DevOps – Final Assessment

Section 1: Multiple-Choice Questions (MCQs)

1. What does WSL stand for in the context of Windows?

a. Windows Software Locator

b. Windows System Locator

c. Windows Subsystem for Linux

d. Windows Shell Language

Answer: (c) Windows Subsystem for Linux

2. What is the primary goal of continuous integration (CI) in DevOps?

a. Automating manual testing

b. Frequent integration of code changes

c. Managing cloud infrastructure

d. Monitoring server performance

Answer: (b) Frequent integration of code changes

3. In the Linux command line, what does the cd command do?

a. Copy files and directories

b. Change the working directory

c. Create a new directory

d. Calculate directory size

Answer: (b) Change the working directory

4. Which of the following is not a Linux distribution?

a. Ubuntu

b. CentOS

c. Docker

d. Debian

Answer: (c) Docker

5. What is Docker primarily used for in DevOps and containerization?

a. Managing cloud infrastructure

b. Running virtual machines

c. Packaging and deploying applications in containers

d. Managing network security

Answer : (c) Packaging and deploying applications in containers

6. What is the primary purpose of Azure DevOps?

a. Infrastructure management

b. Software development and delivery

c. Network security

d. Virtualization

Answer: (b) Software development and delivery

7. Which components are part of Azure DevOps?

a. Azure App Service and Azure Functions

b. Azure Monitor and Azure Security Center

c. Azure Boards and Azure Pipelines

d. Azure Virtual Machines and Azure SQL Database

Answer: (c) Azure Boards and Azure Pipelines

8. How does Azure DevOps support version control in software development?

a. It provides automated database backups.

b. It tracks changes in source code and manages versions.

c. It monitors server performance.

d. It optimizes network configurations.

Answer: (b) It tracks changes in source code and manages versions.

9. In Linux, what is the primary role of the root user?

a. Managing user accounts

b. Running GUI applications

c. Administrative tasks with superuser privileges

d. Monitoring network traffic

Answer: (c) Administrative tasks with superuser privileges

10. In Azure DevOps, which component is used to define, build, test, and deploy applications?

a. Azure Boards

b. Azure Repos

c. Azure Pipelines

d. Azure Artifacts

Answer: (c) Azure Pipelines

Section 2: Labs

Lab 1: File and Directory Management

Tasks:

Step 1: Create a directory called "lab1" in your home directory.

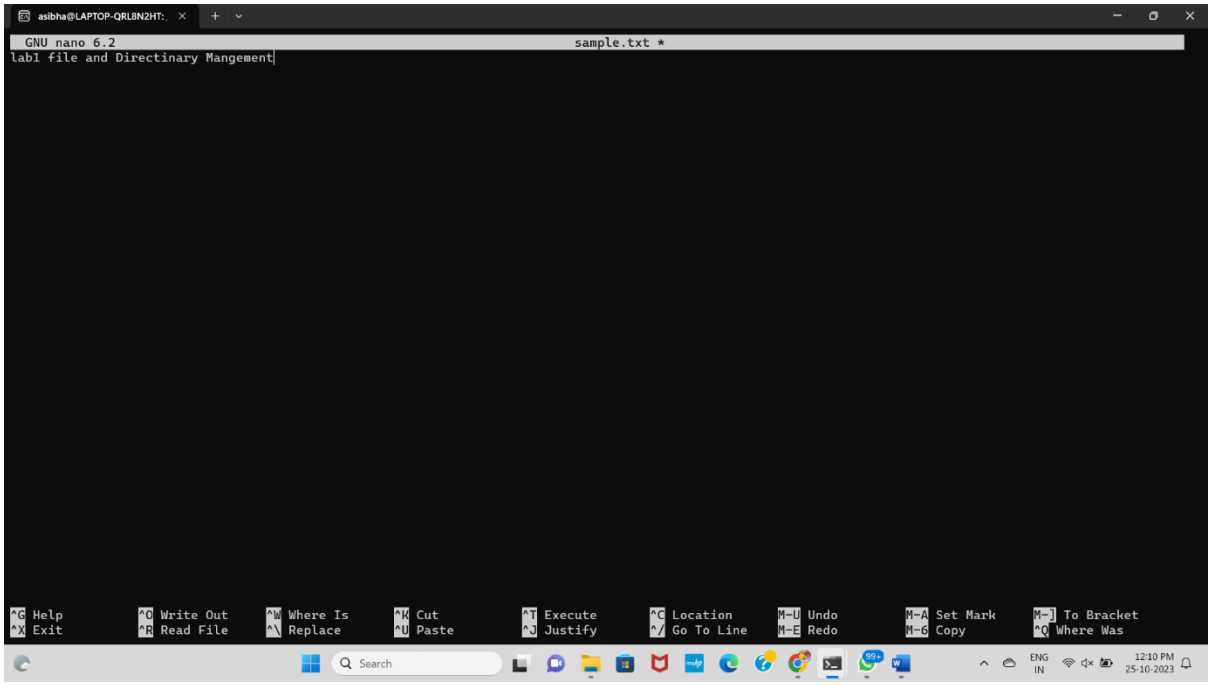
Step 2: Inside "lab1," create a text file named "sample.txt" with some content.

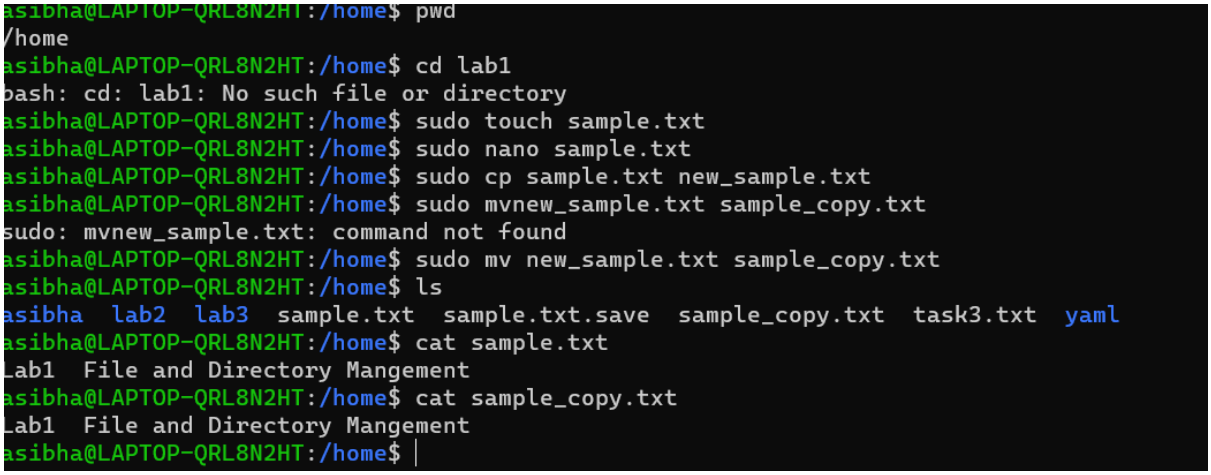
Step 3: Make a copy of "sample.txt" and name it "sample_copy.txt."

Step 4: Rename "sample_copy.txt" to "new_sample.txt."

Step 5: List the files in the "lab1" directory to confirm their names

```
asibha@LAPTOP-QRL8N2HT:/home$ pwd
/home
asibha@LAPTOP-QRL8N2HT:/home$ cd lab1
bash: cd: lab1: No such file or directory
asibha@LAPTOP-QRL8N2HT:/home$ sudo touch sample.txt
asibha@LAPTOP-QRL8N2HT:/home$ sudo nano sample.txt
asibha@LAPTOP-QRL8N2HT:/home$ sudo cp sample.txt new_sample.txt
asibha@LAPTOP-QRL8N2HT:/home$ sudo mvnew_sample.txt sample_copy.txt
sudo: mvnew_sample.txt: command not found
asibha@LAPTOP-QRL8N2HT:/home$ sudo mv new_sample.txt sample_copy.txt
asibha@LAPTOP-QRL8N2HT:/home$ ls
asibha  lab2  lab3  sample.txt  sample.txt.save  sample_copy.txt  task3.txt  yaml
asibha@LAPTOP-QRL8N2HT:/home$ cat sample.txt
Lab1  File and Directory Mangement
asibha@LAPTOP-QRL8N2HT:/home$ cat sample_copy.txt
Lab1  File and Directory Mangement
asibha@LAPTOP-QRL8N2HT:/home$
```





Lab 2: Permissions and Ownership

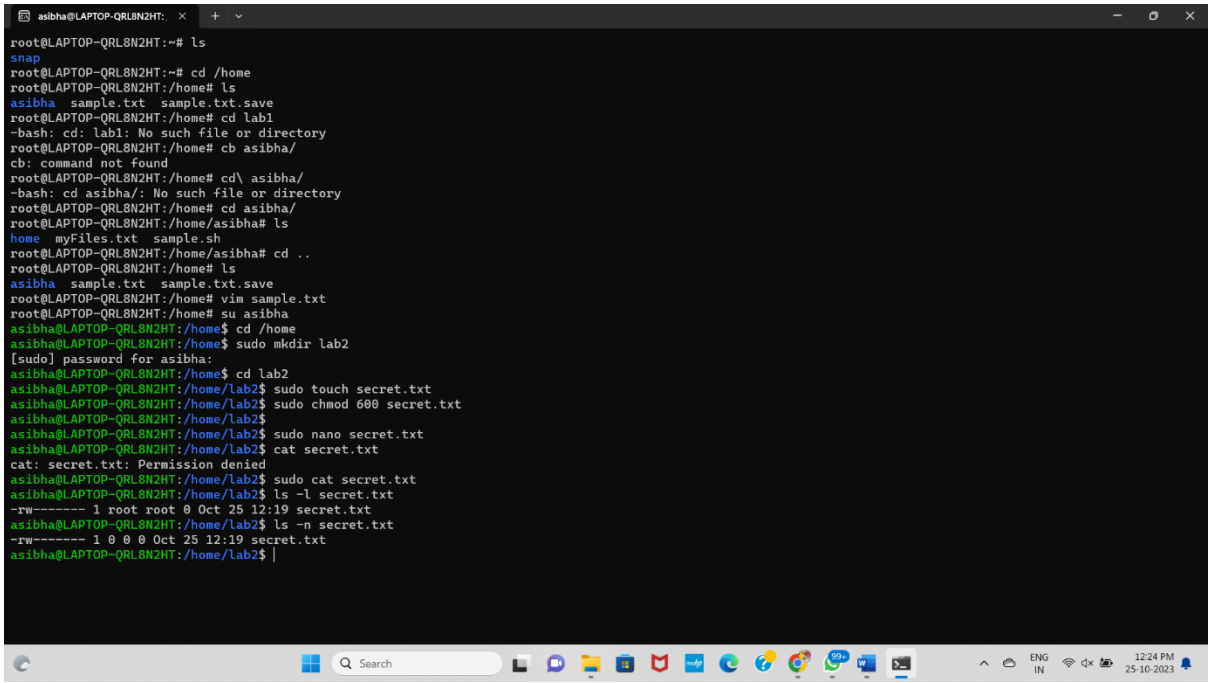
Tasks:

