# **Name: Abdurrahman Qureshi**

# **Roll No: 242466**

Assignment No: 2

Aim: To Implement Continuous Deployment Using Ansible

What is Ansible?

Ansible is an open-source automation tool used for configuration management, application deployment, and IT orchestration. It operates on an agentless architecture, meaning no software needs to be installed on the managed systems. Users define a desired state for their infrastructure using simple, human-readable YAML files, and Ansible works to efficiently and reliably enforce that state across all targeted machines, ensuring consistency and reducing manual effort.

What key problem did Ansible's creators aim to solve that existing agent-based tools had not?

Before tools like Ansible, system administrators faced the challenge of manually configuring servers and applications, a slow and error-prone process. Scaling this manual effort for dozens or hundreds of servers was practically impossible. While other configuration tools existed, many required agents to be installed and maintained on every machine, adding complexity and security concerns that Ansible's creators sought to eliminate with a simpler, more robust solution.

Describe the role and structure of an Ansible Playbook in the automation process.

Ansible's approach is declarative and idempotent. Automation is defined in Playbooks, which are YAML files listing a set of tasks. These tasks use modular code to perform specific functions. The core engine connects to nodes via SSH (or WinRM for Windows), executes these modules, and ensures the system matches the declared state. A key feature is idempotency, meaning playbooks can be run safely multiple times without causing unintended changes.

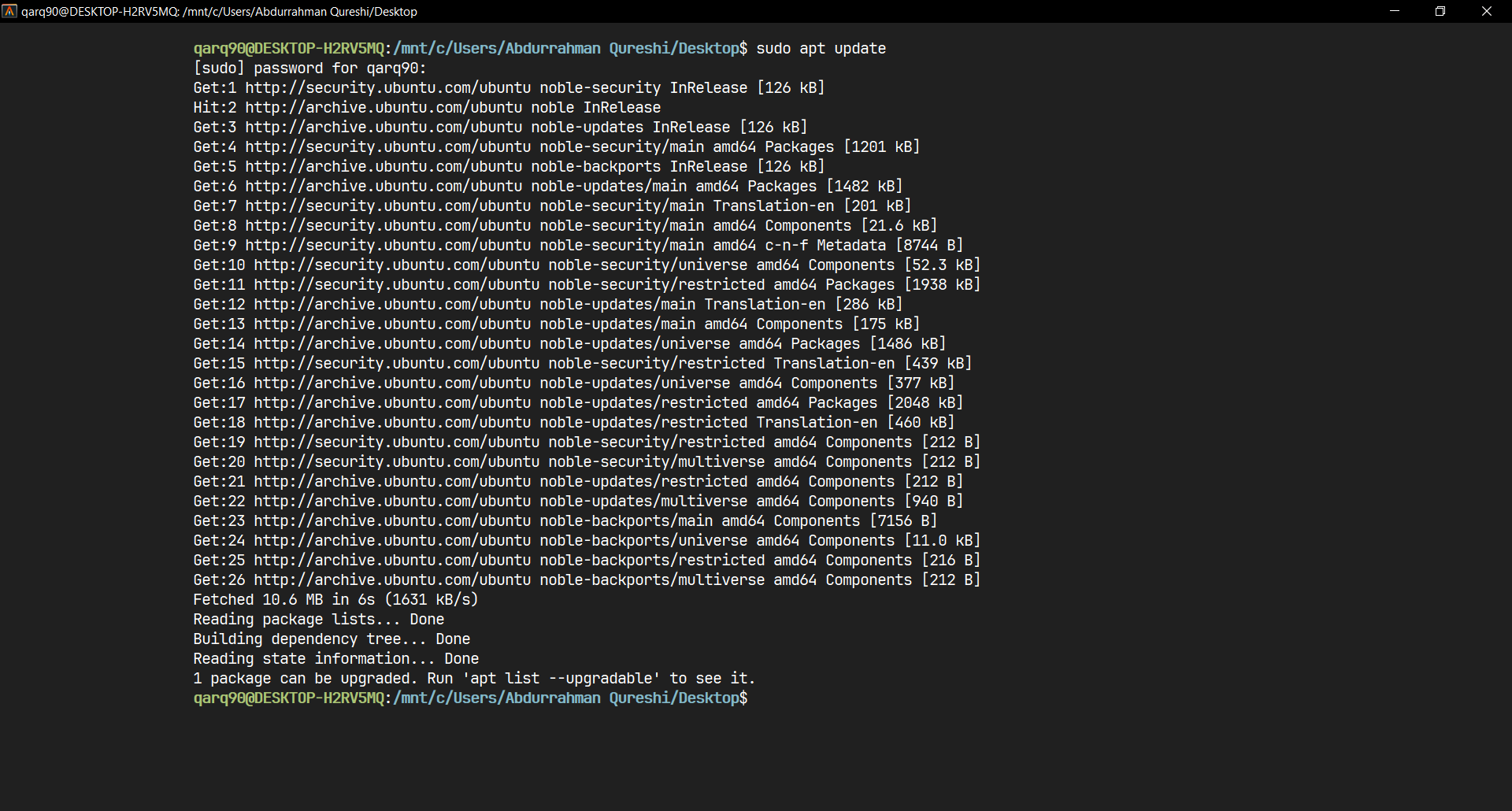
How does the principle of idempotency provide a practical advantage in IT operations?

The primary advantage of Ansible is its simplicity and low barrier to entry, thanks to its agentless design and readable YAML syntax. This reduces management overhead and enhances security. Its idempotent nature ensures predictable and reliable outcomes. Furthermore, its powerful modules and extensive community support make it highly versatile for automating a wide range of tasks, from simple server configuration to complex multi-tier application deployments.

