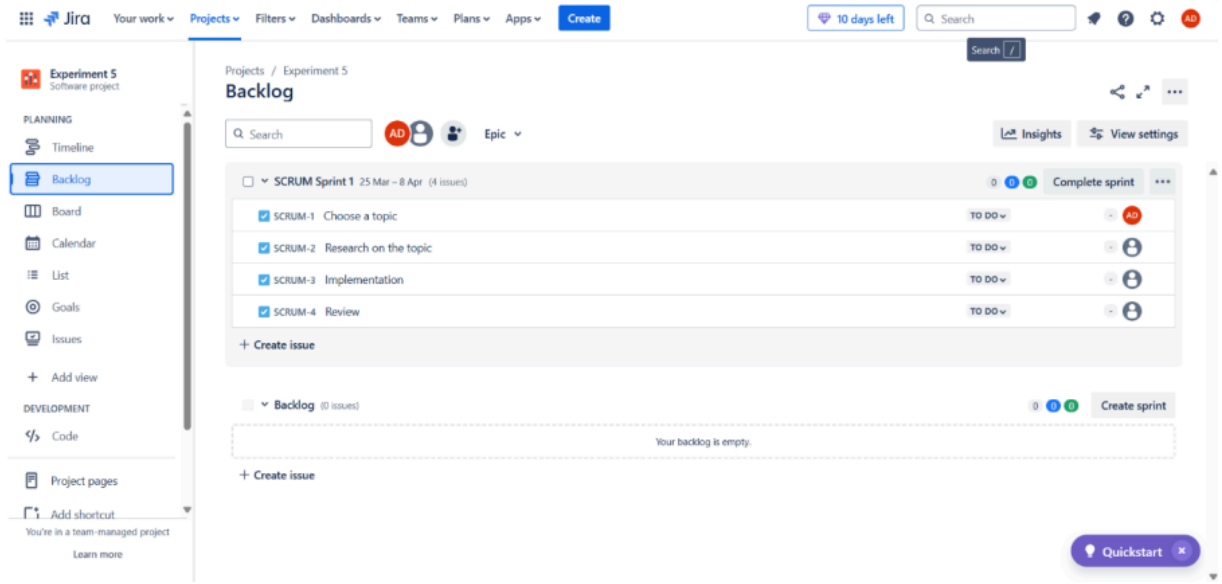

Added people to project
You have added 2 people to your project and 2 new licenses have been added to Jira.
aaryathakur48@gmail.com
New to Jira
raj123@gmail.com
New to Jira
You can manage access from the project settings.
Manage Jira users in User management.
Project settings
OK
SCRUM Sprint 1
Choose a topic
Research on the topic
Implementation
Review

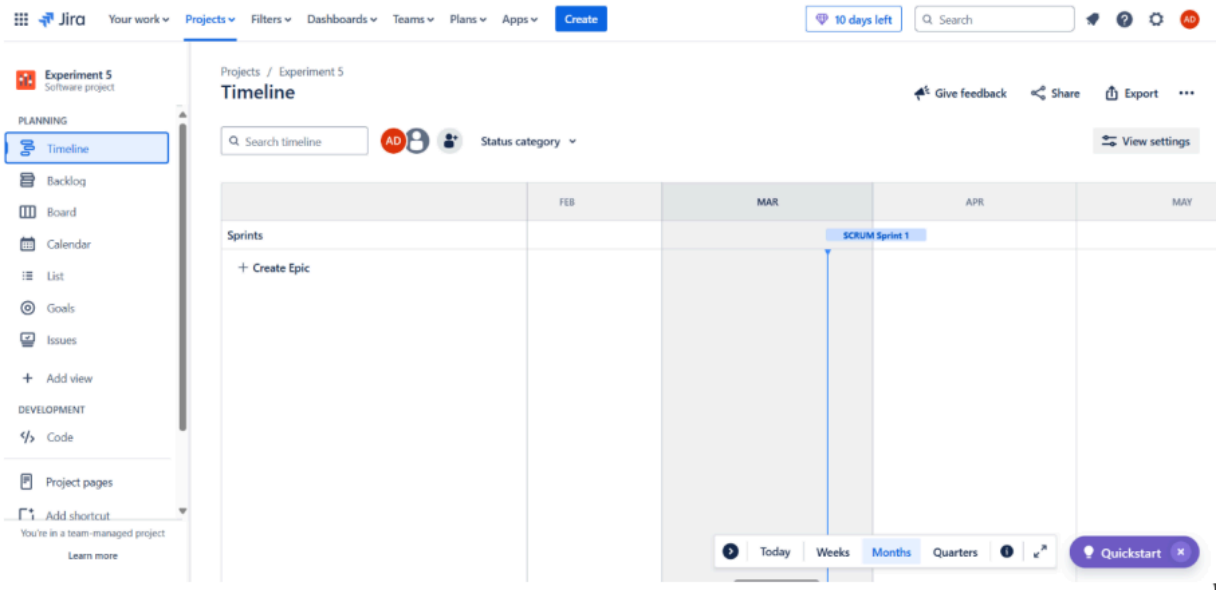

Choose a topic
Description
Activity
Pinned fields
Details
Assignee
Aarya Thakur
Labels
Parent
Team
Sprint
SCRUM Sprint 1
Story point estimate
Reporter

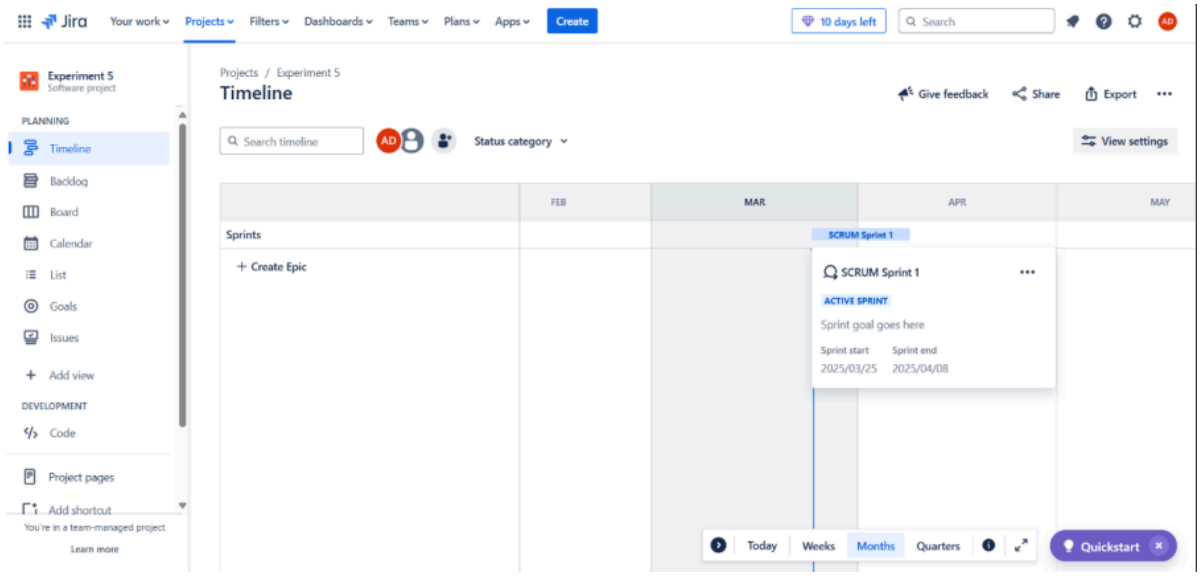

Add Flag
Issue
SCRUM-1 Choose a topic
Not a good topic
Cancel
Confirm


Atlassian uses cookies to improve your browsing experience, perform analytics and research, and conduct advertising. Accept all cookies to indicate that you agree to our use of cookies on your device. Atlassian cookies and tracking notice
Preferences
Only necessary
Accept all
Jira
Your work
Projects
Filters
Dashboards
Teams
Plans
Apps
Create
10 days left
Search
Experiment 5
Software project
PLANNING
Timeline
Backlog
Board
Calendar
List
Goals
Issues
Add view
DEVELOPMENT
Code
You're in a team-managed project
Learn more
Projects / Experiment 5
SCRUM Sprint 1
9 days
Start stand-up
Complete sprint
Search
GROUP BY
None
Insights
View settings
TO DO 4
IN PROGRESS
DONE
Choose a topic
SCRUM-1
Research on the topic
SCRUM-2
Implementation
SCRUM-3
Review
SCRUM-4
Create issue
Quickstart


Remove Flag
Issue
SCRUM-1 Choose a topic
Good topic
Cancel
Confirm


Jira
Your work
Projects
Filters
Dashboards
Teams
Plans
Apps
Create
10 days left
Search
Search /
Experiment 5
Software project
PLANNING
Timeline
Backlog
Board
Calendar
List
Goals
Issues
Add view
DEVELOPMENT
Code
Project pages
Add shortcut
You're in a team-managed project
Learn more
Projects / Experiment 5
Backlog
Epic
Insights
View settings
SCRUM Sprint 1 25 Mar – 8 Apr (4 issues)
Complete sprint
SCRUM-1 Choose a topic
SCRUM-2 Research on the topic
SCRUM-3 Implementation
SCRUM-4 Review
TO DO
Create issue
Backlog (0 issues)
Create sprint
Your backlog is empty.
Quickstart





Conclusion:

Scrum project was implemented using JIRA.

Name : Aarya Thakur
T22
Roll No: 114

Experiment 08

Aim:

To Study Project Scheduling Using Gantt chart in ClickUp.

Theory:

Project Scheduling

A project schedule is a timeline that outlines the tasks, milestones, deadlines, and resources required for completing a project. It helps project managers organise and plan the sequence of activities, allocate resources efficiently, set realistic timelines, and monitor progress. Having a clear project schedule is crucial for a project manager as it ensures tasks are completed on time, helps in managing resources effectively, allows for better coordination among team members, and assists in identifying potential issues or delays, enabling timely adjustments to keep the project on track.

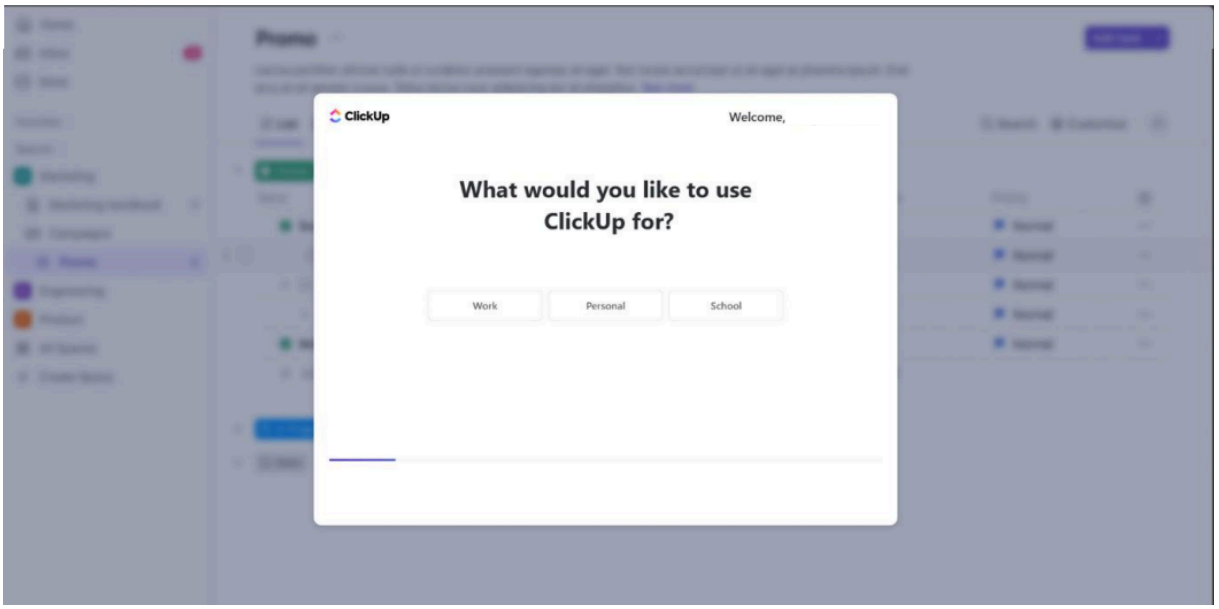
Gantt chart

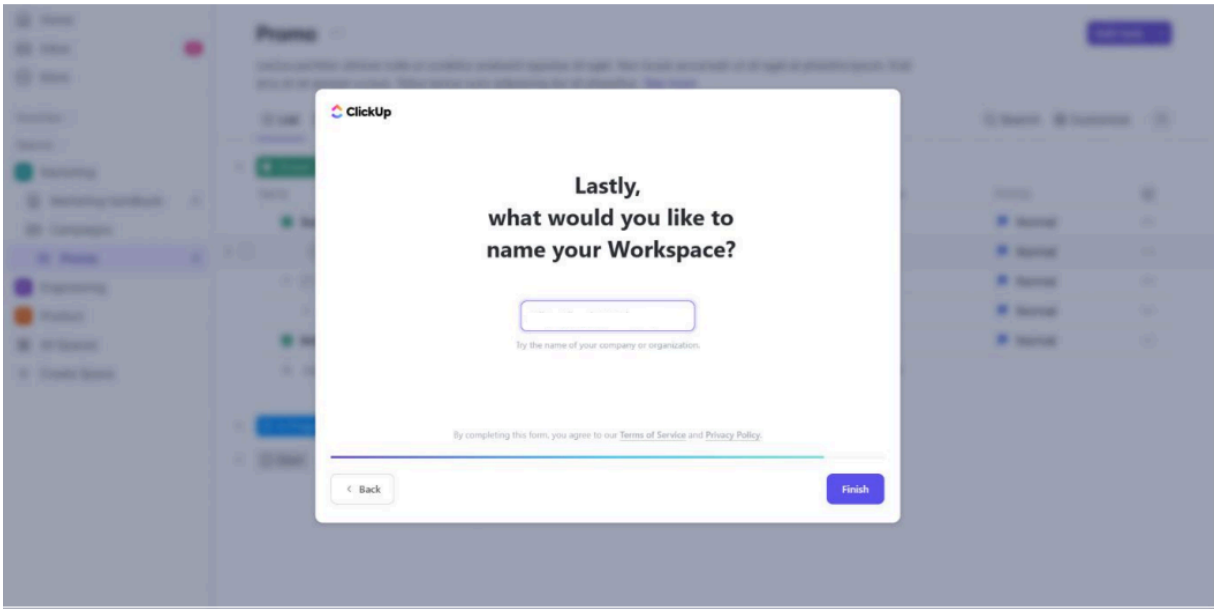
A Gantt chart, commonly used in project management, is one of the most popular and useful ways of showing activities (tasks or events) displayed against time. On the left of the chart is a list of the activities and along the top is a suitable time scale. Each activity is represented by a bar; the position and length of the bar reflects the start date, duration and end date of the activity.

