

Preparation for Lab 2

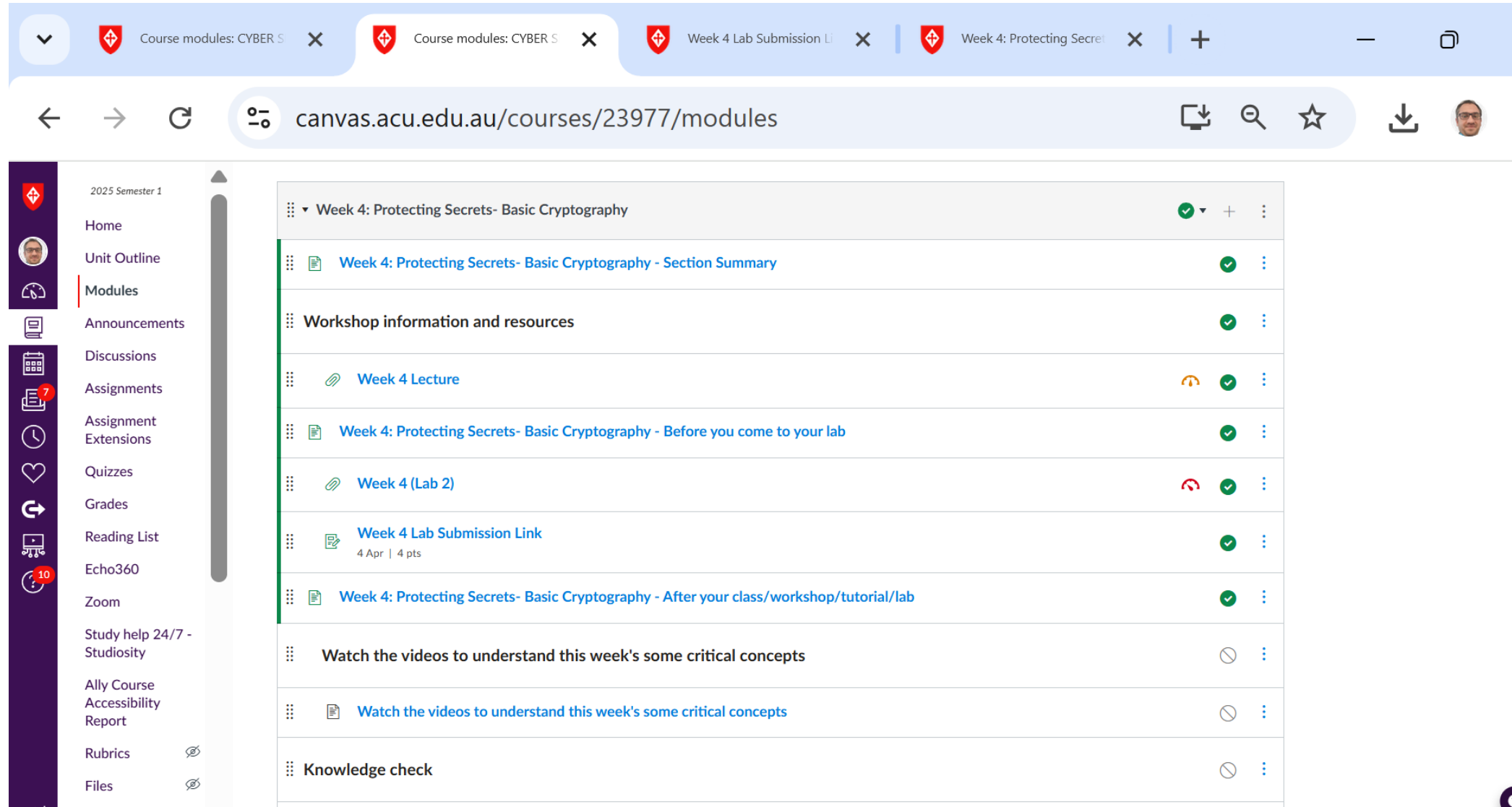
Week 4

Semester 1, 2025

Dr. Farshid Keivanian

Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

Navigate Canvas >> Week 4 >> Lab 2 (submit a word document with screenshot)



The screenshot displays the Canvas LMS interface. The top navigation bar shows several tabs: 'Course modules: CYBER S', 'Course modules: CYBER S', 'Week 4 Lab Submission L', and 'Week 4: Protecting Secrets'. The browser address bar shows the URL 'canvas.acu.edu.au/courses/23977/modules'. The left sidebar contains a navigation menu with options: Home, Unit Outline, Modules (selected), Announcements, Discussions, Assignments (7), Assignment Extensions, Quizzes, Grades, Reading List, Echo360 (10), Zoom, Study help 24/7 - Studiosity, Ally Course Accessibility Report, Rubrics, and Files. The main content area displays the 'Week 4: Protecting Secrets - Basic Cryptography' module. The module content includes a section summary, workshop information and resources, a week 4 lecture, a link to the week 4 lab submission, and a knowledge check. The 'Week 4 Lab Submission Link' is highlighted with a green checkmark and a red 'X' icon, indicating it is the current selection.

Item	Status
Week 4: Protecting Secrets - Basic Cryptography - Section Summary	✓
Workshop information and resources	✓
Week 4 Lecture	✓
Week 4: Protecting Secrets - Basic Cryptography - Before you come to your lab	✓
Week 4 (Lab 2)	✓
Week 4 Lab Submission Link	✓
Week 4: Protecting Secrets - Basic Cryptography - After your class/workshop/tutorial/lab	✓
Watch the videos to understand this week's some critical concepts	✗
Watch the videos to understand this week's some critical concepts	✗
Knowledge check	✗

Introduction

Today, we will work with **VirtualBox** and **Kali Linux** to set up a virtual machine (VM) for penetration testing and security analysis. This lab will guide you step-by-step through installing VirtualBox and setting up Kali Linux.

What is VirtualBox?

VirtualBox is an open-source tool developed by **Oracle** that allows users to create and run multiple operating systems on a single computer. It supports Windows, macOS, and Linux machines.

Why Use VirtualBox?

- Runs multiple OS environments on one device
- Isolates software for testing and development
- Useful for penetration testing and ethical hacking

Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

What Are We Doing in This Lab?

This lab is about **setting up a virtual environment** where we can run **Kali Linux** inside **Oracle VirtualBox** on our Windows computer.

This means:

- We don't need to install Kali Linux directly on our main computer.
 - Instead, we create a **virtual machine (VM)** that runs Kali Linux **inside** Windows, like an app.
- This allows us to experiment with **cybersecurity tools** in Kali Linux without affecting our main operating system.

Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

What is Oracle VirtualBox Manager?

- **Oracle VirtualBox** is a **virtualization software**.
- It allows us to run **multiple operating systems (like Kali Linux)** inside our **computer**.
- Think of it like a **computer inside our computer**.
- Instead of buying a separate computer for Kali Linux, we use **VirtualBox** to **create a virtual computer**.

Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

Main Purpose of VirtualBox in this Lab:

- To **install and run Kali Linux** in a safe, isolated environment.

Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

What is Kali Linux?

- **Kali Linux** is a special operating system designed for **penetration testing, cybersecurity, and ethical hacking**.
- It comes with **many security tools** used by cybersecurity professionals.
- Kali Linux is **based on Linux**, meaning it looks and works differently from Windows.

Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

Main Purpose of Kali Linux in this Lab:

- To **practice cybersecurity skills** in a controlled environment.
- To explore tools that help in **ethical hacking, network security, and system security**.

Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

How Do VirtualBox and Kali Linux Work Together?

VirtualBox is the software that runs Kali Linux as a virtual machine.

Here's the relationship step-by-step:

1. We install VirtualBox on Windows.

- This gives us the ability to create virtual computers.

Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

2. We download and install Kali Linux inside VirtualBox.

- Instead of installing it directly on our computer, we install it inside a **virtual machine**.

3. Now, we can use Kali Linux within VirtualBox.

- We can open VirtualBox → Start Kali Linux → Use it without affecting our Windows system.

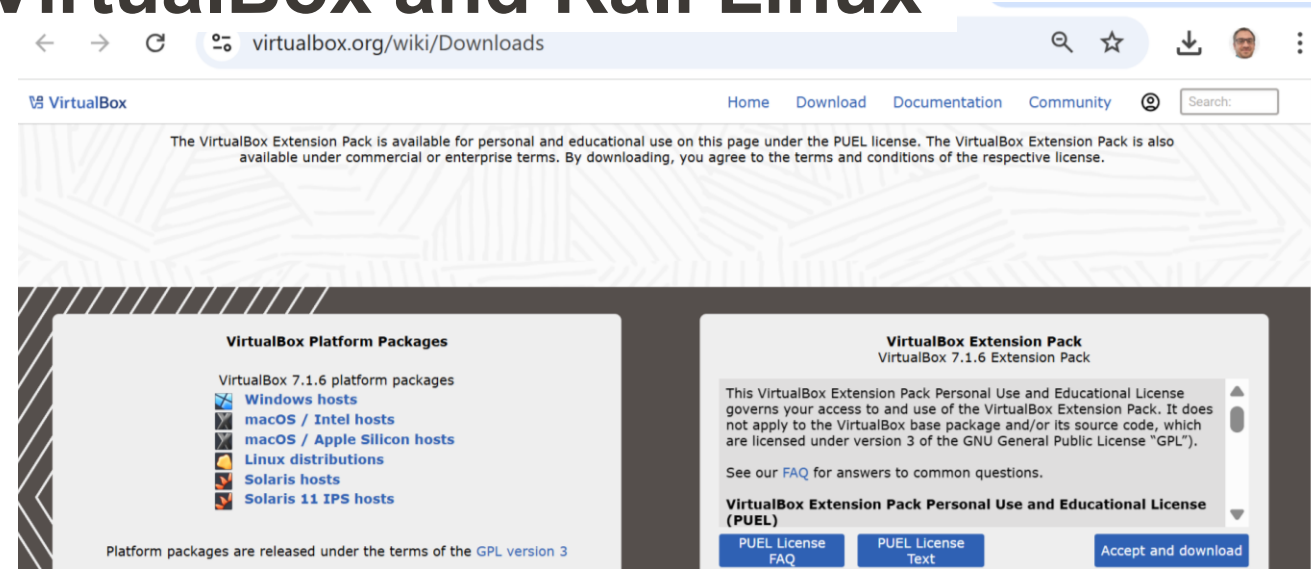
Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

Installing VirtualBox

Follow these steps to install VirtualBox:

1. **Download VirtualBox** from the official website:

<https://www.virtualbox.org/wiki/Downloads>



We should choose the "**Windows hosts**" option if we are installing VirtualBox on a **Windows machine**. If we are using **macOS**, we choose either "**macOS / Intel hosts**" or "**macOS / Apple Silicon hosts**", depending on our system.

For Linux users, we select "**Linux distributions**".

Kali Linux can absolutely run on macOS —you can use it with **VirtualBox for macOS** or **UTM (for Apple Silicon chips)**.

There are two recommended solutions:

Option 1: Use VirtualBox (Intel Mac)

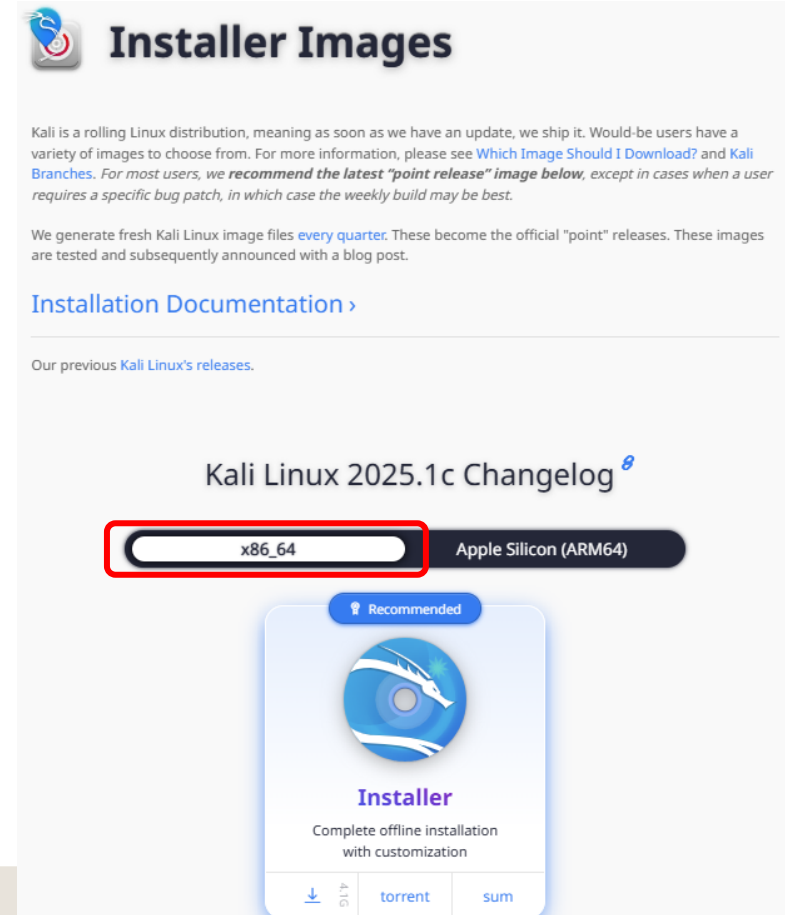
If your Mac has an Intel processor, you can continue using VirtualBox:

1. Download the **Kali Linux ISO (Installer)** version from the official Kali Downloads page. (suitable for Intel-based Macs running VirtualBox)
 2. Set it up as a new VM in VirtualBox.
 3. Follow the same steps provided for Windows users in the Week 8 lab guide.
- ✓ Make sure to choose the "**Installer**" ISO for your architecture (**amd64** for Intel Macs).
- ✗ Do **not** use the Live or NetInstaller versions for lab-based VirtualBox installation.

You should download the **Installer Image for x86_64 architecture**, which is compatible with VirtualBox on Intel Macs.

Link to download (Installer Image):

<https://www.kali.org/get-kali/#kali-installer-images>



Installer Images

Kali is a rolling Linux distribution, meaning as soon as we have an update, we ship it. Would-be users have a variety of images to choose from. For more information, please see [Which Image Should I Download?](#) and [Kali Branches](#). For most users, we **recommend the latest "point release" image below**, except in cases when a user requires a specific bug patch, in which case the weekly build may be best.

We generate fresh Kali Linux image files **every quarter**. These become the official "point" releases. These images are tested and subsequently announced with a blog post.


[Installation Documentation >](#)

Our previous [Kali Linux's releases](#).

Kali Linux 2025.1c Changelog ⁸

x86_64 Apple Silicon (ARM64)

Recommended

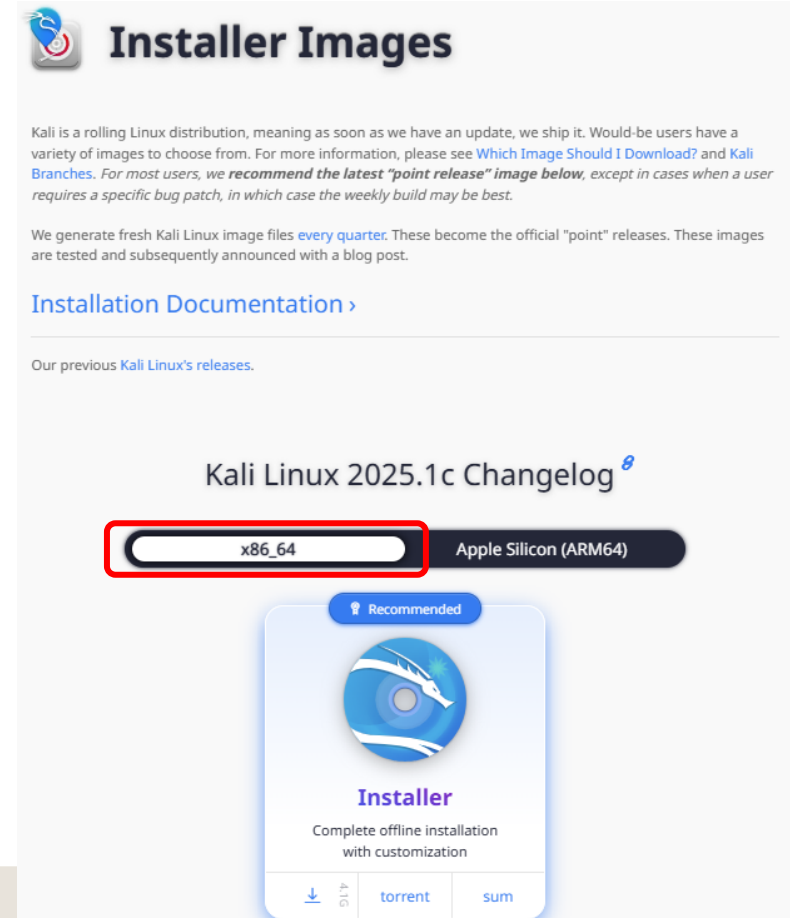


Installer

Complete offline installation with customization

4.1G [torrent](#) [sum](#)

- Choose **x86_64** (not Apple Silicon), then download the **Installer ISO** file.
- This version allows full installation with customization via VirtualBox.



Installer Images

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x86_64 Apple Silicon (ARM64)

Recommended



Installer

Complete offline installation with customization

4.1G [torrent](#) [sum](#)

If you are using an Apple Silicon (M1, M2, M3) Mac:

VirtualBox may not work properly. In this case, option 2 is recommend:

- Download UTM from <https://mac.getutm.app/>
- Then use the **ARM64 image** from this page:

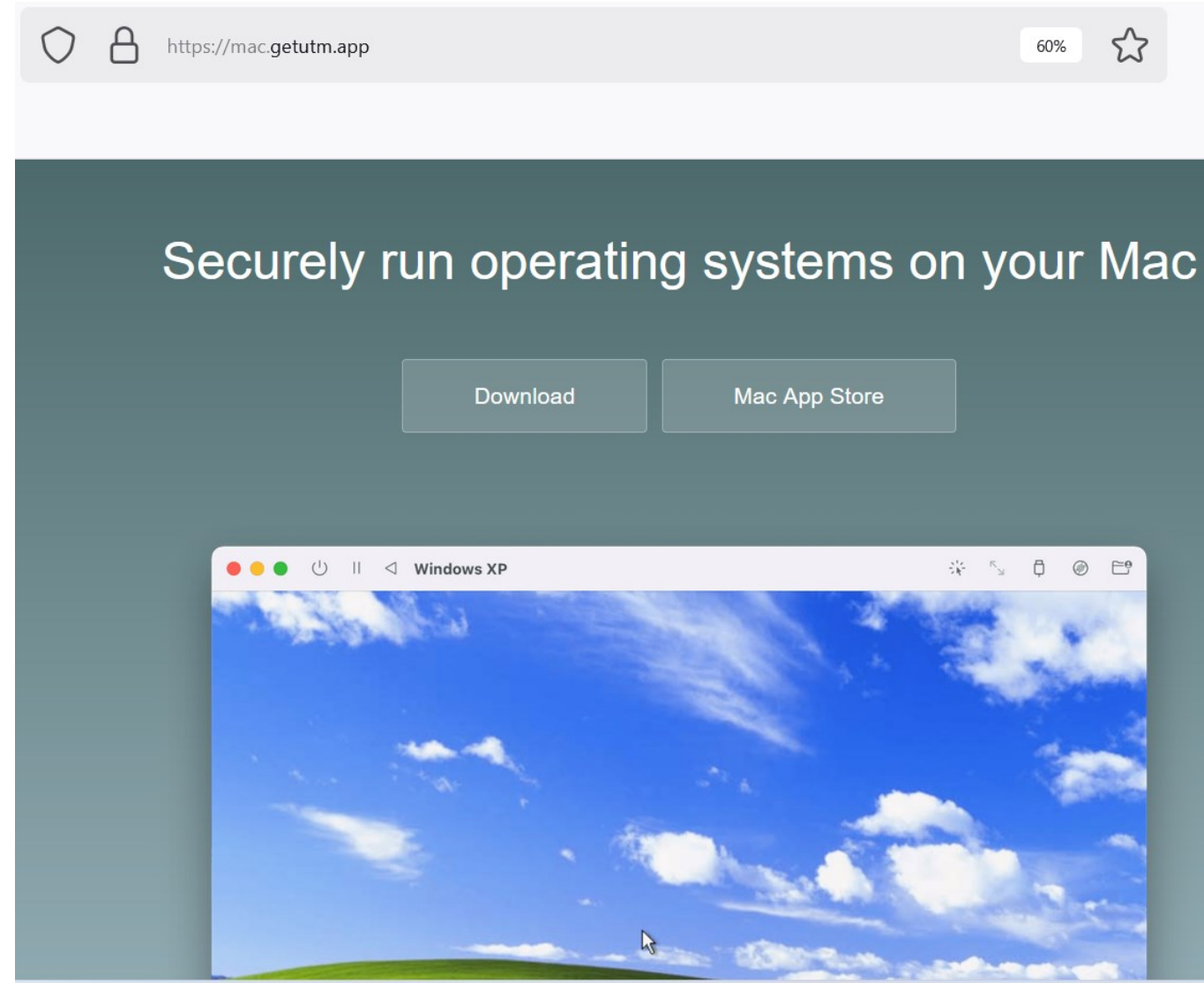
<https://www.kali.org/get-kali/#kali-arm>

Option 2: Use UTM (Apple Silicon/M1/M2/M3 chips)

If you are using an **M1/M2/M3 Mac**,
VirtualBox may not work as expected.

