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1. Jenkins Installation & Setup

Adding Jenkins GPG Key

```
curl -fsSL https://pkg.jenkins.io/debian/jenkins.io-2023.key | sudo tee /usr/share/keyrings/jenkins-keyring.asc > /dev/null
```

- Downloads and adds Jenkins' GPG key for verifying package authenticity.

Adding Jenkins Repository

```
echo "deb [signed-by=/usr/share/keyrings/jenkins-keyring.asc] https://pkg.jenkins.io/debian binary/" | sudo tee /etc/apt/sources.list.d/jenkins.list > /dev/null
```

- Adds Jenkins repository for package installation.

Updating Packages & Installing Java

```
sudo apt update
```

```
sudo apt install fontconfig openjdk-17-jre -y
```

- Updates package lists and installs **OpenJDK 17**, required for Jenkins.

Installing Jenkins

```
sudo apt install jenkins -y
```

- Installs Jenkins.

Retrieving Initial Admin Password

```
sudo cat /var/lib/jenkins/secrets/initialAdminPassword
```

- Displays the **initial Jenkins admin password**.

Adding Jenkins to Docker Group

```
sudo usermod -aG docker jenkins
```

- Grants Jenkins permission to run Docker commands.

Restarting Jenkins

```
sudo systemctl restart jenkins
```

- Applies the group changes by restarting Jenkins.
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2. SSH Key Generation & GitHub Authentication

Generating RSA SSH Key

```
ssh-keygen -t rsa -b 4096 -C "ranawatjinesh@gmail.com"
```

- Creates a **4096-bit RSA SSH key** for secure GitHub authentication.

Checking Generated SSH Keys

```
cd ~/.ssh/
```

```
ls -lrt
```

```
less id_rsa.pub
```

- Navigates to the .ssh directory and verifies the generated keys.

Starting SSH Agent & Adding Key

```
eval "$(ssh-agent -s)"
```

```
ssh-add ~/.ssh/id_rsa
```

- Starts the SSH agent and adds the private key.

Testing GitHub Authentication

```
ssh -T git@github.com
```

- Confirms SSH connection with GitHub.

Cloning a Repository

```
git clone git@github.com:jineshranawatcode/c406firstproject.git
```

- Clones a GitHub repository using SSH.
-

3. User & Group Management

Creating a New User

```
sudo adduser jinesh
```

- Creates a user named jinesh with a home directory.

Switching to the New User

```
su - jinesh
```

- Logs into jinesh's account.

Creating a New Group

```
sudo groupadd c406cohort
```

- Creates a new group named c406cohort.

Adding User to a Group

```
sudo usermod -a -G c406cohort jineshtrying
```

- Adds jineshtrying to the c406cohort group.

Checking User Groups

```
sudo cat /etc/group
```

- Lists all system groups.
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4. Directory & File Permissions

Creating Directories

```
sudo mkdir -p /home/grouptry/jinesh/a
```

- Creates nested directories /home/grouptry/jinesh/a.

Changing File & Directory Permissions

```
sudo chmod 400 /home/grouptry/jinesh/a
```

- Sets **read-only (400)** permission for security.

```
sudo chmod 2775 grouptry/
```

- Sets **group read/write permissions (2775)** and **preserves group ownership (SetGID)**.

Changing Group Ownership

```
sudo chgrp c406cohort /home/grouptry
```

```
sudo chgrp c406cohort /home/grouptry/jinesh/a
```

- Assigns **group ownership** to c406cohort.

Applying SetGID

```
sudo chmod g+s grouptry/jinesh/a
```

- Ensures new files inherit the group.
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5. File Editing & History

Editing Files

`vi alpha.txt`

`sudo vi alpha.txt`

- Opens `alpha.txt` in **Vim editor**.

Checking Command History

`history`

- Displays previously executed commands.