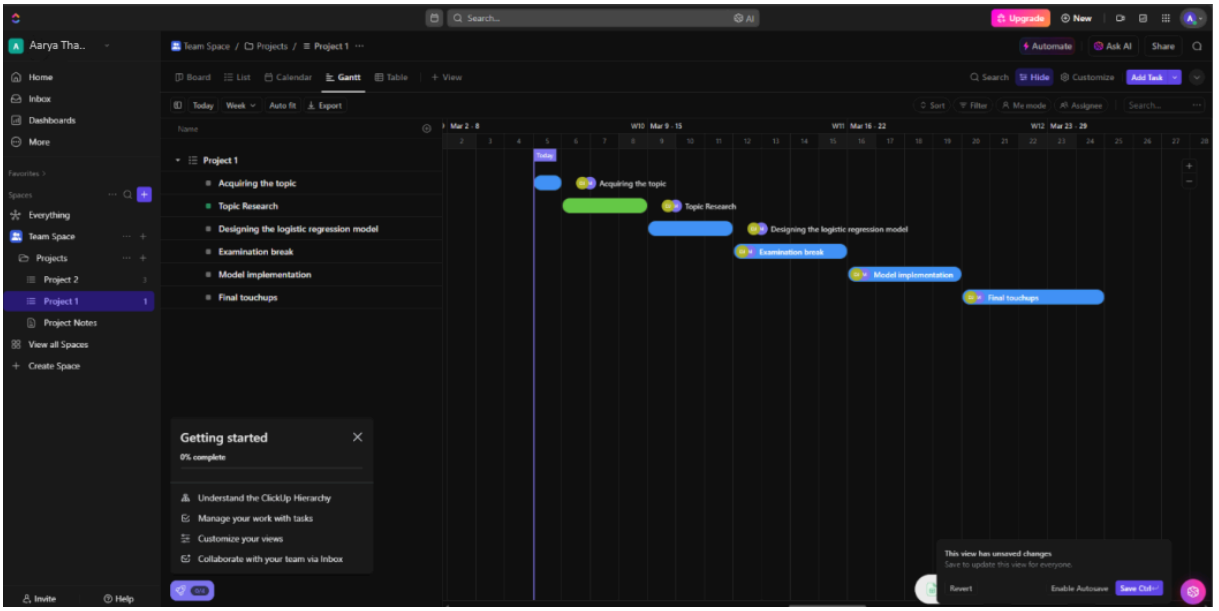
About the topic

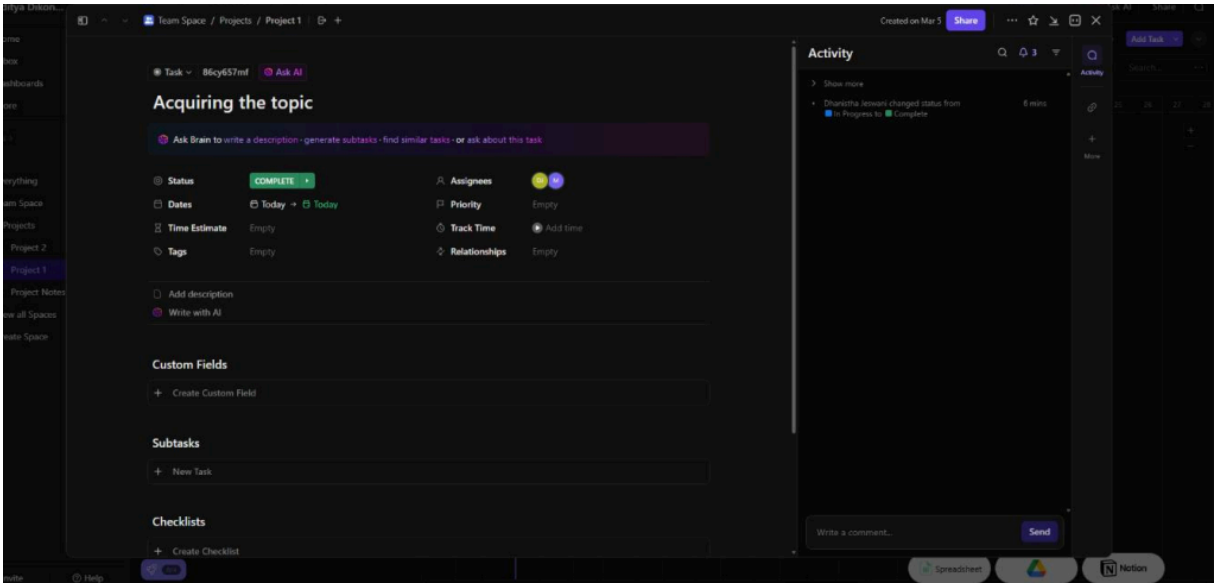
It is a Logistic regression Model designed on Agricultural decision making based on soil characteristics and various other environmental factors. Our dataset Encompasses of essential parameters such as soil composition (Nitrogen,potassium and phosphorus contents of the soil as well as the pH level of the soil) and location specific variables such as temperature, humidity and rainfall. Our model leverages these inputs and aims to predicts the most suitable crop for a given soil and environmental conditions.

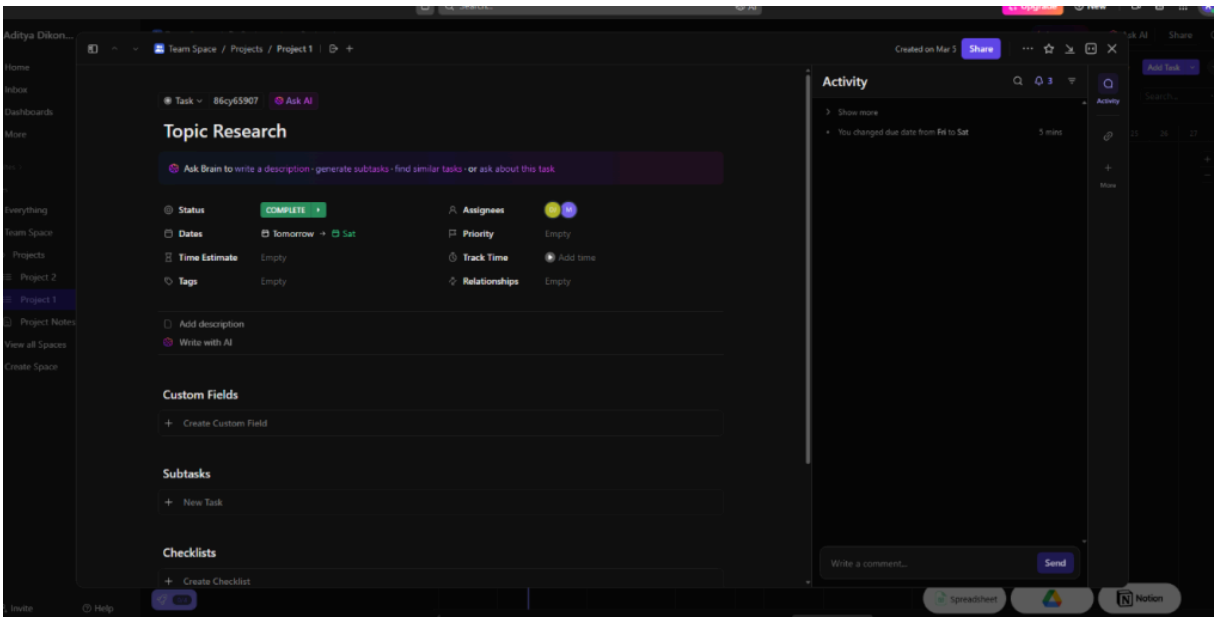
Output:

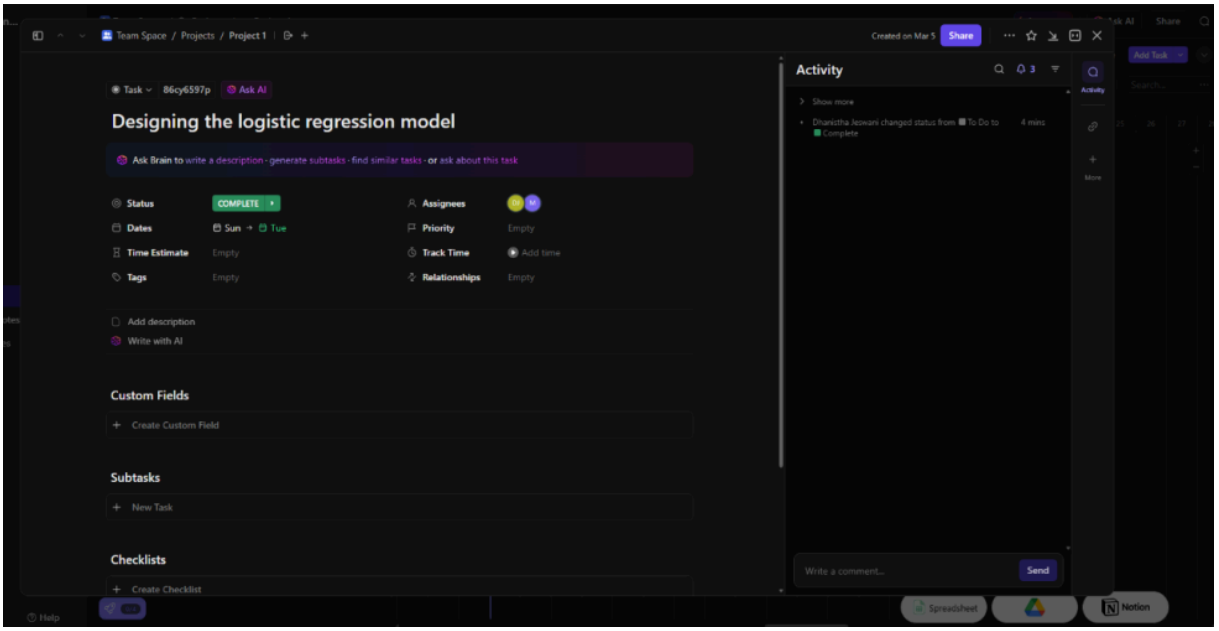

ClickUp
Welcome,
What would you like to use ClickUp for?
Work
Personal
School

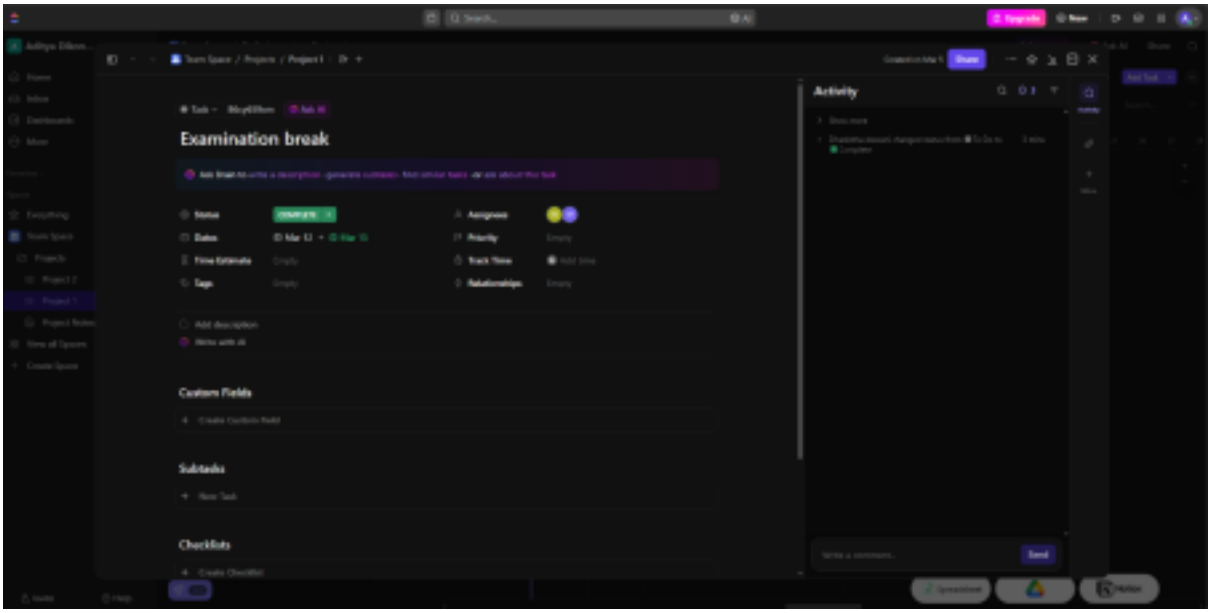

ClickUp
Lastly, what would you like to name your Workspace?
Try the name of your company or organization.
By completing this form, you agree to our Terms of Service and Privacy Policy.
Back
Finish

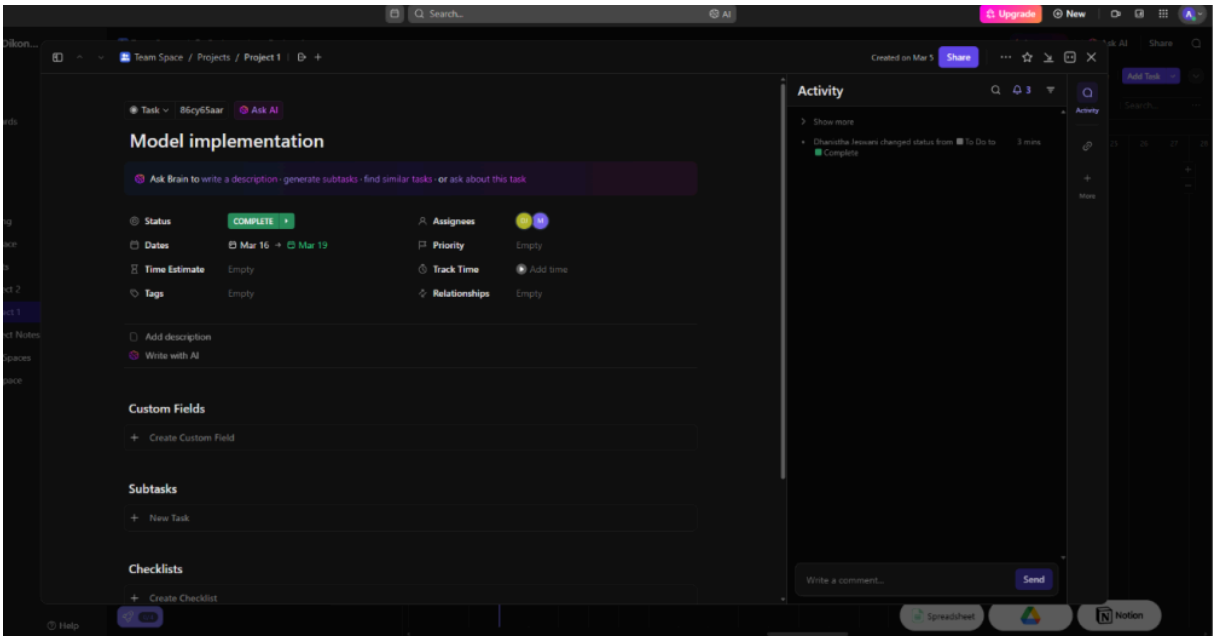

Aarya Tha...
Home
Inbox
Dashboards
More
Everything
Team Space
Projects
Project 2
Project 1
Project Notes
View all Spaces
Create Space
Invite
Help
Team Space / Projects / Project 1
Board
List
Calendar
Gantt
Table
Project 1
Acquiring the topic
Topic Research
Designing the logistic regression model
Examination break
Model implementation
Final touchups
Getting started
0% complete
Understand the ClickUp Hierarchy
Manage your work with tasks
Customize your views
Collaborate with your team via Inbox