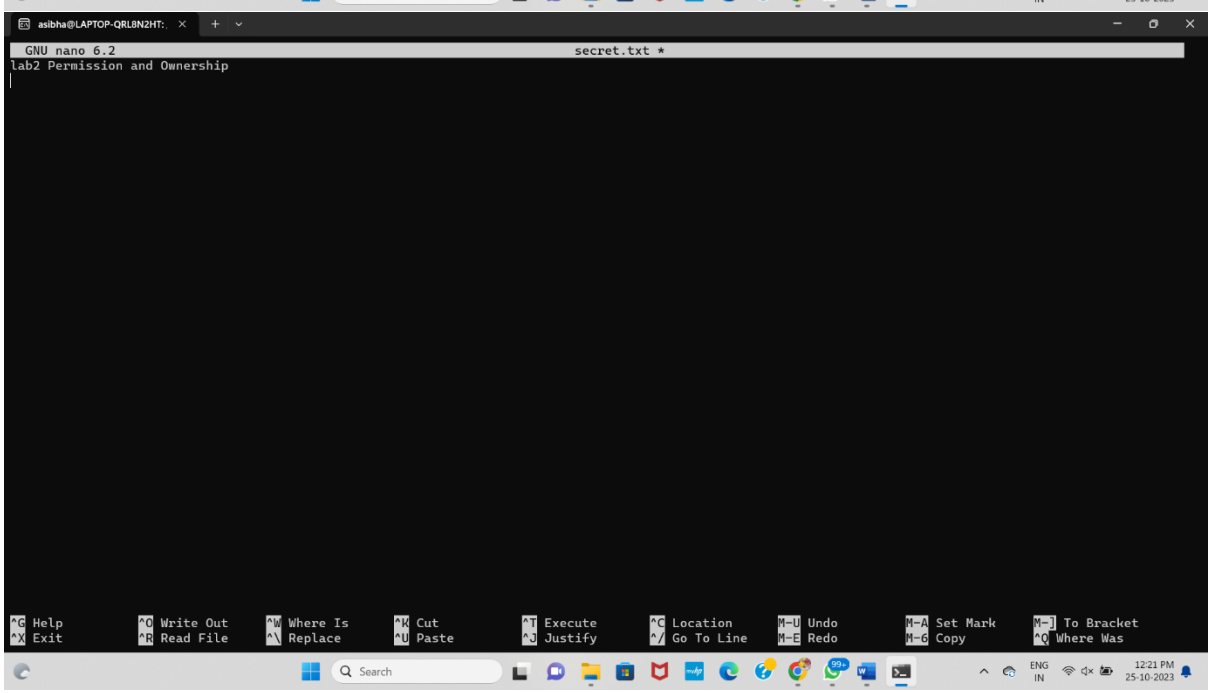
Step 1: Create a new file named "secret.txt" in the "lab2" directory.

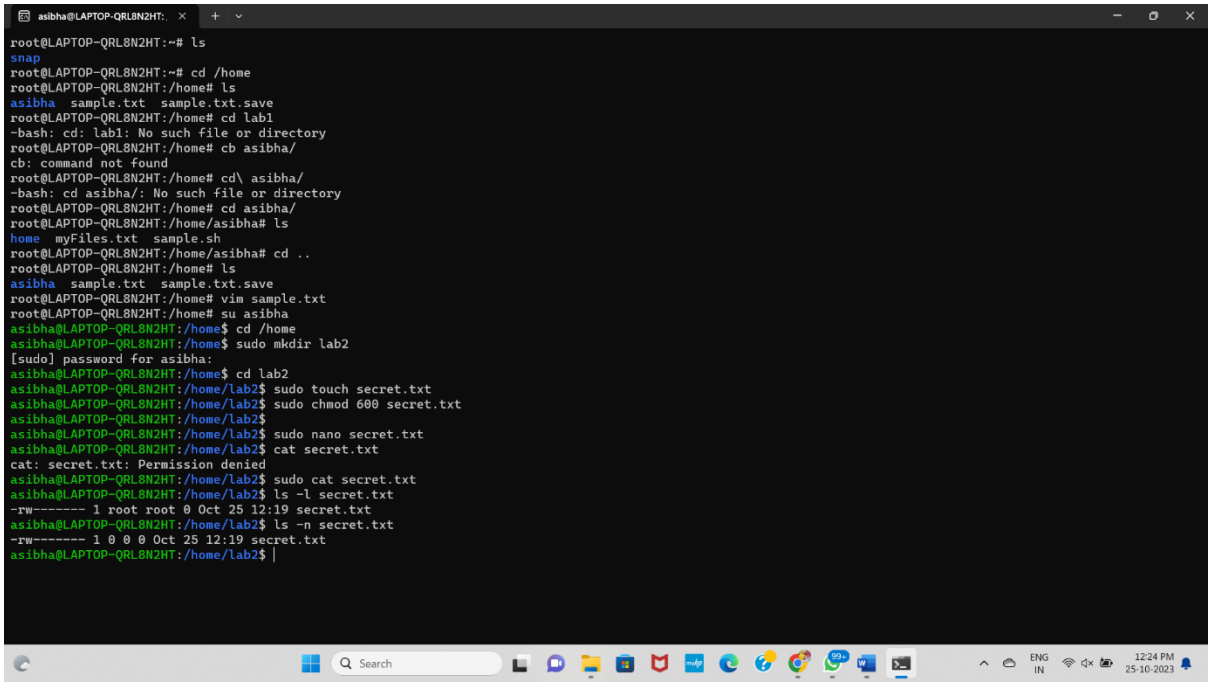
Step 2: Set the file permissions to allow read and write access only to the owner.

Step 3: Change the owner of "secret.txt" to another user.

Step 4: Verify the new permissions and owner using the ls -l and ls -n commands.


asibha@LAPTOP-QRL8N2HT:
root@LAPTOP-QRL8N2HT:~# ls
snap
root@LAPTOP-QRL8N2HT:~# cd /home
root@LAPTOP-QRL8N2HT:/home# ls
asibha sample.txt sample.txt.save
root@LAPTOP-QRL8N2HT:/home# cd lab1
-bash: cd: lab1: No such file or directory
root@LAPTOP-QRL8N2HT:/home# cb asibha/
cb: command not found
root@LAPTOP-QRL8N2HT:/home# cd\ asibha/
-bash: cd asibha/: No such file or directory
root@LAPTOP-QRL8N2HT:/home# cd asibha/
root@LAPTOP-QRL8N2HT:/home/asibha# ls
home myFiles.txt sample.sh
root@LAPTOP-QRL8N2HT:/home/asibha# cd ..
root@LAPTOP-QRL8N2HT:/home# ls
asibha sample.txt sample.txt.save
root@LAPTOP-QRL8N2HT:/home# vim sample.txt
root@LAPTOP-QRL8N2HT:/home# su asibha
asibha@LAPTOP-QRL8N2HT:/home$ cd /home
asibha@LAPTOP-QRL8N2HT:/home$ sudo mkdir lab2
[sudo] password for asibha:
asibha@LAPTOP-QRL8N2HT:/home$ cd lab2
asibha@LAPTOP-QRL8N2HT:/home/lab2$ sudo touch secret.txt
asibha@LAPTOP-QRL8N2HT:/home/lab2$ sudo chmod 600 secret.txt
asibha@LAPTOP-QRL8N2HT:/home/lab2$
asibha@LAPTOP-QRL8N2HT:/home/lab2$ sudo nano secret.txt
asibha@LAPTOP-QRL8N2HT:/home/lab2$ cat secret.txt
cat: secret.txt: Permission denied
asibha@LAPTOP-QRL8N2HT:/home/lab2$ sudo cat secret.txt
asibha@LAPTOP-QRL8N2HT:/home/lab2$ ls -l secret.txt
-rw------- 1 root root 0 Oct 25 12:19 secret.txt
asibha@LAPTOP-QRL8N2HT:/home/lab2$ ls -n secret.txt
-rw------- 1 0 0 0 Oct 25 12:19 secret.txt
asibha@LAPTOP-QRL8N2HT:/home/lab2$
Search
ENG
IN
12:24 PM
25-10-2023


asibha@LAPTOP-QRL8N2HT:
GNU nano 6.2
secret.txt *
lab2 Permission and Ownership
^G Help
^O Write Out
^W Where Is
^K Cut
^T Execute
^C Location
M-U Undo
M-A Set Mark
M-] To Bracket
^X Exit
^R Read File
^\ Replace
^U Paste
^J Justify
^/ Go To Line
M-E Redo
M-6 Copy
^Q Where Was
Search
ENG
IN
12:21 PM
25-10-2023