In that case:

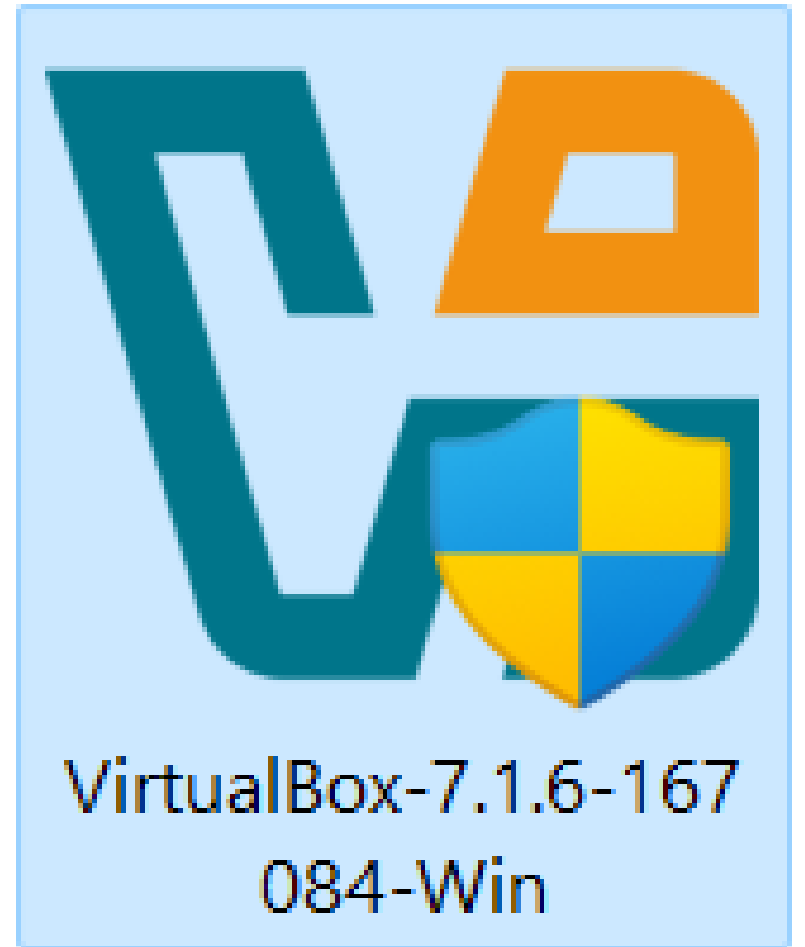
1. Download and install **UTM** from <https://mac.getutm.app/>
2. Use a pre-built **Kali ARM image** from Kali ARM images.
3. Import it into UTM and start your Kali environment.



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2. Once downloaded, **locate** the installation file on your computer and double-click to start the installation (Run as Administrator)

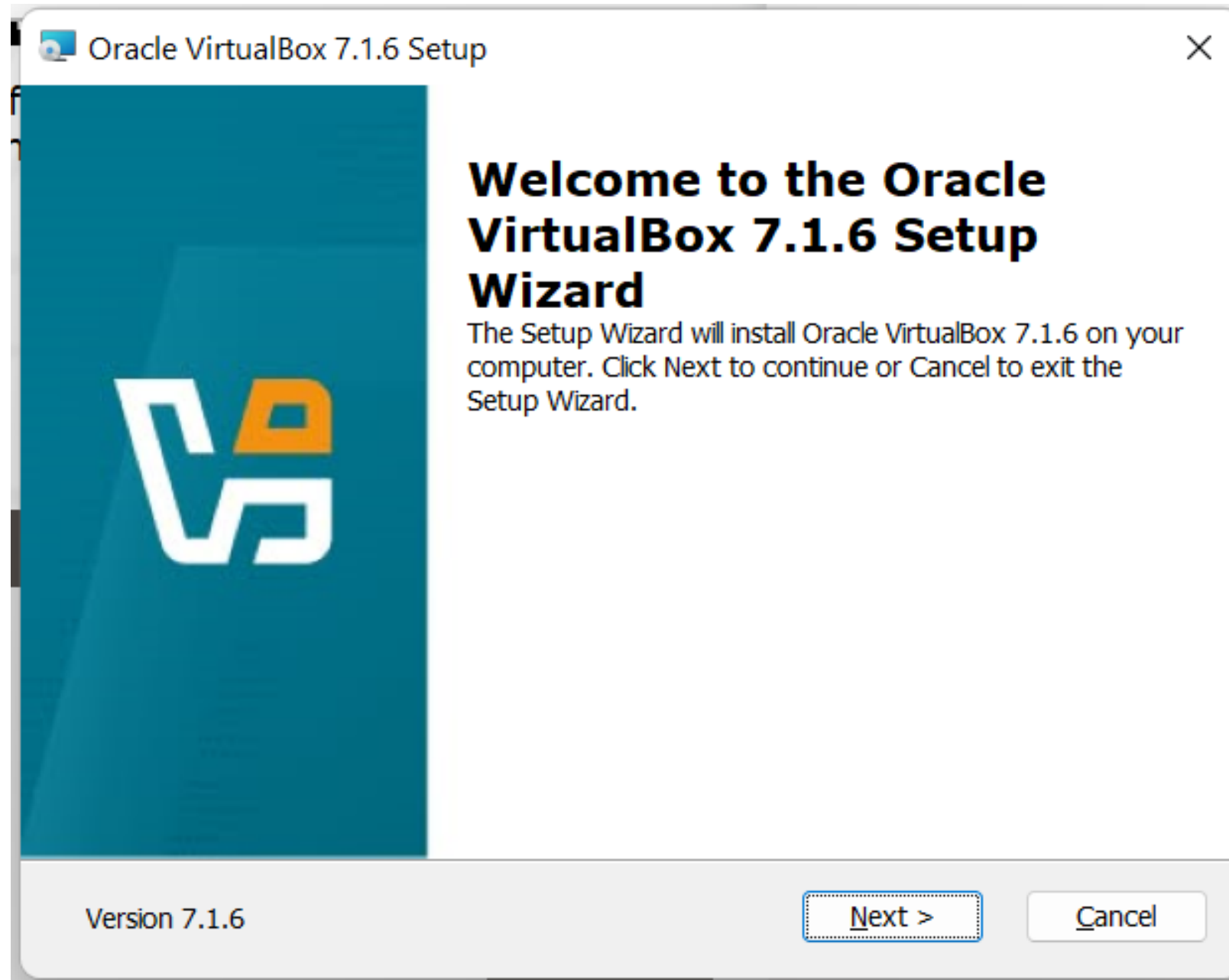
▼ Today (14)



Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

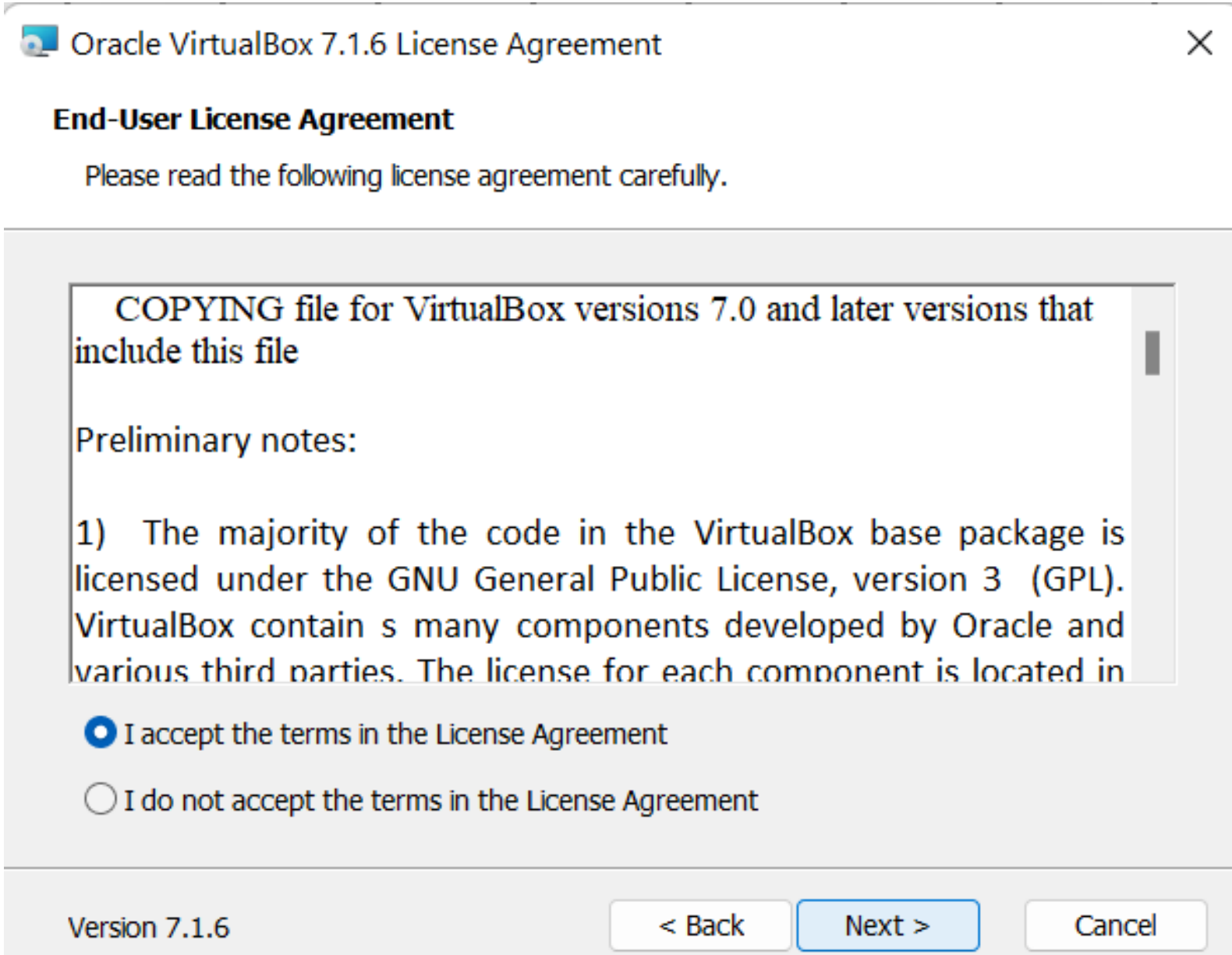


3. Click on Next



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4. Accept & Click on Next



Oracle VirtualBox 7.1.6 License Agreement

End-User License Agreement

Please read the following license agreement carefully.

COPYING file for VirtualBox versions 7.0 and later versions that include this file

Preliminary notes:

1) The majority of the code in the VirtualBox base package is licensed under the GNU General Public License, version 3 (GPL). VirtualBox contains many components developed by Oracle and various third parties. The license for each component is located in

☒ I accept the terms in the License Agreement

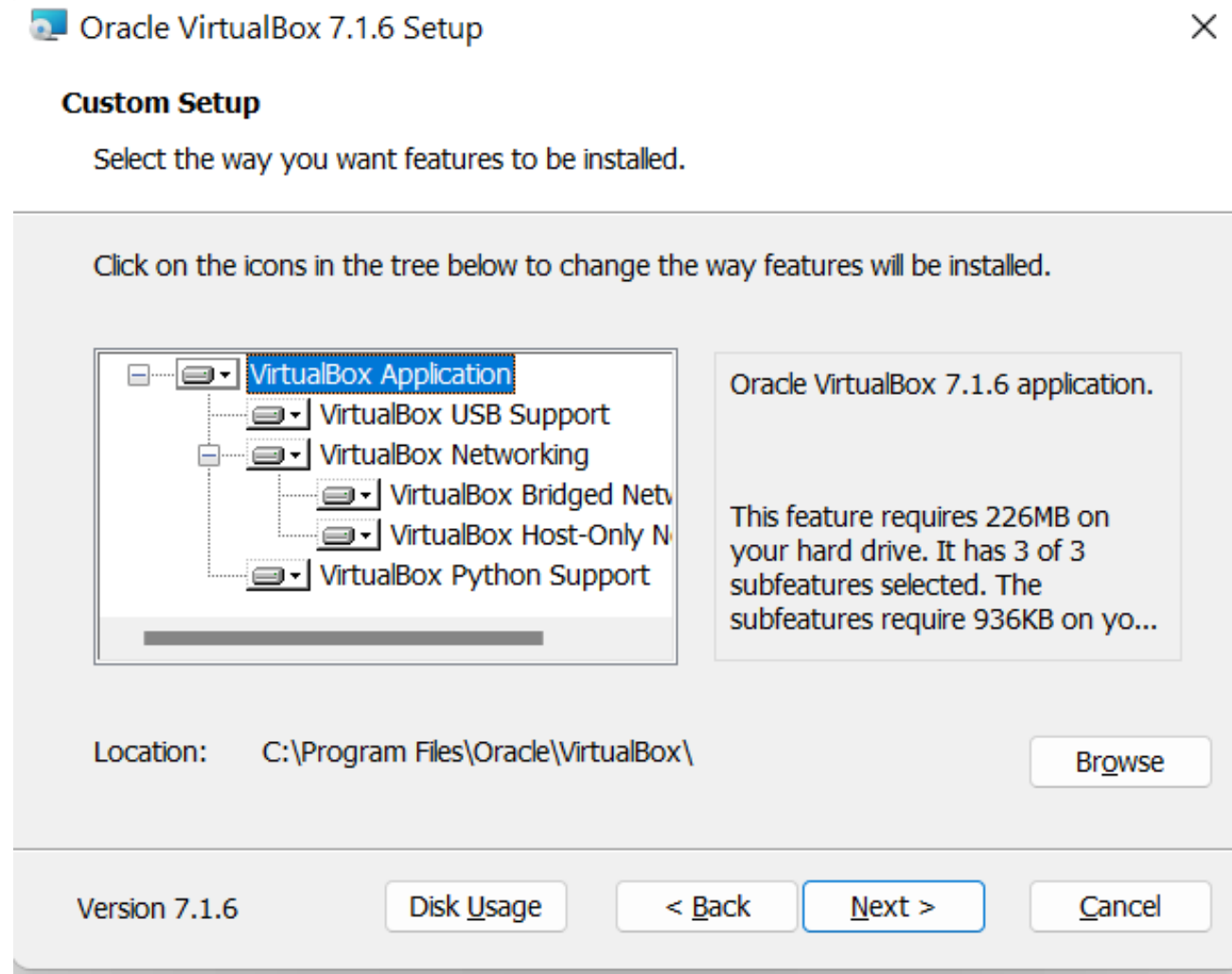
☐ I do not accept the terms in the License Agreement

Version 7.1.6

< Back Next > Cancel

Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

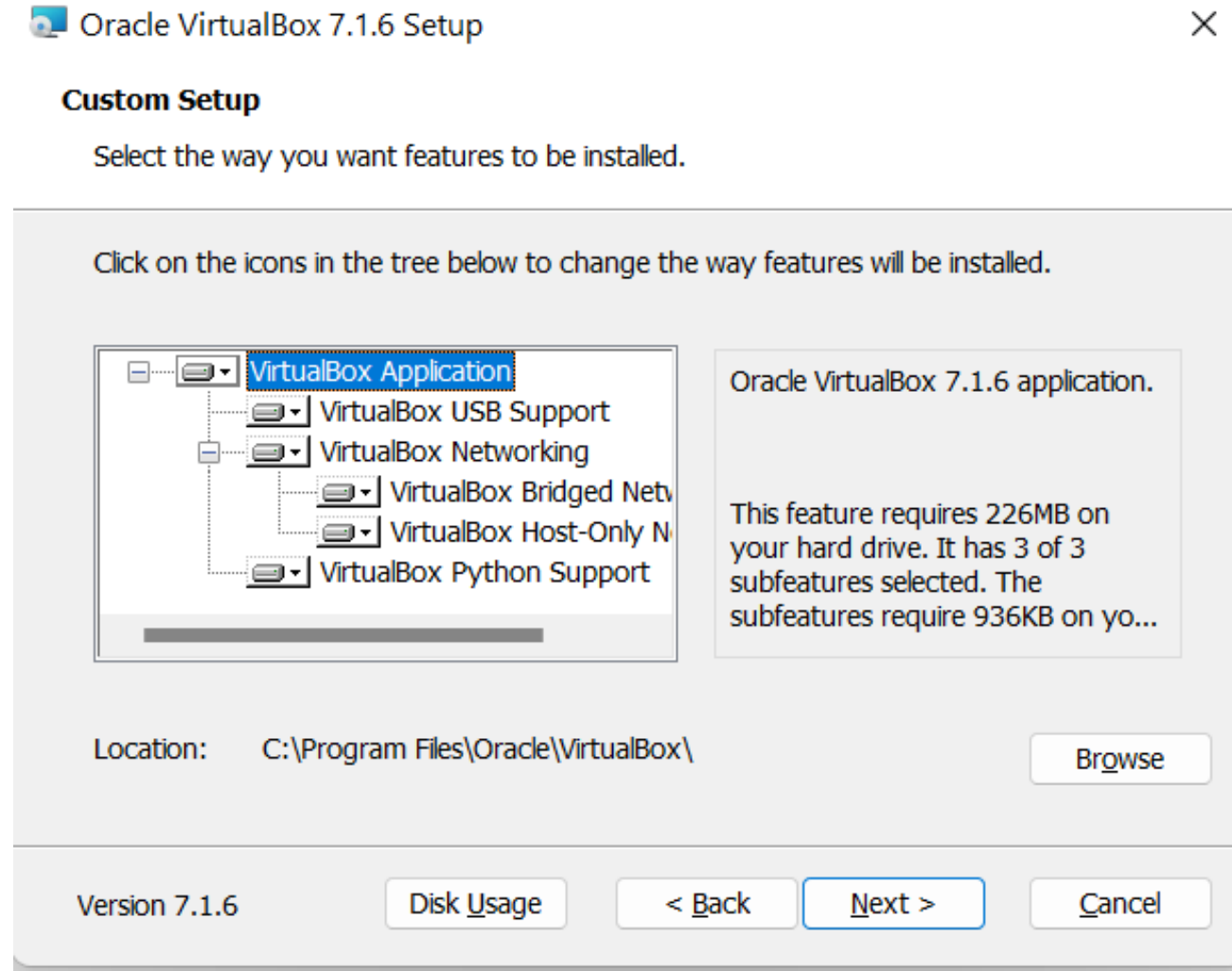
- **VirtualBox Application** (Mandatory for installation)
- **VirtualBox USB Support** (Recommended for USB device compatibility)
- **VirtualBox Networking** (Includes Bridged Networking, Host-Only Networking, and other network features—recommended to keep)



Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- **VirtualBox Python Support** (Optional, but useful if you plan to run automation scripts)

5. Keep the default options selected & proceed with the installation



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Oracle VirtualBox 7.1.6

- Click on Next & Yes



Warning: Network Interfaces

Installing the Oracle VirtualBox 7.1.6 Networking feature will reset your network connection and temporarily disconnect you from the network.

Proceed with installation now?

Version 7.1.6

Yes

No

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Oracle VirtualBox 7.1.6 Setup

Custom Setup

Select the way you want features to be installed.

Please choose from the options below:

- ☒ Create start menu entries
- ☒ Create a shortcut on the desktop
- ☒ Create a shortcut in the Quick Launch Bar
- ☒ Register file associations

Version 7.1.6

< Back

Next >

Cancel

- Next

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Oracle VirtualBox 7.1.6 Setup



Ready to Install

The Setup Wizard is ready to begin the Custom installation.

Click Install to begin the installation. If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.