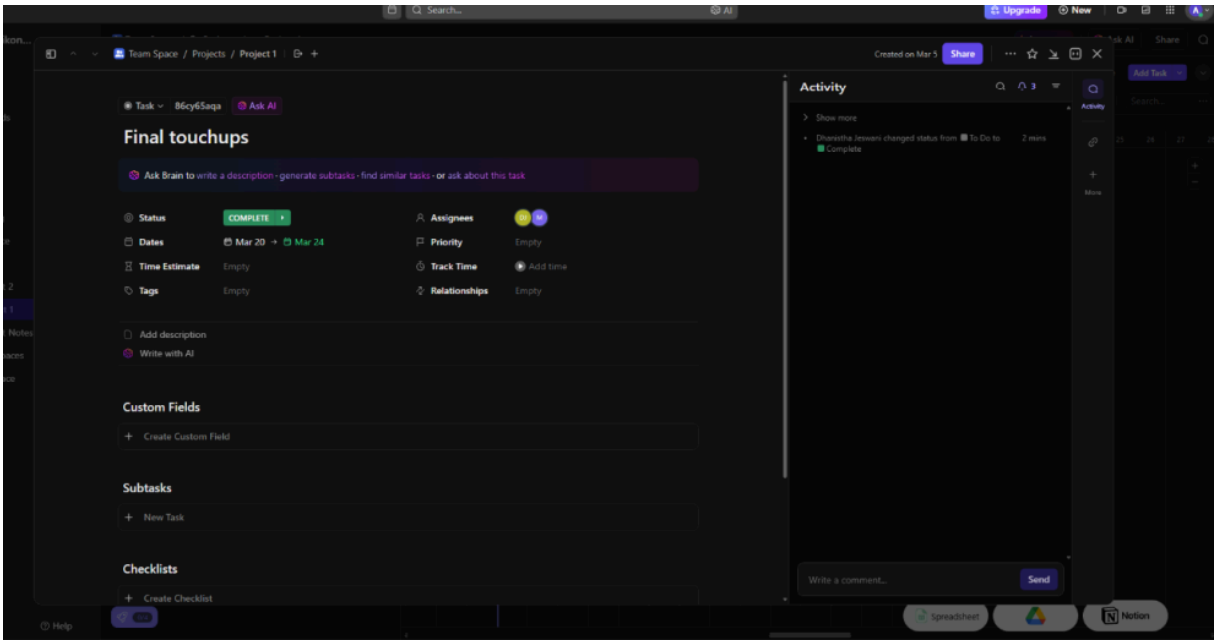

Team Space / Projects / Project 1
Created on Mar 5
Share
Task 86cy657mf
Ask AI
Acquiring the topic
Ask Brain to write a description · generate subtasks · find similar tasks · or ask about this task
Status
COMPLETE
Assignees
Dates
Today → Today
Priority
Empty
Time Estimate
Empty
Track Time
Add time
Tags
Empty
Relationships
Empty
Add description
Write with AI
Custom Fields
Create Custom Field
Subtasks
New Task
Checklists
Create Checklist
Activity
Show more
Dhanistha Jeswani changed status from
In Progress to Complete
6 mins
Write a comment...
Send
Spreadsheet
Notion

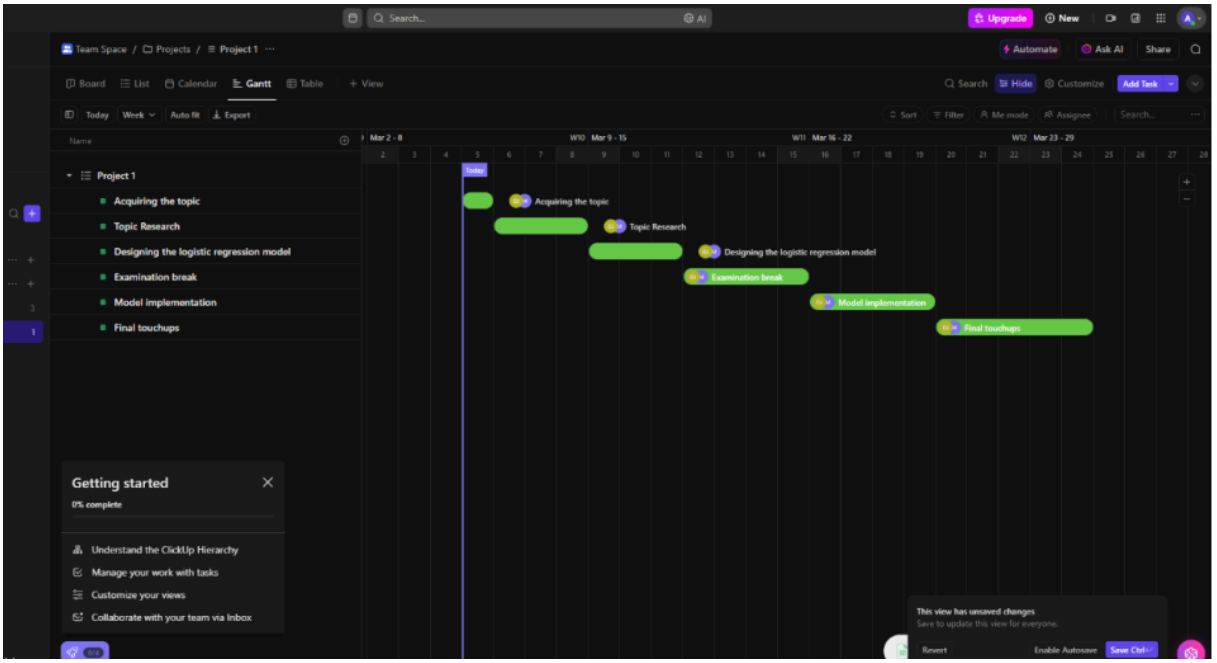

Team Space / Projects / Project 1
Created on Mar 5
Share
Task 86cy65907
Ask AI
Topic Research
Ask Brain to write a description · generate subtasks · find similar tasks · or ask about this task
Status
COMPLETE
Assignees
Dates
Tomorrow → Sat
Priority
Empty
Time Estimate
Empty
Track Time
Add time
Tags
Empty
Relationships
Empty
Add description
Write with AI
Custom Fields
Create Custom Field
Subtasks
New Task
Checklists
Create Checklist
Activity
Show more
You changed due date from Fri to Sat
5 mins
Write a comment...
Send
Spreadsheet
Notion


Team Space / Projects / Project 1
Created on Mar 5
Share
Task 86cy6597p
Ask AI
Designing the logistic regression model
Ask Brain to write a description · generate subtasks · find similar tasks · or ask about this task
Status
COMPLETE
Assignees
Dates
Sun → Tue
Priority
Empty
Time Estimate
Empty
Track Time
Add time
Tags
Empty
Relationships
Empty
Add description
Write with AI
Custom Fields
Create Custom Field
Subtasks
New Task
Checklists
Create Checklist
Activity
Show more
Dhanistha Jeswani changed status from To Do to
Complete
4 mins
Write a comment...
Send
Spreadsheet
Notion


Examination break
Activity
Custom Fields
Subtasks
Checklists


Team Space / Projects / Project 1
Task 86cy65aar Ask AI
Model implementation
Ask Brain to write a description · generate subtasks · find similar tasks · or ask about this task
Status COMPLETE
Dates Mar 16 → Mar 19
Time Estimate Empty
Tags Empty
Assignees
Priority Empty
Track Time Add time
Relationships Empty
Add description
Write with AI
Custom Fields
Create Custom Field
Subtasks
New Task
Checklists
Create Checklist
Activity
Show more
Dhanistha Jeswani changed status from To Do to Complete 3 mins
Write a comment...
Send
Spreadsheet
Notion


Team Space / Projects / Project 1
Task 86cy65aqa Ask AI
Final touchups
Ask Brain to write a description · generate subtasks · find similar tasks · or ask about this task
Status COMPLETE
Dates Mar 20 → Mar 24
Time Estimate Empty
Tags Empty
Assignees
Priority Empty
Track Time Add time
Relationships Empty
Add description
Write with AI
Custom Fields
Create Custom Field
Subtasks
New Task
Checklists
Create Checklist
Activity
Show more
Dhanistha Jeswani changed status from To Do to Complete 2 mins
Write a comment...
Send
Spreadsheet
Notion



Conclusion:
This project delved into the application of polynomial regression in financial data analysis, comparing implementations from scratch using Python libraries with those utilizing PyTorch. Through data preprocessing, model implementation, training, and evaluation, we examined the performance of each approach. While both methods proved effective, PyTorch demonstrated advantages in computational efficiency and scalability. This project underscores the importance of selecting appropriate tools and frameworks based on the task's requirements, offering insights into the practical utility of polynomial regression in financial modeling.

Software Engineering & Project Management Lab Experiment No: - 09

Aim: To understand Docker Architecture and Container Life Cycle, install Docker and execute docker commands to manage images and interact with containers

Theory:

What is Docker?

Docker is a platform that allows developers to build, package, and deploy applications in lightweight, portable containers. These containers include everything needed to run an application, such as code, runtime, system tools, libraries, and dependencies.

Containerization Technology

Containers are isolated environments where applications run independently. Unlike traditional virtualization, which requires separate operating systems for each application, containers share the host OS kernel, making them faster and more efficient.

Docker Architecture

Docker follows a client-server architecture consisting of the following key components:

1. Docker Client

- It is the command-line interface (CLI) that allows users to interact with Docker.
- Commands such as docker run, docker build, and docker stop are executed through the client.

2. Docker Daemon (dockerd)

- It runs in the background and manages Docker containers, images, volumes, and networks.
- It listens for requests from the Docker Client and executes commands.

3. Docker Images

- A Docker image is a read-only template containing the application code, libraries, and dependencies.
- Images are created using Dockerfiles, which define the steps to build an image.
- Images are stored in Docker Hub or private repositories.

4. Docker Containers

- A container is an instance of a Docker image running as an isolated process on a host machine.
- Containers are lightweight, portable, and can be started, stopped, or removed as needed.

5. Docker Registry

- It is a storage system for Docker images.
- The public registry, Docker Hub, provides access to a vast collection of pre-built images.
- Users can also create private registries for security and control.

Docker Container Life Cycle

The **life cycle of a container** follows these steps:

1. **Create** – A container is created from an image using the docker create command.
2. **Start** – The container starts running using the docker start command.
3. **Run** – A new container can be started directly using docker run.
4. **Pause/Unpause** – Containers can be temporarily paused and resumed.
5. **Stop** – The container can be stopped using docker stop.
6. **Restart** – A stopped container can be restarted.
7. **Kill** – A container can be forcefully stopped using docker kill.
8. **Remove** – Containers that are no longer needed can be deleted using docker rm.

Benefits of Docker

1. Portability

- Containers can run on any platform that supports Docker.
- Applications behave consistently across different environments.

2. Efficiency

- Containers share the host OS kernel, reducing overhead and improving performance.
- They consume fewer resources compared to virtual machines.

3. Isolation

- Each container runs in its own isolated environment, preventing dependency conflicts.

4. Scalability

- Applications can be scaled up quickly by launching multiple containers.
- Docker enables automatic load balancing in large-scale deployments.

5. Consistency

- Ensures that the application runs the same way in development, testing, and production.
- Eliminates the "works on my machine" problem.

Docker Engine:

At the core of Docker is the Docker Engine, which is responsible for building, running, and managing containers. It consists of the Docker daemon, which manages containers, images, networks, and volumes, and the Docker client, which allows users to interact with the daemon through the Docker API.

Docker Images:

Docker images are read-only templates used to create containers. They contain the application code, runtime, libraries, dependencies, and other files needed to run the application. Images are built using Dockerfiles, which are text files that define the steps needed to create the image.

Software Engineering & Project Management Lab Experiment No: - 09

Aim: To understand Docker Architecture and Container Life Cycle, install Docker and execute docker commands to manage images and interact with containers

OUTPUT:-

```
C:\Users\202>docker run redis
Unable to find image 'redis:latest' locally
latest: Pulling from library/redis
8a1e25ce7c4f: Pull complete
8ab039a68e51: Pull complete
2b12a49dcfb9: Pull complete
cdf9868f47ac: Pull complete
e73ea5d3136b: Pull complete
890ad32c613f: Pull complete
4f4fb700ef54: Pull complete
ba517b76f92b: Pull complete
Digest: sha256:7dd707032d90c6eaafd566f62a00f5b0116ae08fd7d6cbbb0f311b82b47171a2
Status: Downloaded newer image for redis:latest
1:C 13 Mar 2024 03:19:03.928 * oO0OoO0OoO0Oo Redis is starting oO0OoO0OoO0Oo
1:C 13 Mar 2024 03:19:03.928 * Redis version=7.2.4, bits=64, commit=00000000, mod
1:C 13 Mar 2024 03:19:03.928 # Warning: no config file specified, using the defau
s.conf
1:M 13 Mar 2024 03:19:03.929 * monotonic clock: POSIX clock_gettime
1:M 13 Mar 2024 03:19:03.929 * Running mode=standalone, port=6379.
1:M 13 Mar 2024 03:19:03.929 * Server initialized
1:M 13 Mar 2024 03:19:03.929 * Ready to accept connections tcp
1:signal-handler (1710300105) Received SIGINT scheduling shutdown...
1:M 13 Mar 2024 03:21:45.877 * User requested shutdown...
1:M 13 Mar 2024 03:21:45.877 * Saving the final RDB snapshot before exiting.
1:M 13 Mar 2024 03:21:45.887 * DB saved on disk
1:M 13 Mar 2024 03:21:45.887 # Redis is now ready to exit, bye bye...
```

```
C:\Users\202>docker images
REPOSITORY   TAG       IMAGE ID       CREATED         SIZE
redis        latest    170a1e90f843   2 months ago    138MB
```

```
C:\Users\202>docker pull redis
Using default tag: latest
latest: Pulling from library/redis
Digest: sha256:7dd707032d90c6eaafd566f62a00f5b0116ae08fd7d6cbbb0f311b82b47171a2
Status: Image is up to date for redis:latest
docker.io/library/redis:latest
```

```
C:\Users\202>docker ps
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS     NAMES

C:\Users\202>docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED              STATUS          PORTS      NAMES
052aecb0ee88   redis     "docker-entrypoint.s…"   About a minute ago   Up 4 seconds    6379/tcp   container121
1c4472744083   redis     "docker-entrypoint.s…"   6 minutes ago        Up 10 seconds   6379/tcp   modest_herschel

C:\Users\202>
```

Software Engineering & Project Management Lab Experiment No: - 09

Aim: To understand Docker Architecture and Container Life Cycle, install Docker and execute docker commands to manage images and interact with containers

```
C:\Users\202>docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED              STATUS          PORTS      NAMES
052aecb0ee88   redis     "docker-entrypoint.s…"   About a minute ago   Up 4 seconds    6379/tcp   container121
1c4472744083   redis     "docker-entrypoint.s…"   6 minutes ago        Up 10 seconds   6379/tcp   modest_herschel

C:\Users\202>
C:\Users\202>
C:\Users\202>docker stop 052aecb0ee88
052aecb0ee88

C:\Users\202>docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED         STATUS         PORTS      NAMES
1c4472744083   redis     "docker-entrypoint.s…"   9 minutes ago   Up 2 minutes   6379/tcp   modest_herschel
```

```
C:\Users\202>docker start 052aecb0ee88
052aecb0ee88

C:\Users\202>docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED          STATUS          PORTS      NAMES
052aecb0ee88   redis     "docker-entrypoint.s…"   5 minutes ago    Up 8 seconds    6379/tcp   container121
1c4472744083   redis     "docker-entrypoint.s…"   10 minutes ago   Up 3 minutes    6379/tcp   modest_herschel
```

```
C:\Users\202>docker rm 052aecb0ee88
052aecb0ee88
```

```
C:\Users\202>docker images
REPOSITORY   TAG       IMAGE ID       CREATED        SIZE
redis        latest    170a1e90f843   2 months ago   138MB
```

```
C:\Users\202>docker exec -d 1c4472744083 touch /tmp/execWorks

C:\Users\202>docker exec -it 1c4472744083 bash
root@1c4472744083:/data#
```

```
C:\Users\202>docker restart 1c4472744083
1c4472744083

C:\Users\202>docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED          STATUS         PORTS      NAMES
1c4472744083   redis     "docker-entrypoint.s…"   13 minutes ago   Up 3 seconds   6379/tcp   modest_herschel
```

Aim: To understand Docker Architecture and Container Life Cycle, install Docker and execute docker commands to manage images and interact with containers