Lab 3: Text Processing with Command Line Tools

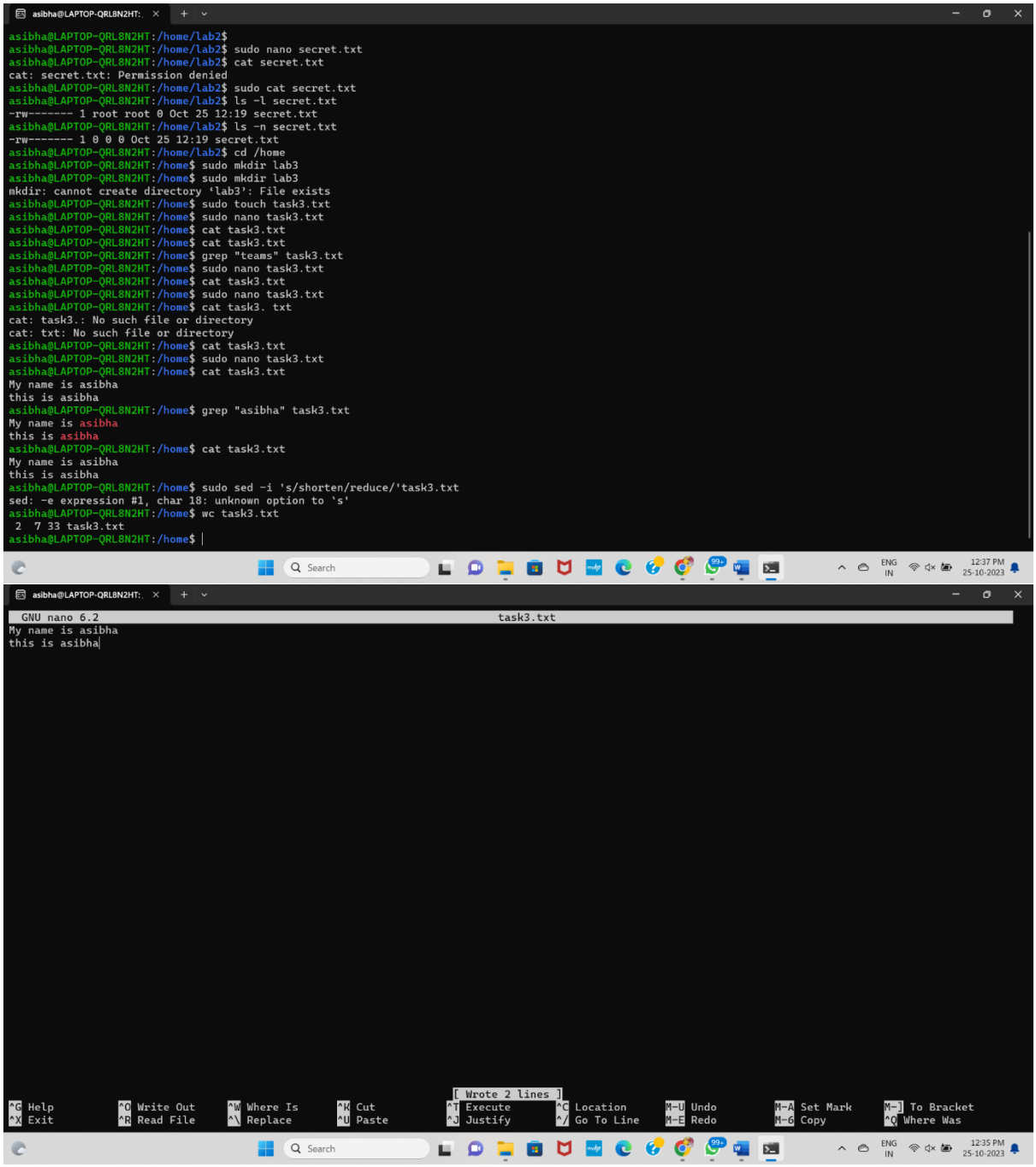
Tasks:

Step 1: Create a text file with some random text in the "lab3" directory.

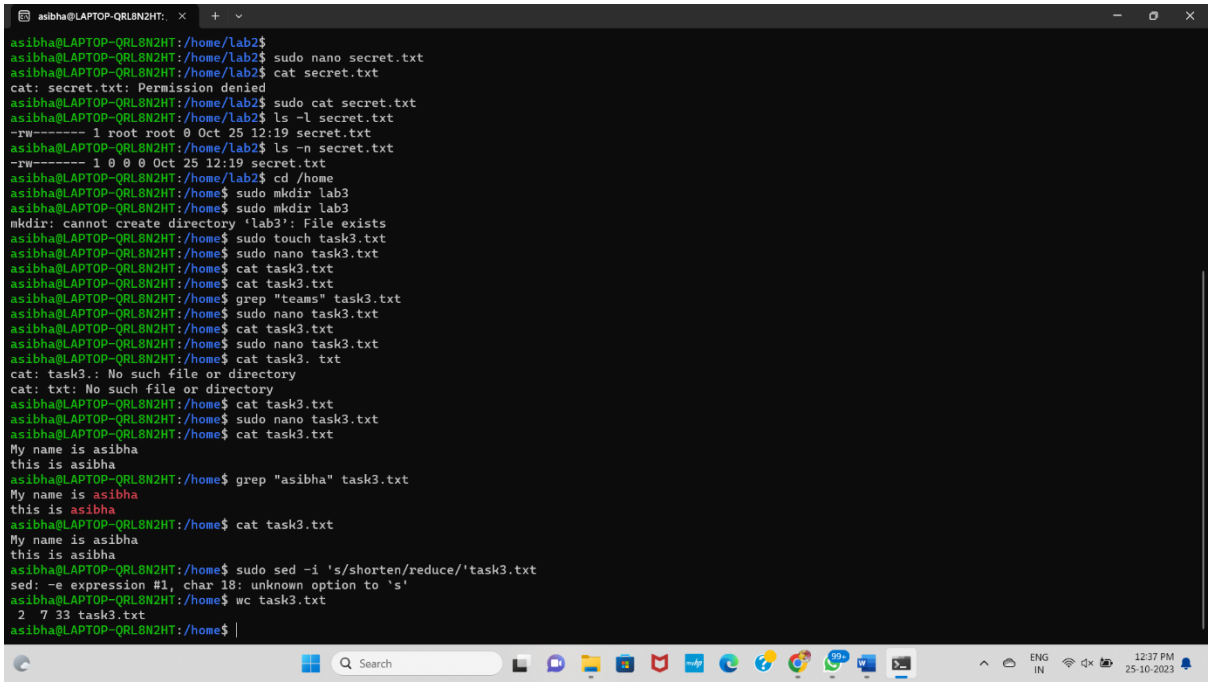
Step 2: Use the ‘grep’ command to search for a specific word or pattern in the file.

Step 3: Use the ‘sed’ command to replace a word or phrase with another in the file.

Step 4: Use the ‘wc’ command to count the number of lines, words, and characters in the file.


asibha@LAPTOP-QRL8N2HT:/home/lab2$
asibha@LAPTOP-QRL8N2HT:/home/lab2$ sudo nano secret.txt
asibha@LAPTOP-QRL8N2HT:/home/lab2$ cat secret.txt
cat: secret.txt: Permission denied
asibha@LAPTOP-QRL8N2HT:/home/lab2$ sudo cat secret.txt
asibha@LAPTOP-QRL8N2HT:/home/lab2$ ls -l secret.txt
-rw------- 1 root root 0 Oct 25 12:19 secret.txt
asibha@LAPTOP-QRL8N2HT:/home/lab2$ ls -n secret.txt
-rw------- 1 0 0 0 Oct 25 12:19 secret.txt
asibha@LAPTOP-QRL8N2HT:/home/lab2$ cd /home
asibha@LAPTOP-QRL8N2HT:/home$ sudo mkdir lab3
asibha@LAPTOP-QRL8N2HT:/home$ sudo mkdir lab3
mkdir: cannot create directory 'lab3': File exists
asibha@LAPTOP-QRL8N2HT:/home$ sudo touch task3.txt
asibha@LAPTOP-QRL8N2HT:/home$ sudo nano task3.txt
asibha@LAPTOP-QRL8N2HT:/home$ cat task3.txt
asibha@LAPTOP-QRL8N2HT:/home$ cat task3.txt
asibha@LAPTOP-QRL8N2HT:/home$ grep "teams" task3.txt
asibha@LAPTOP-QRL8N2HT:/home$ sudo nano task3.txt
asibha@LAPTOP-QRL8N2HT:/home$ cat task3.txt
asibha@LAPTOP-QRL8N2HT:/home$ sudo nano task3.txt
asibha@LAPTOP-QRL8N2HT:/home$ cat task3. txt
cat: task3.: No such file or directory
cat: txt: No such file or directory
asibha@LAPTOP-QRL8N2HT:/home$ cat task3.txt
asibha@LAPTOP-QRL8N2HT:/home$ sudo nano task3.txt
asibha@LAPTOP-QRL8N2HT:/home$ cat task3.txt
My name is asibha
this is asibha
asibha@LAPTOP-QRL8N2HT:/home$ grep "asibha" task3.txt
My name is asibha
this is asibha
asibha@LAPTOP-QRL8N2HT:/home$ cat task3.txt
My name is asibha
this is asibha
asibha@LAPTOP-QRL8N2HT:/home$ sudo sed -i 's/shorten/reduce/'task3.txt
sed: -e expression #1, char 18: unknown option to `s'
asibha@LAPTOP-QRL8N2HT:/home$ wc task3.txt
2 7 33 task3.txt
asibha@LAPTOP-QRL8N2HT:/home$
Search
ENG
IN
12:37 PM
25-10-2023

GNU nano 6.2 task3.txt
My name is asibha
this is asibha
[Wrote 2 lines]
^G Help ^O Write Out ^W Where Is ^K Cut ^T Execute ^C Location M-U Undo M-A Set Mark M-] To Bracket
^X Exit ^R Read File ^\ Replace ^U Paste ^J Justify ^/ Go To Line M-E Redo M-6 Copy ^Q Where Was
Search
ENG
IN
12:35 PM
25-10-2023