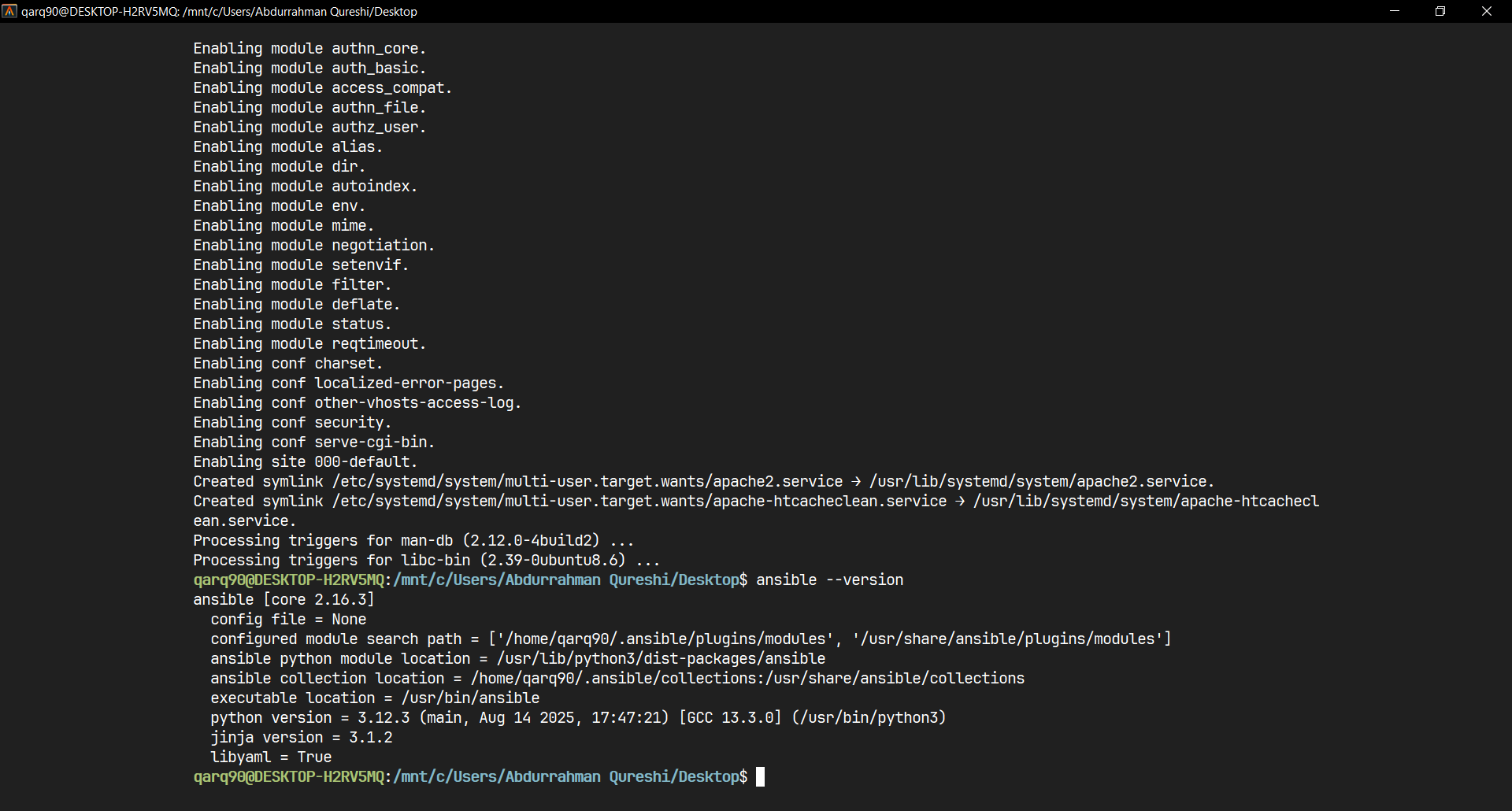
From a business perspective, why should an organization choose to implement Ansible?

You should use Ansible because it fundamentally simplifies IT automation. It saves significant time, eliminates manual errors, and ensures a consistent environment, which is crucial for stability and compliance. By treating your infrastructure as code, Ansible enables version control, repeatability, and seamless scaling. It is the pragmatic choice for organizations seeking to improve operational efficiency, accelerate deployments, and reliably manage complex infrastructure across hybrid environments.

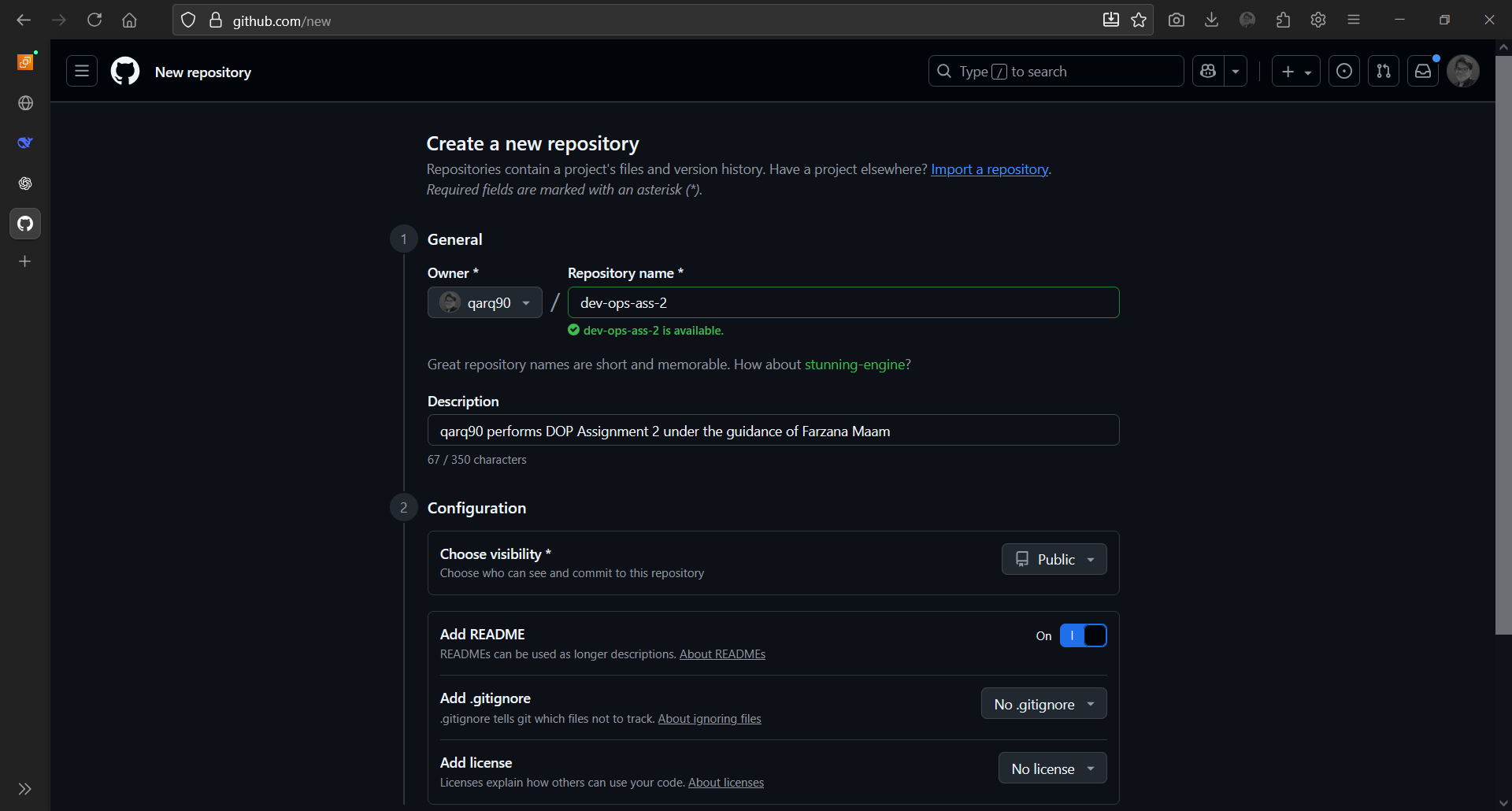
Procedure:



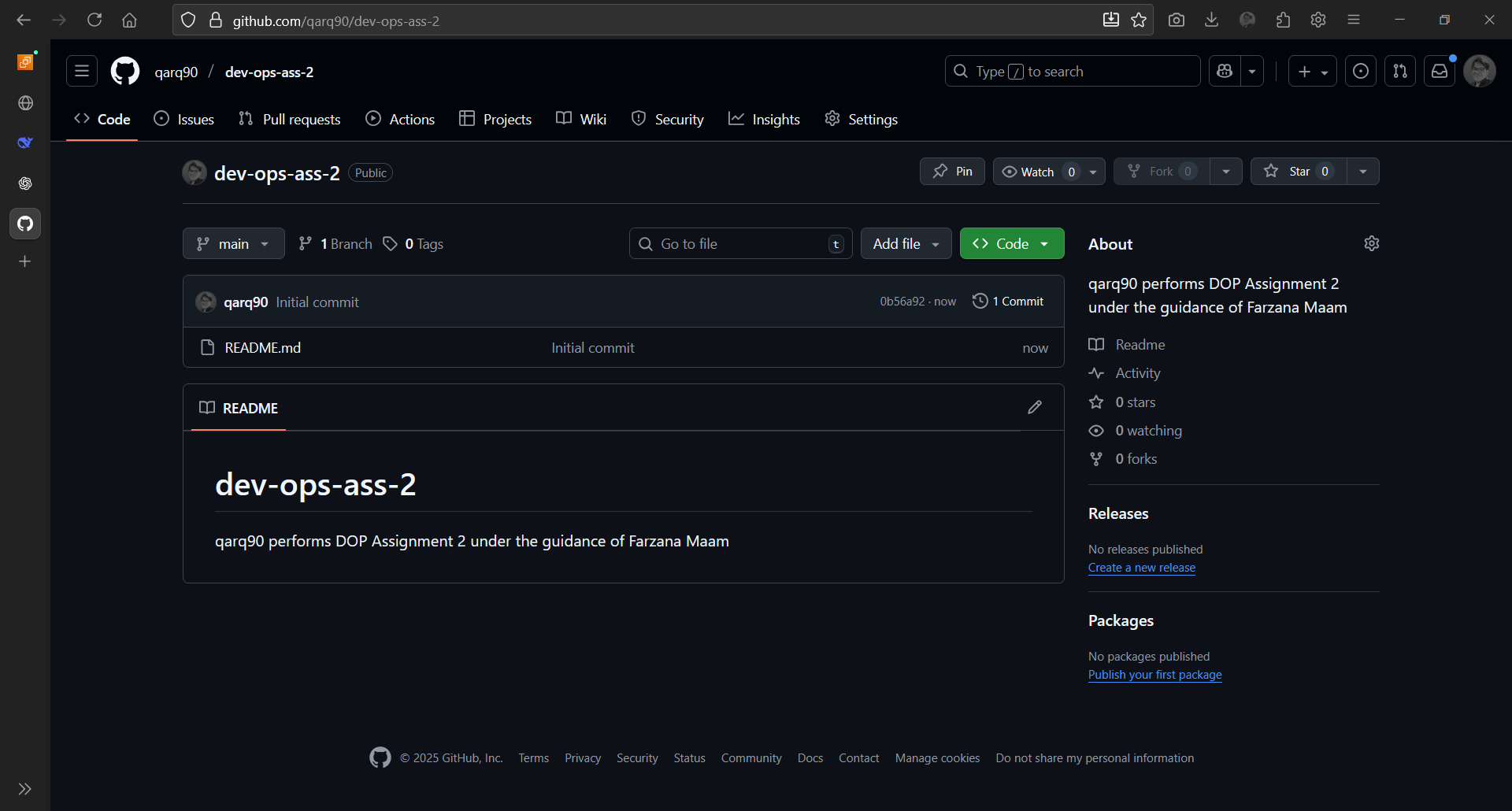
Updating package lists from repositories.



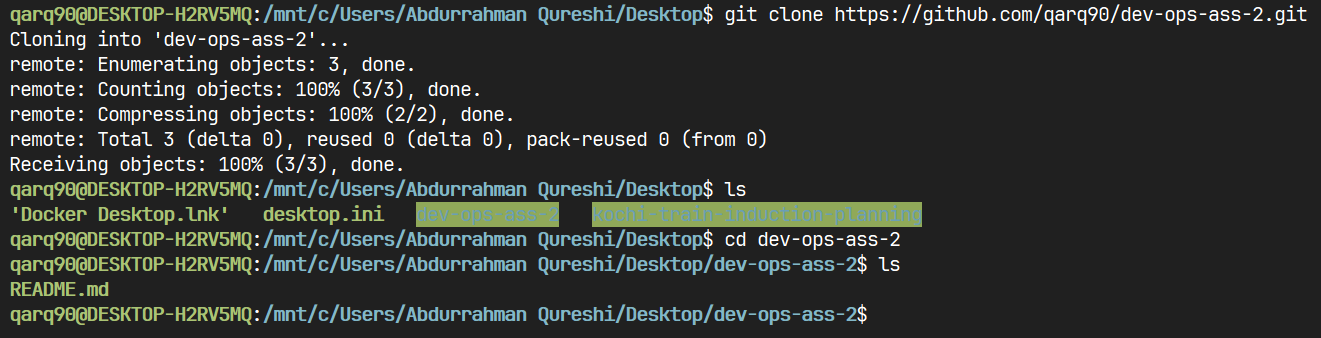
Successfully Installed Ansible



Creating New GitHub Repository



Repository Created Successfully



Repository Cloned

index.html:

<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8">

    <title>Hello Page</title>

<style>

        body {

            display: grid;

            grid-template-columns: repeat(3, 1fr);

            grid-template-rows: repeat(3, 1fr);

            gap: 10px;

            height: 100vh;

            margin: 0;

            padding: 10px;

            box-sizing: border-box;

            font-family: 'Courier New', Courier, monospace;

        }

        img {

            grid-column: 2;

            grid-row: 1;

            max-width: 100%;

            height: auto;

            justify-self: center;

            align-self: center;

        }

        h1 {

            grid-column: 2;

            grid-row: 2;

            text-align: center;

            margin: 0;

            align-self: center;

        }

        div {

            display: flex;

            flex-direction: column;

            align-items: center;

            justify-content: center;

            gap: 16px;

        }

    </style>

</head>

<body>

    <div>

        <h1>

            "Dad can I borrow $50?"

        </h1>

        <img src="The\_Happy\_Merchant.jpg" alt="" srcset="">

    </div>

    <div>

        <h1>

            "Who controls the media?"

        </h1>

        <img src="The\_Happy\_Merchant.jpg" alt="" srcset="">

    </div>

    <div>

        <h1>

            "Who controls the government?"

        </h1>

        <img src="The\_Happy\_Merchant.jpg" alt="" srcset="">

    </div>

    <div>

        <h1>

            "Who controls the central banks?"

        </h1>

        <img src="The\_Happy\_Merchant.jpg" alt="" srcset="">

    </div>

    <div>

        <h1>

            "Who attacked USS Liberty?"

        </h1>

        <img src="The\_Happy\_Merchant.jpg" alt="" srcset="">

    </div>

    <div>

        <h1>

            "Who controls the media?"

        </h1>

        <img src="The\_Happy\_Merchant.jpg" alt="" srcset="">

    </div>

    <div>

        <h1>

            "Who did 9/11?"