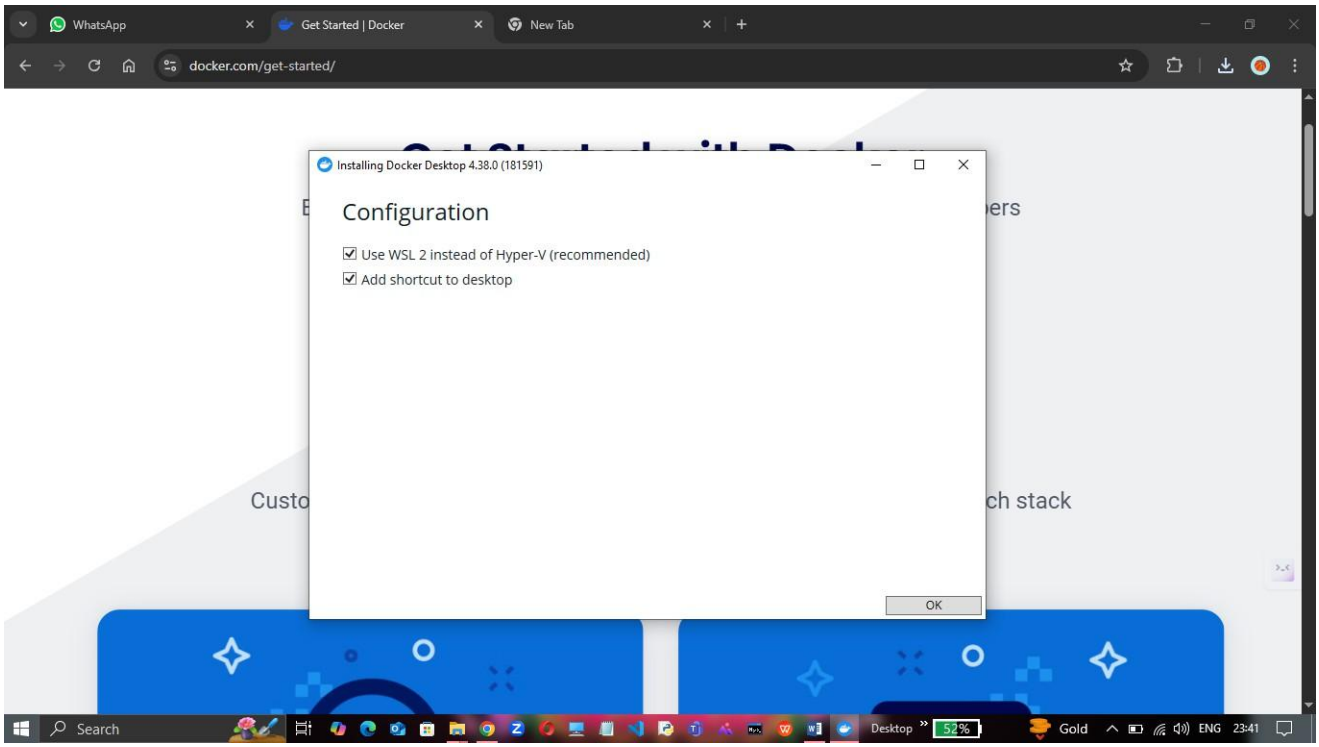
```
C:\Users\202>docker inspect 1c4472744083
[
    {
        "Id": "1c447274408314475b093dcbf93163064b819bdd9ad8378bb3a4fa847dc411d80",
        "Created": "2024-03-13T03:19:03.418741433Z",
        "Path": "docker-entrypoint.sh",
        "Args": [
            "redis-server"
        ],
        "State": {
            "Status": "running",
            "Running": true,
            "Paused": false,
            "Restarting": false,
            "OOMKilled": false,
            "Dead": false,
            "Pid": 2112,
            "ExitCode": 0,
            "Error": "",
            "StartedAt": "2024-03-13T03:32:13.750463204Z",
            "FinishedAt": "2024-03-13T03:32:13.145321277Z"
        },
        "Image": "sha256:170a1e90f8436daa6778aeea3926e716928826c215ca23a8dfd8055f663f9428",
        "ResolvConfPath": "/var/lib/docker/containers/1c447274408314475b093dcbf93163064b819bdd9a
```

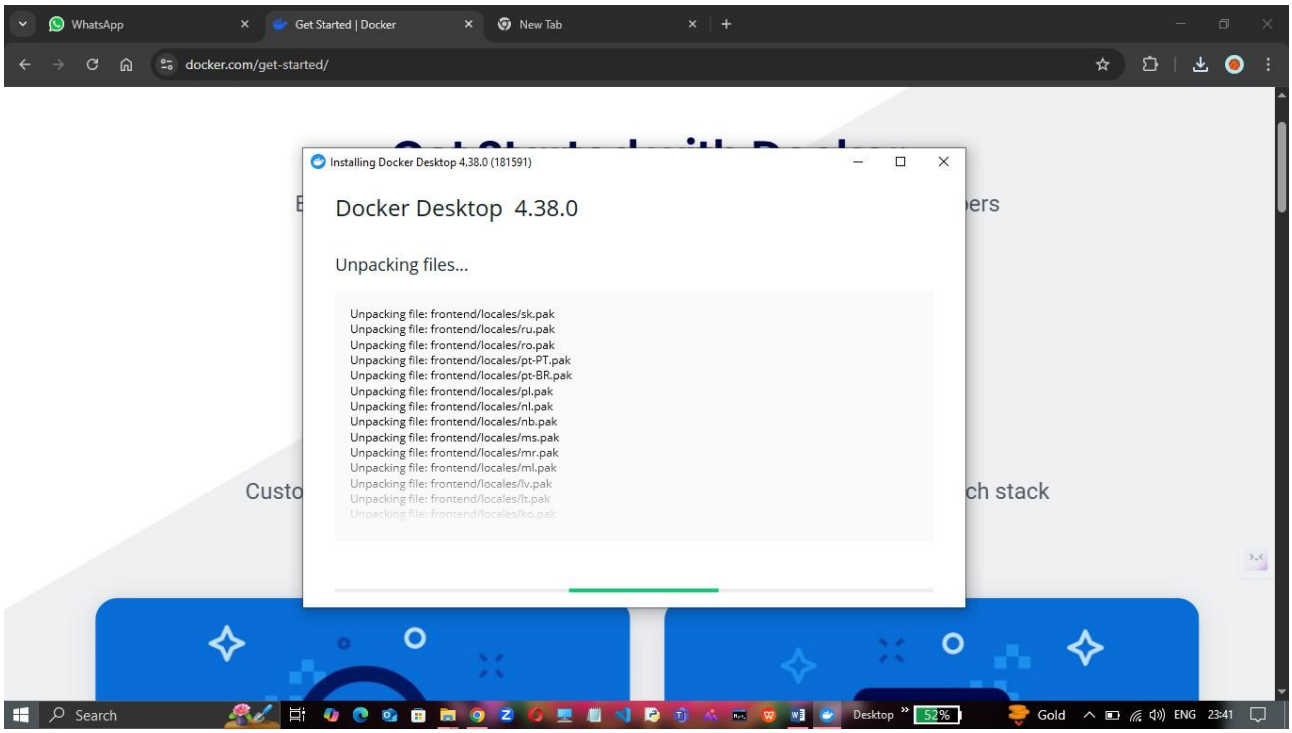
```
C:\Users\202>docker commit 1c4472744083 new_image_name:redis2
sha256:33e4284a7e92a4a1331555d01f6e078fc496e3a3ed8eb7f84f2678261ad07e83

C:\Users\202>docker images
REPOSITORY       TAG       IMAGE ID       CREATED          SIZE
new_image_name   redis2    33e4284a7e92   4 seconds ago    138MB
new_image_name   tag       61ab016507fa   36 seconds ago   138MB
redis            latest    170a1e90f843   2 months ago     138MB
```

Software Engineering & Project Management Lab Experiment No: - 09

Aim: To understand Docker Architecture and Container Life Cycle, install Docker and execute docker commands to manage images and interact with containers

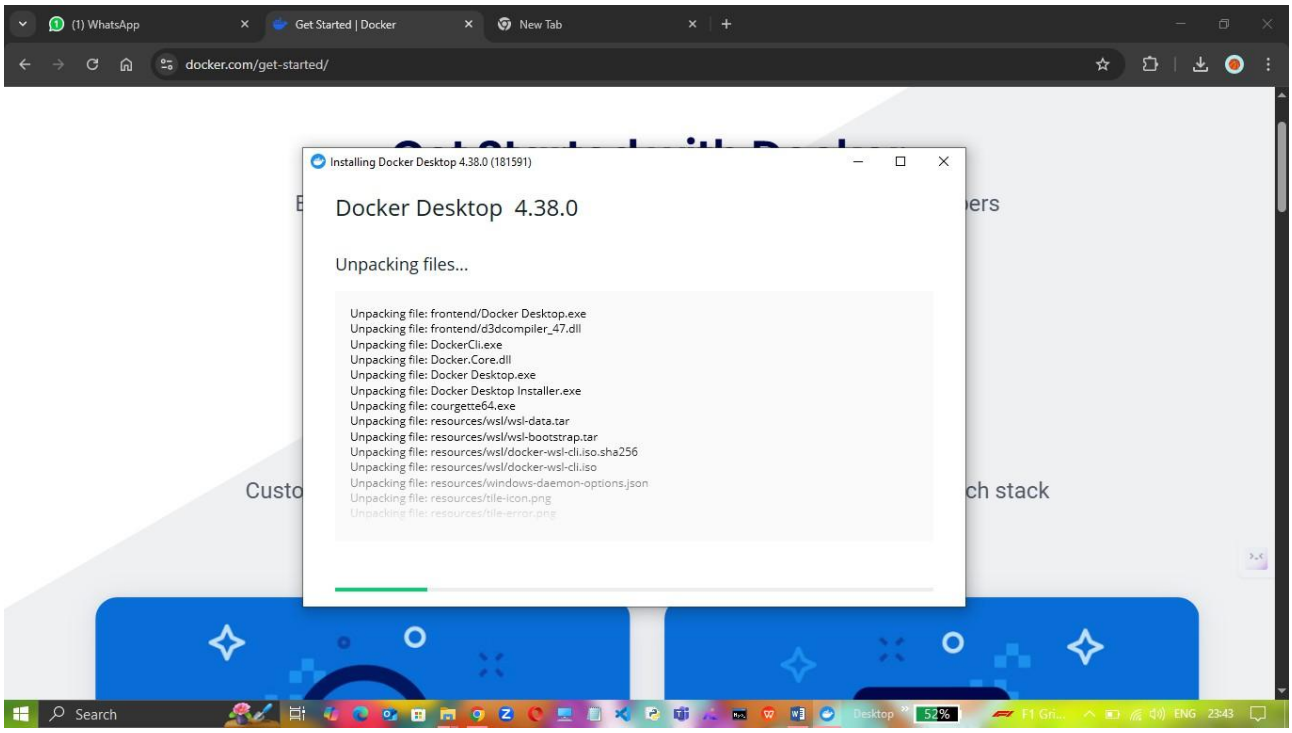
SCREENSHOTS:

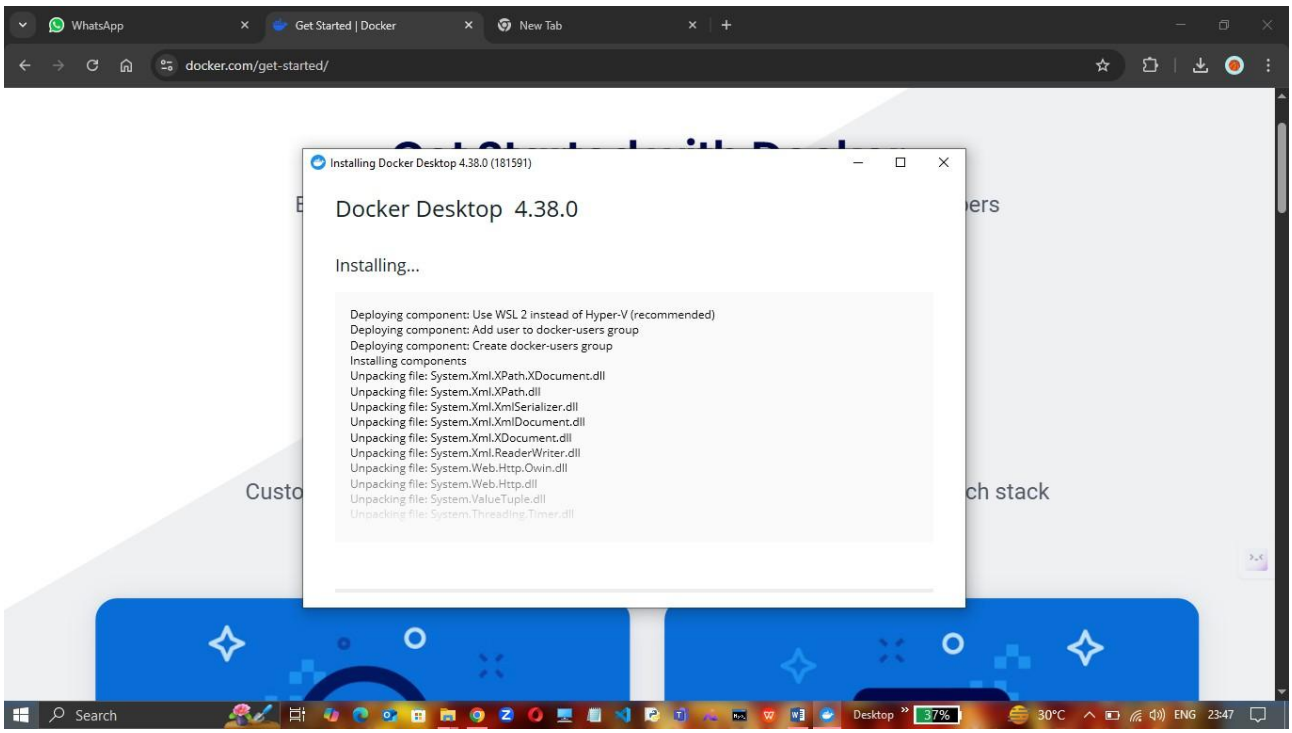




Software Engineering & Project Management Lab Experiment No: - 09

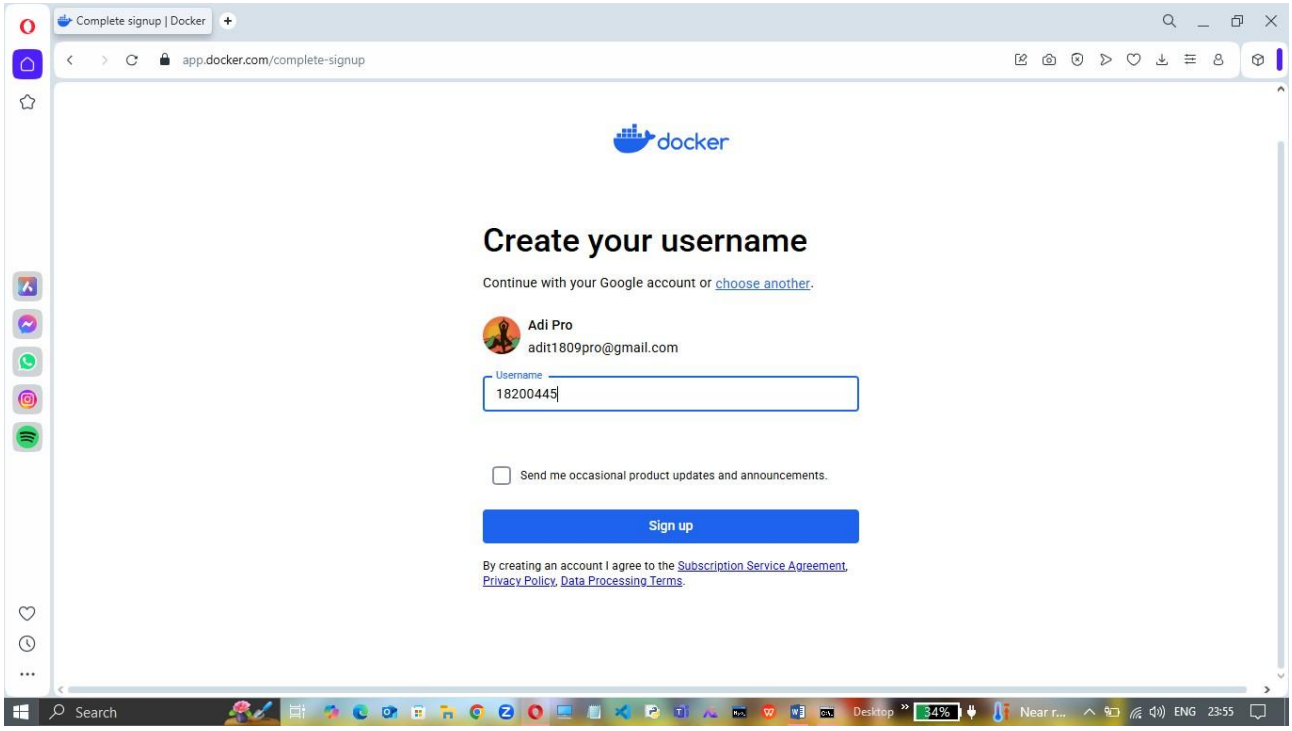
Aim: To understand Docker Architecture and Container Life Cycle, install Docker and execute docker commands to manage images and interact with containers





