please create a github repository for all the labs, and share it with robustness@gmail.com

Lab 1:

1. Check if your processor supports Intel/AMD virtualization technology. Enable Intel virtualization technology in BIOS if possible.

**done**

2. The cloud is almost everywhere in our lives now. What do you think are the fundamental reasons behind its success? Name three pros and three cons of cloud.

**The cloud has become successful because it’s scalable, cost-effective, and allows for easy access and collaboration from anywhere.**

**Pros of Cloud:**

1. **Cost savings – No need for expensive hardware.**
2. **Scalability – Easily adjust resources based on demand.**
3. **Automatic updates – Cloud providers handle maintenance.**

**Cons of Cloud:**

1. **Security risks – Data is stored with third parties, which can be vulnerable.**
2. **Downtime – Cloud services can experience outages.**
3. **Limited control – Users depend on the cloud provider's infrastructure.**

3. What is the primary function of a hypervisor in virtualization?

**A hypervisor is software or firmware that creates and manages virtual machines (VMs) on a physical host. It allows multiple VMs to share the same hardware while keeping them isolated from each other.**

4. What is a virtual machine (VM)?

**A virtual machine is a software-based emulation of a physical computer that runs an operating system and applications independently from the host system. It operates using virtualized hardware provided by a hypervisor.**

5. What are the benefits of using virtual machines?

* **Efficient Resource Utilization – VMs allow multiple operating systems to share the same hardware.**
* **Isolation & Security – VMs are isolated from each other, reducing the risk of malware spreading.**
* **Portability – VMs can be moved between different systems without compatibility issues.**
* **Cost Savings – Reduces the need for multiple physical servers, saving costs on hardware and energy.**
* **Snapshot & Backup Capabilities – Allows easy recovery by restoring previous states**

6. List five use cases of virtual machines.

* **Software Development & Testing – Developers use VMs to test applications on different operating systems.**
* **Server Virtualization – Data centers use VMs to run multiple server instances on a single physical machine.**
* **Running Legacy Applications – VMs can run outdated software on modern hardware.**
* **Cybersecurity & Malware Analysis – Security professionals use VMs to test malware safely.**
* **Cloud Computing – Cloud providers offer VMs for hosting applications and services remotely.**

7. In virtualization, what is the guest operating system?

a) The main operating system running on the physical machine

b) The operating system installed on a virtual machine

c) The operating system running on a remote server

d) The operating system running on a mobile device

**Answer:**

✅ b) The operating system installed on a virtual machine

8. What does virtual machine isolation mean?

a) Virtual machines can communicate directly with the physical hardware.

b) Virtual machines share the same resources and cannot be isolated.

c) Virtual machines run independently and are isolated from each other and the host system.

d) Virtual machines can only be accessed locally.

**Answer:**

✅ **c) Virtual machines run independently and are isolated from each other and the host system.**

**Each VM operates separately, preventing failures or malware in one VM from affecting others or the host.**

9. What is the benefit of virtual machine portability?

a) It allows virtual machines to communicate with each other easily.

b) It ensures faster boot times for virtual machines.

c) It allows virtual machines to be moved between different physical machines with compatible hypervisors.

d) It reduces the need for hardware virtualization.

**Answer:**

✅ **c) It allows virtual machines to be moved between different physical machines with compatible hypervisors.**

**VM portability enables easy migration between servers, making system upgrades and disaster recovery simpler.**

10. What is the purpose of cloning a virtual machine?

**Cloning a VM creates an exact copy of an existing virtual machine, including its operating system, applications, and settings. This is useful for:**

**Quick Deployment – Setting up multiple identical VMs efficiently.**

**Backup & Recovery – Keeping a copy of a VM before making changes.**

**Testing & Development – Developers use cloned VMs to test different configurations.**