        </h1>

        <img src="The\_Happy\_Merchant.jpg" alt="" srcset="">

    </div>

    <div>

        <h1>

            "Who worships Satan?"

        </h1>

        <img src="The\_Happy\_Merchant.jpg" alt="" srcset="">

    </div>

    <div>

        <h1>

            "Who will begin WW3?"

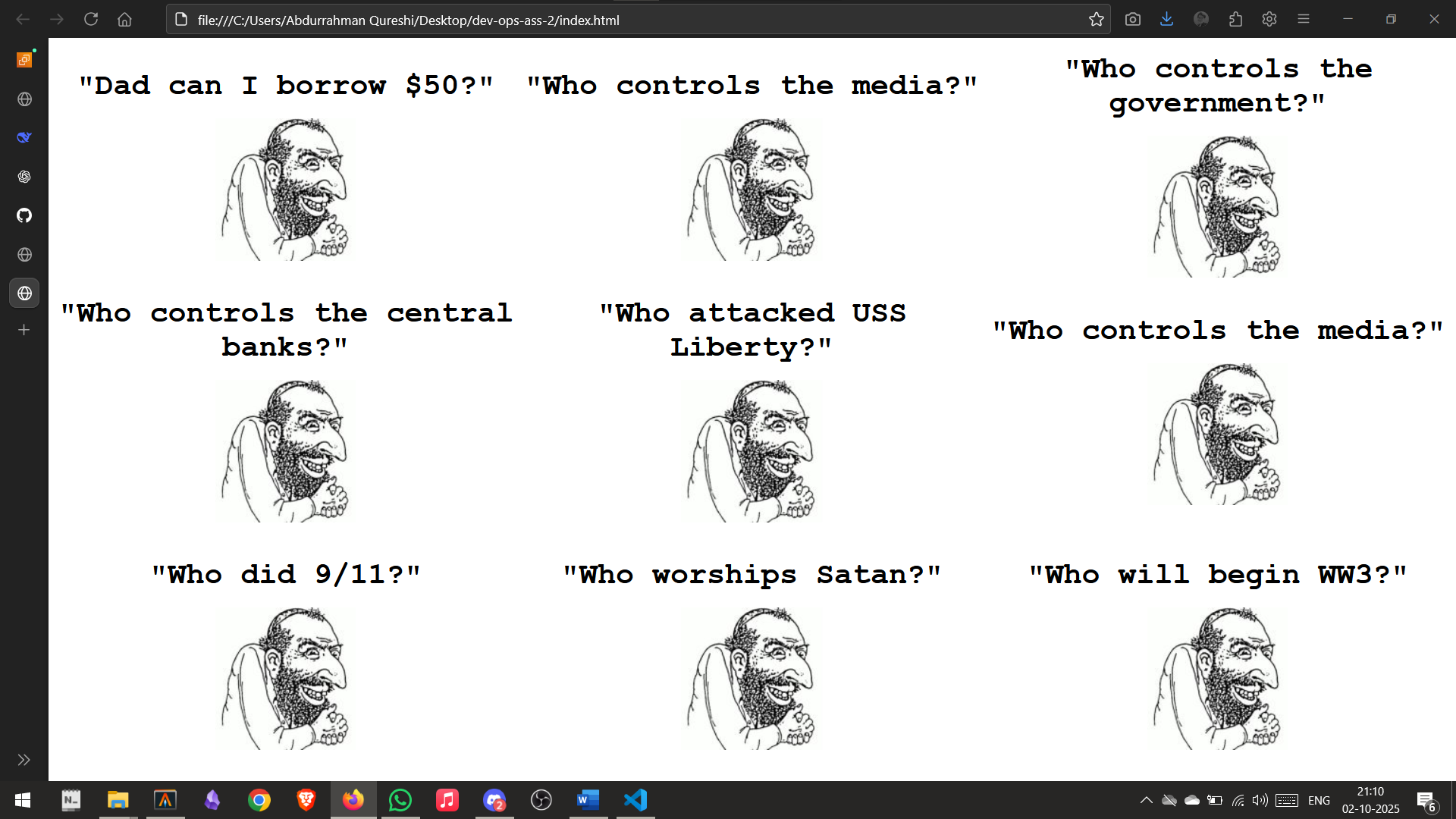
        </h1>

        <img src="The\_Happy\_Merchant.jpg" alt="" srcset="">

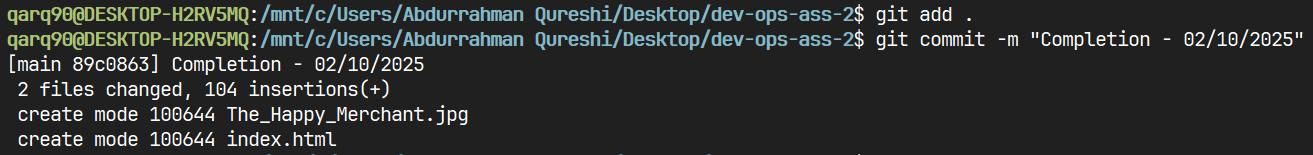
    </div>

</body>

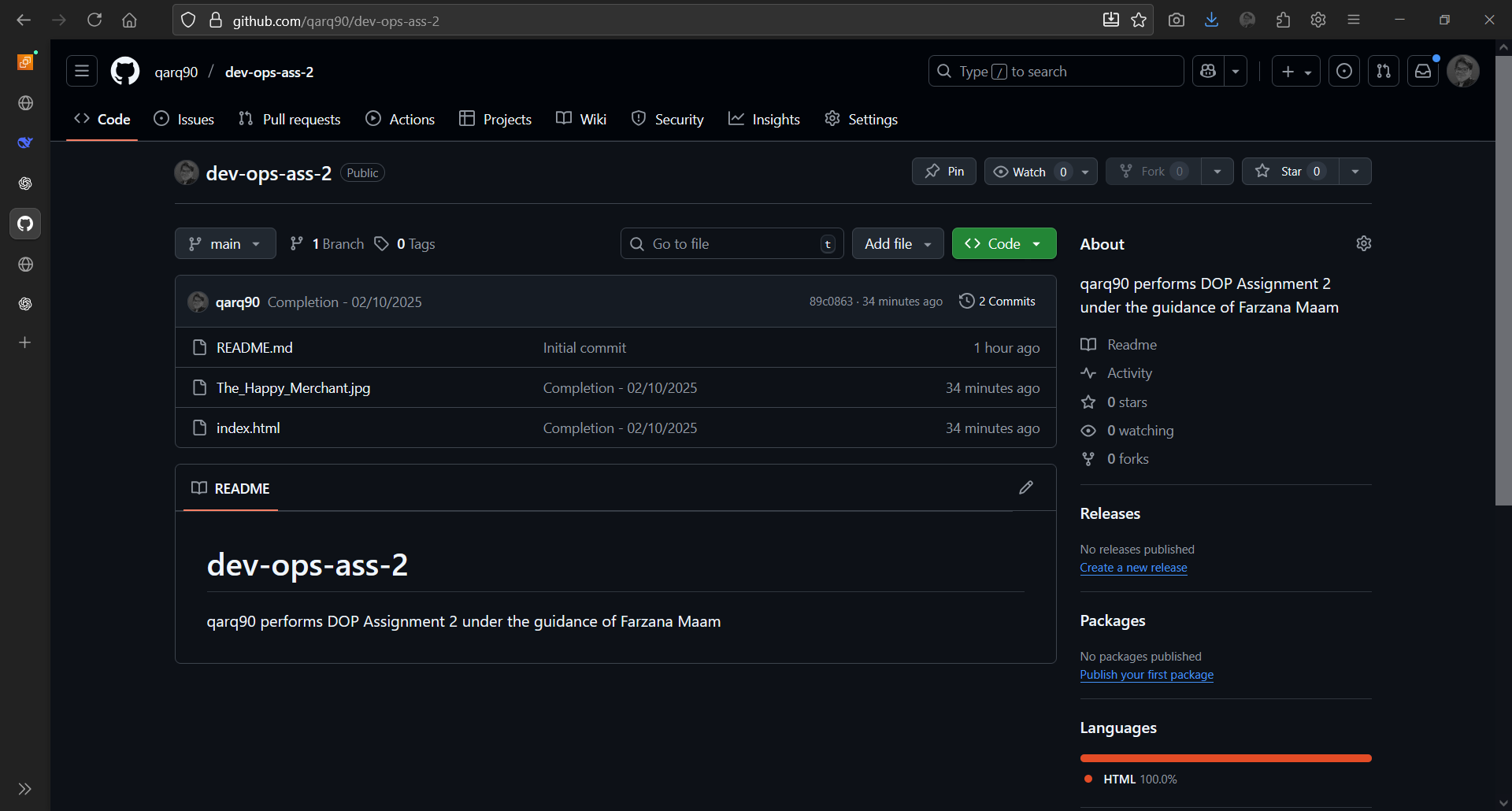
</html>



Output of index.html



Changes committed and pushed to repository

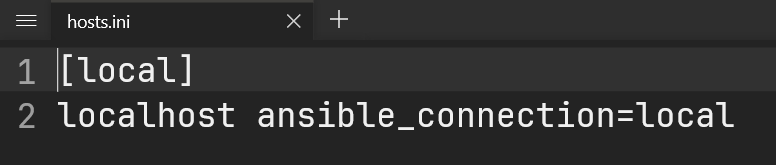


Repository Updated

hosts.ini

[local]

localhost ansible\_connection=local



deploy.yml

---

- name: Continuous Deployment on Localhost

hosts: local

become: yes

tasks:

- name: Install Apache Web Server

apt:

name: apache2

state: present

update\_cache: yes

- name: Configure Git safe directory

command: git config --global --add safe.directory /var/www/html/app

become: yes

- name: Remove existing app directory to avoid conflicts

file:

path: /var/www/html/app

state: absent

- name: Pull code from GitHub

git:

repo: 'https://github.com/qarq90/dev-ops-ass-2.git'

dest: /var/www/html/app

version: main

force: yes

- name: Copy ALL website files to root web folder

copy:

src: /var/www/html/app/

dest: /var/www/html/

remote\_src: yes

owner: www-data

group: www-data

mode: '0755'

- name: Set proper permissions on web directory

file:

path: /var/www/html

owner: www-data

group: www-data

mode: '0755'

recurse: yes

- name: Restart Apache

service:

name: apache2

state: restarted:

- name: Install Apache Web Server

apt:

name: apache2

state: present

update\_cache: yes

- name: Pull code from GitHub

git:

repo: 'https://github.com/qarq90/dev-ops-ass-2.git'

dest: /var/www/html/app

version: main

- name: Copy index.html to root web folder

copy:

src: /var/www/html/app/index.html

dest: /var/www/html/index.html

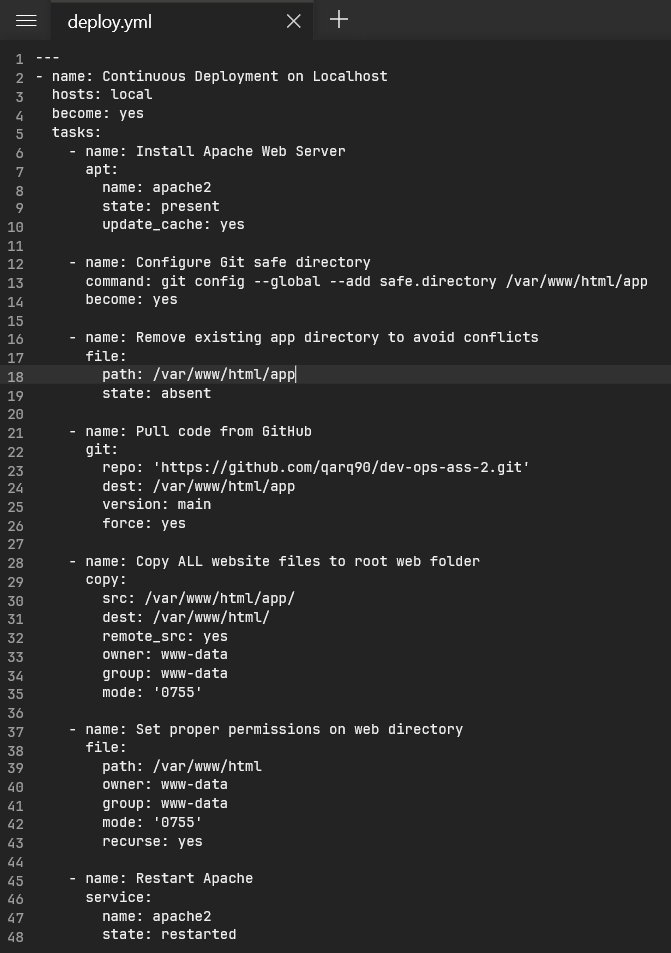
remote\_src: yes

- name: Restart Apache

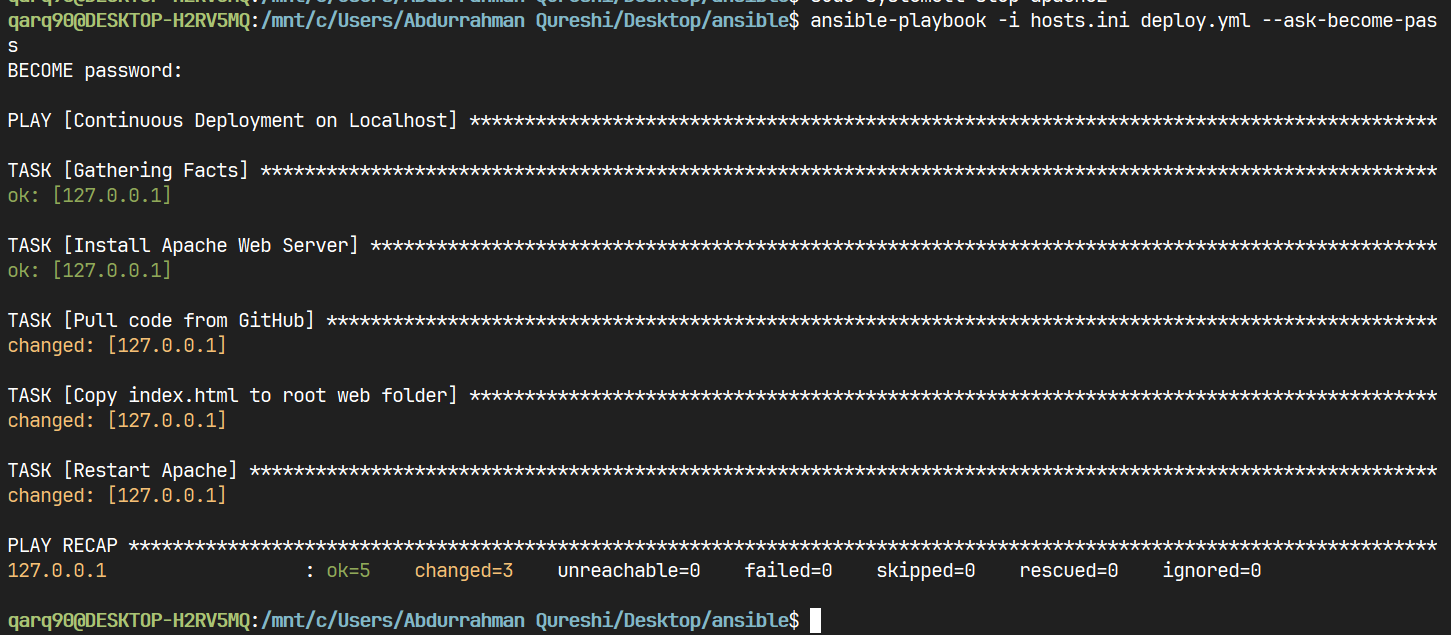
service:

name: apache2

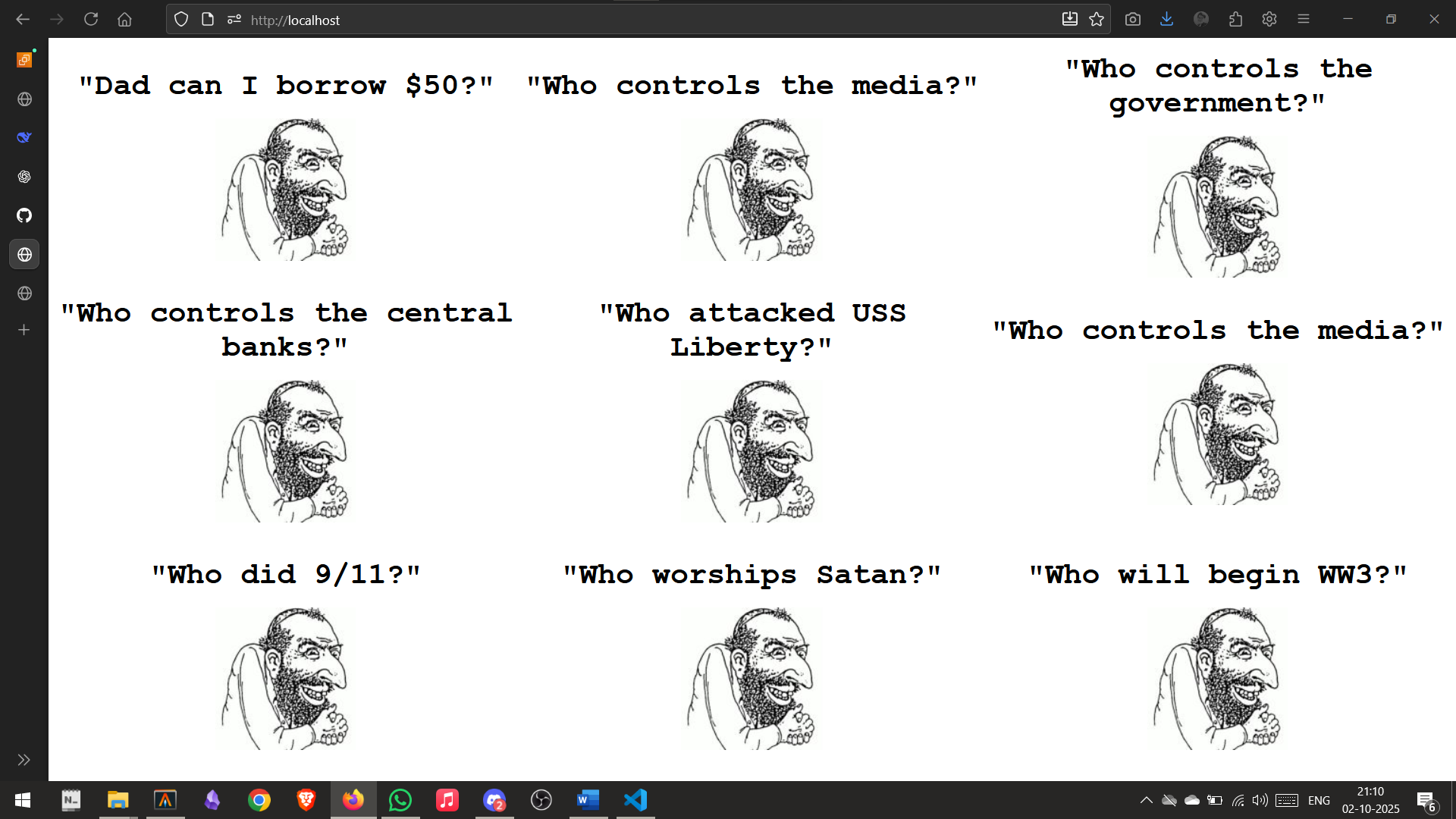
state: restarted



deploy.yml File



Ansible Playbook executed successfully



Output on localhost

Code Changes:

 div {

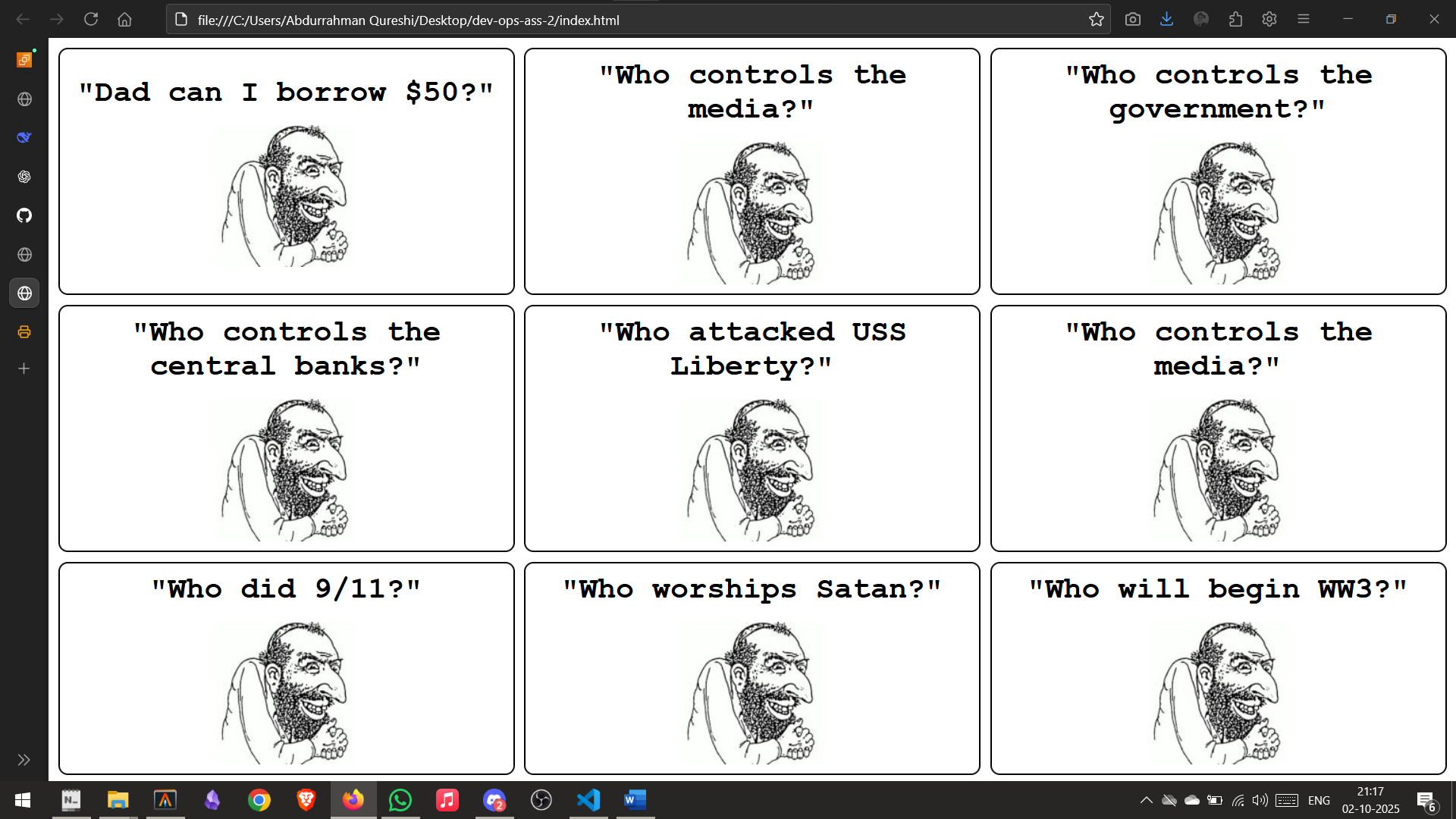
            border: 2px black solid; // Added this Line

            border-radius: 10px; // Added this Line

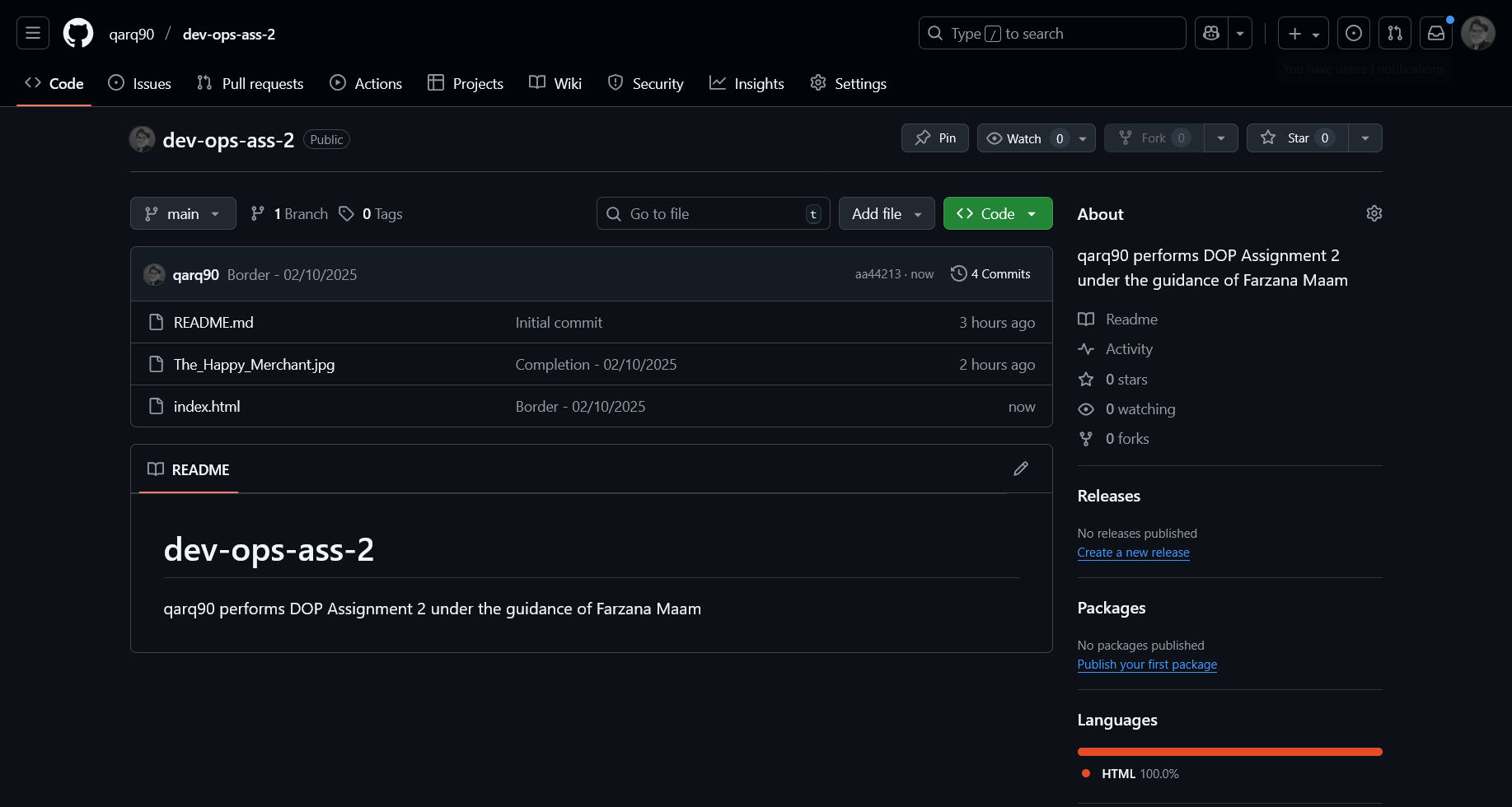
            padding: 10px; // Added this Line