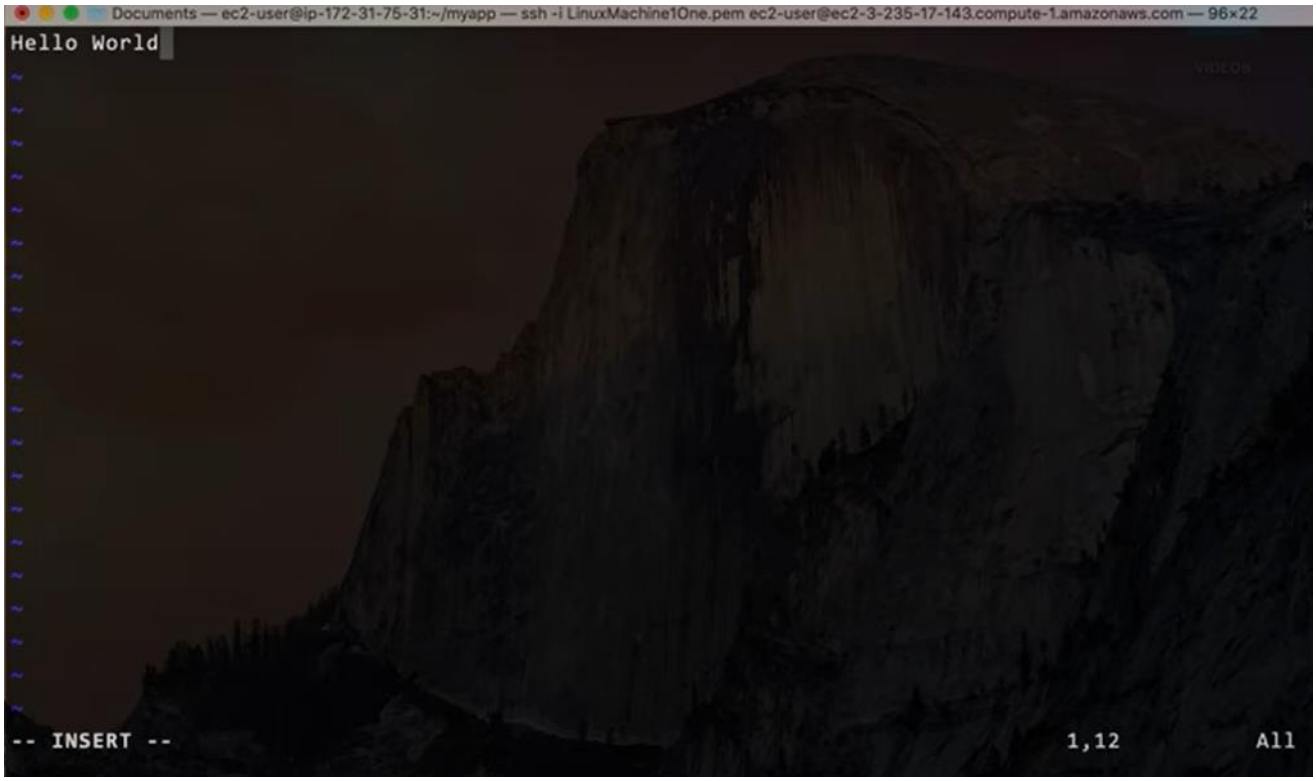
Software Engineering & Project Management Lab Experiment No: - 09

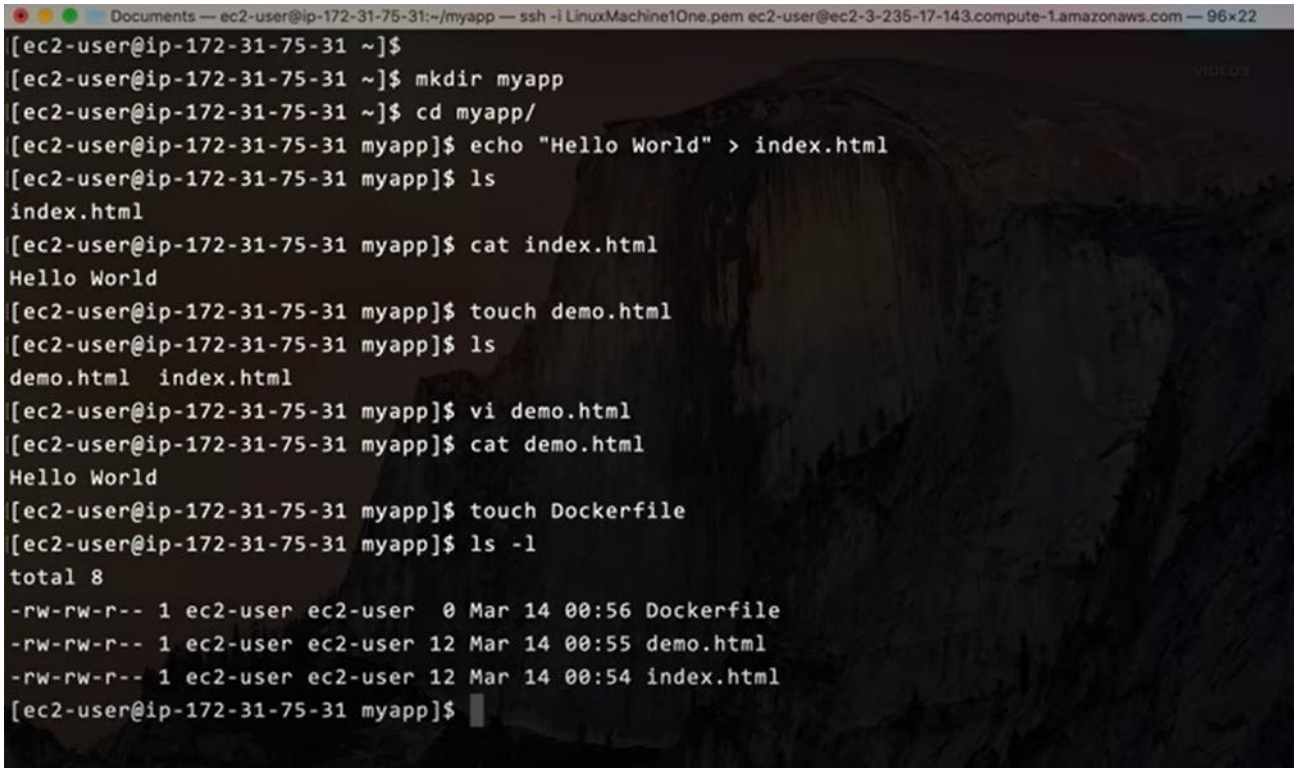
Aim: To understand Docker Architecture and Container Life Cycle, install Docker and execute docker commands to manage images and interact with containers



Software Engineering & Project Management Lab Experiment No: - 09

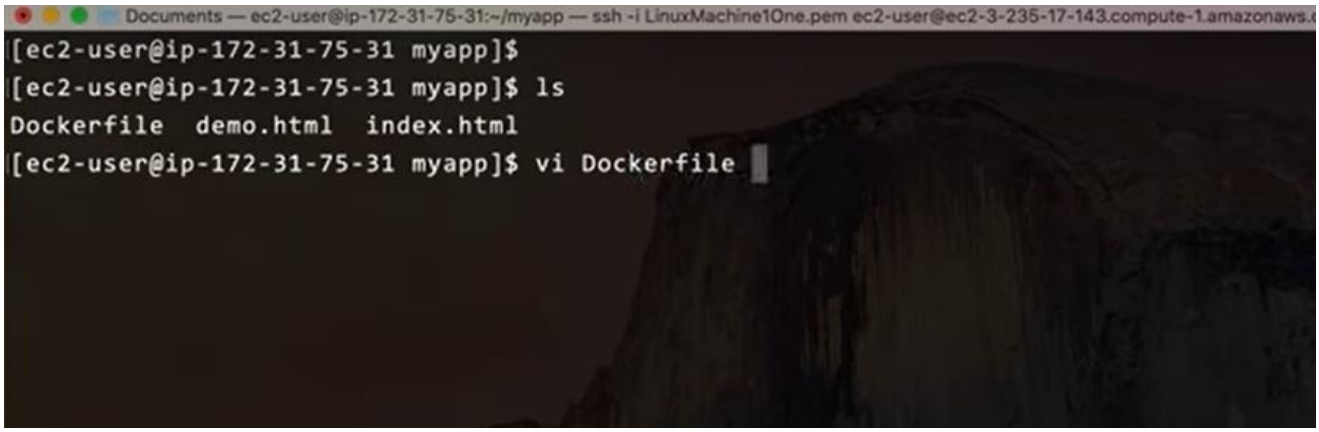
Aim: To understand Docker Architecture and Container Life Cycle, install Docker and execute docker commands to manage images and interact with containers

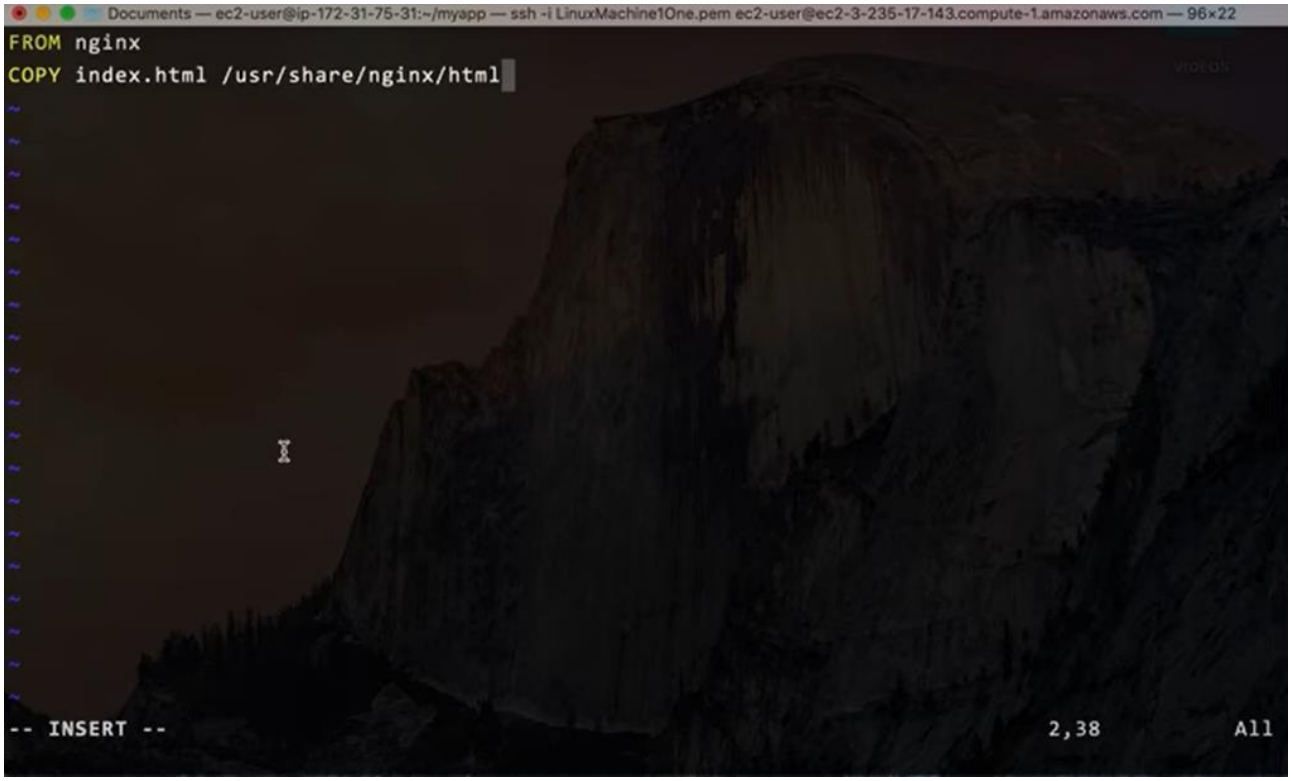




Software Engineering & Project Management Lab Experiment No: - 09

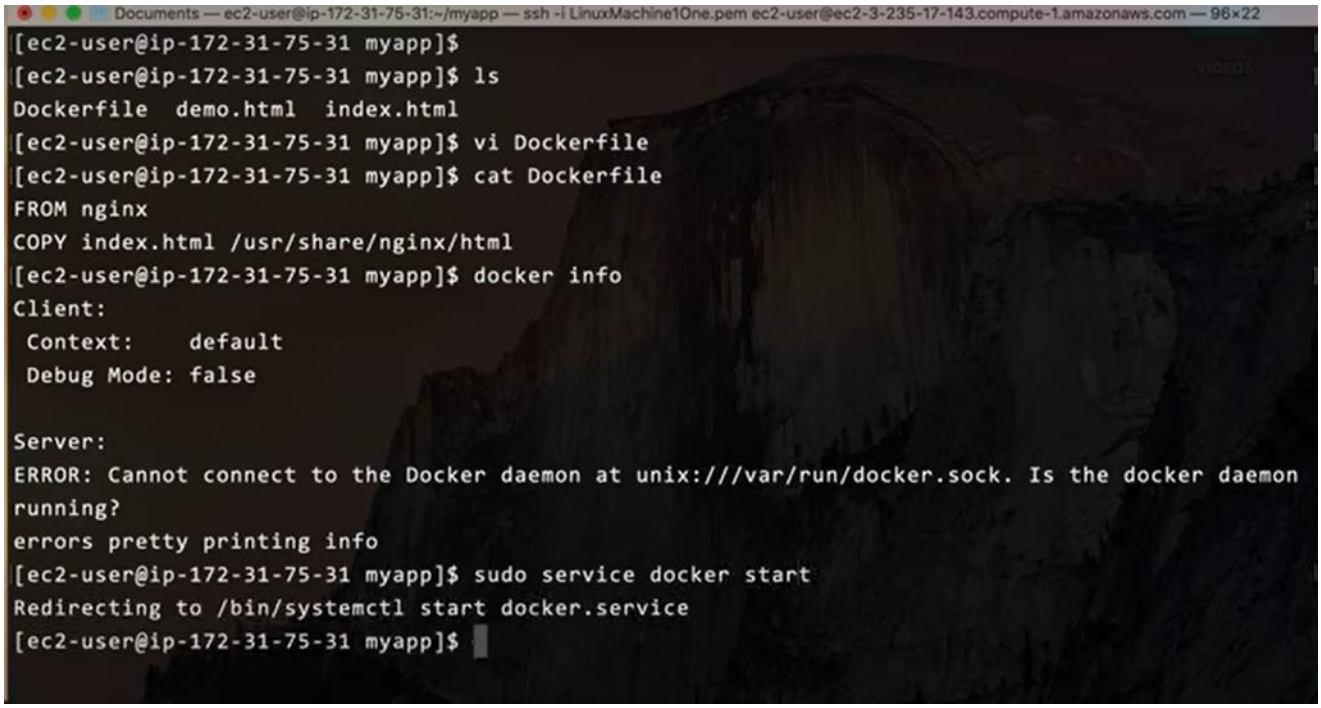
Aim: To understand Docker Architecture and Container Life Cycle, install Docker and execute docker commands to manage images and interact with containers

