

Hello friends,


I hope you're all doing well.

The following exercises are not exam questions, but rather open-ended prompts whose answers can often be found online, through chatbots, or even in technical interviews. These are intended to encourage deeper exploration and self-directed learning based on your current knowledge.


We've selected these questions based on real-world experience and past exam patterns to help you better understand the types of concepts that appear in the LPIC exam. Many of the questions don't have a single correct answer — instead, they are designed to broaden your perspective and understanding.

Please be kind and patient with yourself as you write and research your responses.

Please complete the following exercises using the same format as the directory structure below. Combine your answers into a single PDF file named **answer.pdf** and submit a pull request.

 Reference format:

[https://github.com/devopsdoctors/Academy/tree/main/L1-JavanPahlevanan/Exercises/T\(x\)/name-family\(emailAddress\)/answer.pdf](https://github.com/devopsdoctors/Academy/tree/main/L1-JavanPahlevanan/Exercises/T(x)/name-family(emailAddress)/answer.pdf)

 Sample answer file:

[https://github.com/devopsdoctors/Academy/tree/main/L1-JavanPahlevanan/Exercises/T1/ali-farhadian\(alifrd49@gmail.com\)/answer.pdf](https://github.com/devopsdoctors/Academy/tree/main/L1-JavanPahlevanan/Exercises/T1/ali-farhadian(alifrd49@gmail.com)/answer.pdf)

1. Could you please explain the security mechanisms used by package repositories to prevent the installation of corrupted or tampered packages on a system?
2. We are using the following APT source list in `/etc/apt/sources.list`:
Could you explain the role of each repository component (e.g., main, universe, multiverse, security, updates, backports)?

```
deb http://ir.archive.ubuntu.com/ubuntu focal main restricted
deb http://ir.archive.ubuntu.com/ubuntu focal-updates main restricted
deb http://ir.archive.ubuntu.com/ubuntu focal universe
deb http://ir.archive.ubuntu.com/ubuntu focal-updates universe
deb http://ir.archive.ubuntu.com/ubuntu focal multiverse
deb http://ir.archive.ubuntu.com/ubuntu focal-updates multiverse
deb http://ir.archive.ubuntu.com/ubuntu focal-backports main restricted universe
multiverse
deb http://security.ubuntu.com/ubuntu focal-security main restricted
deb http://security.ubuntu.com/ubuntu focal-security universe
deb http://security.ubuntu.com/ubuntu focal-security multiverse
```

3. What is the difference between KVM and QEMU? Also, what exactly is `qemu-kvm`?
4. What are the differences between a virtual machine and a container?
For each of the following scenarios, which one would you recommend and why?
 - A database under heavy load with frequent disk writes
 - A stateless web application
 - A monolithic web application with high resource demands
 - An application that requires a specific hardware driver (e.g., a printer driver)
 - Graphical (GUI) applications
 - Applications that depend on multiple system services initialized at boot (e.g., mail servers)
 - Applications that require custom kernel modules
 - Lightweight programs with minimal resource needs
 - Applications that need to interact with other processes directly
5. What is the difference between a hashing algorithm and an encryption algorithm?

6. I have a directory with many configuration files. How can I generate checksums to detect even a single-character change in any file?