            box-sizing: border-box; // Added this Line

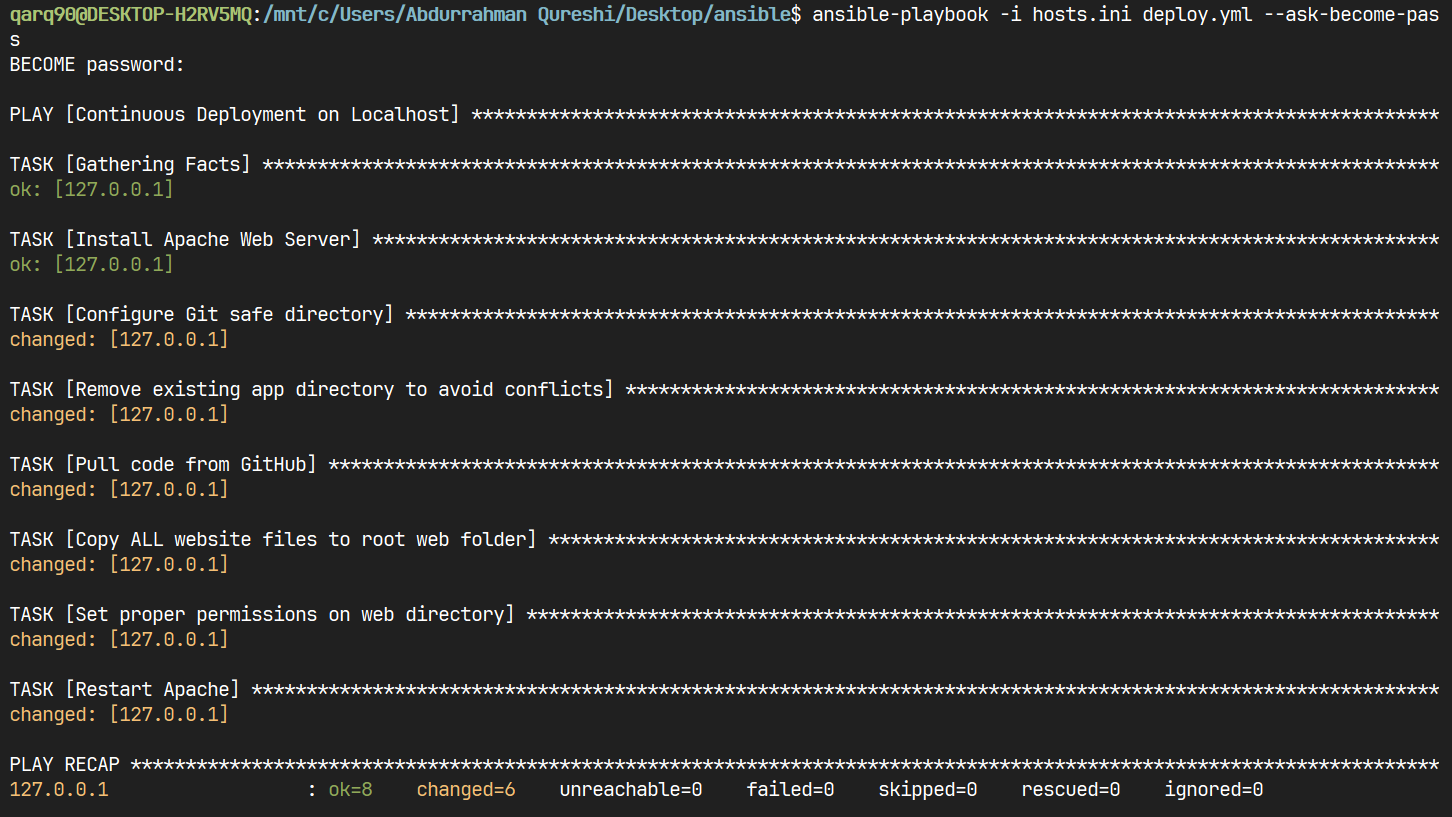
        }



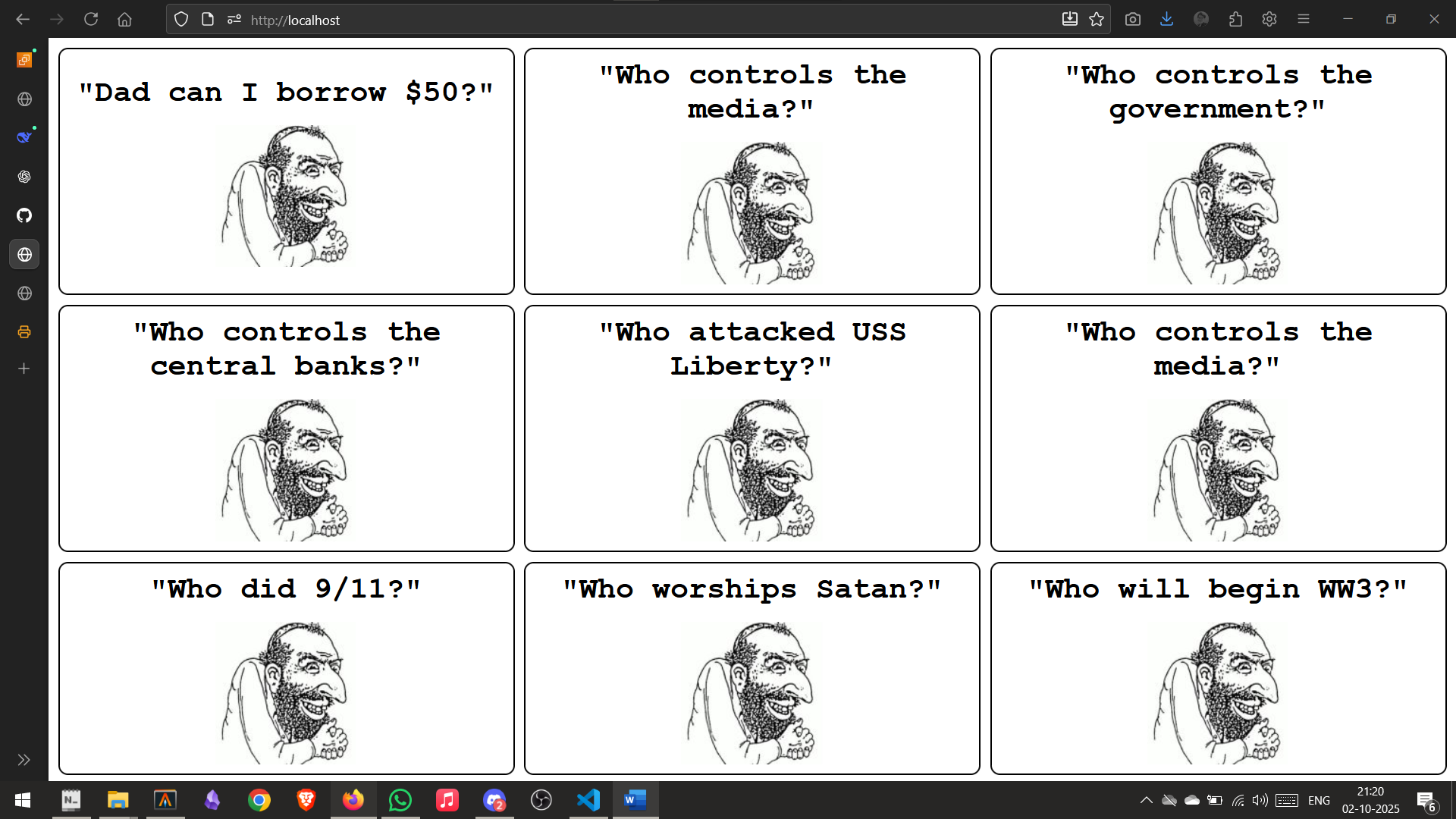
Output Changes (Added a border)



Changes pushed to repository



Playbook executed again successfully



Latest changes reflected on localhost