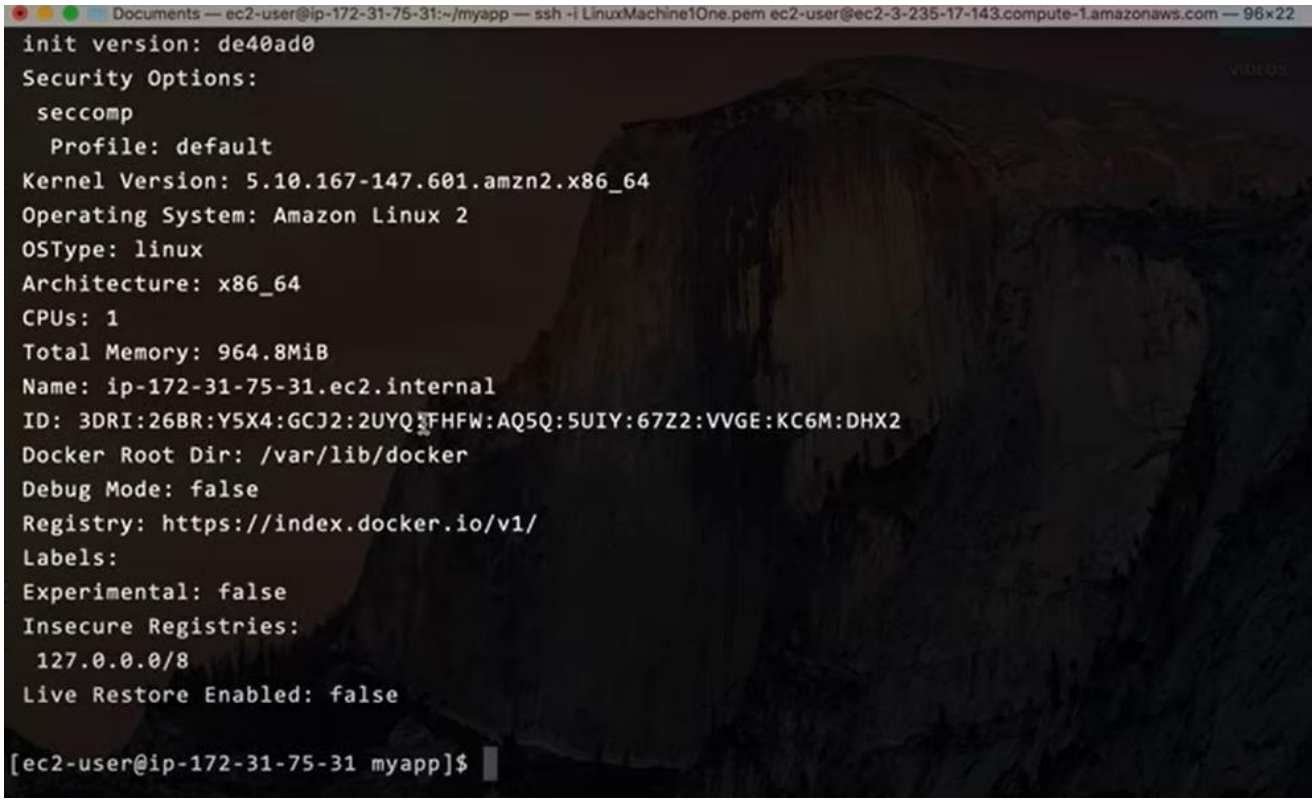




Software Engineering & Project Management Lab Experiment No: - 09

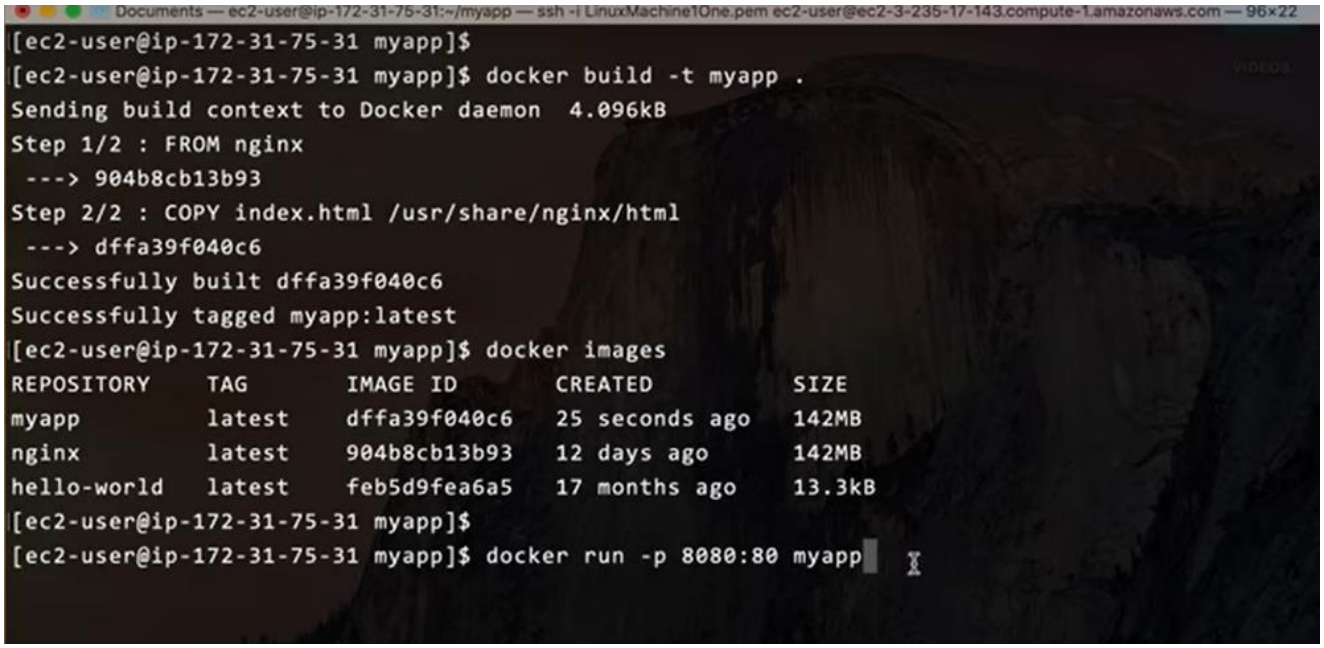
Aim: To understand Docker Architecture and Container Life Cycle, install Docker and execute docker commands to manage images and interact with containers

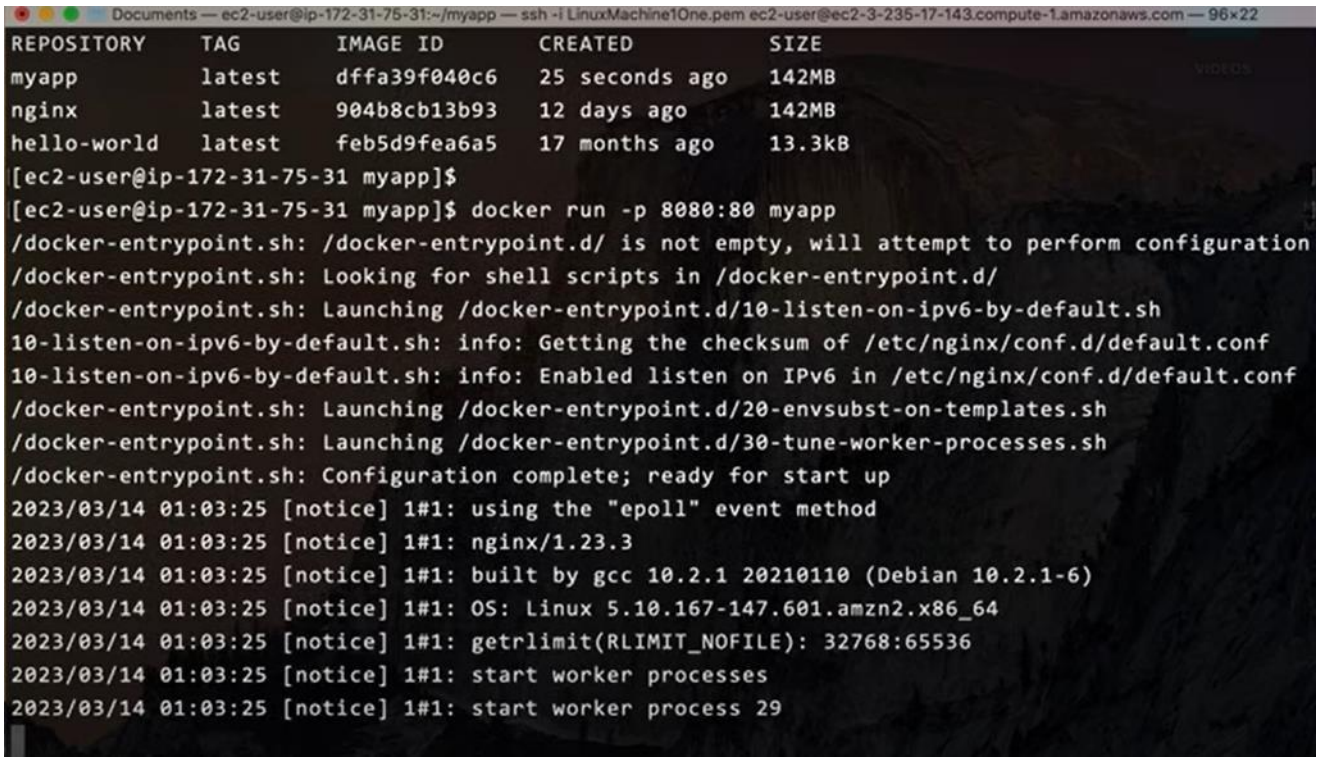




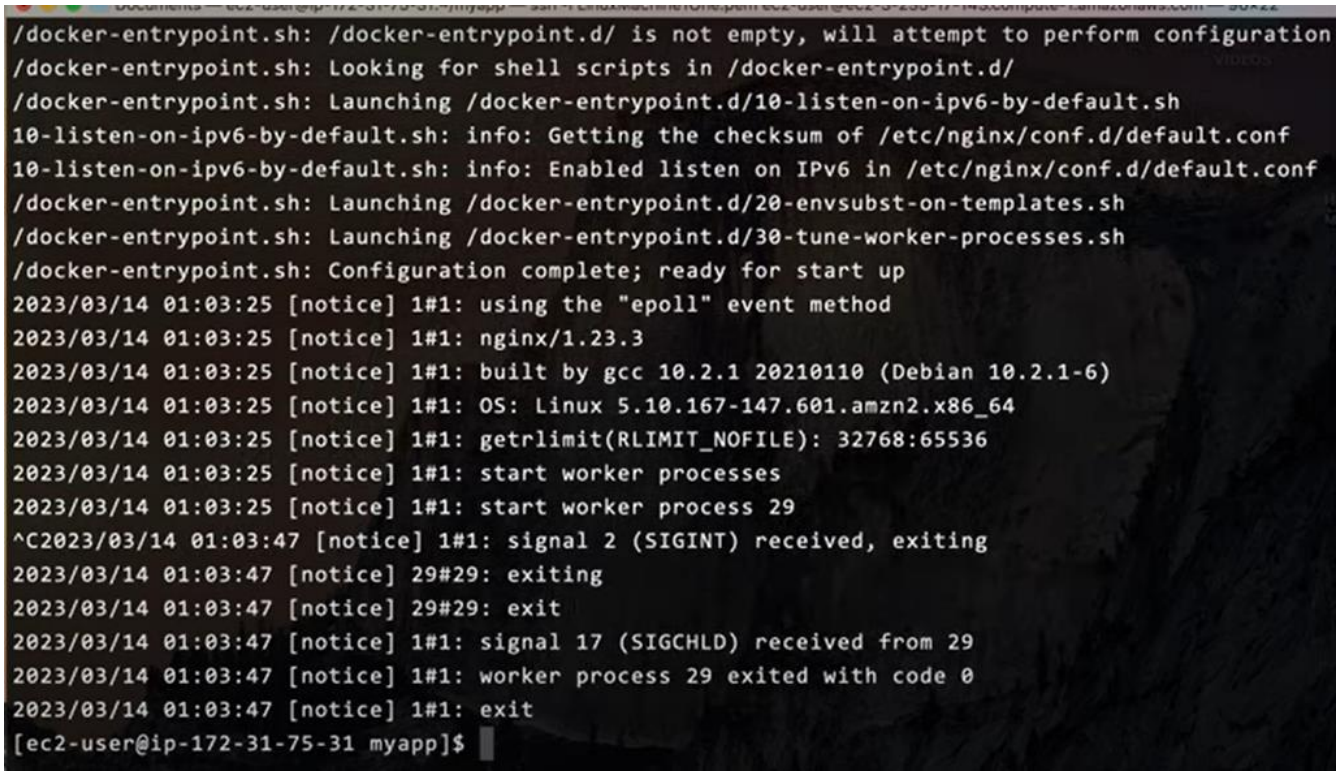
Software Engineering & Project Management Lab Experiment No: - 09

Aim: To understand Docker Architecture and Container Life Cycle, install Docker and execute docker commands to manage images and interact with containers





Aim: To understand Docker Architecture and Container Life Cycle, install Docker and execute docker commands to manage images and interact with containers



<u>Conclusion</u>: Thus, we have successfully installed Docker and execute docker commands to manage images and interact with containers.

Software Engineering & Project Management Lab Experiment No: - 10

Aim: To learn Dockerfile instructions, build an image for a sample web application using DOCKERFILE.

Name : Aarya Thakur

T22

Roll No: 114

Theory:

What is Docker?

Docker is a platform that allows developers to build, package, and deploy applications in lightweight, portable containers. These containers include everything needed to run an application, such as code, runtime, system tools, libraries, and dependencies.

Benefits of Docker

1. Portability

- Containers can run on any platform that supports Docker.
- Applications behave consistently across different environments.

2. Efficiency

- Containers share the host OS kernel, reducing overhead and improving performance.
- They consume fewer resources compared to virtual machines.

3. Isolation

- Each container runs in its own isolated environment, preventing dependency conflicts.

4. Scalability

- Applications can be scaled up quickly by launching multiple containers.
- Docker enables automatic load balancing in large-scale deployments.

5. Consistency

- Ensures that the application runs the same way in development, testing, and production.

- Eliminates the "works on my machine" problem.