Lab 4: Creating a Simple YAML File

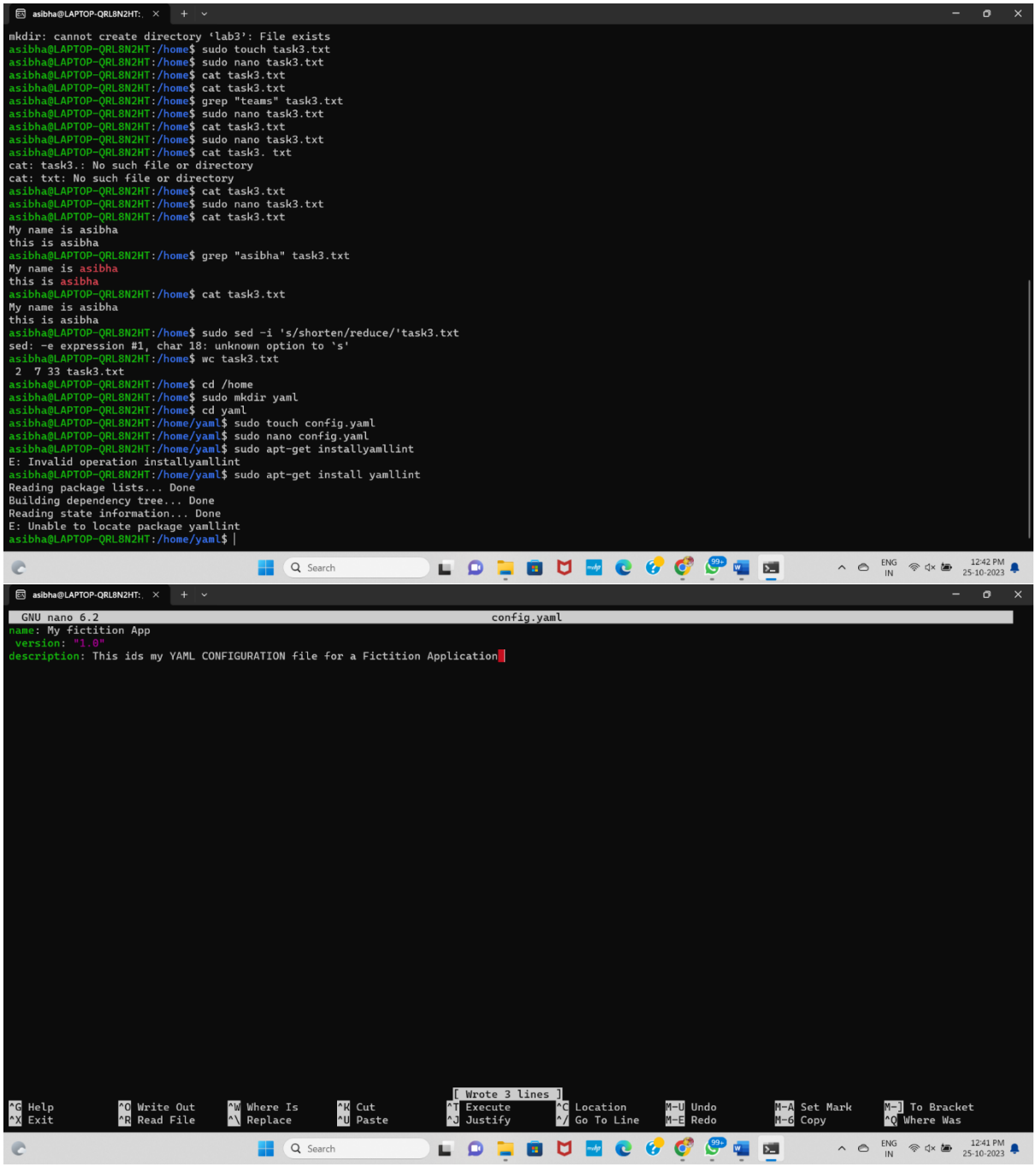
Task:

Step 1: Create a YAML file named "config.yaml."

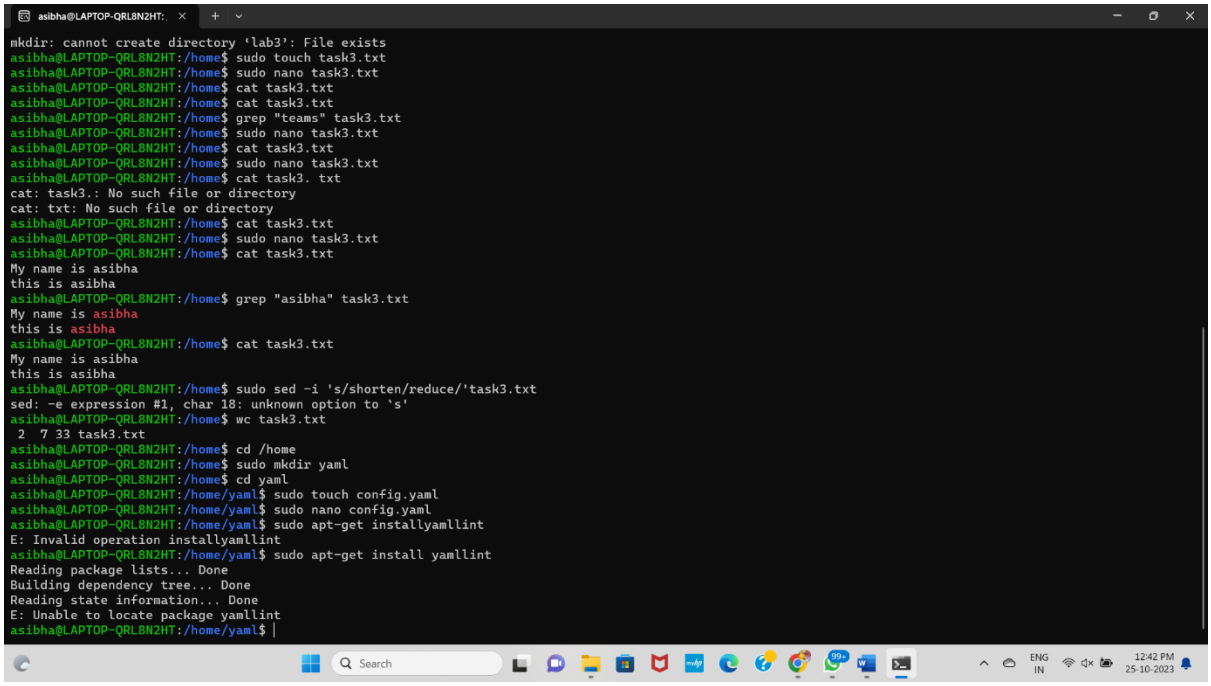
Step 2: Define key-value pairs in YAML for a fictitious application, including name, version, and description.

Step 3: Save the file.

Step 4: Validate that the YAML file is correctly formatted.


asibha@LAPTOP-QRL8N2HT:.
mkdir: cannot create directory 'lab3': File exists
asibha@LAPTOP-QRL8N2HT:/home$ sudo touch task3.txt
asibha@LAPTOP-QRL8N2HT:/home$ sudo nano task3.txt
asibha@LAPTOP-QRL8N2HT:/home$ cat task3.txt
asibha@LAPTOP-QRL8N2HT:/home$ cat task3.txt
asibha@LAPTOP-QRL8N2HT:/home$ grep "teams" task3.txt
asibha@LAPTOP-QRL8N2HT:/home$ sudo nano task3.txt
asibha@LAPTOP-QRL8N2HT:/home$ cat task3.txt
asibha@LAPTOP-QRL8N2HT:/home$ sudo nano task3.txt
asibha@LAPTOP-QRL8N2HT:/home$ cat task3. txt
cat: task3.: No such file or directory
cat: txt: No such file or directory
asibha@LAPTOP-QRL8N2HT:/home$ cat task3.txt
asibha@LAPTOP-QRL8N2HT:/home$ sudo nano task3.txt
asibha@LAPTOP-QRL8N2HT:/home$ cat task3.txt
My name is asibha
this is asibha
asibha@LAPTOP-QRL8N2HT:/home$ grep "asibha" task3.txt
My name is asibha
this is asibha
asibha@LAPTOP-QRL8N2HT:/home$ cat task3.txt
My name is asibha
this is asibha
asibha@LAPTOP-QRL8N2HT:/home$ sudo sed -i 's/shorten/reduce/'task3.txt
sed: -e expression #1, char 18: unknown option to `s'
asibha@LAPTOP-QRL8N2HT:/home$ wc task3.txt
2 7 33 task3.txt
asibha@LAPTOP-QRL8N2HT:/home$ cd /home
asibha@LAPTOP-QRL8N2HT:/home$ sudo mkdir yaml
asibha@LAPTOP-QRL8N2HT:/home$ cd yaml
asibha@LAPTOP-QRL8N2HT:/home/yaml$ sudo touch config.yaml
asibha@LAPTOP-QRL8N2HT:/home/yaml$ sudo nano config.yaml
asibha@LAPTOP-QRL8N2HT:/home/yaml$ sudo apt-get installyamllint
E: Invalid operation installyamllint
asibha@LAPTOP-QRL8N2HT:/home/yaml$ sudo apt-get install yamllint
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
E: Unable to locate package yamllint
asibha@LAPTOP-QRL8N2HT:/home/yaml$
Search
ENG
IN
12:42 PM
25-10-2023

asibha@LAPTOP-QRL8N2HT:.
GNU nano 6.2
config.yaml
name: My fictition App
version: "1.0"
description: This ids my YAML CONFIGURATION file for a Fictition Application
[Wrote 3 lines]
^G Help
^X Exit
^O Write Out
^R Read File
^W Where Is
^\ Replace
^K Cut
^U Paste
^T Execute
^J Justify
^C Location
^/ Go To Line
M-U Undo
M-E Redo
M-A Set Mark
M-6 Copy
M-] To Bracket
^Q Where Was
Search
ENG
IN
12:41 PM
25-10-2023



Lab 5: Working with Lists in YAML

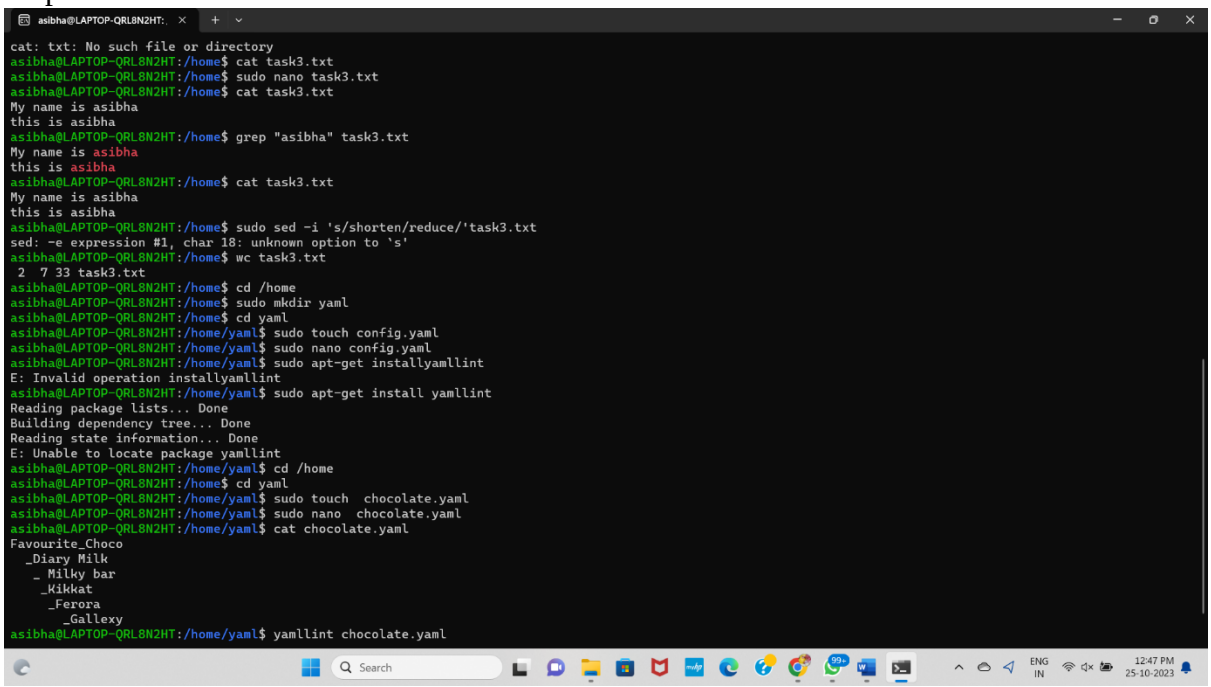
Task:

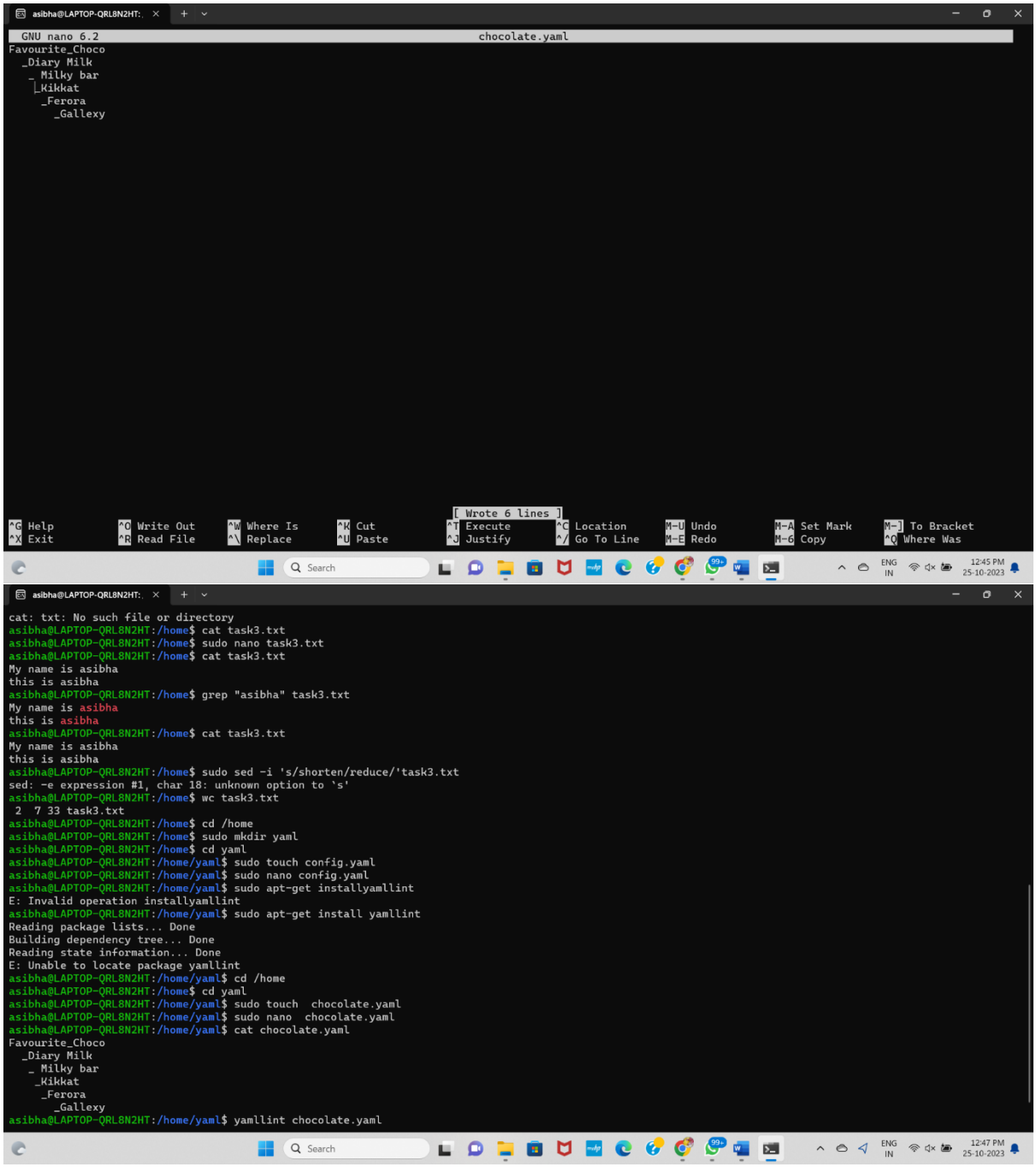
Step 1: Create a YAML file named "fruits.yaml."

Step 2: Define a list of your favorite fruits using YAML syntax.

Step 3: Add items to the list.

Step 4: Save and validate the YAML file.





Lab 6: Nested Structures in YAML

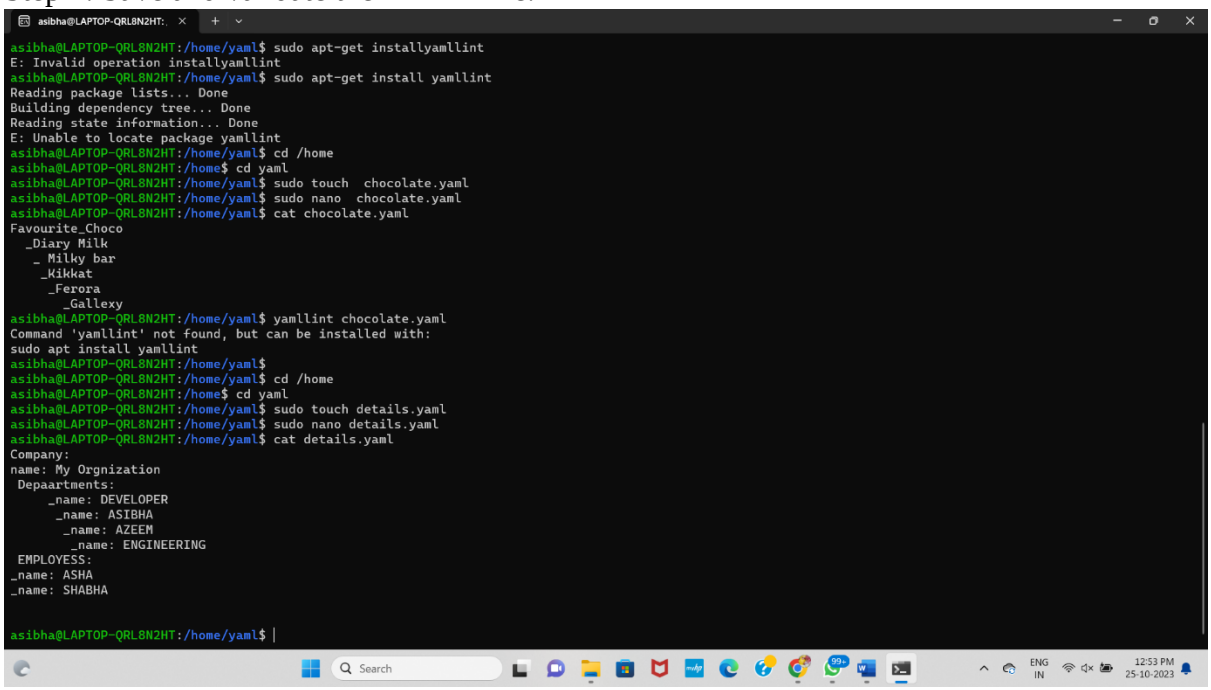
Task:

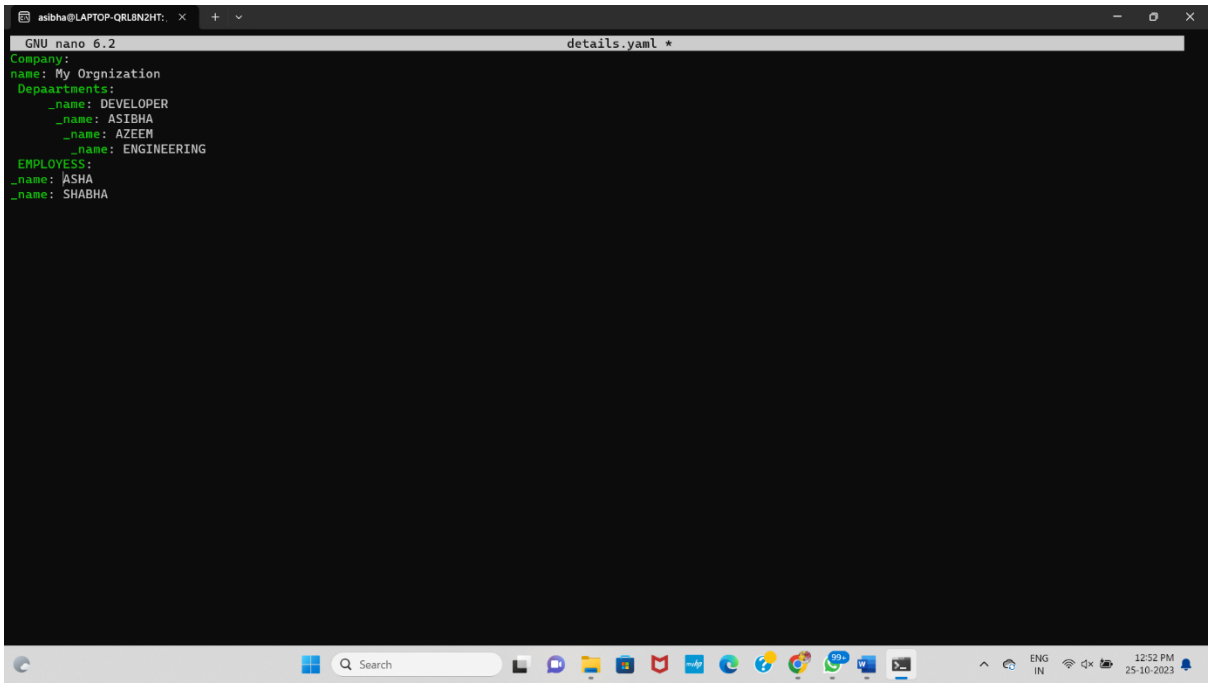
Step 1: Create a YAML file named "data.yaml."