Version 7.1.6

< Back

Install

Cancel

- Install

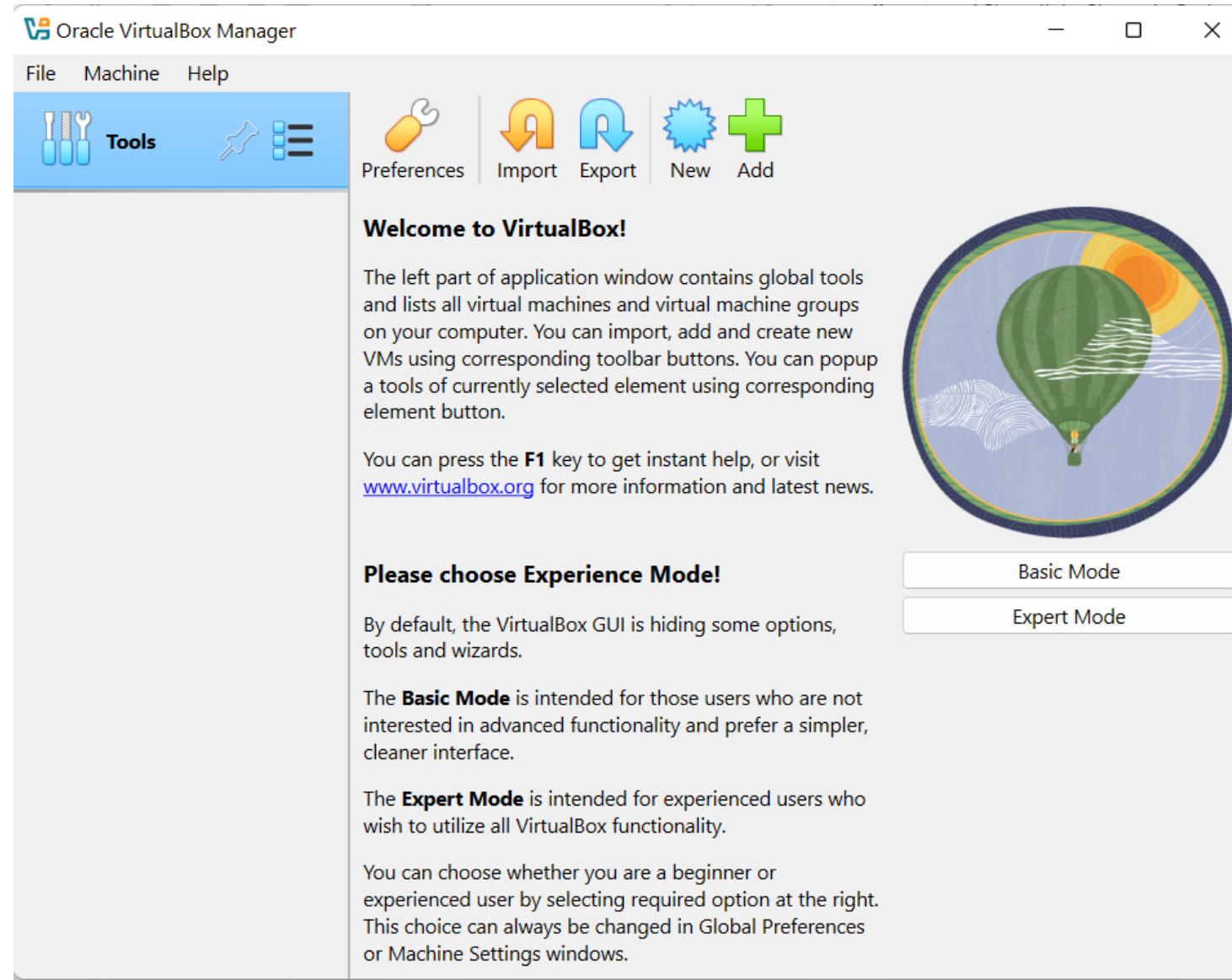
Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Click **Finish** to exit the setup wizard



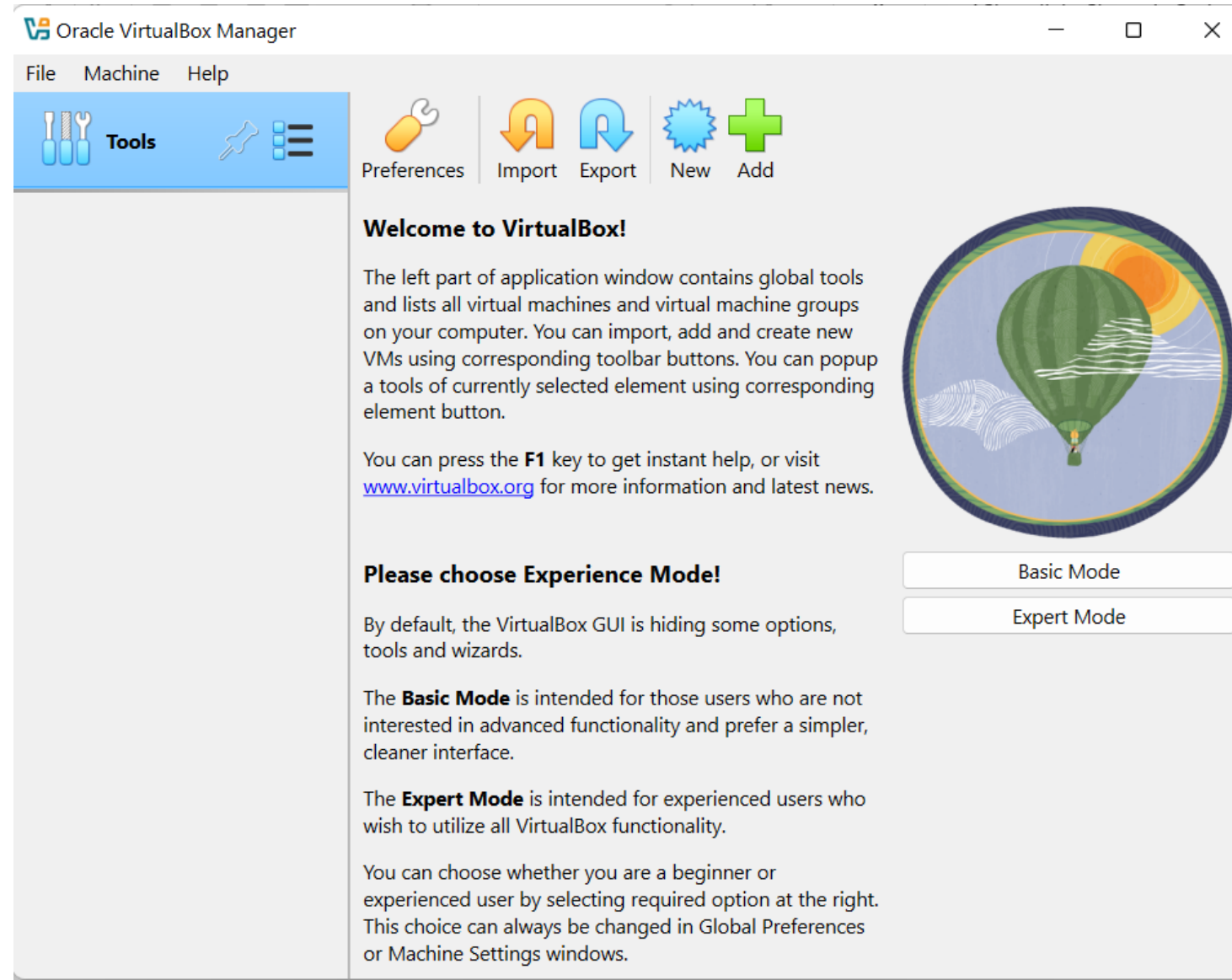
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- Now Virtual Box is ready to use
- If you are a **beginner**, select "**Basic Mode**" (Recommended).
- It provides a simpler interface with essential options for creating and managing virtual machines.



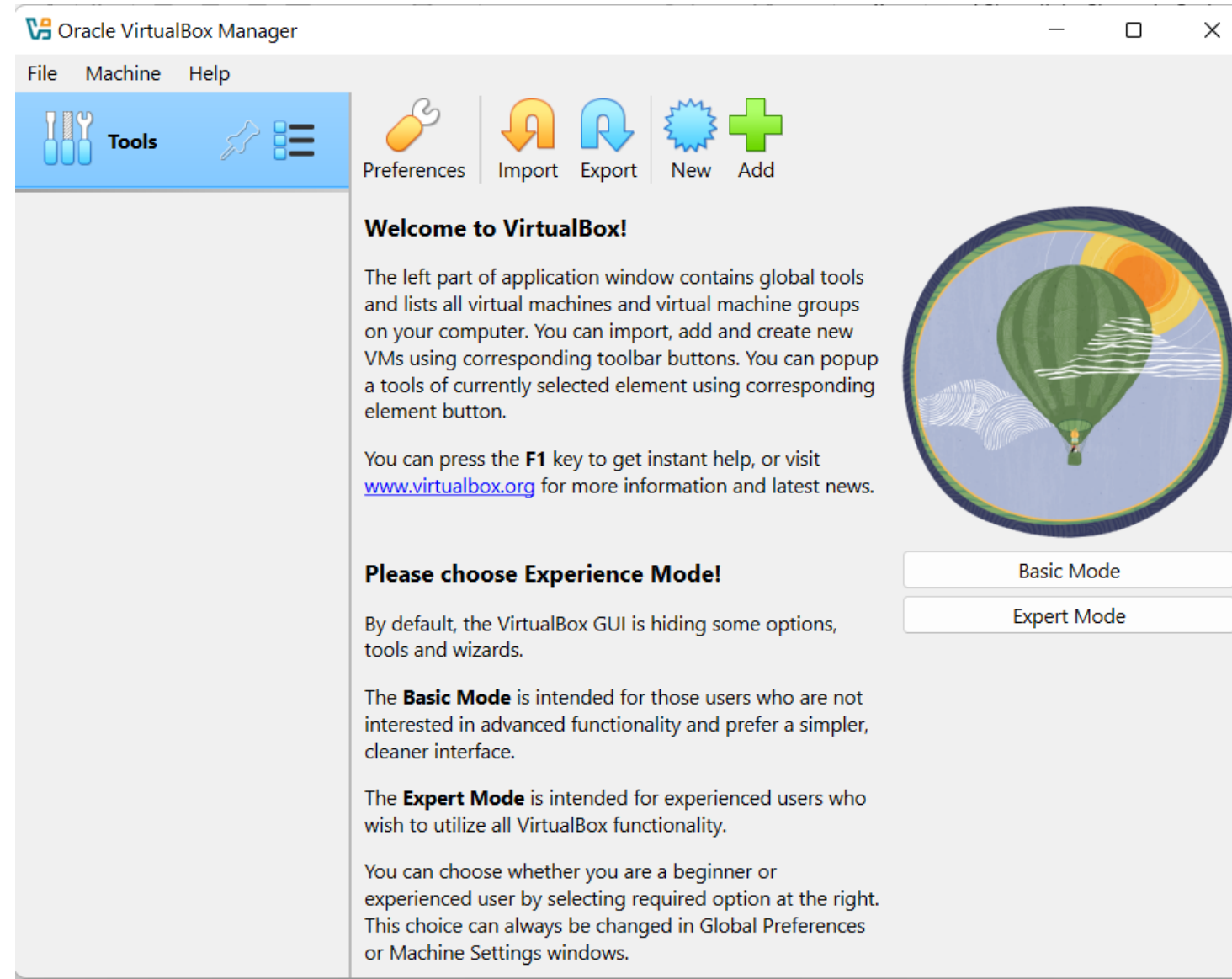
Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- If you are **comfortable with advanced settings**, select **"Expert Mode"**.
- This mode gives you more flexibility when setting up virtual machines, such as manually configuring storage, memory, and network settings.



Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Currently, we select **Basic Mode**. We can always switch to **Expert Mode** later from the preferences if needed.



What is Kali Linux?

Kali Linux is a **Linux distribution** designed for penetration testing, security auditing, and ethical hacking. It comes pre-installed with a wide range of cybersecurity tools.

Why Use Kali Linux?

- Includes essential security and penetration testing tools
- Helps in cybersecurity training and research
- Open-source and regularly updated

Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

Installing Kali Linux on VirtualBox

Follow these steps to install **Kali Linux** on your VirtualBox:

1. **Download Kali Linux** from the official website:

<https://www.kali.org/get-kali/#kali-platforms>

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We plan to download the 64-bit ISO file

kali.org/get-kali/#kali-platforms

GET KALI BLOG DOCUMENTATION ▾ COMMUNITY ▾ CO

Choose **your** Platform |


LIGHT ☒ DARK




Installer Images

- ✓ Direct access to hardware
- ✓ Customized Kali kernel
- ✓ No overhead

Single or multiple boot Kali, giving you complete control over the hardware access (perfect for in-built Wi-Fi and GPU), enabling the best performance.


 Recommended



Virtual Machines

- ✓ Snapshots functionary
- ✓ Isolated environment
- ✓ Customized Kali kernel
- ✗ Limited direct access to hardware
- ✗ Higher system requirements

VMware & VirtualBox pre-built images. Allowing for a Kali install without altering the host OS with additional features such as snapshots. Vagrant images for quick spin-up also available.

 Recommended

Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

Wait 5-6 minutes until the file is completed

Downloads



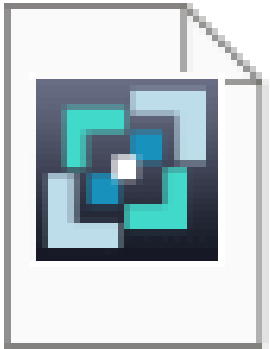
kali-linux-2025.1a-installer-amd64.iso



11.7 MB/s - 1.3 GB of 4.1 GB, 4 mins left

Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Once downloaded, we can install Kali Linux on our VirtualBox



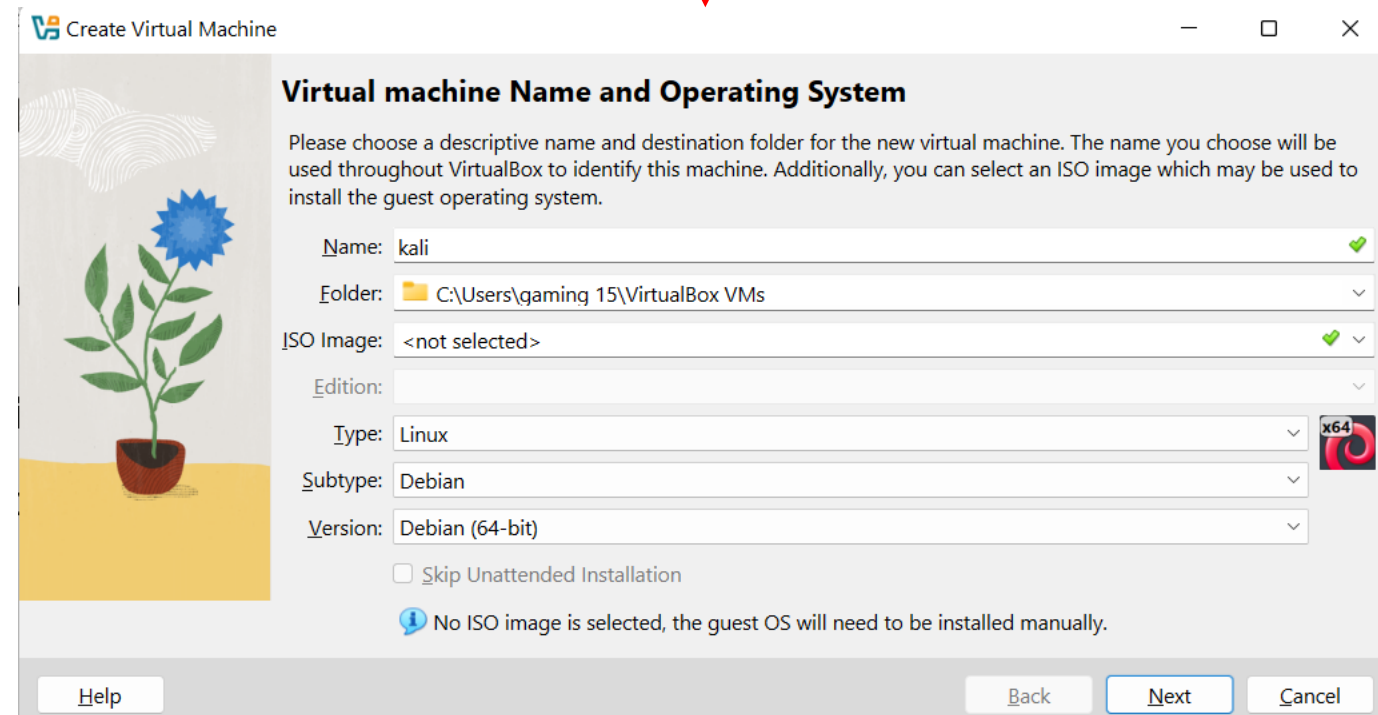
kali-linux-2025.1a-installer-amd64

ISO File

4.13 GB

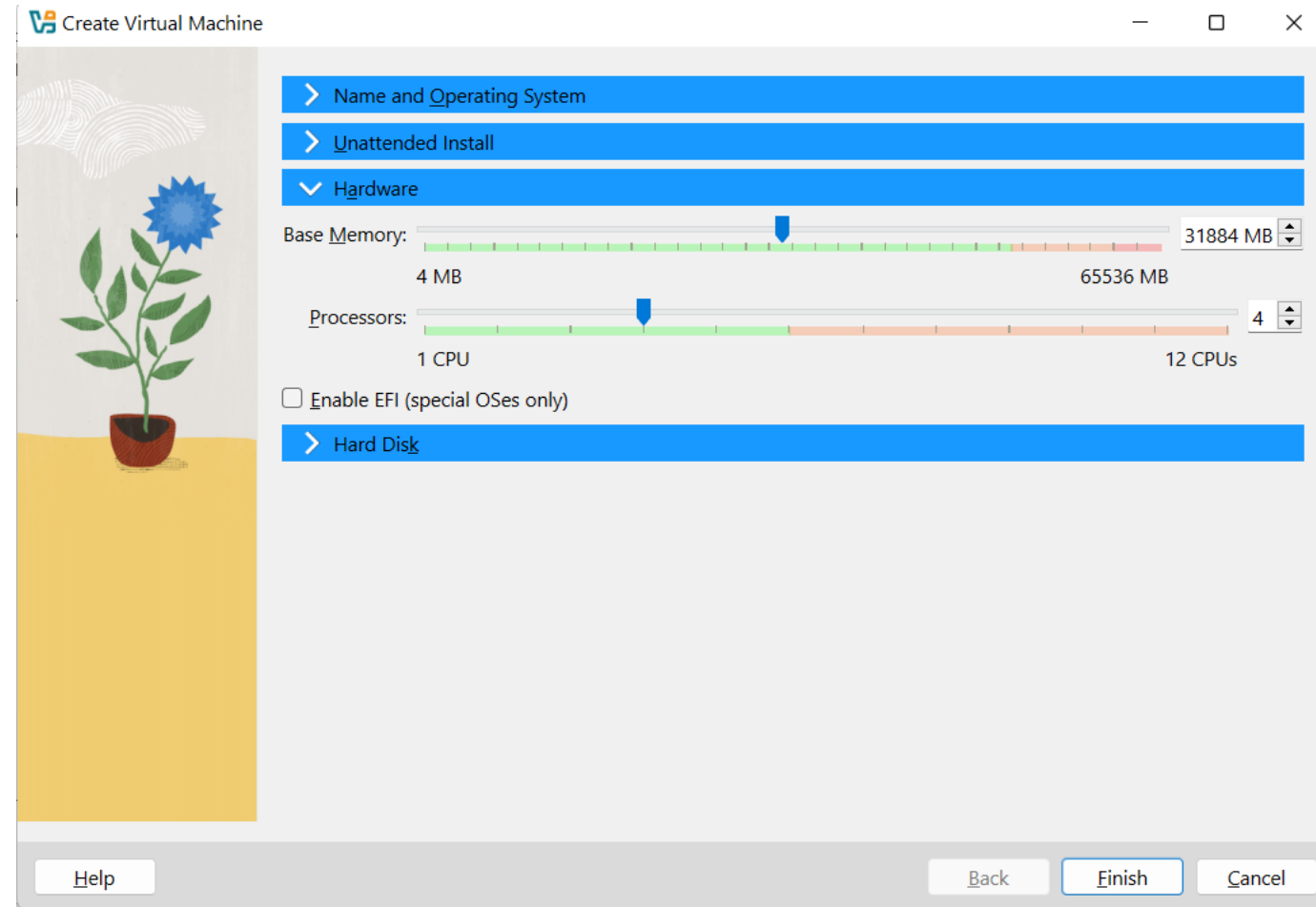
Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Click on New
- Write a name for the virtual machine e.g.,
kali
- Type: Linux
- Version: Oracle Linux



