**Day 1: Introduction to Linux and Basic Commands**

Assignment:

1. Familiarise yourself with the Linux file system hierarchy.
2. Practise basic Linux commands: ls, cd, mkdir, touch, cp, mv, rm, pwd, and cat.
3. Practice using advanced file manipulation commands: grep, find, locate, and diff.
4. Learn about file permissions (read, write, execute) and practice changing them using chmod.
5. Understand the concept of users and groups, and create a new user and group.
6. Practice changing file ownership with chown and chgrp.
7. Learn about umask and setuid/setgid permissions.

Questions:

1. What is the difference between an absolute and a relative path in Linux?
2. How do you create a new file and a new directory in Linux?
3. How can you view the contents of a file in the terminal?
4. How are file permissions represented in Linux?
5. How do you add a user to a group?
6. What is the difference between chown and chgrp?

**Day 2: Linux System Monitoring and Networking**

Assignment:

1. Learn about system monitoring commands: top, htop, ps, and free.
2. Understand and practise basic networking commands: ifconfig, ip, ping, and traceroute.
3. Learn about SSH and practice connecting to a remote server.
4. Get familiar with basic network configuration files and their locations.

Questions:

1. How do you check the system's CPU and memory usage in Linux?
2. What is the purpose of the ifconfig and ip commands?
3. How do you connect to a remote server using SSH?

**Day 4: Introduction to Git (Part 1)**

Assignment:

1. Install Git and configure your username and email.
2. Initialise a new Git repository and practice adding, committing, and checking the status of your files.
3. Learn about branching, merging, and resolving conflicts.
4. Practice using git log, and git diff commands.

Questions:

1. What is version control and why is it important?
2. What is the purpose of the .gitignore file?
3. How do you switch between branches in Git?

**Day 5: Introduction to Git (Part 2)**

Assignment:

1. Create a GitHub account and learn about remote repositories.
2. Push your local Git repository to GitHub and practice cloning, fetching, and pulling changes.
3. Learn about forking and creating pull requests.
4. Practice collaborating with others by resolving pull request conflicts.

Questions:

1. What is the difference between a fetch and a pull in Git?
2. How do you resolve merge conflicts?
3. What is the purpose of a pull request?

**Day 6: Introduction to Operating Systems (Part 1)**

Assignment:

1. Learn about the basic components of an operating system (kernel, system calls, processes, memory management, and file systems).
2. Understand the difference between process and thread.
3. Get familiar with common OS scheduling algorithms and memory management techniques.
4. Explore process states and process control blocks (PCB).

Questions:

1. What is the role of the kernel in an operating system?
2. What is the difference between a monolithic kernel and a microkernel?
3. How does virtual memory work?

**Day 7: Introduction to Operating Systems (Part 2)**

Assignment:

1. Learn about inter-process communication (IPC) mechanisms such as pipes, message queues, and shared memory.
2. Understand the concept of synchronisation and study various synchronisation techniques (mutex, semaphore, and monitors).
3. Learn about deadlock and how to prevent or resolve it.
4. Explore file systems and disk management techniques in operating systems.

Questions:

1. What is the difference between a mutex and a semaphore?
2. Explain the four necessary conditions for deadlock to occur.
3. How does a file system manage disk space allocation?

**Day 8: Introduction to Networking (Part 1)**

Assignment:

1. Learn about the OSI model and its layers.
2. Understand the basics of IP addressing, subnetting, and routing.
3. Get familiar with common networking protocols and tools, such as ICMP, ARP, DNS, and traceroute.
4. Practice using netstat, nslookup, and dig commands.

Questions:

1. What are the key differences between the OSI model and the TCP/IP model?
2. What is the role of a router in a network?
3. What is the difference between TCP and UDP?

**Day 9: Introduction to Networking (Part 2)**

Assignment:

1. Learn about network devices, such as switches, hubs, and firewalls.
2. Understand the concept of network address translation (NAT) and port forwarding.
3. Study the basics of network security, including encryption, authentication, and firewalls.
4. Set up a simple local network with multiple devices and practice configuring IP addresses and subnet masks.

Questions:

1. How does a switch differ from a hub?
2. What is the purpose of network address translation (NAT)?
3. What are some common network security threats and their countermeasures?

**Day 10: Review, Recap, and Reflection**

Assignment:

1. Review the materials from the previous nine days and make sure you understand the core concepts.
2. Complete any unfinished assignments or activities.
3. Identify areas where you feel less confident, and spend time revisiting those topics or seeking additional resources.
4. Reflect on your learning progress and consider how these skills will help you in the future.

Questions

1. What were the most challenging concepts for you during these ten days? Why?
2. How do you see these skills helping you in your career at CubexO?
3. What programming languages or frameworks are you considering learning next, and why?