Lab 1:

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

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.

Why it's successful:

Cost: It turns a huge upfront cost into a manageable monthly bill.

Scalability: You can get more power or storage instantly when you need it, and scale back down when you don't. It's like elastic.

Accessibility: You can access your work and data from anywhere, on any device, as long as you have an internet connection.

Three Pros:

Saves Money: You don't have to buy, maintain, or power your own servers.

Reliable: Major cloud providers have backups upon backups, so your service is very unlikely to go down.

Fast and Flexible: You can set up a new server in minutes instead of waiting weeks for hardware to arrive.

Three Cons:

Unexpected Costs: It's easy to lose track of what you're using and get a surprisingly large bill.

Security Concerns: You're storing your data on someone else's computers, which can be a risk for sensitive information.

Vendor Lock-in: It can be difficult and expensive to move your data and services from one cloud provider (like Amazon) to another (like Google).

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

Think of the hypervisor as the manager of the house. Its main job is to create the virtual machines and hand out the physical resources of the computer (like CPU, memory, and storage) to each VM, making sure they all play nicely together without crashing into each other.

4. What is a virtual machine (VM)?

A Virtual Machine is a software computer. It acts exactly like a physical computer with its own operating system (like Windows or Linux) and apps, but it runs *inside* another computer on a piece of software. It's a computer within a computer.

5. What are the benefits of using virtual machines?

Saves Hardware: You can run many "computers" (VMs) on a single physical machine.

Isolation: If one VM crashes or gets a virus, the others are completely safe and unaffected.

Easy to Move & Backup: A whole VM is just a bunch of files. You can easily copy, move, or back up an entire "computer" instantly.

Test New Things Safely: You can test software or a new operating system in a VM without risking your main computer.

6. List five use cases of virtual machines.

Running different OSes: Like running Linux on a Windows laptop, or vice-versa.

Software Development & Testing: Developers use VMs to create isolated environments to build and test code.

Server Consolidation: Companies use them to run multiple servers (web, email, database) on one powerful physical machine.

Safe Browsing: You can use a VM for risky web browsing; if it gets infected, just delete the VM.

Disaster Recovery: Backing up an entire server is as easy as copying a VM file.

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**

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**

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**

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

To make an exact, identical copy of it. This is incredibly useful for quickly creating multiple copies of the same setup (e.g., for a classroom of students) or for creating a perfect backup before you try making risky changes to the original VM.