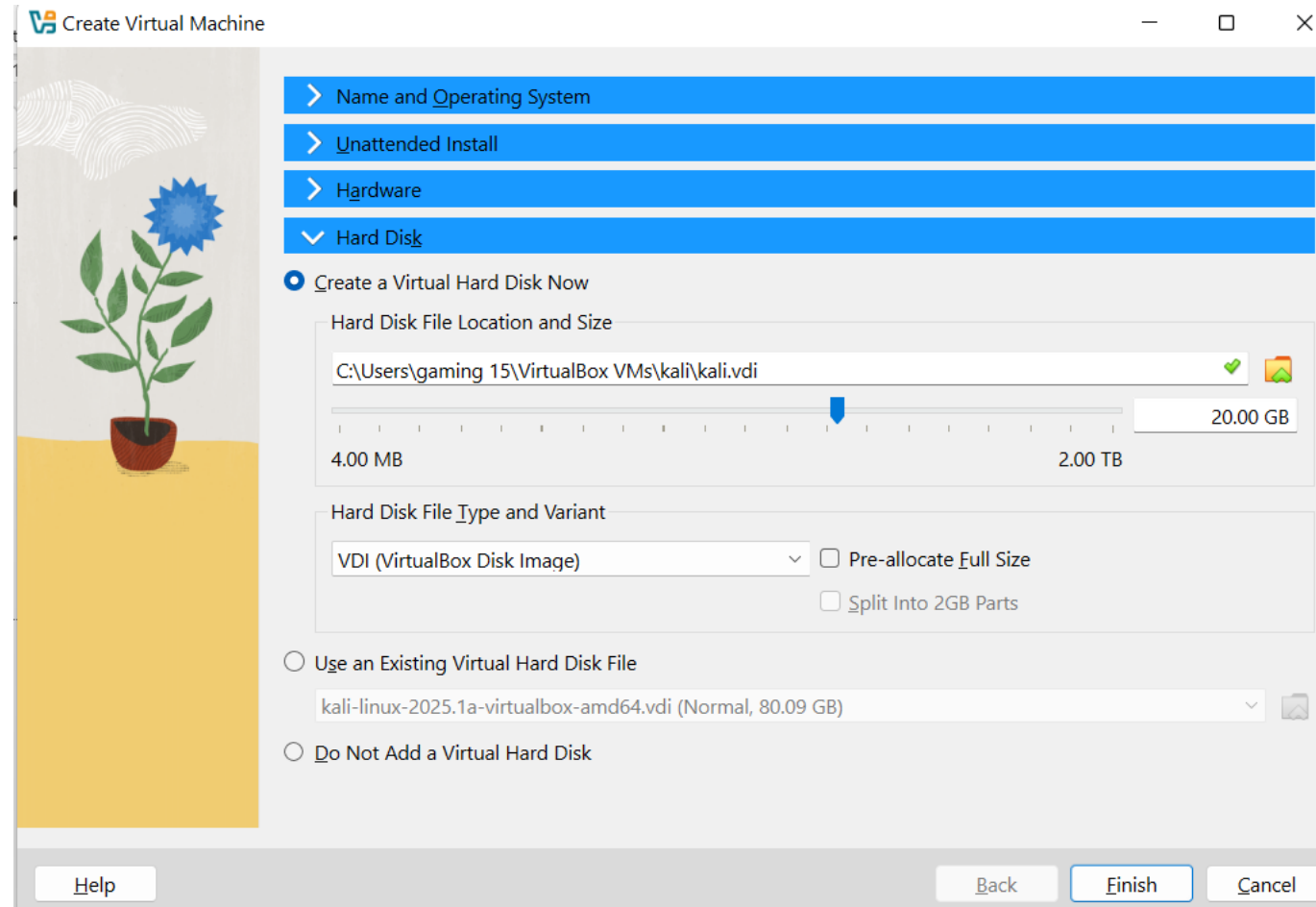
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- Base Memory Size: Up to red (end of green level) ~ 3G
- Processor CPU 4



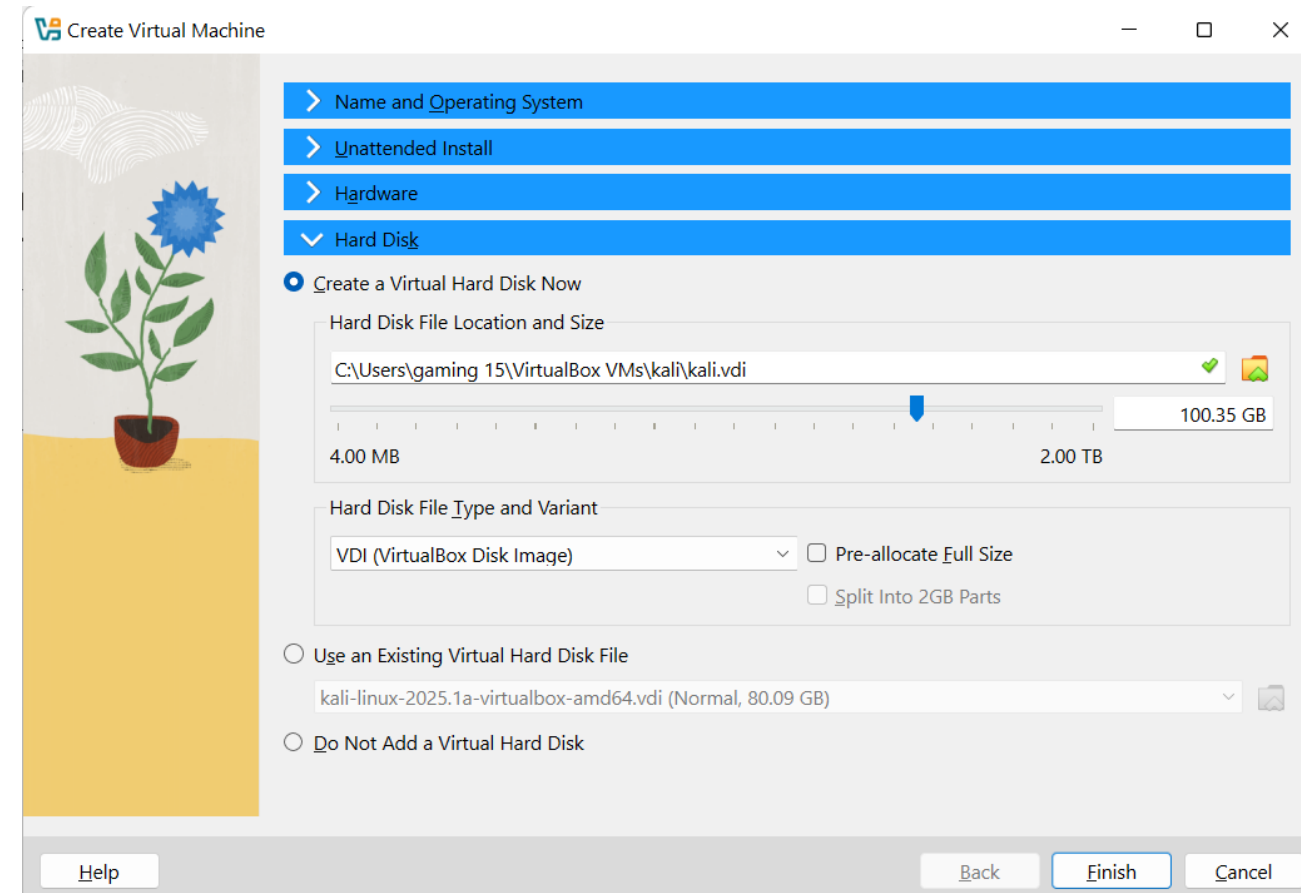
Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Hard Disk File Type: VDI (Virtual Disk Image)
- Create
- Hard Disk File Type: VDI (Virtual Disk Image)
- Finish



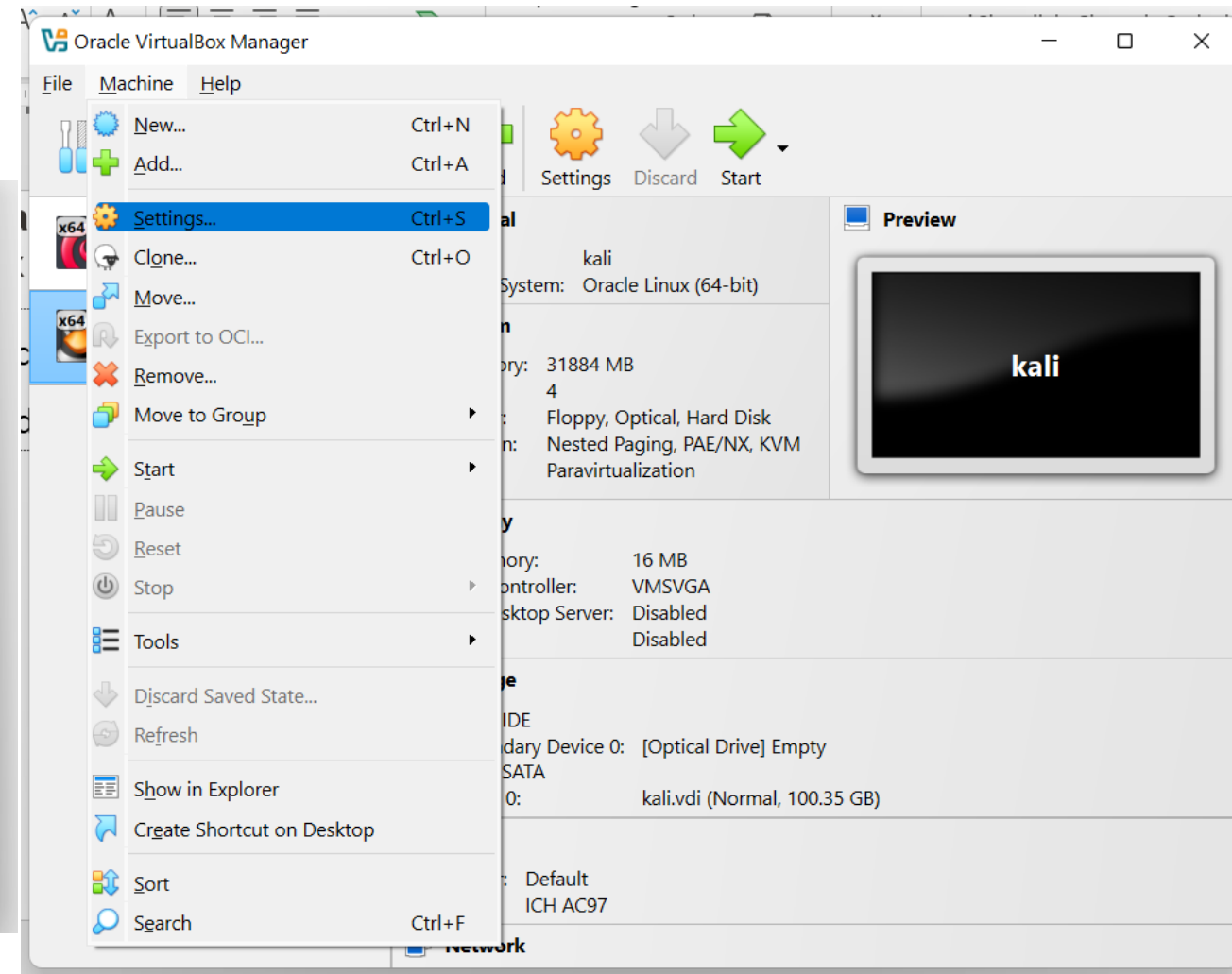
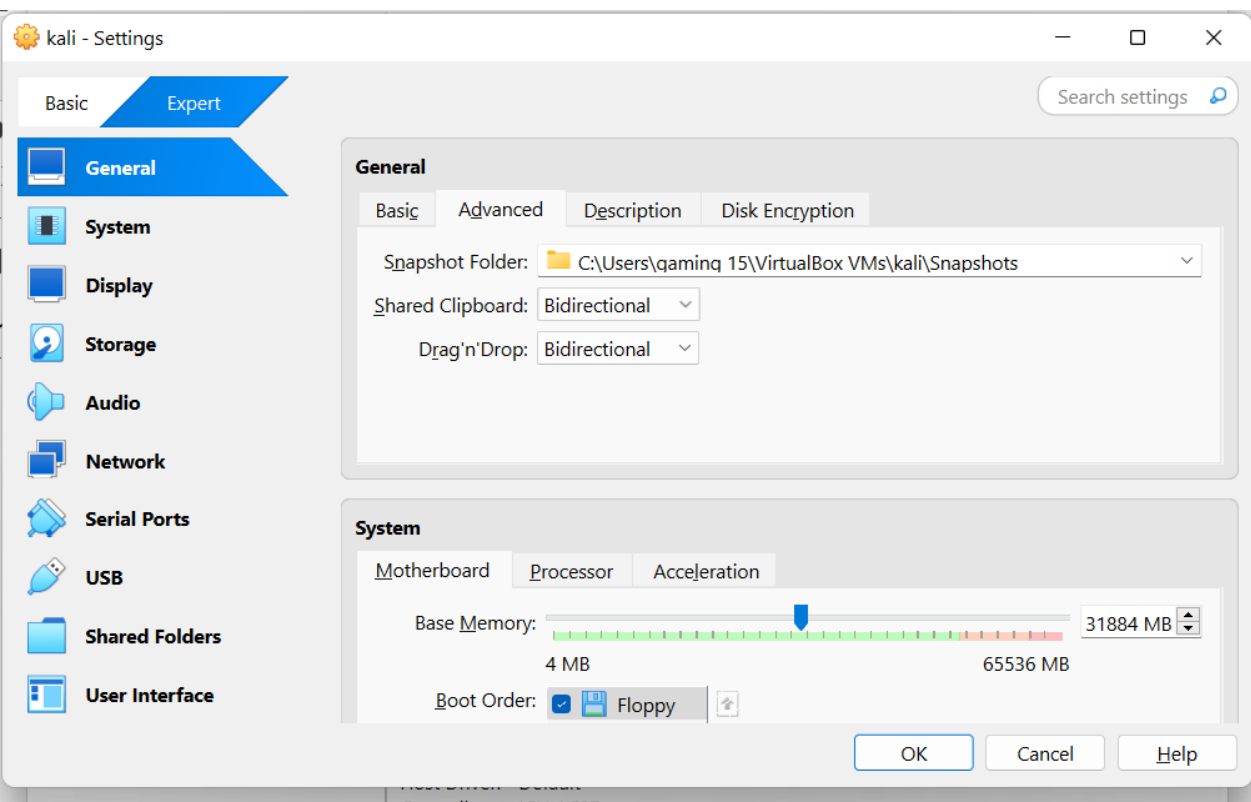
Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- File Location and Size: Move Size to around 100 GB
- Finish → It will create a virtual machine on Virtual Box Manager



Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

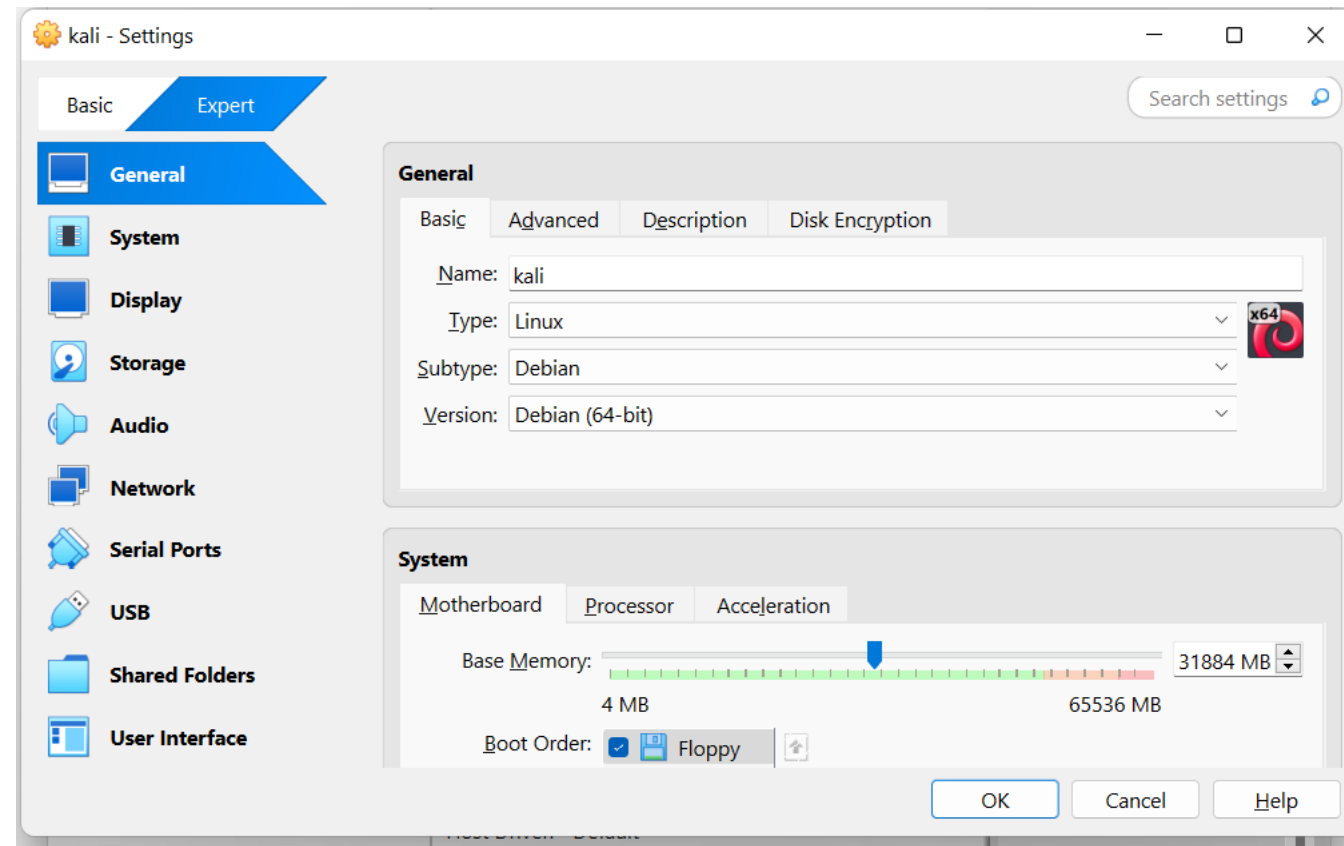
- Click on Settings >> General >> Advanced >> Shared Clipboard (Bidirectional) and Drag & Drop (Bidirectional)



Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

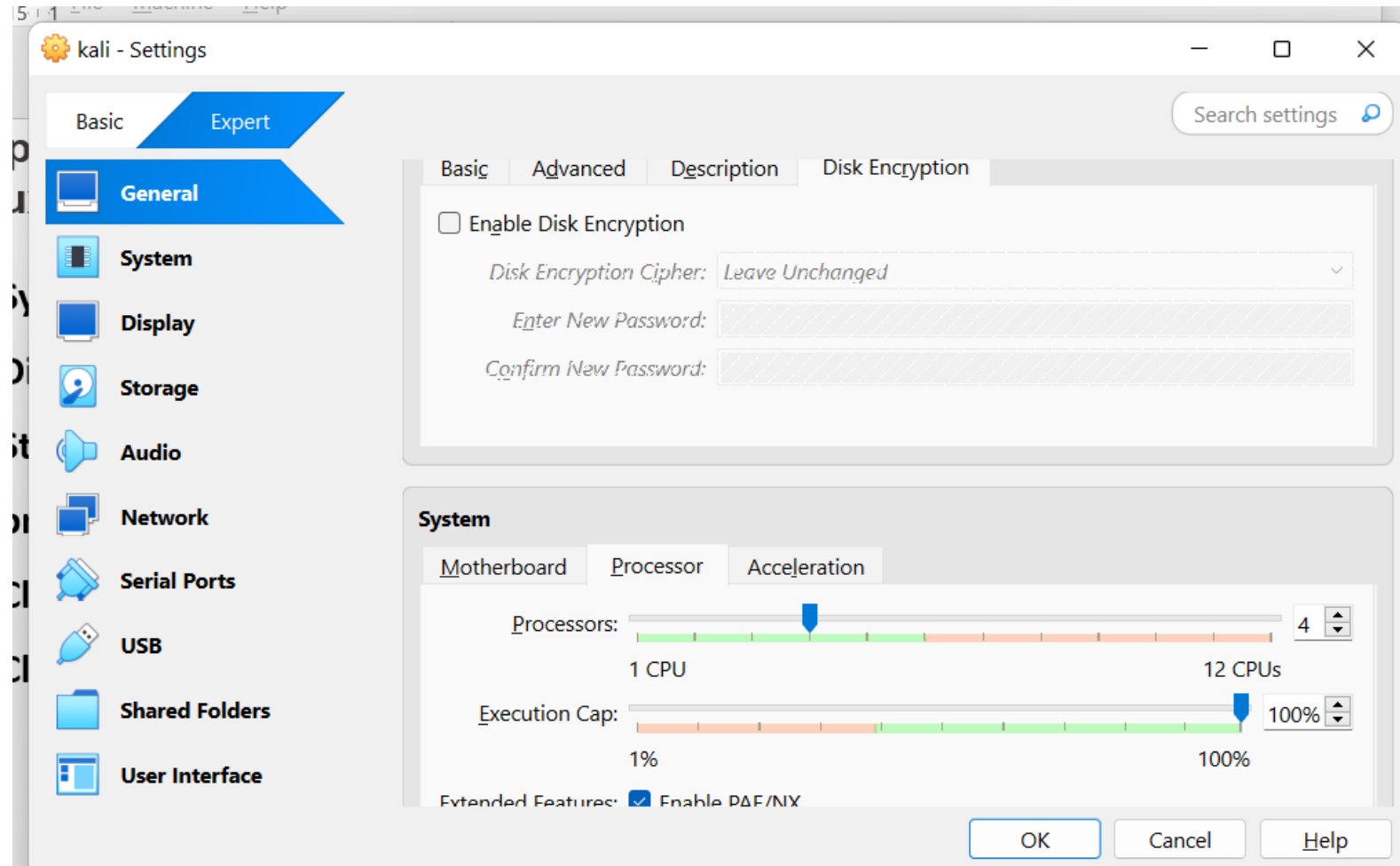
- **Kali General Settings: Type = Linux, Subtype = Debian**

Since **Kali Linux** is based on **Debian**, using Debian (64-bit) ensures proper compatibility with the virtual machine settings.