DIRECTIVE argument

Although the DIRECTIVE is case-insensitive, it is recommended to write all directives in uppercase to differentiate them from arguments. A Dockerfile usually consists of multiple lines of instructions that are executed sequentially by the Docker engine during the image-building process.

Software Engineering & Project Management Lab Experiment No: - 10

Aim: To learn Dockerfile instructions, build an image for a sample web application using DOCKERFILE.

Now that you understand the purpose of a Dockerfile, let's get our hands dirty by building one for a sample Python application.

Building a Dockerfile for a Sample Python/Flask Application

The application we'll be working with is a simple Flask app with only one home route that returns Hello, World!.

Let's start by setting up the Flask application. Open your favorite code editor and create a new directory for your project. In this directory, create a new file named app.py and add the following Python code:

```
from flask import Flask
app = Flask(__name__)
@app.route('/')
def hello():
    return 'Hello, World!'
```

Now, let's build the Dockerfile.

In the same directory as your app.py, create a new file named Dockerfile (with no file extension). This is where you'll write the instructions for Docker to build your image.
Now, follow the steps below to create the Dockerfile:

#1: Specify the base image

The very first instruction you write in a Dockerfile must be the FROM directive, which specifies the base image. The base image is the image from which all other layers in your Docker image will be built. It's the foundation of your Docker image, much like the foundation of a building.
Add the following instruction to your Dockerfile:

```
FROM python:3.11-slim
```

Here, we're telling Docker to use the official Python Docker image, and more specifically, the 3.11-slim version. This slim variant of Python Docker image is a minimal version that excludes some packages to make the image smaller. Note that the base image you specify will be downloaded from Docker Hub, Docker's official image registry. The reason we're using Python as the base image is that the application containerization is written in Python. The Python base image includes a Python interpreter, which is necessary to run Python code, as well as a number of commonly used Python utilities and libraries. By using the Python base image, we're ensuring that the environment within the Docker container is preconfigured for running Python code.

#2 Set the working directory

Once you've chosen the base image, the next step is to determine the working directory using the WORKDIR directive. Insert the following line after the FROM directive:

```
WORKDIR /app
```

Here, we're telling Docker to create a directory named app in the Docker container and use it as the current working directory. All instructions that FROM python:3.11-slim WORKDIR /app follow (like RUN, COPY, and CMD) will be run in this directory inside the container. Think of this as typing the command cd /app in a terminal to change the current working directory to /app. The difference here is that it's being done within the Docker container as part of the build process. A working directory within the container is necessary because it designates a specific location for our application code within the container and determines where commands will be run from. If we don't set a working directory, Docker won't have a clear context for where your application is located, which would make it harder to interact with.

#3 Install dependencies Once the working directory is set, the next step is to install the dependencies. Our Python application relies on the Flask web framework, which manages requests, routes URLs, and handles other web-related tasks. To install Flask, add the following instruction in your Dockerfile just under the WORKDIR directive:

Aim: To learn Dockerfile instructions, build an image for a sample web application using DOCKERFILE.

```
RUN pip install flask==2.3
```

Here, we're instructing Docker to use pip (a package installer for Python) to install the specific version of Flask we need for our application.

#4 Copy application files to the container After setting up the working directory and installing the necessary dependencies, we're now ready to copy the application files into the Docker container. To do this, add the following instruction just below the RUN directive:

```
COPY . /app
```

This line copies everything in the current directory (denoted by ".") on our host machine into the /app directory we previously set as our working directory within the Docker container. It's like using the cp command in the terminal to copy files from one directory to another, but in this context, it's copying files from your local machine to the Docker container. Why do we need to do this? It's simple. Without this step, the Docker container wouldn't have access to our application's code, making it impossible to run our app.

#5 Specify the environment variable Once the application files are copied, we need to set up the FLASK_APP environment variable for our Docker container using the ENV directive. Now, you may be wondering why we need this environment variable in the first place. In our app.py file, we create an instance of the Flask application and assign it to the variable app. This application instance is what Flask needs to run, and it's located in the app.py file. When starting our Flask application using the flask run command (which we'll discuss in the next section), Flask must know where to locate the application instance to run. Flask uses the FLASK_APP environment variable to find this instance. Hence, we need to use the ENV directive to set the value of FLASK_APP to app.py. To do this, add the following line under the RUN directive:

```
ENV FLASK_APP=app.py
```

This line ensures Flask knows exactly where to find the application instance to run, which in our case is app.py.

#6 Define the default command The last instruction that we need for our application is to specify the default command that will be executed when the Docker container starts:

```
CMD ["flask", "run", "--host=0.0.0.0", "--port=5000"]
```

from the image, we'll build from this Dockerfile.

Insert the following instruction below the ENV directive:

Here's what each part of the argument passed to the CMD directive does:

- flask: This is the program that we want to run. In this case, it's the Flask command-line interface.
- run: This command instructs Flask to start a local development server.
- --host=0.0.0.0: This argument tells the Flask server to listen on all public IPs. In the context of Docker, this means the Flask application will be accessible on any IP address that can reach the Docker container.
- --port=5000: This argument specifies the port number that the Flask server will listen on. Port 5000 is the default port for Flask, but it's good practice to explicitly declare it for clarity.

After this, our Dockerfile is ready. It should look like this:

```
FROM python:3.11-slim
WORKDIR /app
RUN pip install flask==2.3
COPY . /app
ENV FLASK_APP=app.py
CMD ["flask", "run", "--host=0.0.0.0", "--port=5000"]
```

It's worth noting that the directives we used in the Dockerfile for our Python app aren't the only ones available in Docker. But they are the ones you'll often encounter when working with Dockerfiles.

Aim: To learn Dockerfile instructions, build an image for a sample web application using DOCKERFILE.

#7 Create a .dockerignore file Before we go ahead and build our Docker image, we need to take care of one last thing. Remember the following COPY directive?

```
COPY . /app
```

This line instructs Docker to copy everything from our current directory to the app directory inside the container, which includes the Dockerfile itself. But, the Dockerfile isn't required for our app to work—it's just for us to create the Docker image. So, we need to ensure that the Dockerfile doesn't get copied to the app directory in the container. Here's how we do it: Create a new file called .dockerignore in the same directory as your Dockerfile. This file works much like a .gitignore file if you're familiar with Git. Then, add the word Dockerfile to this file. This tells Docker to ignore the Dockerfile when copying files into the container. Now that we've prepared everything, it's time to build our Docker image, run a container from this image, and test our application to see if everything works as expected.

Building and running the Docker Image

Open a terminal and navigate to the directory where your Dockerfile is located. Now, run the following command to create an image named sample-flask-app:v1 (you can name the image anything you prefer):

```
$ docker build . -t sample-flask-app:v1
```

In the command above, the dot (.) after the build command indicates that the current directory is the build context. We're using the -t flag to tag the Docker image with the name sample-flask-app and version v1. After running this command, you'll see an output similar to this:

Aim: To learn Dockerfile instructions, build an image for a sample web application using DOCKERFILE.

```
$ docker build . -t sample-flask-app:v1
[+] Building 17.7s (10/10) FINISHED docker:default
 => [internal] load build definition from Do  0.0s
 => => transferring dockerfile: 192B          0.0s
 => [internal] load metadata for docker.io/l  3.5s
 => [auth] library/python:pull token for reg  0.0s
 => [internal] load .dockerignore             0.0s
 => => transferring context: 50B              0.0s
 => [1/4] FROM docker.io/library/python:3.11  9.0s
 => => resolve docker.io/library/python:3.11  0.0s
 => => sha256:1103112ebfc46e 3.51MB / 3.51MB  1.9s
 => => sha256:b4b80ef7128d 12.87MB / 12.87MB  2.7s
 => => sha256:a2eb07f336e4f1 1.65kB / 1.65kB  0.0s
 => => sha256:4bcdb5d5bc81ca 1.37kB / 1.37kB  0.0s
 => => sha256:15646a3fa12dde 6.93kB / 6.93kB  0.0s
 => => sha256:8a1e25ce7c4f 29.12MB / 29.12MB  4.8s
 => => sha256:cc7f04ac52f8a3bad5 243B / 243B  2.4s
 => => sha256:87b8bf94a2ace2 3.41MB / 3.41MB  3.3s
 => => extracting sha256:8a1e25ce7c4f75e372e  1.8s
 => => extracting sha256:1103112ebfc46e01c0f  0.2s
 => => extracting sha256:b4b80ef7128dc9bd114  1.0s
 => => extracting sha256:cc7f04ac52f8a3bad5b  0.0s
 => => extracting sha256:87b8bf94a2ace2b005d  0.7s
 => [internal] load build context             0.0s
 => => transferring context: 194B             0.0s
 => [2/4] WORKDIR /app                        0.2s
 => [3/4] RUN pip install flask==2.3          4.7s
 => [4/4] COPY . /app                         0.0s
 => exporting to image                        0.2s
 => => exporting layers                       0.2s
 => => writing image sha256:c6879156c7750c89  0.0s
 => => naming to docker.io/library/sample-fl  0.0s

What's Next?
  View a summary of image vulnerabilities and recommendations → docker scout quickview
```

To make sure the image sample-flask-app:v1 has been successfully created, run the following command to check the list of Docker images on your system:

```
$ docker image ls
```

Aim: To learn Dockerfile instructions, build an image for a sample web application using DOCKERFILE.

The resulting output should look something like this:

```
$ docker image ls
REPOSITORY          TAG       IMAGE ID       CREATED          SIZE
sample-flask-app    v1        c6879156c775   10 seconds ago   147MB
mongo               latest    24041ceefc56   6 days ago       755MB
```

In the list, you should see sample-flask-app:v1, which confirms the image is now in our system. Now, run the sample-flask-app:v1 image as a container by executing the following command:

```
$ docker container run -d -p 5000:5000 sample-flask-app:v1
```

The -d flag is short for --detach and runs the container in the background. The -p flag is short for --publish and maps port 5000 of the host to port 5000 of the Docker container. After running this command, you'll see an output like this:

```
$ docker container run -d -p 5000:5000 sample-flask-app:v1
ff37071dd4cef95cc1dc2ce7e145019339cfaec54575659f72aea4e560238f8c
```

The long string you see printed in the terminal is the container ID. To make sure the container is running, list the currently active Docker containers by running the following command:

```
$ docker container ls
```

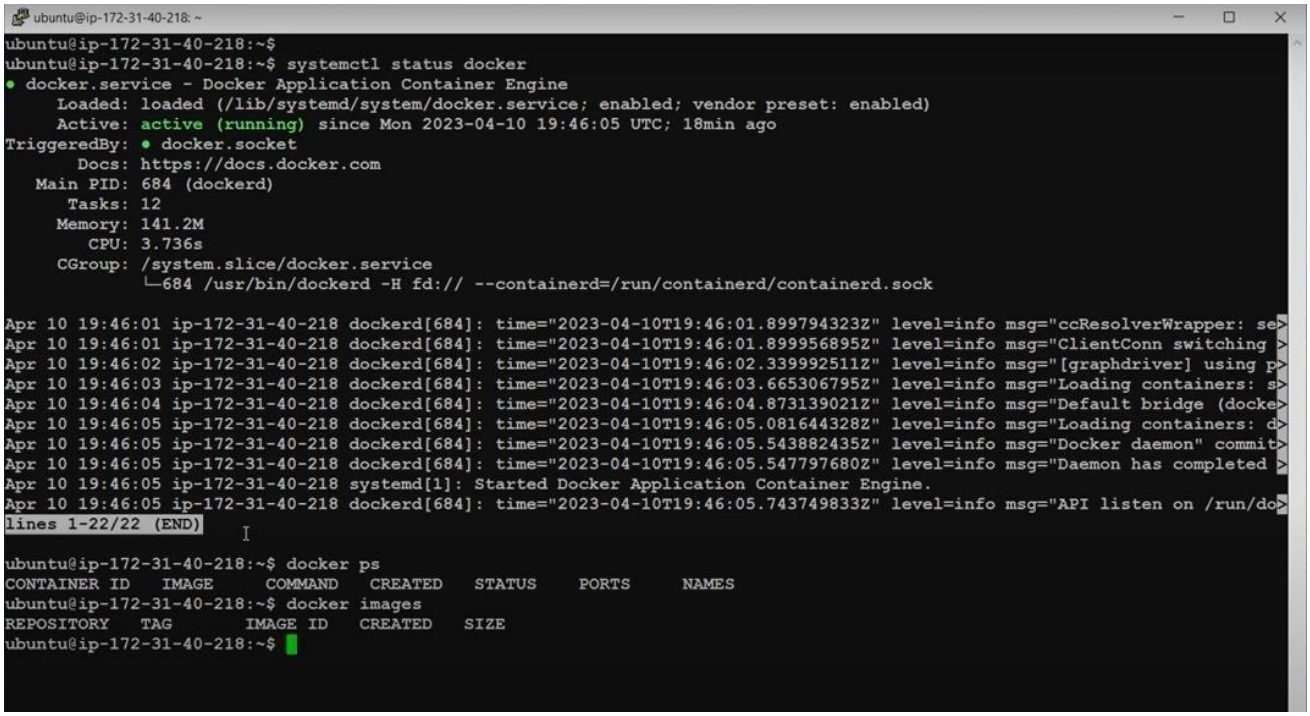
You should see something like this:

```
$ docker container ls
CONTAINER ID  IMAGE              COMMAND                  CREATED         STATUS         PORTS                    NAMES
c301c50152ac  sample-flask-app:v1  "flask run --host=0…"  14 seconds ago  Up 12 seconds  0.0.0.0:5000->5000/tcp  xenodochial_mendel
```

Aim: To learn Dockerfile instructions, build an image for a sample web application using DOCKERFILE.

The container is up and running as expected. Our Flask application is now running inside the container. To test it, open a web browser and go to http://localhost:5000. You should see the message Hello, World! displayed like this:

SCREENSHOTS:



Software Engineering & Project Management Lab Experiment No: - 10

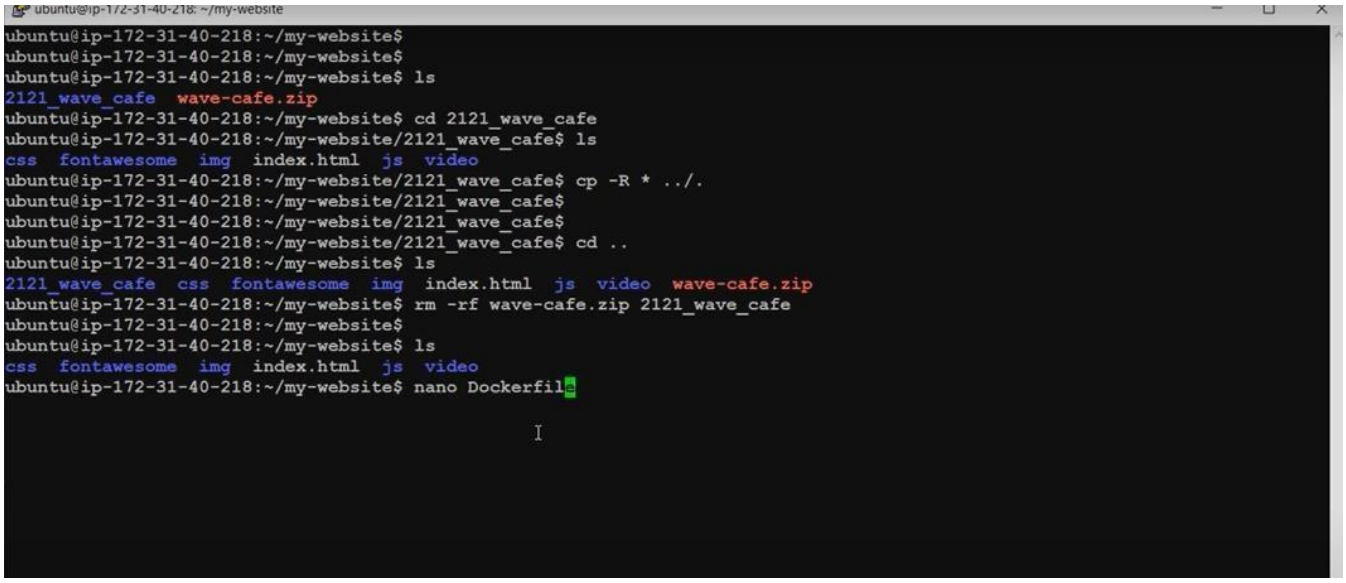
Aim: To learn Dockerfile instructions, build an image for a sample web application using DOCKERFILE.