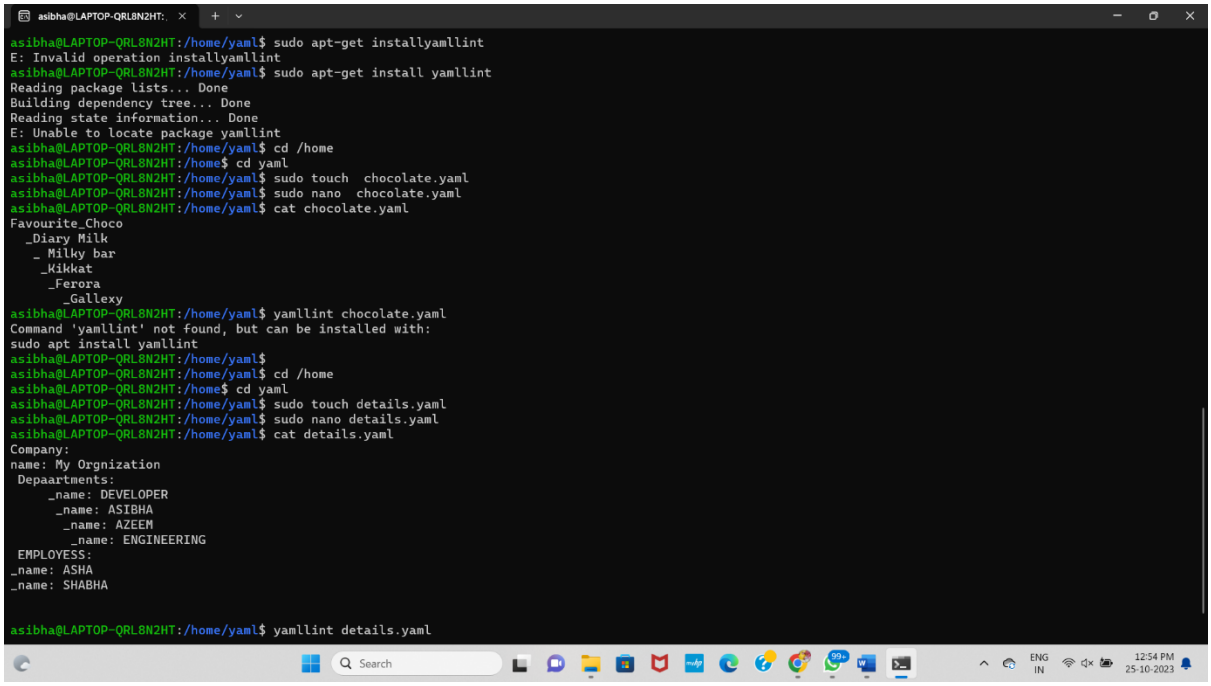
Step 2: Define a nested structure representing a fictitious organization with departments and employees using YAML syntax.

Step 3: Use YAML syntax to add, update, or remove data within the nested structure.

Step 4: Save and validate the YAML file.





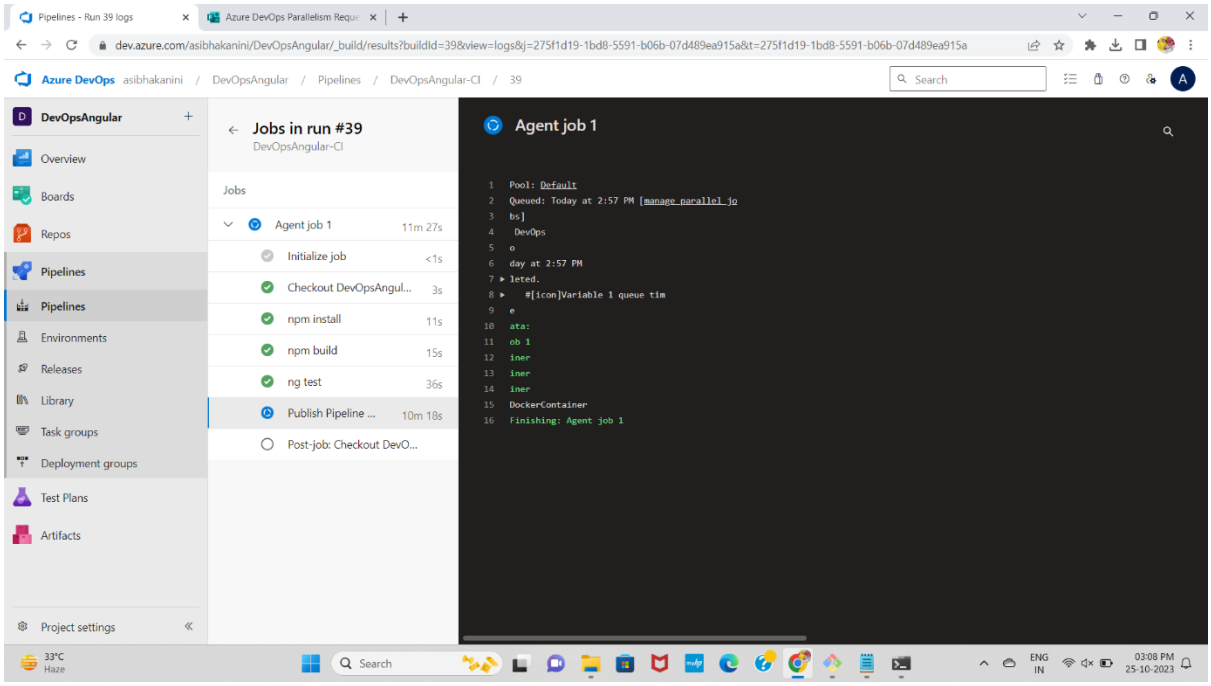


Lab 7: Create Classic Azure CI Pipeline for Angular Application

Objective: Set up a classic Azure CI pipeline to build a simple Angular application with unit testing using Jasmine and Karma.

Tasks:

1. Create an Azure DevOps project.
2. Set up a classic CI pipeline to build an Angular application.
3. Configure the pipeline to use Jasmine and Karma for unit testing.
4. Run the pipeline and validate the test results.



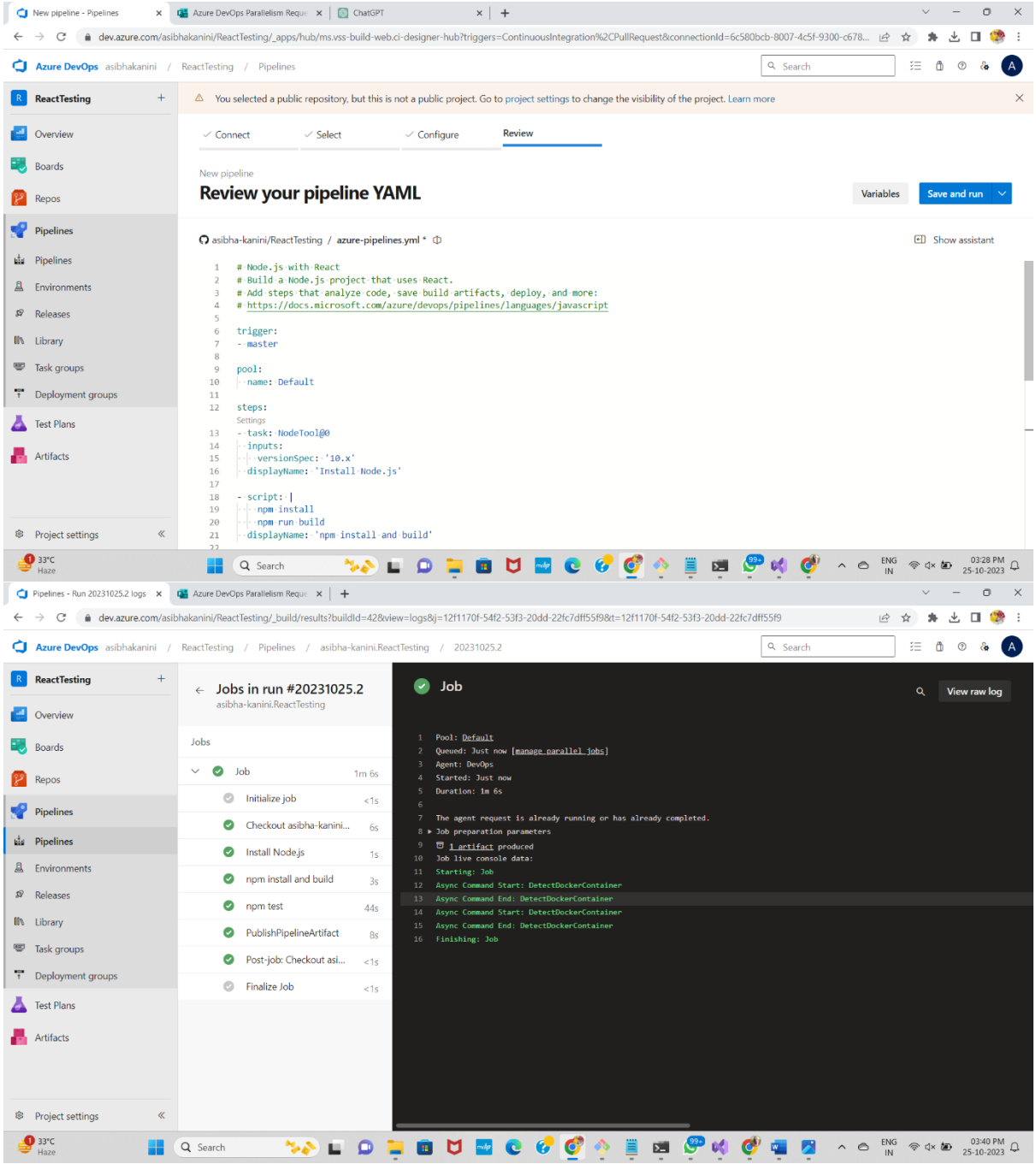
Lab 8: Create YAML Azure CI Pipeline for React Application

Objective: Create a YAML-based Azure CI pipeline to build a simple React application with unit testing using Enzyme and Jest.

Tasks:

1. Create an Azure DevOps project.
2. Create a YAML-based CI pipeline to build a React application.
3. Configure the pipeline to use Enzyme and Jest for unit testing.

4. Trigger the pipeline and verify the test results.



Lab 9: Create CI Pipeline for .NET Core Application with MS Unit Test

Objective: Create a CI pipeline, either classic or YAML, to build a .NET Core application and run MS Unit tests.