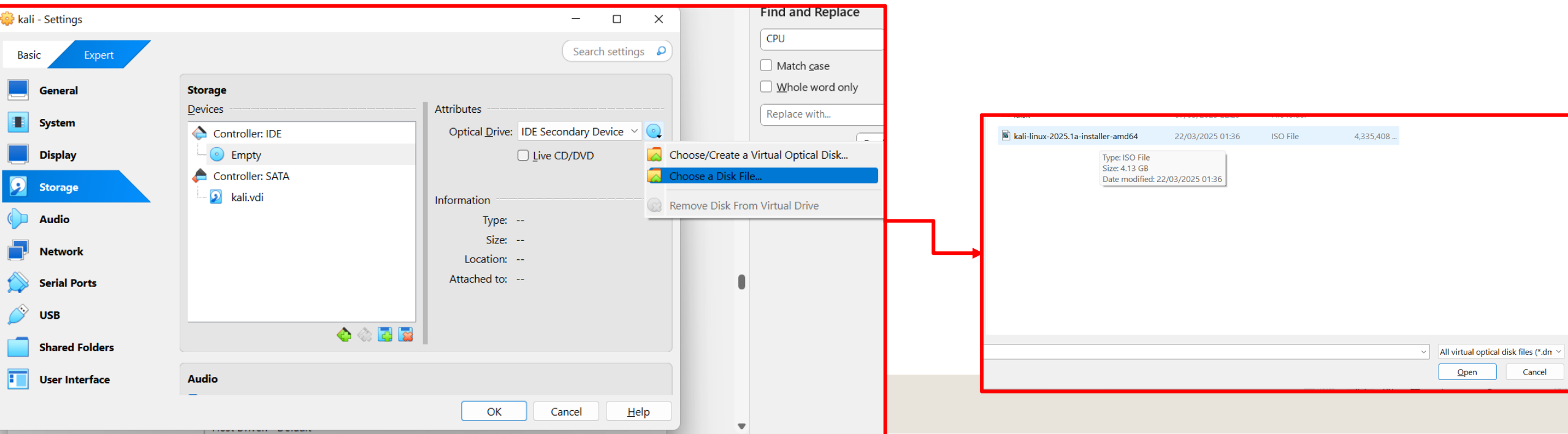
Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- **System → Processor → Assign 4 CPU to Virtual Machine**



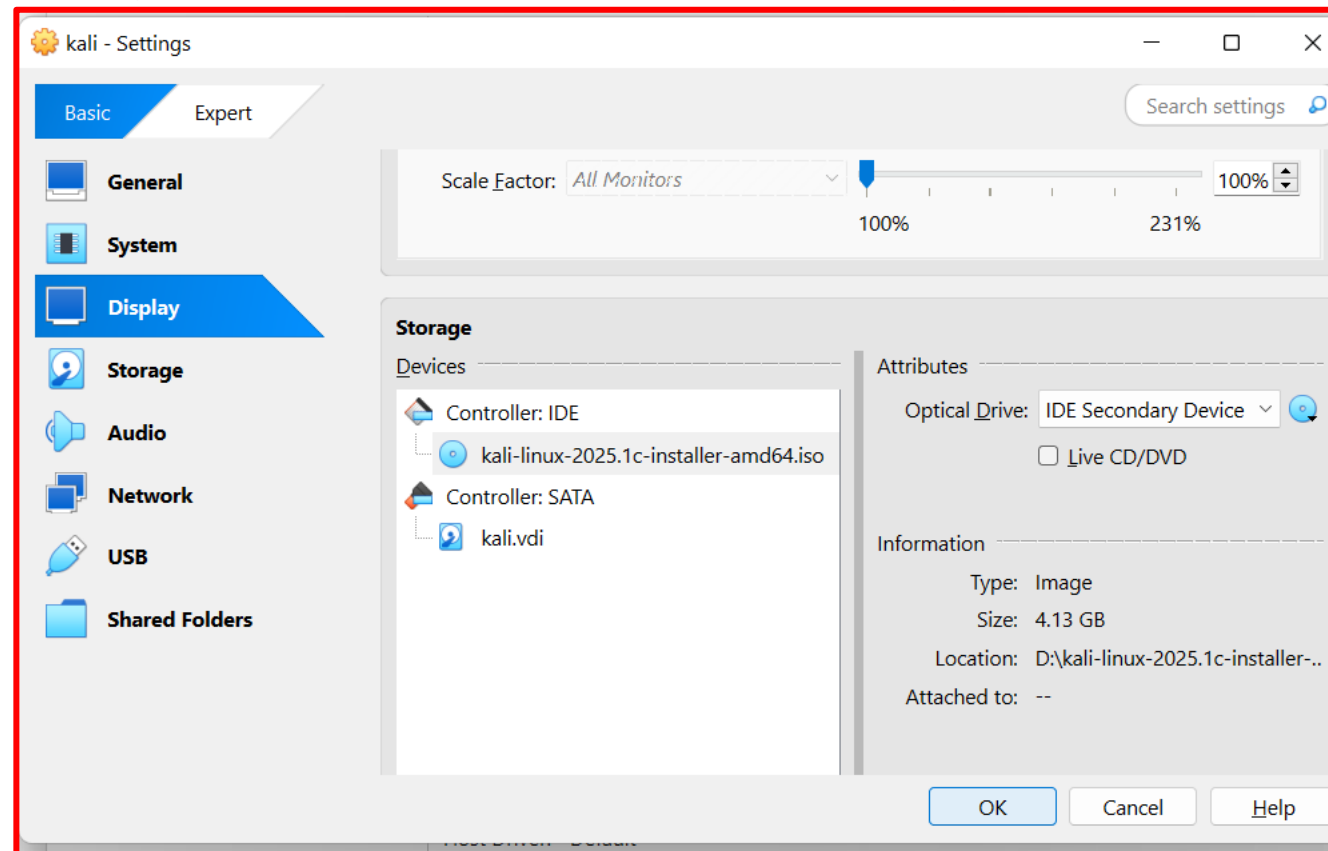
Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Display → Default
- Storage → Controller – IDE → Empty → Optical Drive → Choose a Disk file → browse to the path you downloaded iso file (open)
- Click Start



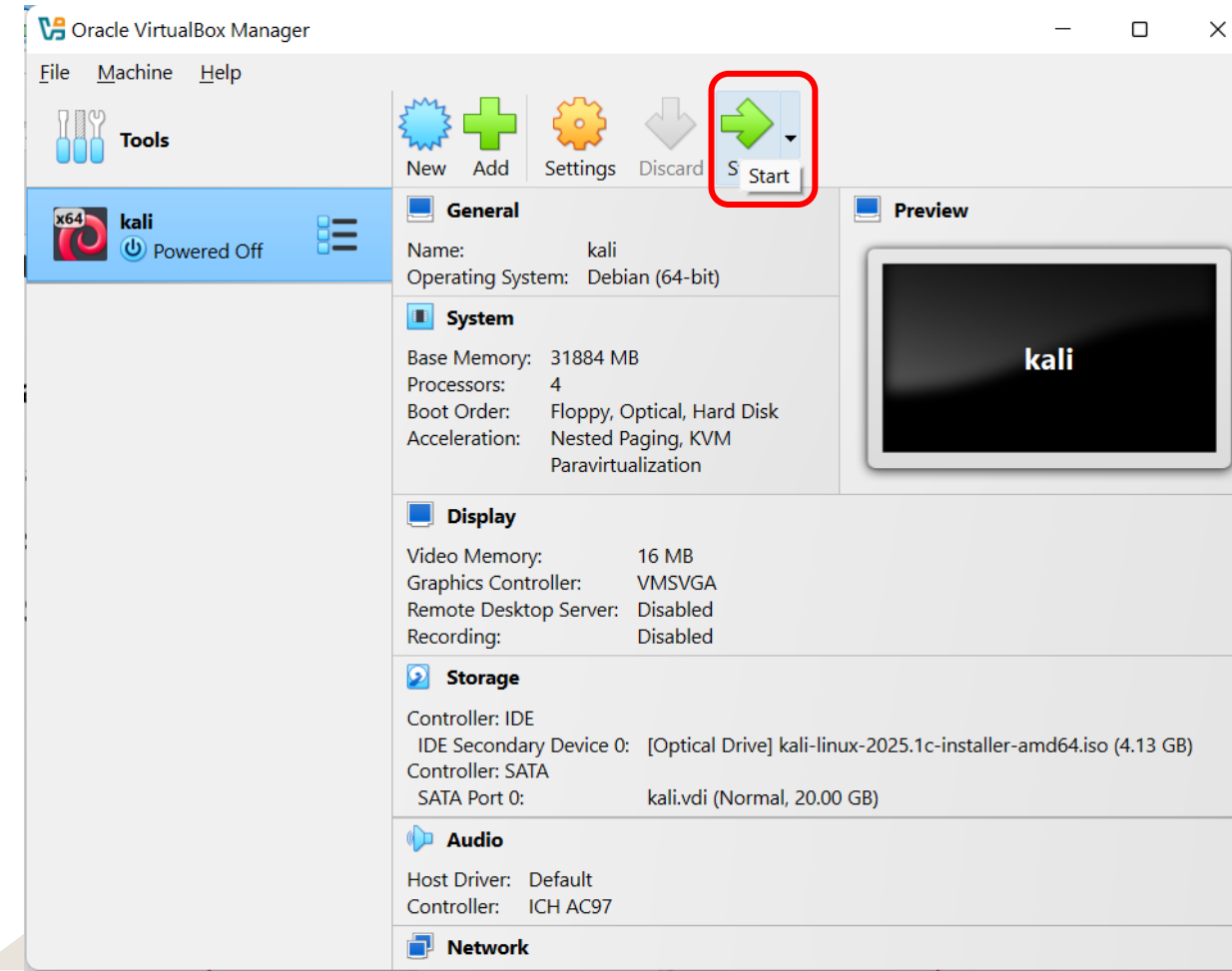
Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

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Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

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- Click Start



Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- **Select Language (English)**
- **Select Location**
- **Configure Keyboard Layout**
- **If it asks for host name by default is it kali**
- **Domain name → leave it blank**
- **Full name of new user → e.g., kali or codebind**

Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- **Set a Password when you login to Kali Linux (remember when you log in)**
- **Choose a clock → Central region**
- **Partition Disks → Guided use entire disk**
- **Continue**
- **Partition Disks → All files in one partition**
- **Finish Partitioning and write changes to disk**
- **Write the changes to disk? Yes**

Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- **Configure the Package Manager → Blank & Continue**
- **Software Selection → Be default & Continue**
- **Installation step failed (Click on Continue)**
- **Install the GRUB boot loader on a hard disk? Yes**
- **Enter device manually → /dev/sda ..**
- **Wait for Kali Linux to restart**

Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

Login Window (e.g., codebind username):

Login Credentials for Kali Linux:

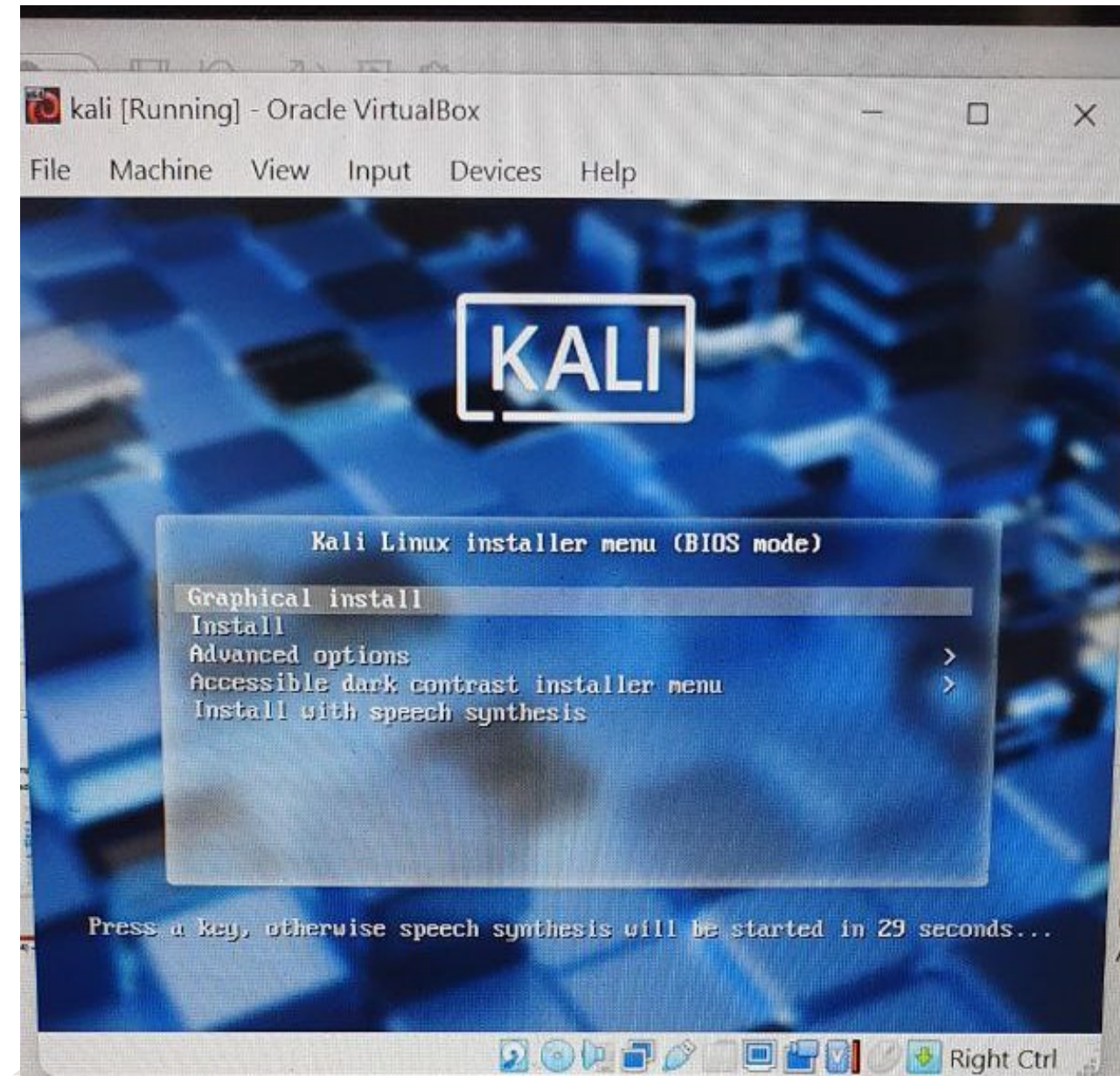
- **Kali Linux 2019:**
 - **Username:** root
 - **Password:** toor
- **Kali Linux 2020 and later:**
 - **Username:** kali
 - **Password:** kali
- **Now, Kali Linux is installed and ready to use!**

Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Start **Kali Linux** VM and log in with:
 - **Username:** kali
 - **Password:** kali
- **VirtualBox >> Click New**
- Set the name as **Kali Linux**
- Select **Type: Linux** and **Version: Debian (64-bit)**
- Allocate at least **2GB RAM** (recommended: 4GB or more)
- Create a **virtual hard disk** (20GB minimum)

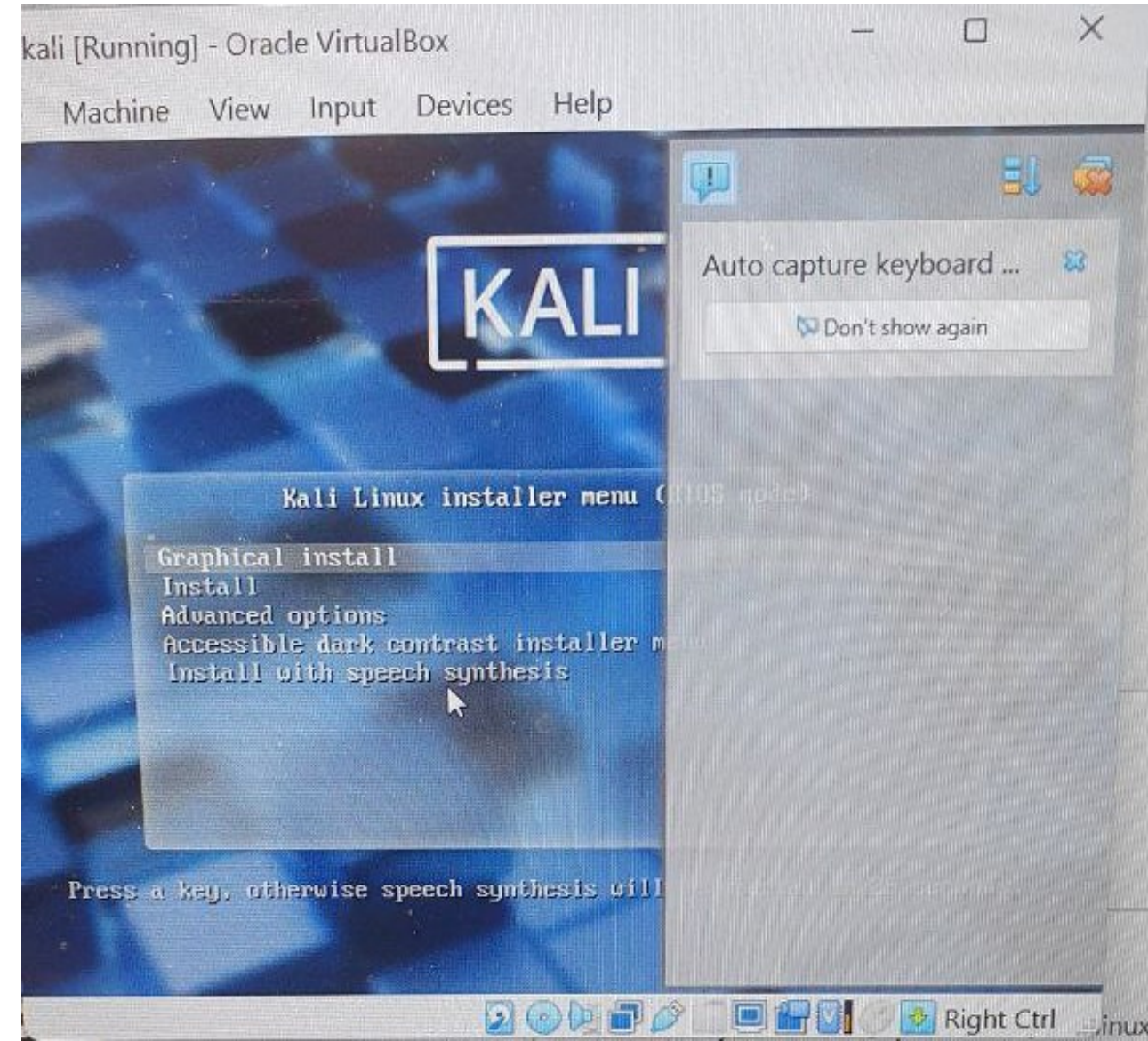
Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Proceed the steps, as explain or shown in the following