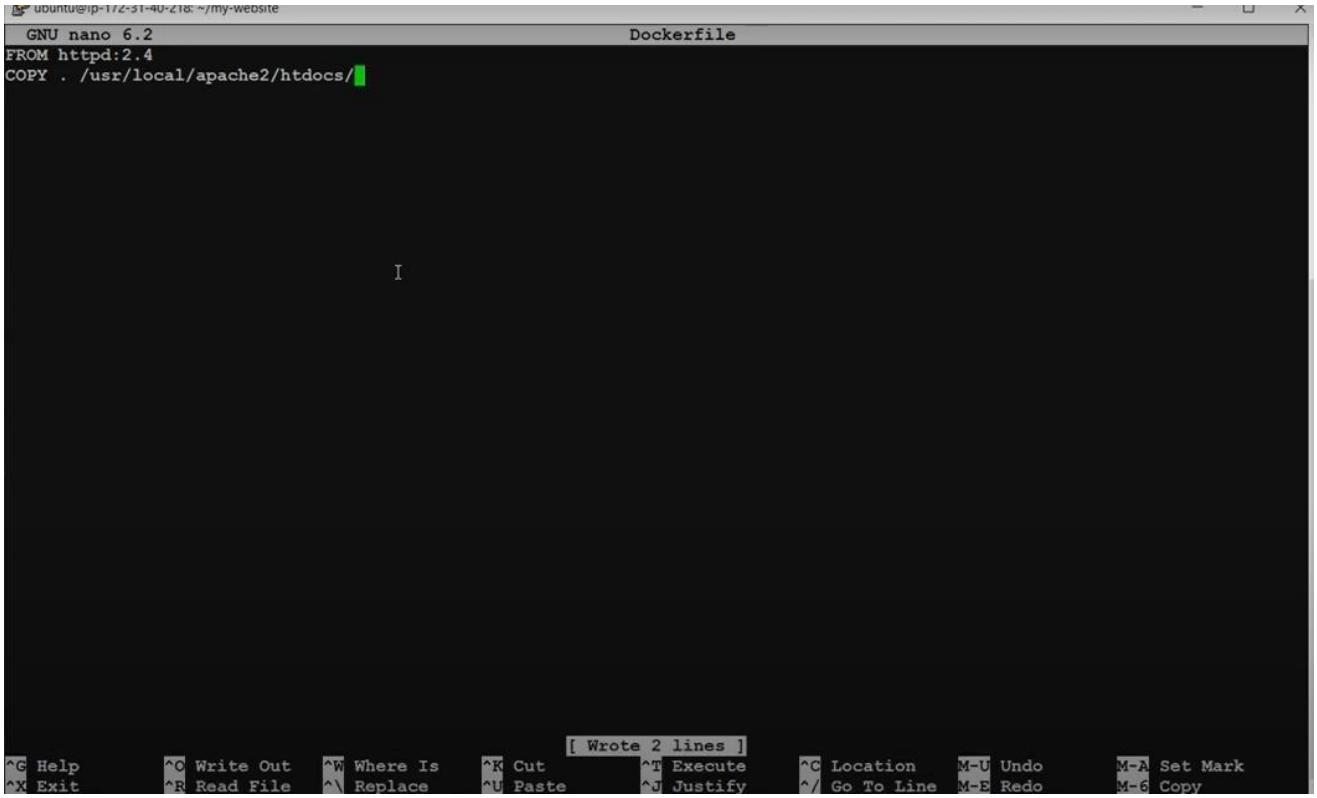
```
ubuntu@ip-172-31-40-218:~$
ubuntu@ip-172-31-40-218:~$ pwd
/home/ubuntu
ubuntu@ip-172-31-40-218:~$ mkdir my-website
ubuntu@ip-172-31-40-218:~$ cd my-website/
ubuntu@ip-172-31-40-218:~/my-website$ wget https://www.free-css.com/assets/files/free-css-templates/download/page290/wave-c
afe.zip
--2023-04-10 20:06:14--  https://www.free-css.com/assets/files/free-css-templates/download/page290/wave-cafe.zip
Resolving www.free-css.com (www.free-css.com)... 217.160.0.242, 2001:8d8:100f:f000::28f
Connecting to www.free-css.com (www.free-css.com)|217.160.0.242|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 11896390 (11M) [application/zip]
Saving to: 'wave-cafe.zip'

wave-cafe.zip                 100%[=================================================>]  11.34M  6.08MB/s    in 1.9s

2023-04-10 20:06:17 (6.08 MB/s) - 'wave-cafe.zip' saved [11896390/11896390]

ubuntu@ip-172-31-40-218:~/my-website$
ubuntu@ip-172-31-40-218:~/my-website$
ubuntu@ip-172-31-40-218:~/my-website$ ls
wave-cafe.zip
ubuntu@ip-172-31-40-218:~/my-website$ unzip wave-cafe.zip
```

```
ubuntu@ip-172-31-40-218: ~/my-website
  inflating: 2121_wave_cafe/fontawesome/webfonts/fa-regular-400.ttf
  inflating: 2121_wave_cafe/fontawesome/webfonts/fa-regular-400.woff
  inflating: 2121_wave_cafe/fontawesome/webfonts/fa-regular-400.woff2
  inflating: 2121_wave_cafe/fontawesome/webfonts/fa-solid-900.eot
  inflating: 2121_wave_cafe/fontawesome/webfonts/fa-solid-900.svg
  inflating: 2121_wave_cafe/fontawesome/webfonts/fa-solid-900.ttf
  inflating: 2121_wave_cafe/fontawesome/webfonts/fa-solid-900.woff
  inflating: 2121_wave_cafe/fontawesome/webfonts/fa-solid-900.woff2
   creating: 2121_wave_cafe/img/
  inflating: 2121_wave_cafe/img/about-1.png
  inflating: 2121_wave_cafe/img/about-2.png
  inflating: 2121_wave_cafe/img/hot-americano.png
  inflating: 2121_wave_cafe/img/hot-cappuccino.png
  inflating: 2121_wave_cafe/img/hot-espresso.png
  inflating: 2121_wave_cafe/img/hot-latte.png
  inflating: 2121_wave_cafe/img/iced-americano.png
  inflating: 2121_wave_cafe/img/iced-cappuccino.png
  inflating: 2121_wave_cafe/img/iced-espresso.png
  inflating: 2121_wave_cafe/img/iced-latte.png
  inflating: 2121_wave_cafe/img/smoothie-1.png
  inflating: 2121_wave_cafe/img/smoothie-2.png
  inflating: 2121_wave_cafe/img/smoothie-3.png
  inflating: 2121_wave_cafe/img/smoothie-4.png
  inflating: 2121_wave_cafe/img/special-01.jpg
  inflating: 2121_wave_cafe/img/special-02.jpg
  inflating: 2121_wave_cafe/img/special-03.jpg
  inflating: 2121_wave_cafe/img/special-04.jpg
  inflating: 2121_wave_cafe/img/special-05.jpg
  inflating: 2121_wave_cafe/img/special-06.jpg
  inflating: 2121_wave_cafe/index.html
   creating: 2121_wave_cafe/js/
  inflating: 2121_wave_cafe/js/jquery-3.4.1.min.js
   creating: 2121_wave_cafe/video/
  inflating: 2121_wave_cafe/video/wave-cafe-video-bg.mp4
ubuntu@ip-172-31-40-218:~/my-website$
ubuntu@ip-172-31-40-218:~/my-website$
ubuntu@ip-172-31-40-218:~/my-website$
ubuntu@ip-172-31-40-218:~/my-website$ clear
```

Software Engineering & Project Management Lab Experiment No: - 10

Aim: To learn Dockerfile instructions, build an image for a sample web application using DOCKERFILE.





Software Engineering & Project Management Lab Experiment No: - 10

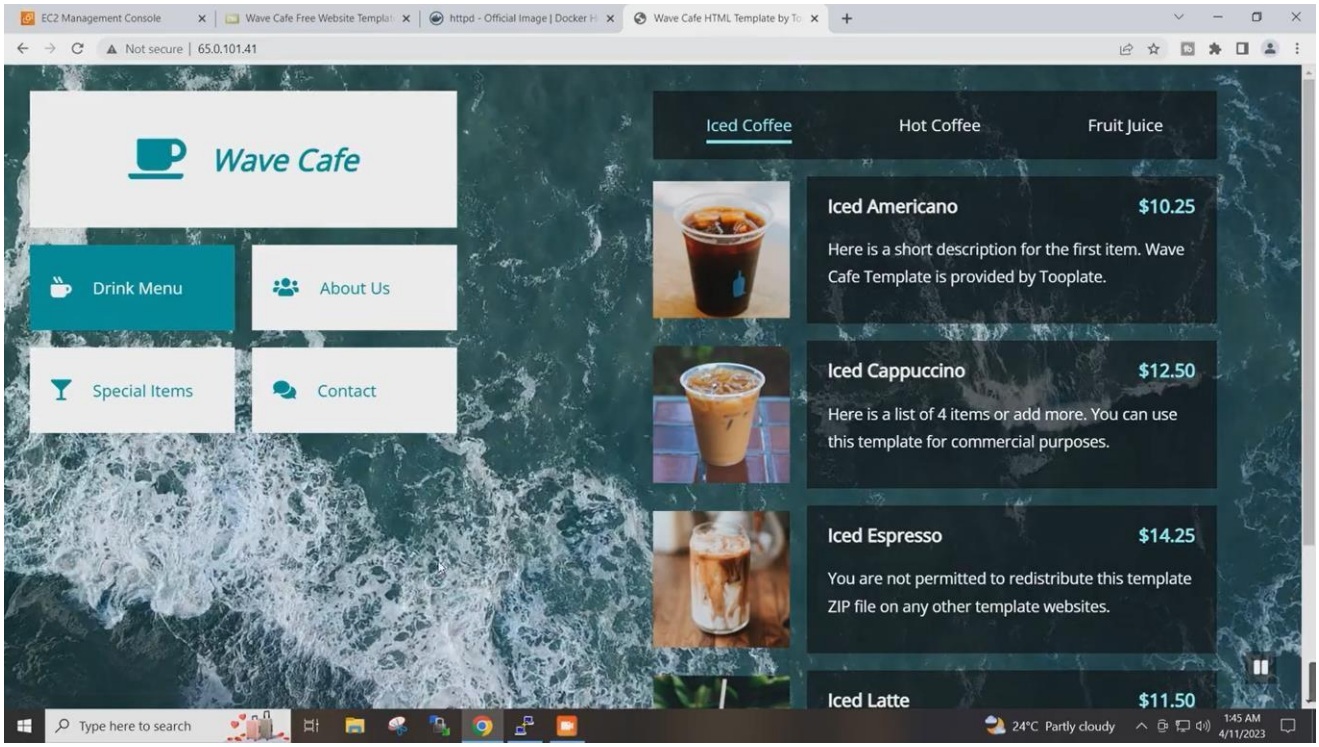
Aim: To learn Dockerfile instructions, build an image for a sample web application using DOCKERFILE.

```
ubuntu@ip-172-31-40-218:~/my-website$
ubuntu@ip-172-31-40-218:~/my-website$ ls
2121_wave_cafe  wave-cafe.zip
ubuntu@ip-172-31-40-218:~/my-website$ cd 2121_wave_cafe
ubuntu@ip-172-31-40-218:~/my-website/2121_wave_cafe$ ls
css  fontawesome  img  index.html  js  video
ubuntu@ip-172-31-40-218:~/my-website/2121_wave_cafe$ cp -R * ../.
ubuntu@ip-172-31-40-218:~/my-website/2121_wave_cafe$
ubuntu@ip-172-31-40-218:~/my-website/2121_wave_cafe$
ubuntu@ip-172-31-40-218:~/my-website/2121_wave_cafe$ cd ..
ubuntu@ip-172-31-40-218:~/my-website$ ls
2121_wave_cafe  css  fontawesome  img  index.html  js  video  wave-cafe.zip
ubuntu@ip-172-31-40-218:~/my-website$ rm -rf wave-cafe.zip 2121_wave_cafe
ubuntu@ip-172-31-40-218:~/my-website$
ubuntu@ip-172-31-40-218:~/my-website$ ls
css  fontawesome  img  index.html  js  video
ubuntu@ip-172-31-40-218:~/my-website$ nano Dockerfile
ubuntu@ip-172-31-40-218:~/my-website$ ls
Dockerfile  css  fontawesome  img  index.html  js  video
ubuntu@ip-172-31-40-218:~/my-website$ docker build . -t my-website:latest
Sending build context to Docker daemon  13.61MB
Step 1/2 : FROM httpd:2.4
2.4: Pulling from library/httpd
f1f26f570256: Pull complete
a6b093ae1967: Pull complete
6b400bbb27df: Pull complete
6e310dd059b6: Pull complete
471cb5914961: Pull complete
Digest: sha256:4055b18d92fd006f74d4a2aac172a371dc9a750eaa78000756dee55a9beb4625
Status: Downloaded newer image for httpd:2.4
 ---> dc1a95e13784
Step 2/2 : COPY . /usr/local/apache2/htdocs/
 ---> 7d48427f5e2f
Successfully built 7d48427f5e2f
Successfully tagged my-website:latest
ubuntu@ip-172-31-40-218:~/my-website$
ubuntu@ip-172-31-40-218:~/my-website$
ubuntu@ip-172-31-40-218:~/my-website$ clear
```

```
ubuntu@ip-172-31-40-218: ~/my-website
ubuntu@ip-172-31-40-218:~/my-website$
ubuntu@ip-172-31-40-218:~/my-website$
ubuntu@ip-172-31-40-218:~/my-website$ docker images
REPOSITORY   TAG       IMAGE ID       CREATED          SIZE
my-website   latest    7d48427f5e2f   15 seconds ago   159MB
httpd        2.4       dc1a95e13784   4 days ago       145MB
ubuntu@ip-172-31-40-218:~/my-website$
ubuntu@ip-172-31-40-218:~/my-website$ docker run -d -p 80:80 my-website:latest
e0a6d7f3ab6718a1b648d9b5f00dcc89e846d1fe12bd568ce9b1412fc0d3c9da
ubuntu@ip-172-31-40-218:~/my-website$
ubuntu@ip-172-31-40-218:~/my-website$
ubuntu@ip-172-31-40-218:~/my-website$
ubuntu@ip-172-31-40-218:~/my-website$ docker ps
CONTAINER ID   IMAGE              COMMAND              CREATED         STATUS         PORTS
NAMES
e0a6d7f3ab67   my-website:latest   "httpd-foreground"   8 seconds ago   Up 7 seconds   0.0.0.0:80->80/tcp, :::80->80/tcp
trusting_rosalind
ubuntu@ip-172-31-40-218:~/my-website$
```

Software Engineering & Project Management Lab Experiment No: - 10

Aim: To learn Dockerfile instructions, build an image for a sample web application using DOCKERFILE.



<u>Conclusion</u>: Thus, we have successfully learnt Dockerfile instructions & build an image for a sample web application using DOCKERFILE.