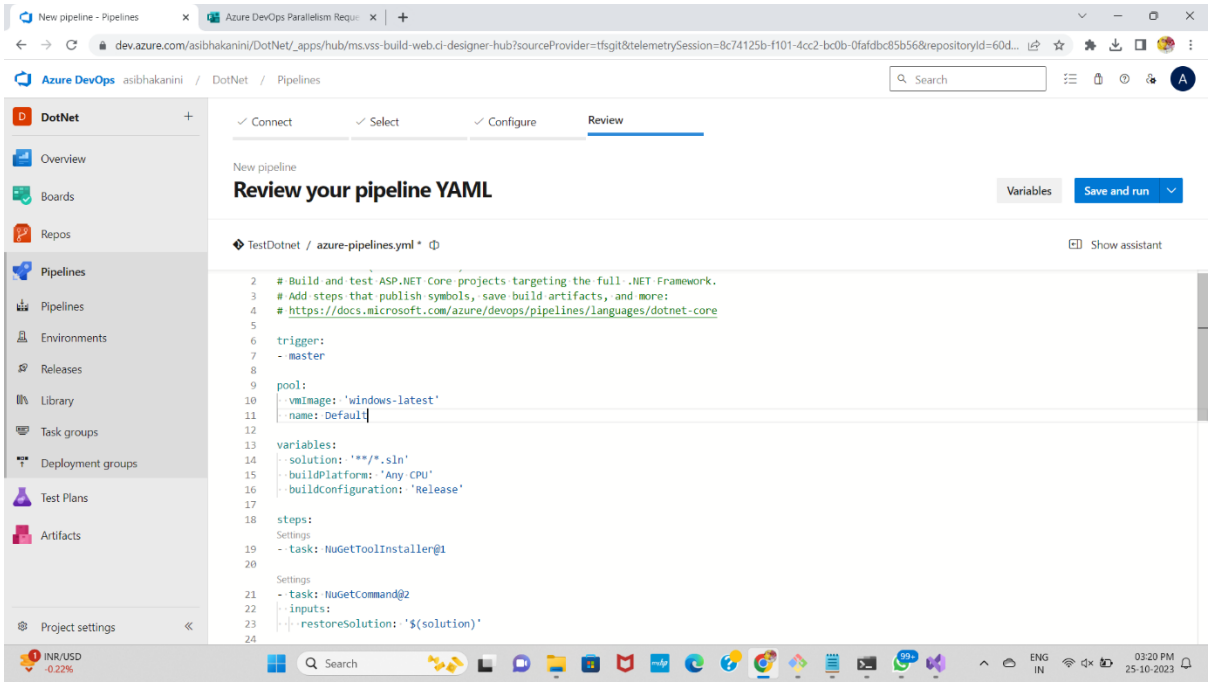
Tasks:

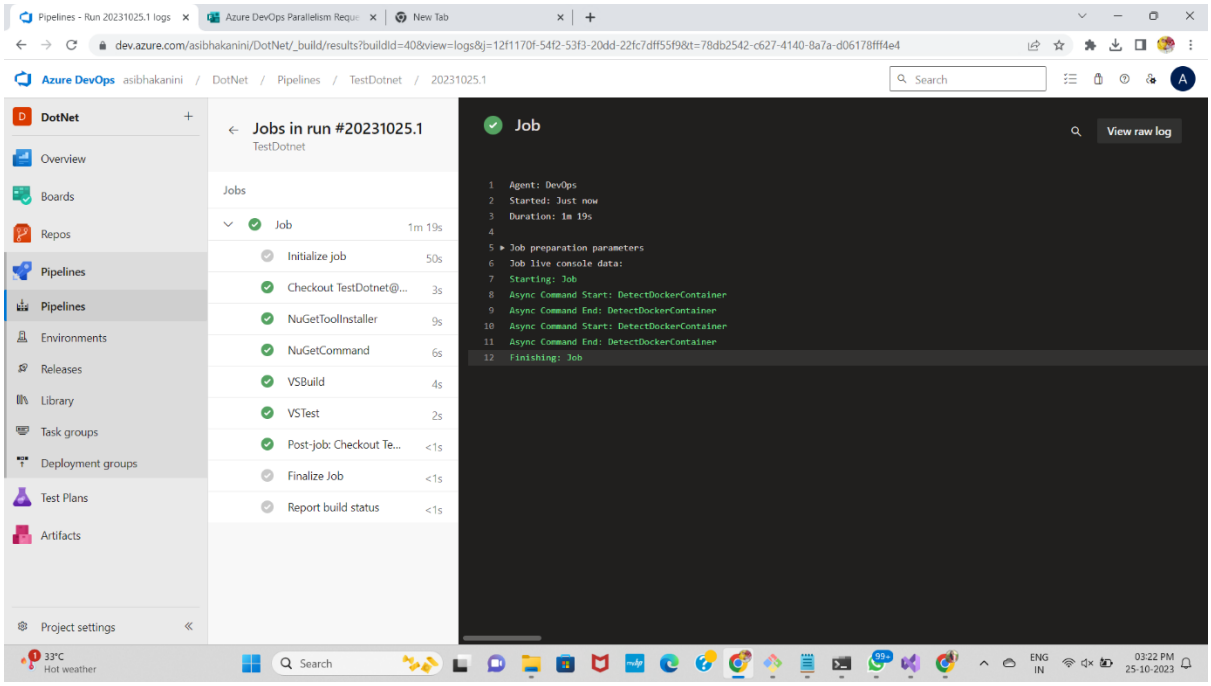
1. Set up a new Azure DevOps project.

2. Create a CI/CD pipeline for a .NET Core application.

3. Configure the pipeline to use MS Unit tests.

4. Trigger the pipeline and validate the test results.





Lab 10: Creating a Docker Image for a .NET Core Web API and Running it in Rancher

Desktop

Objective: In this lab, you will create a Docker image for a sample .NET Core Web API application and then run the Web API container in Rancher Desktop.

Prerequisites:

 Rancher Desktop installed and running.

 .NET Core SDK installed on your machine.

Tasks

Step 1: Create a .NET Core Web API Project

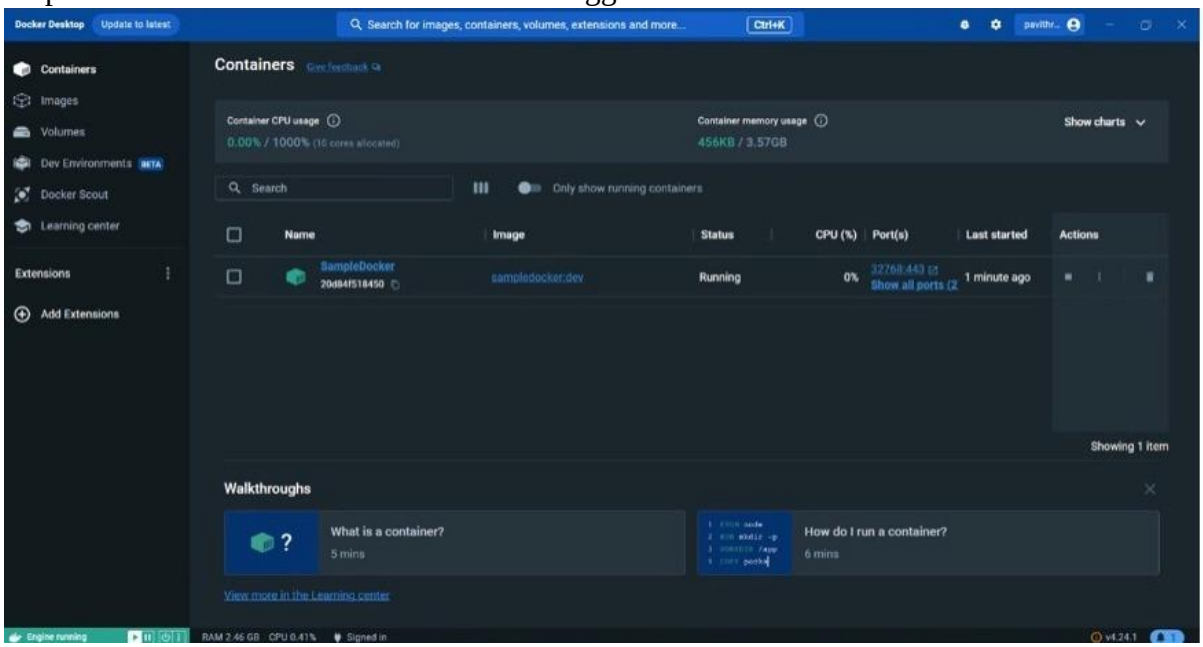
Step 2: Build the .NET Core Web API Project