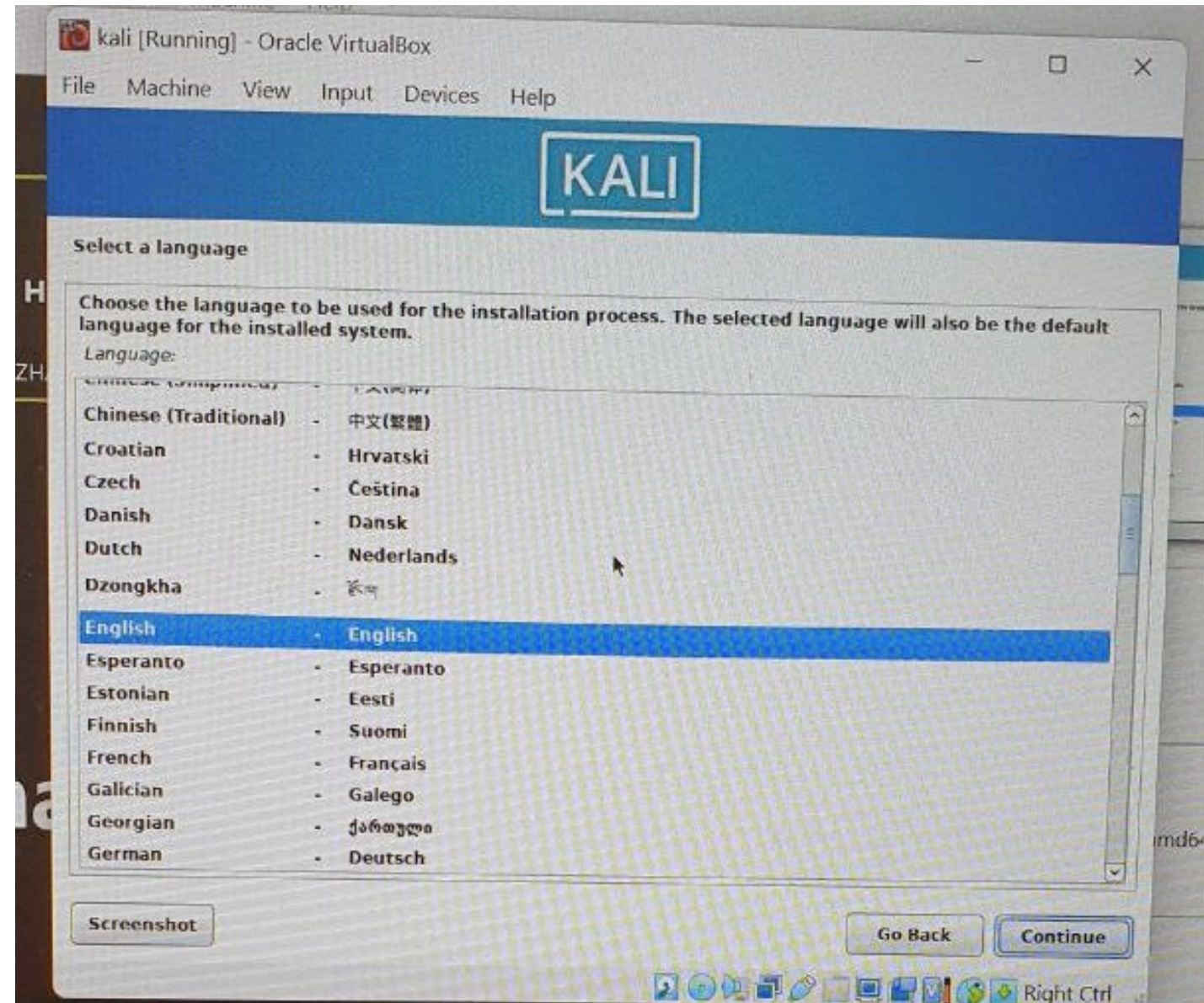
Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- **Proceed the steps, as explain or shown in the following**



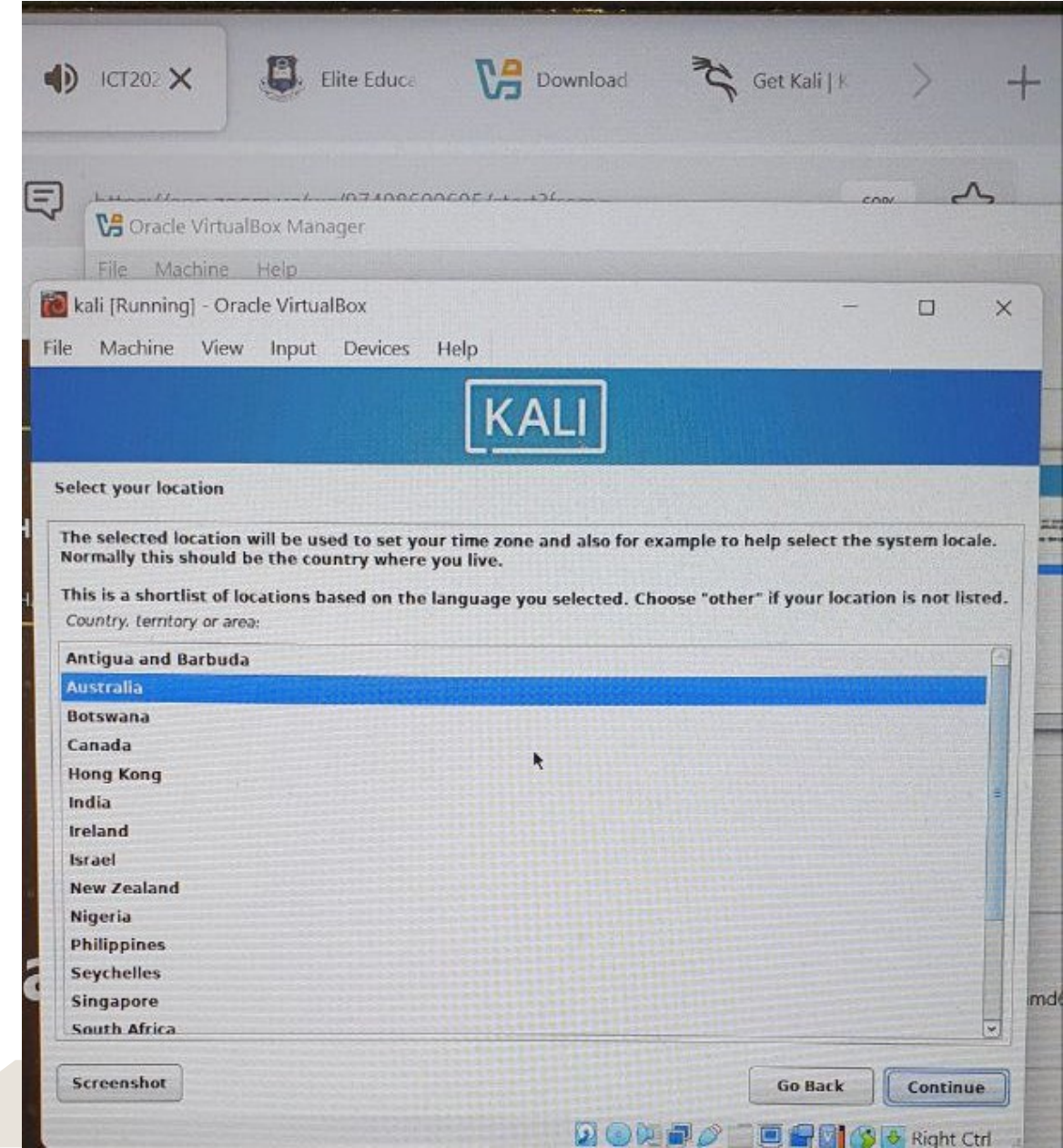
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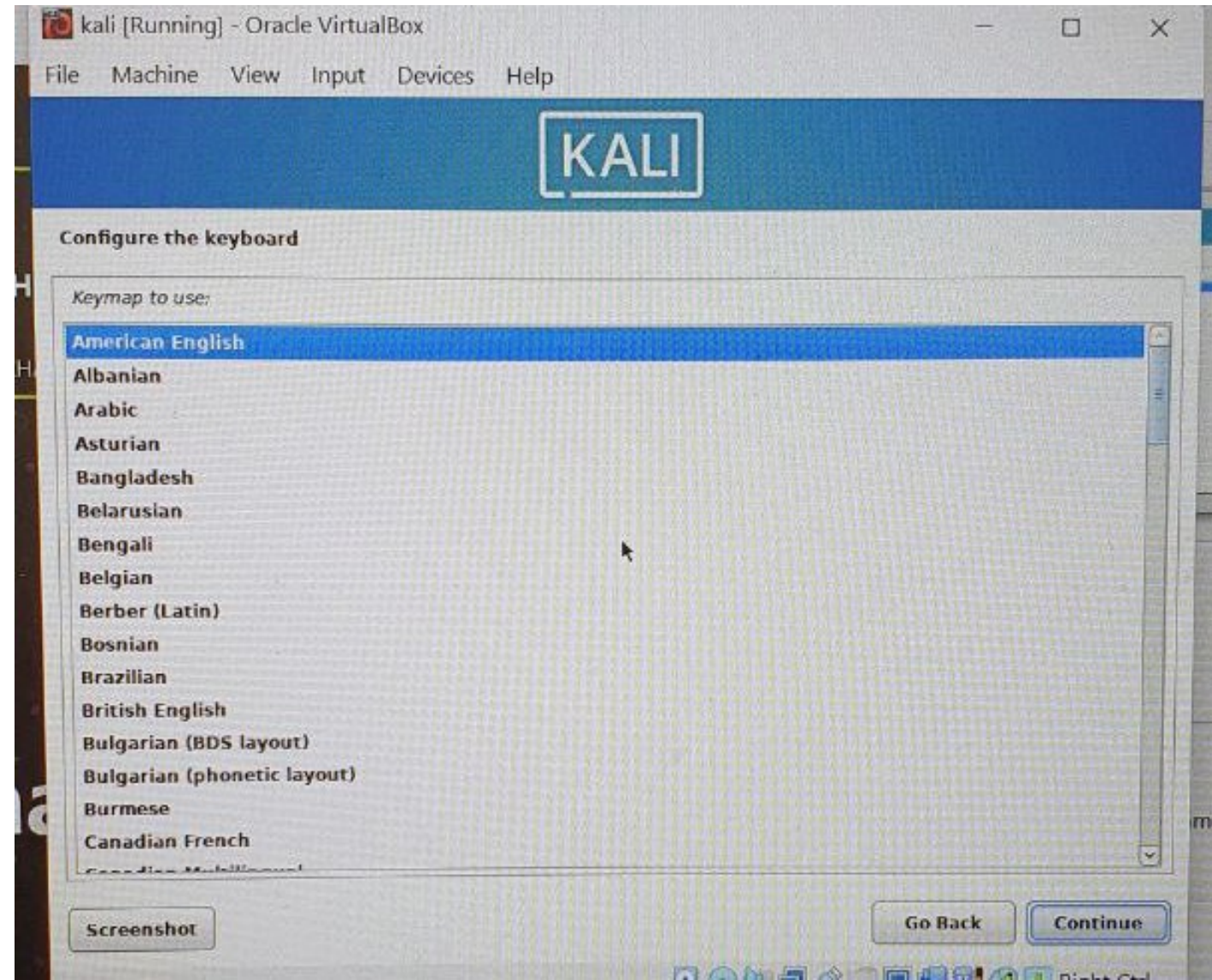
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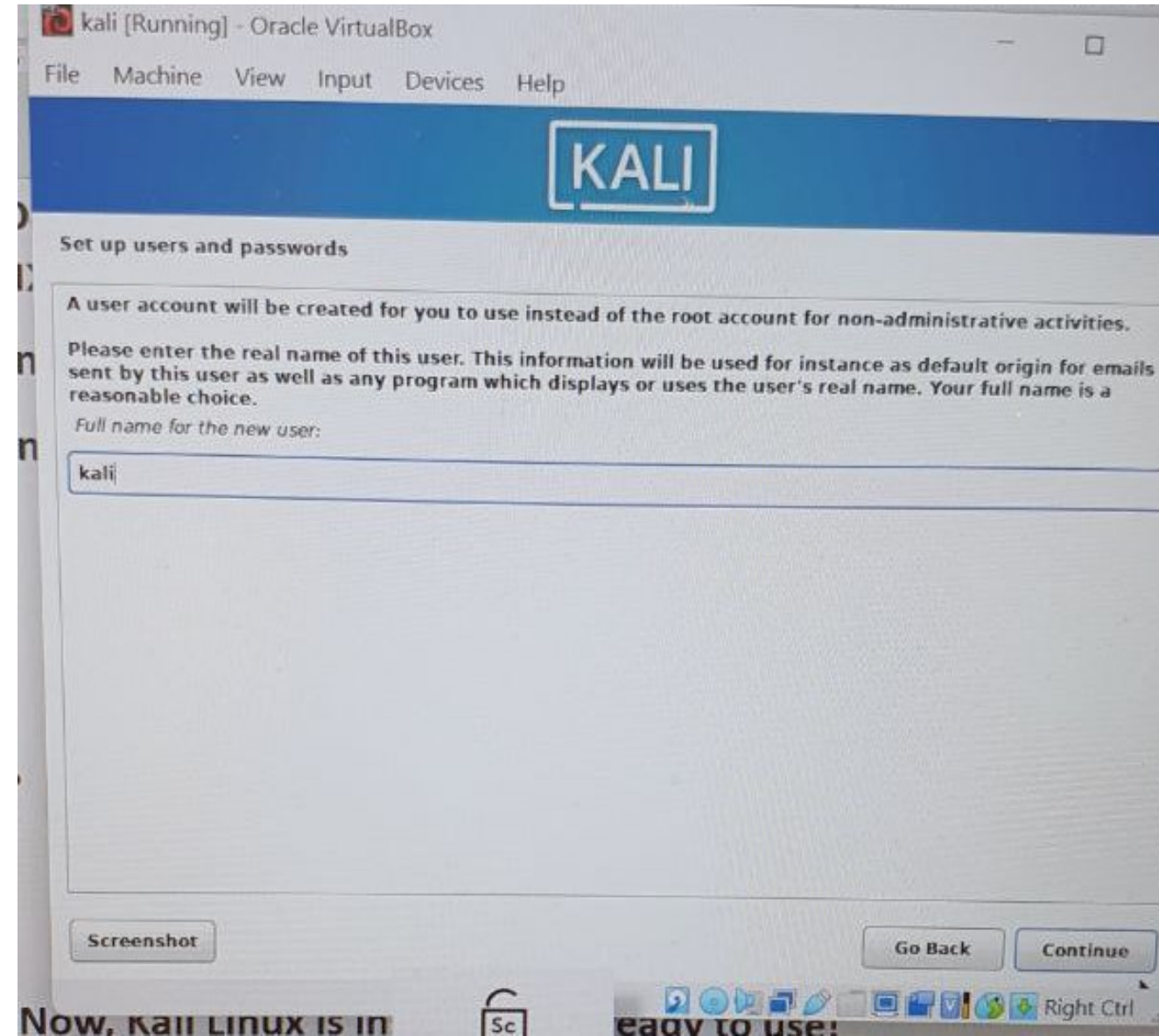
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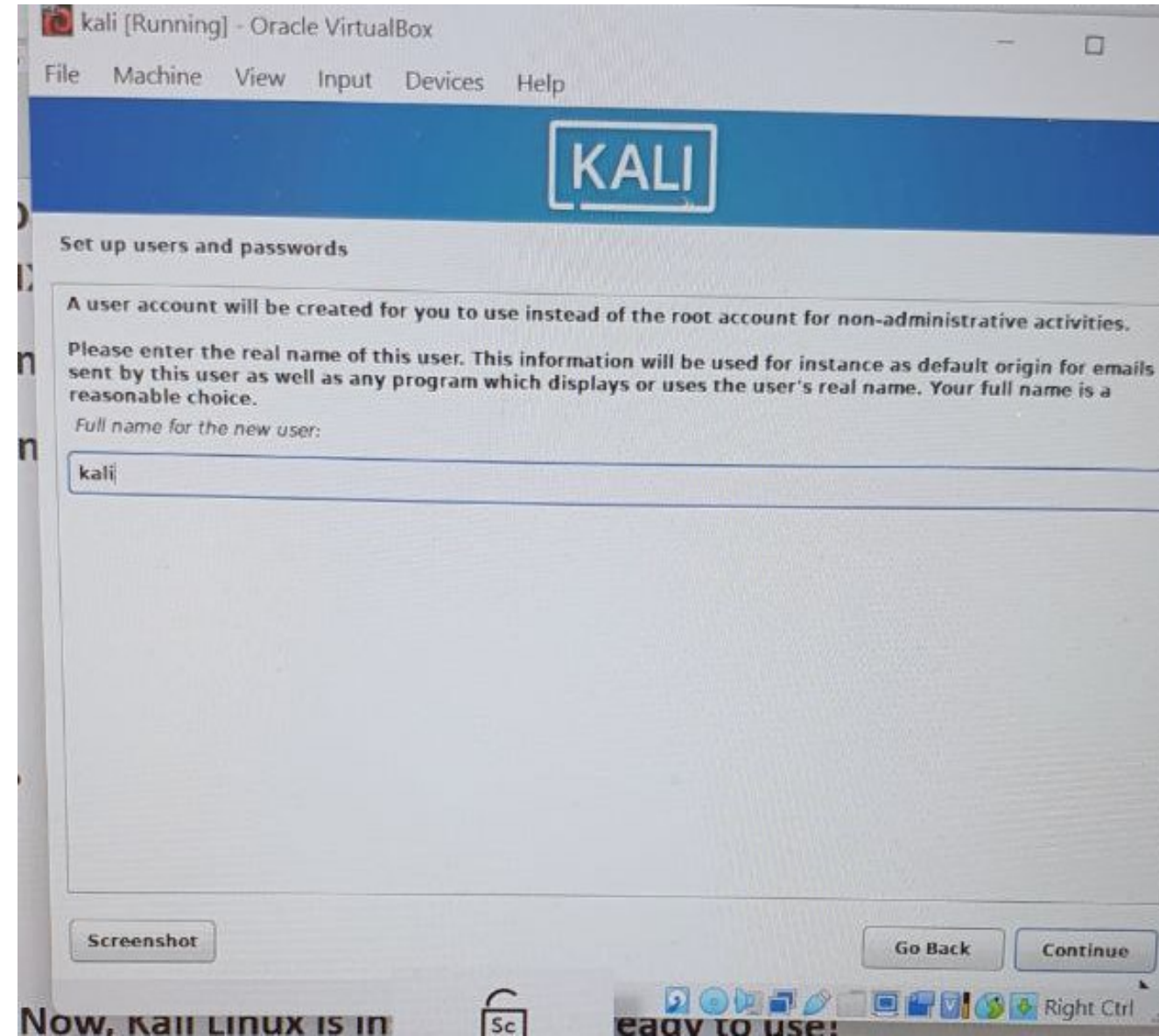
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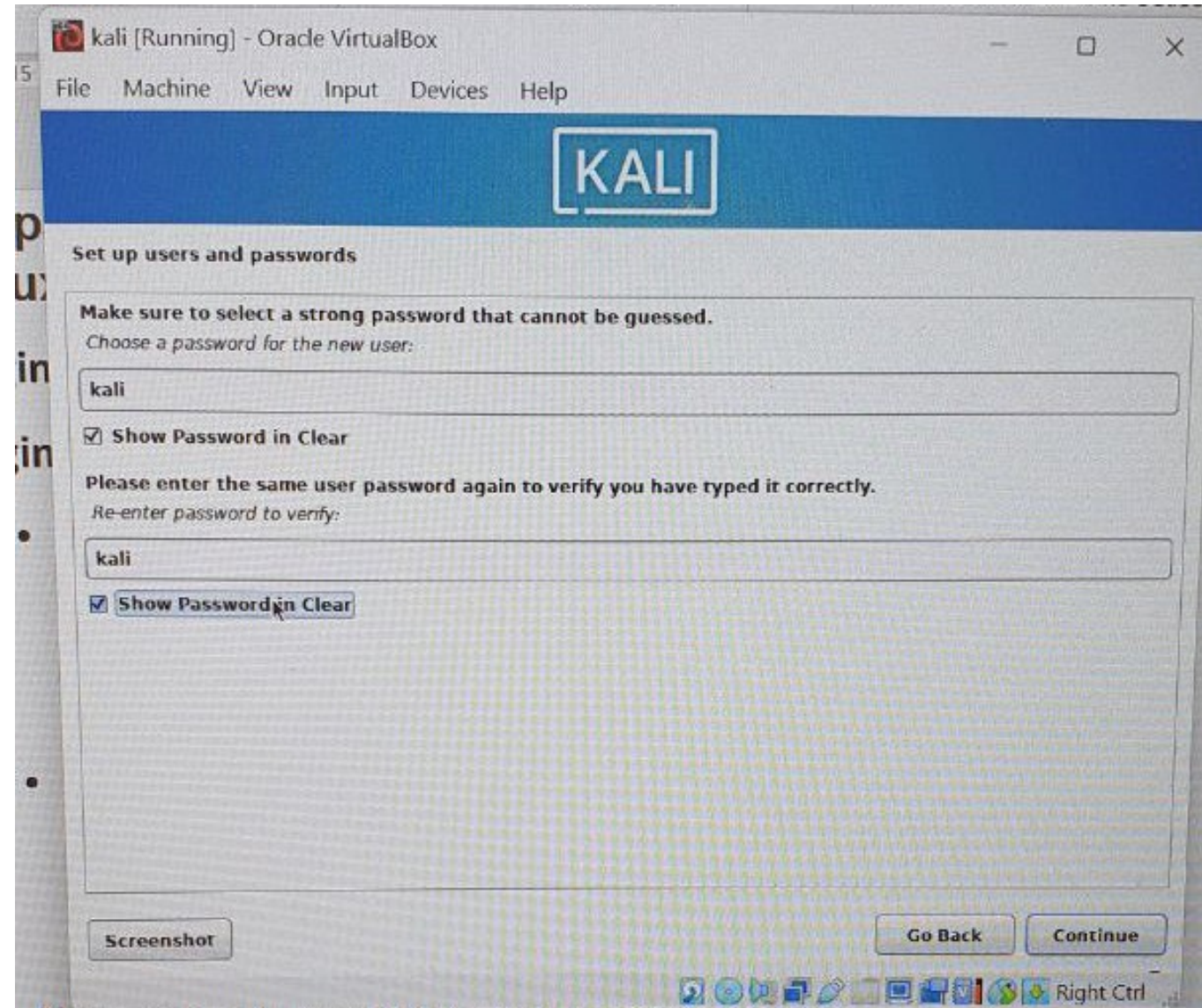
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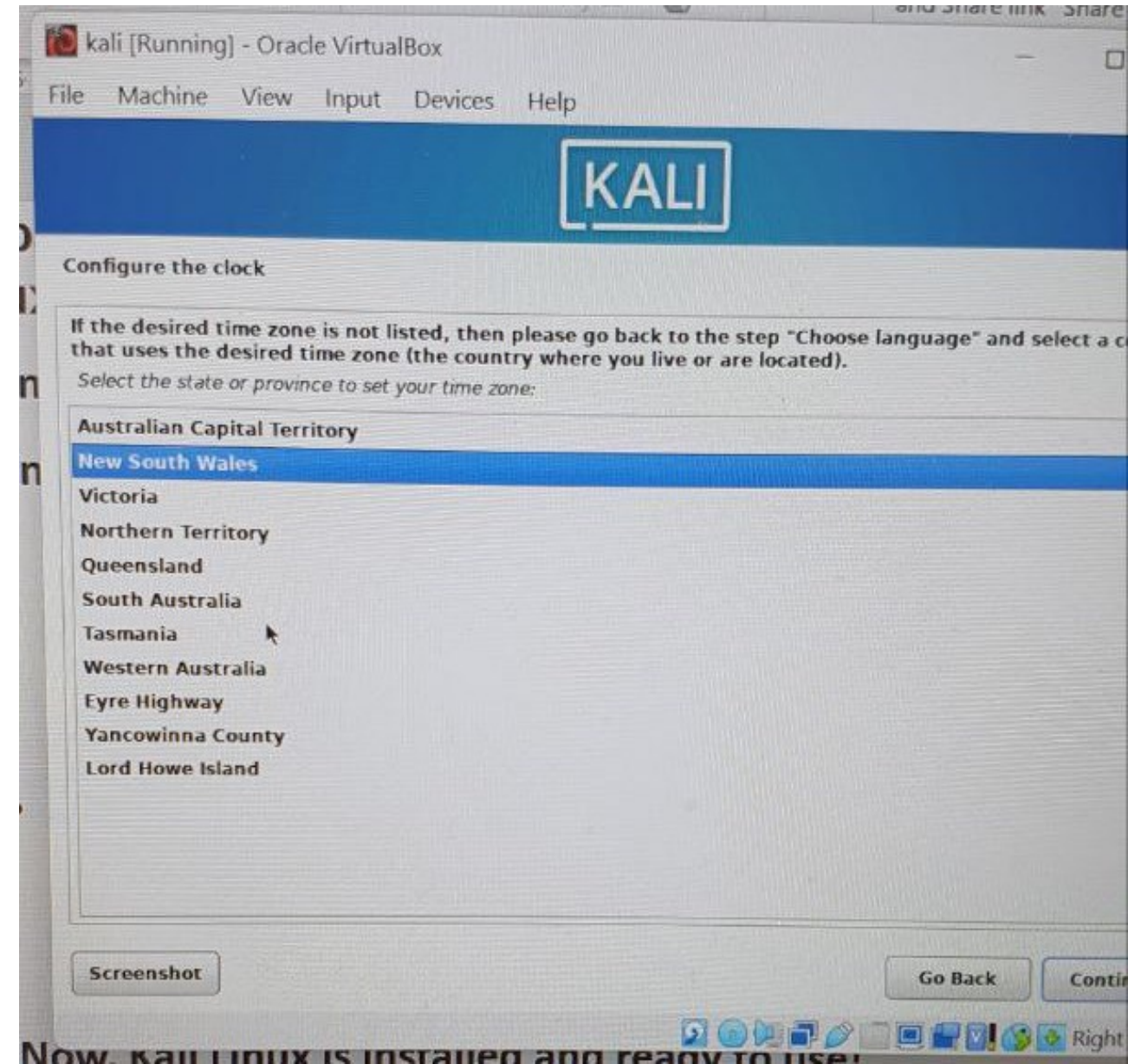
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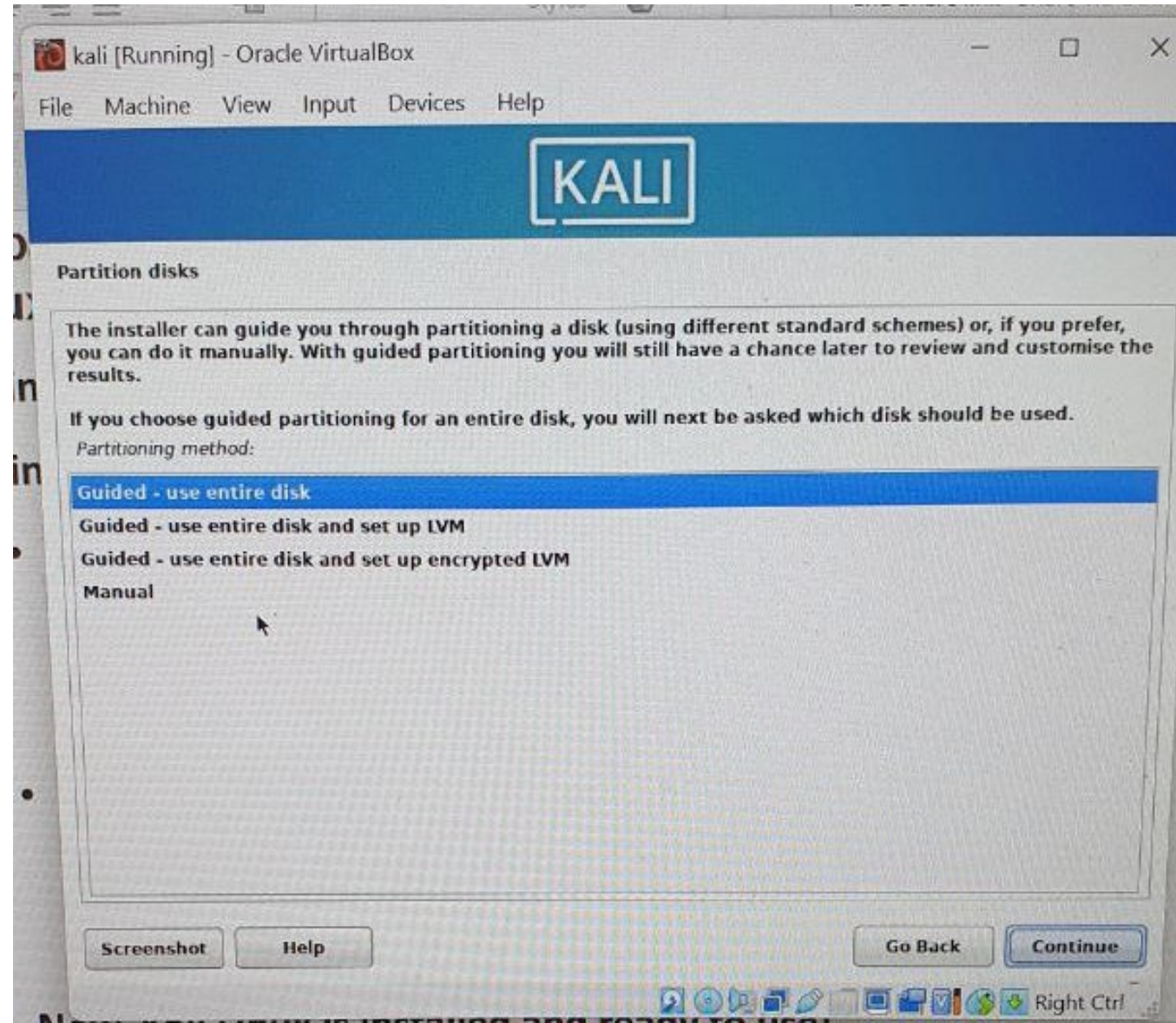
Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Proceed the steps, as explain or shown in the following



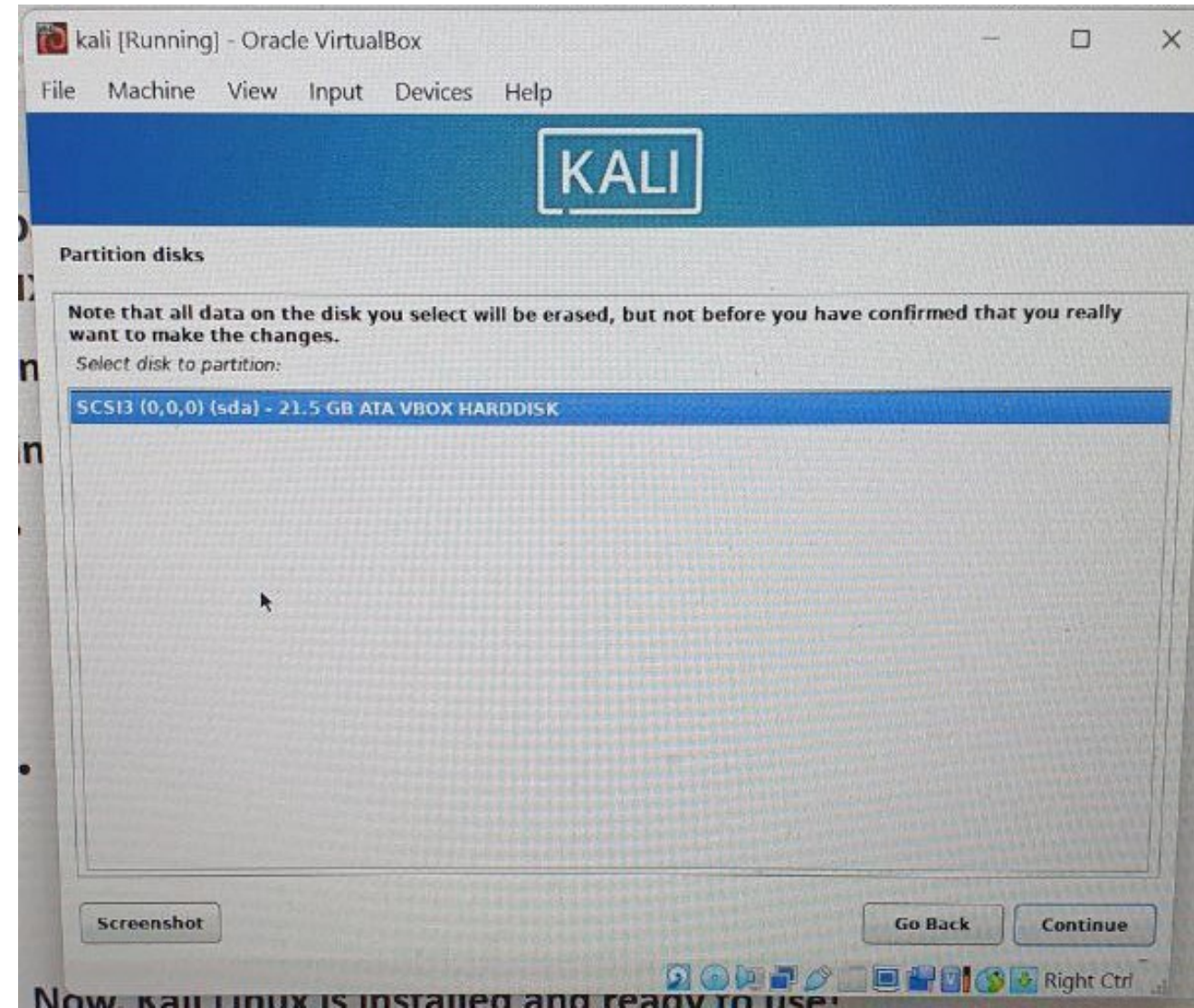
Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

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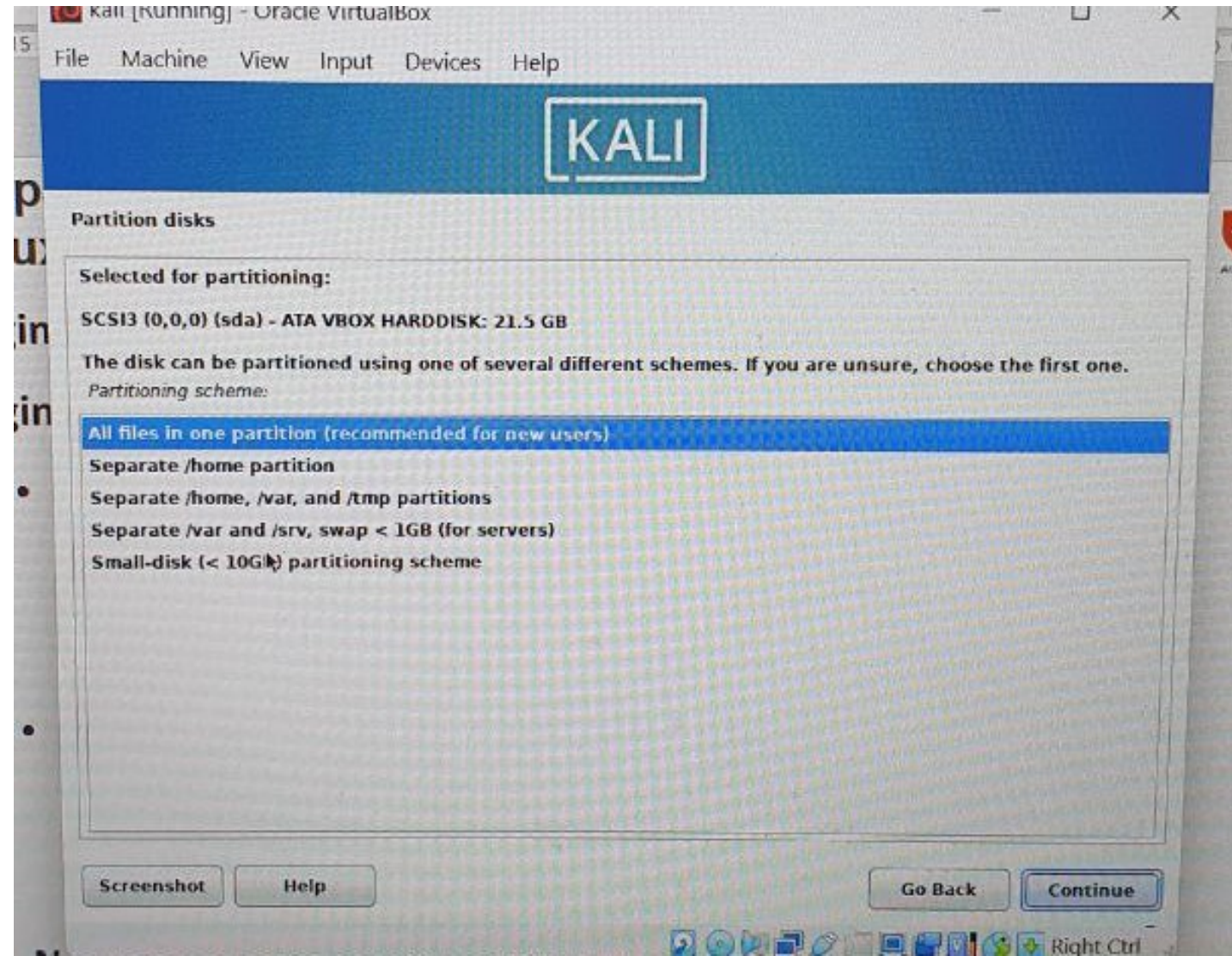
Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

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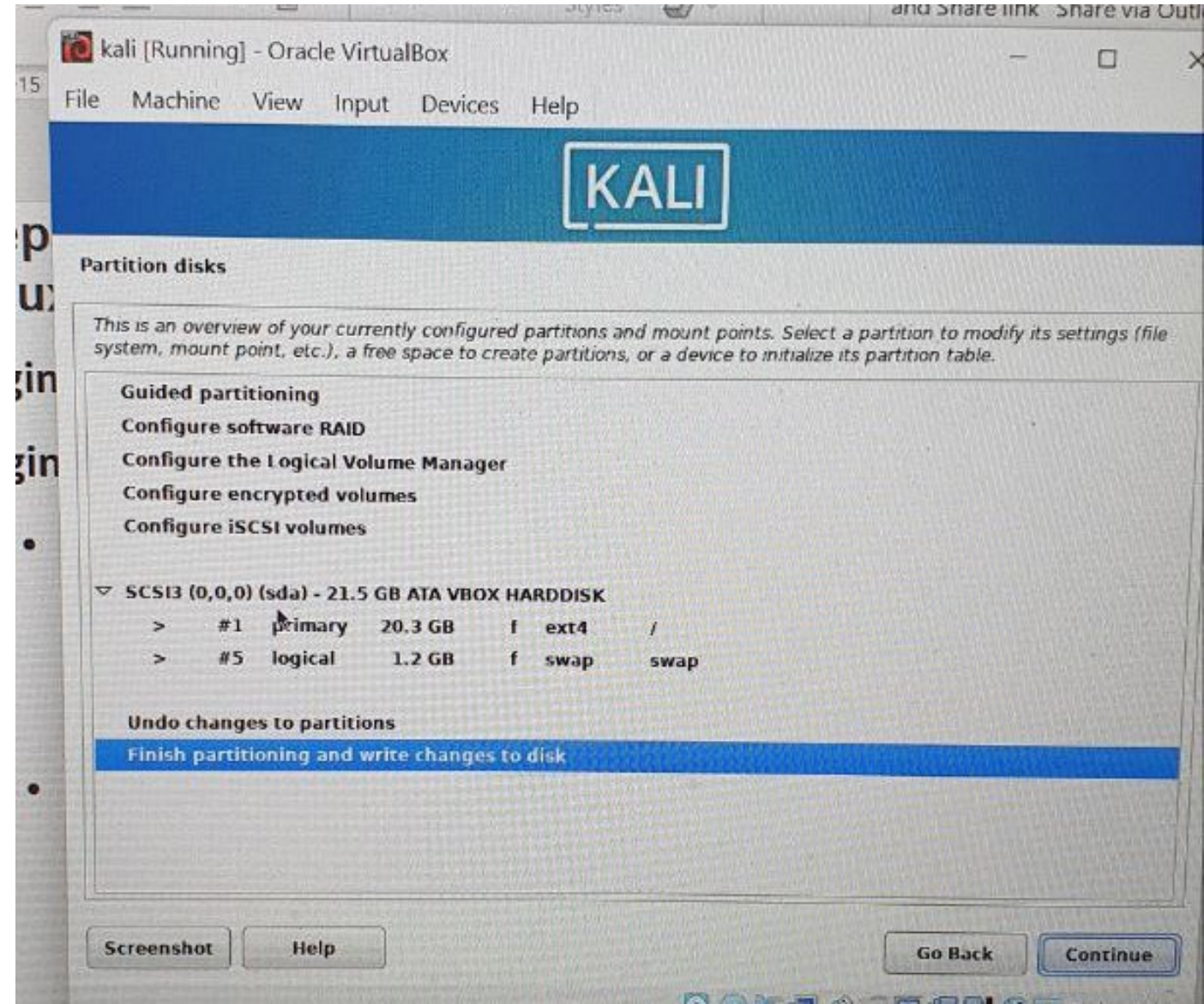
Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