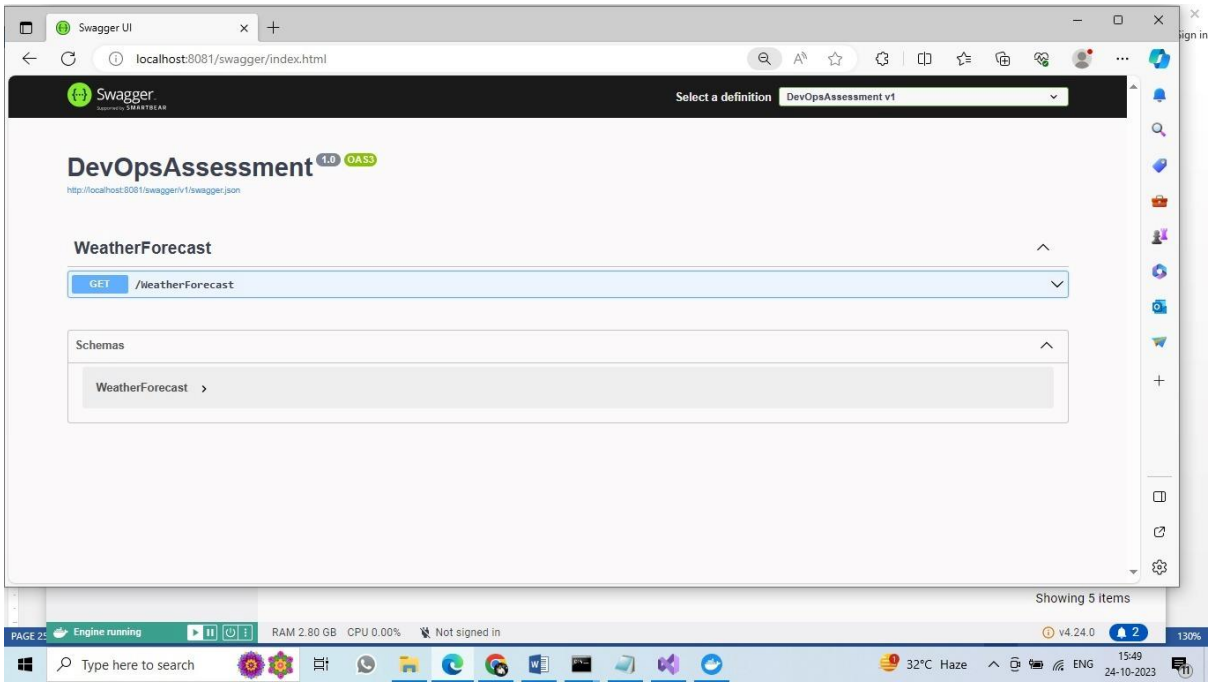
Step 3: Dockerize the .NET Core Web API

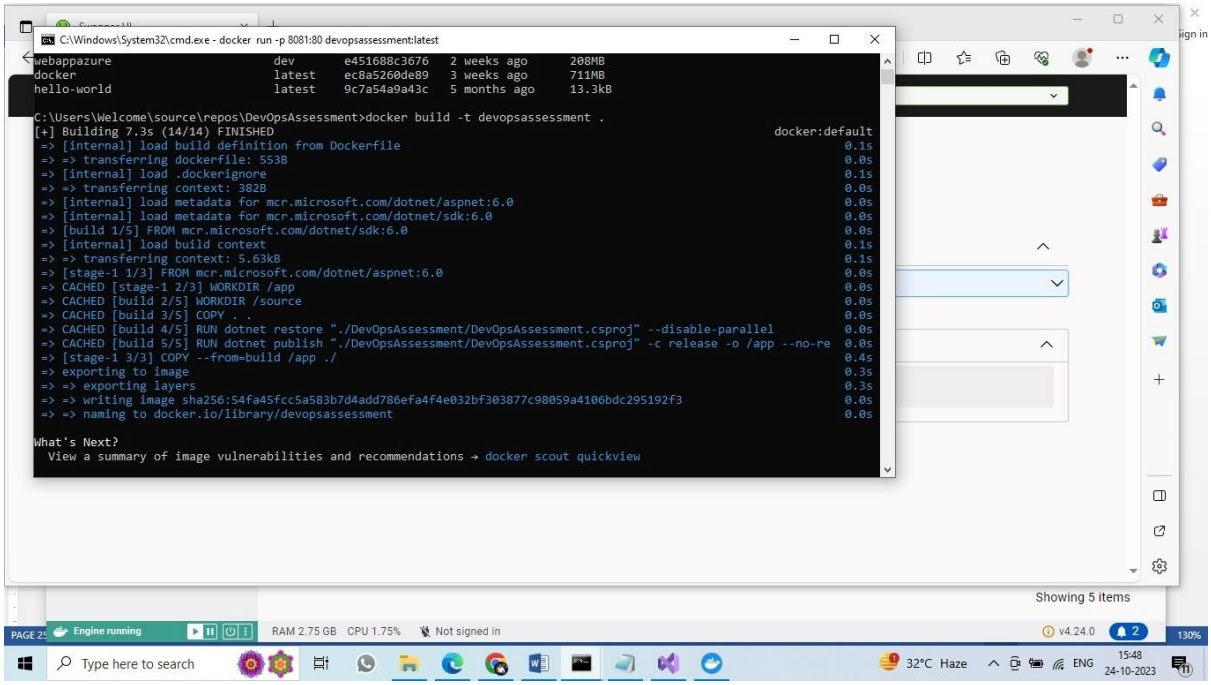
Step 4: Build the Docker Image

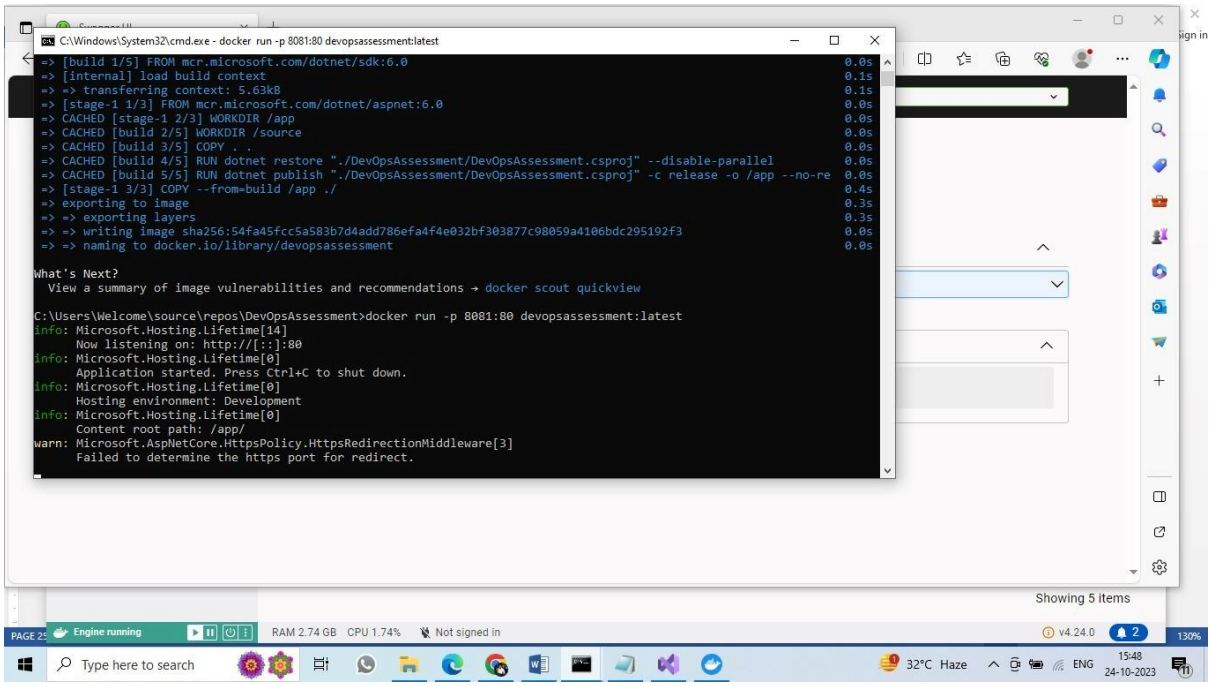
Step 5: Run the Docker Container in Rancher Desktop

Step 6: Test the .NET Core Web API via swagger




Swagger UI
localhost:8081/swagger/index.html
Swagger
Select a definition
DevOpsAssessment v1
DevOpsAssessment
1.0
OAS3
http://localhost:8081/swagger/v1/swagger.json
WeatherForecast
GET
/WeatherForecast
Schemas
WeatherForecast
Showing 5 items
Engine running
RAM 2.80 GB CPU 0.00%
Not signed in
v4.24.0
Type here to search
32°C Haze
ENG
15:49
24-10-2023


C:\Windows\System32\cmd.exe - docker run -p 8081:80 devopsassessment:latest
webappazure dev e451688c3676 2 weeks ago 208MB
docker latest ec8a5260de89 3 weeks ago 711MB
hello-world latest 9c7a54a9a43c 5 months ago 13.3kB
C:\Users\Welcome\source\repos\DevOpsAssessment>docker build -t devopsassessment .
[+] Building 7.3s (14/14) FINISHED docker:default
=> [internal] load build definition from Dockerfile 0.1s
=> => transferring dockerfile: 553B 0.0s
=> [internal] load .dockerignore 0.1s
=> => transferring context: 382B 0.0s
=> [internal] load metadata for mcr.microsoft.com/dotnet/aspnet:6.0 0.0s
=> [internal] load metadata for mcr.microsoft.com/dotnet/sdk:6.0 0.0s
=> [build 1/5] FROM mcr.microsoft.com/dotnet/sdk:6.0 0.0s
=> [internal] load build context 0.1s
=> => transferring context: 5.63kB 0.1s
=> [stage-1 1/3] FROM mcr.microsoft.com/dotnet/aspnet:6.0 0.0s
=> CACHED [stage-1 2/3] WORKDIR /app 0.0s
=> CACHED [build 2/5] WORKDIR /source 0.0s
=> CACHED [build 3/5] COPY . . 0.0s
=> CACHED [build 4/5] RUN dotnet restore "./DevOpsAssessment/DevOpsAssessment.csproj" --disable-parallel 0.0s
=> CACHED [build 5/5] RUN dotnet publish "./DevOpsAssessment/DevOpsAssessment.csproj" -c release -o /app --no-re 0.0s
=> [stage-1 3/3] COPY --from=build /app ./ 0.4s
=> exporting to image 0.3s
=> => exporting layers 0.3s
=> => writing image sha256:54fa45fcc5a583b7d4add786efa4f4e032bf303877c98059a4106bdc295192f3 0.0s
=> => naming to docker.io/library/devopsassessment 0.0s
What's Next?
View a summary of image vulnerabilities and recommendations → docker scout quickview
Showing 5 items
Engine running
RAM 2.75 GB CPU 1.75%
Not signed in
v4.24.0
Type here to search
32°C Haze
ENG
15:48
24-10-2023


C:\Windows\System32\cmd.exe - docker run -p 8081:80 devopsassessment:latest
=> [build 1/5] FROM mcr.microsoft.com/dotnet/sdk:6.0 0.0s
=> [internal] load build context 0.1s
=> => transferring context: 5.63kB 0.1s
=> [stage-1 1/3] FROM mcr.microsoft.com/dotnet/aspnet:6.0 0.0s
=> CACHED [stage-1 2/3] WORKDIR /app 0.0s
=> CACHED [build 2/5] WORKDIR /source 0.0s
=> CACHED [build 3/5] COPY . . 0.0s
=> CACHED [build 4/5] RUN dotnet restore "./DevOpsAssessment/DevOpsAssessment.csproj" --disable-parallel 0.0s
=> CACHED [build 5/5] RUN dotnet publish "./DevOpsAssessment/DevOpsAssessment.csproj" -c release -o /app --no-re 0.0s
=> [stage-1 3/3] COPY --from=build /app ./ 0.4s
=> exporting to image 0.3s
=> => exporting layers 0.3s
=> => writing image sha256:54fa45fcc5a583b7d4add786efa4f4e032bf303877c98059a4106bdc295192f3 0.0s
=> => naming to docker.io/library/devopsassessment 0.0s
What's Next?
View a summary of image vulnerabilities and recommendations → docker scout quickview
C:\Users\Welcome\source\repos\DevOpsAssessment>docker run -p 8081:80 devopsassessment:latest
info: Microsoft.Hosting.Lifetime[14]
Now listening on: http://[::]:80
info: Microsoft.Hosting.Lifetime[0]
Application started. Press Ctrl+C to shut down.
info: Microsoft.Hosting.Lifetime[0]
Hosting environment: Development
info: Microsoft.Hosting.Lifetime[0]
Content root path: /app/
warn: Microsoft.AspNetCore.HttpsPolicy.HttpsRedirectionMiddleware[3]
Failed to determine the https port for redirect.
Showing 5 items
Engine running
RAM 2.74 GB CPU 1.74%
Not signed in
v4.24.0
Type here to search
32°C Haze
ENG
15:48
24-10-2023