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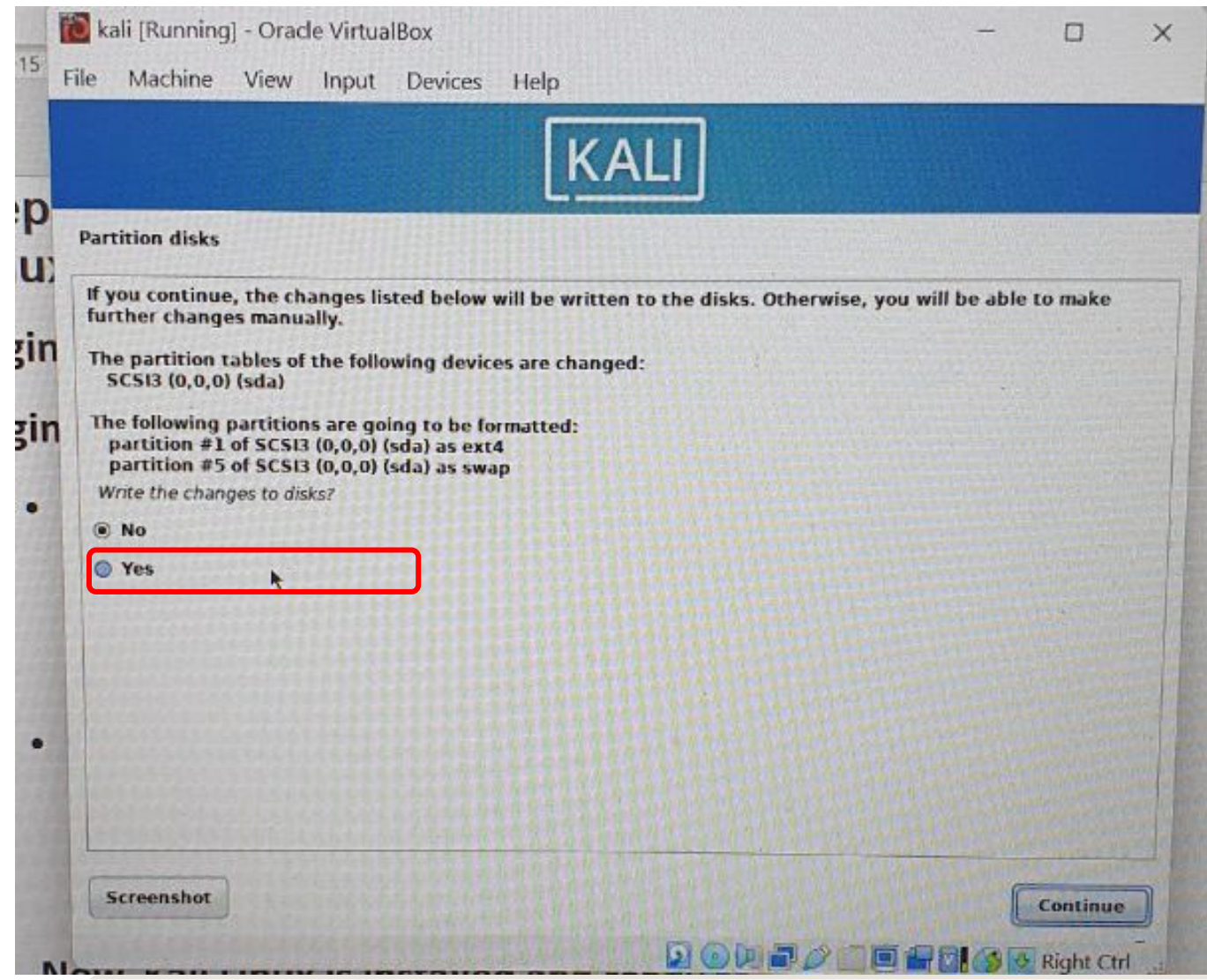
Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

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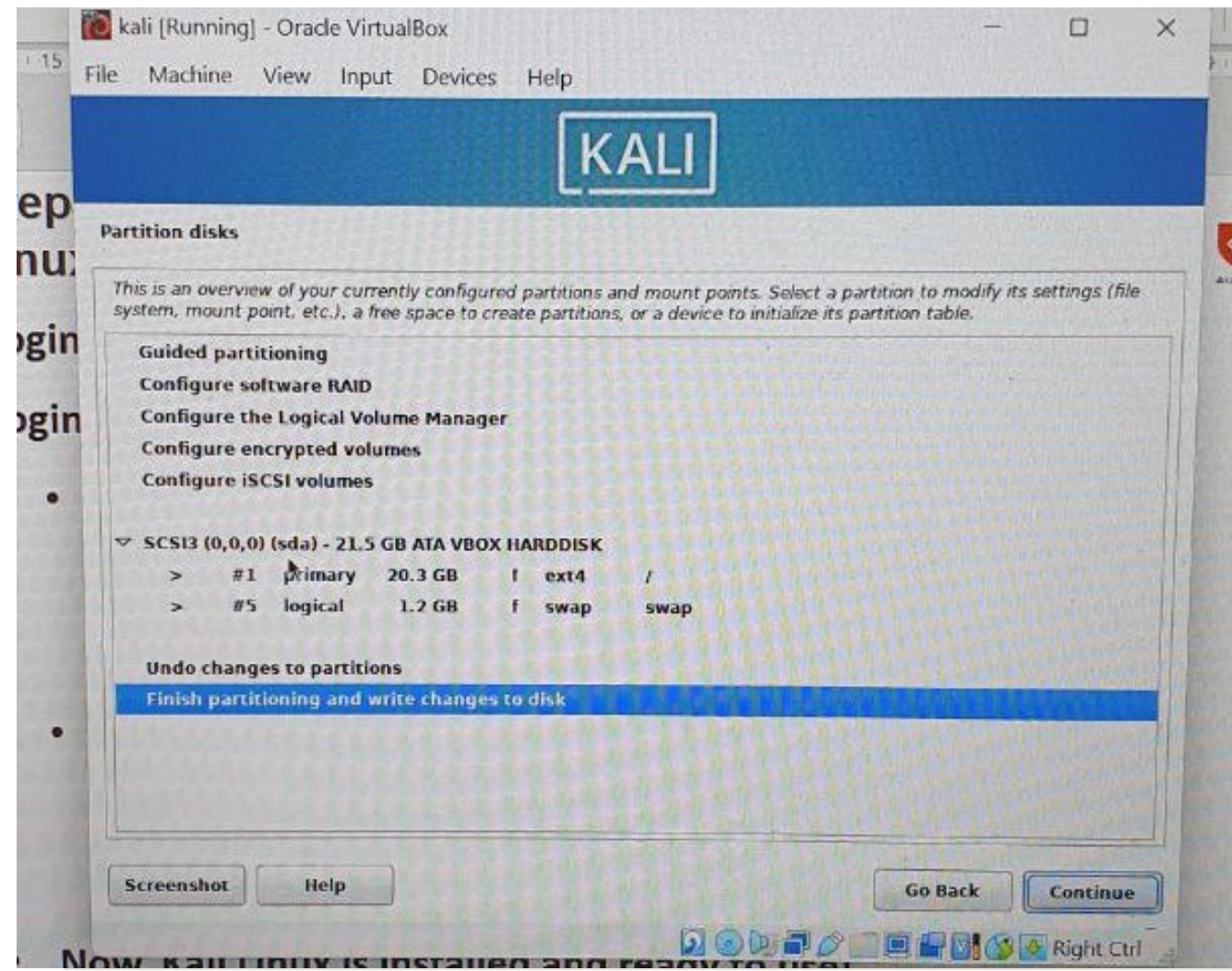
Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

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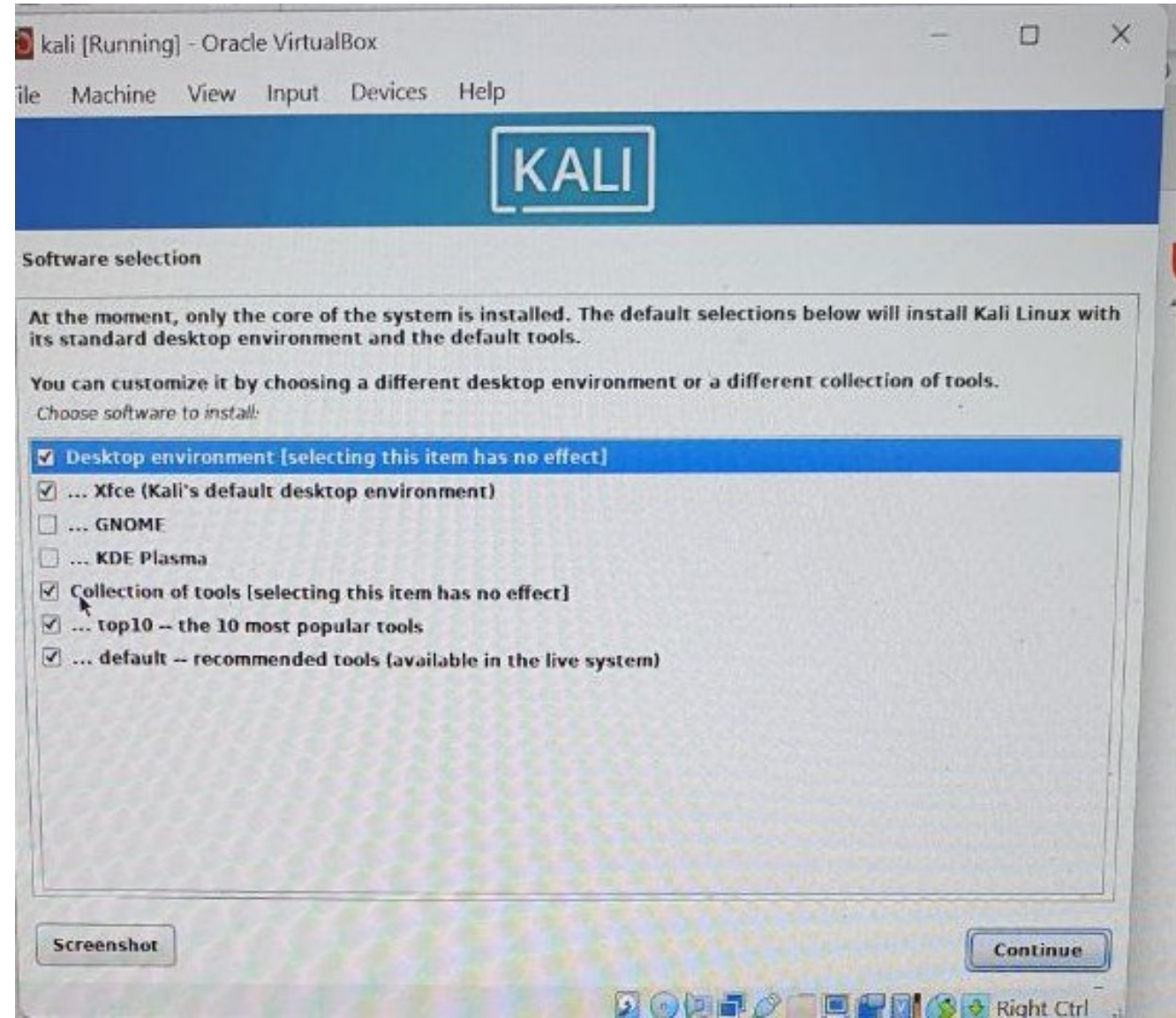
Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

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Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

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Complete Lab Tasks

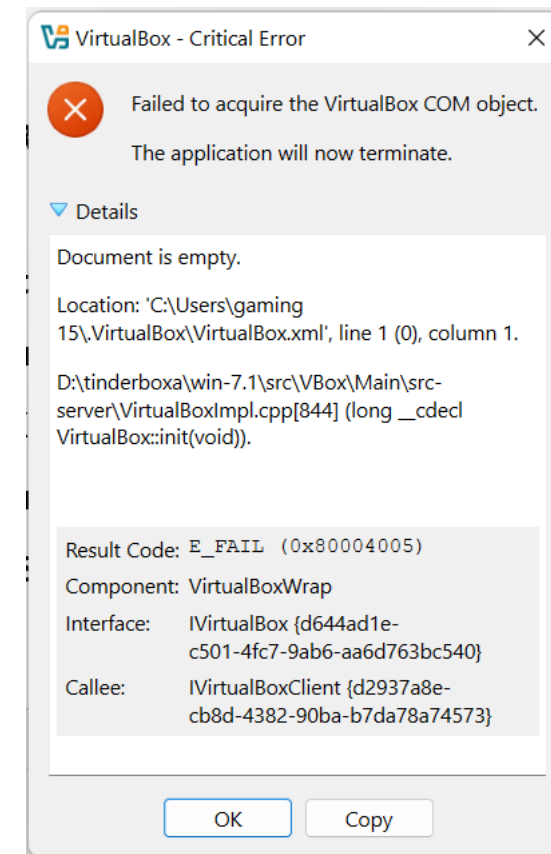
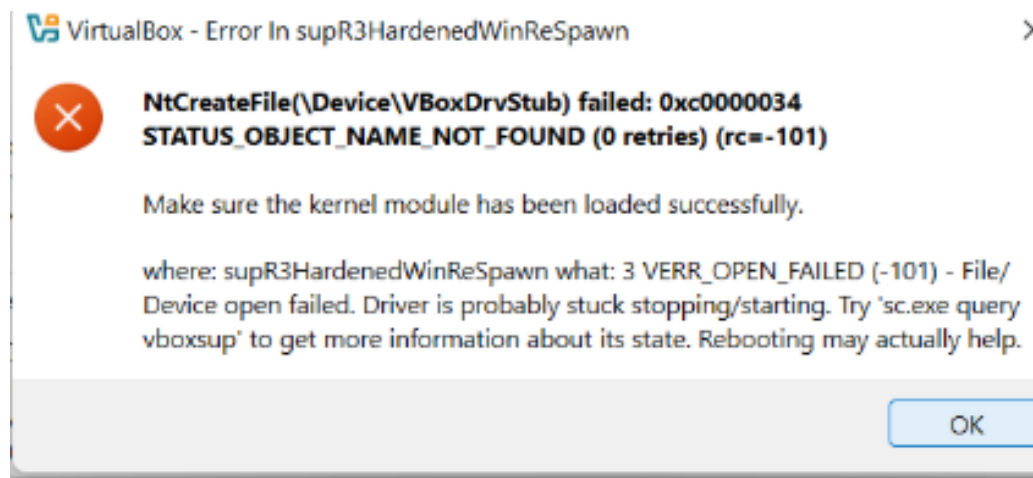
1. **Take a screenshot** of your Kali Linux desktop after a successful installation.
2. **List all problems** you encountered during this lab and provide **recommendations** to fix them.

Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

In case, if you saw an error like these:

Solution 1: Restart Your Computer

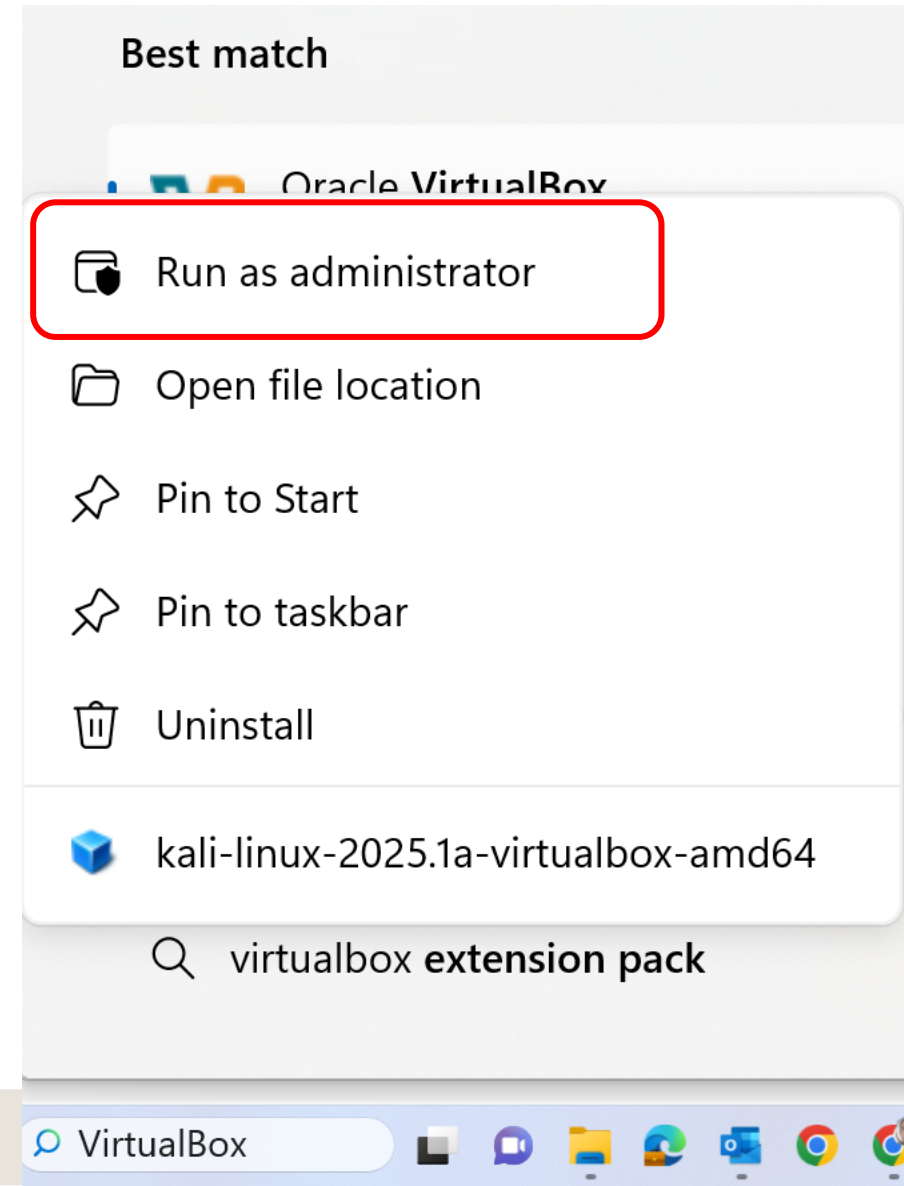
- **First, restart your computer** and try starting Kali Linux again.
- If the issue continues, move to **Solution 2**.



Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

Solution 2: Run VirtualBox as Administrator

1. **Close VirtualBox completely.**
2. **Right-click on the VirtualBox icon and select "Run as administrator".**
3. **Try starting Kali Linux again.**



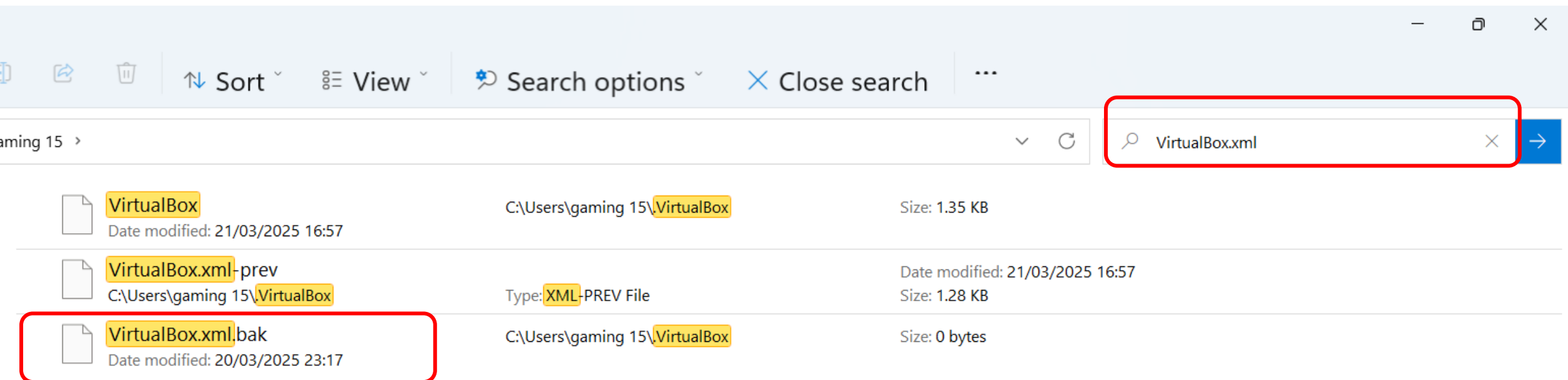
Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

Solution 3: Reinstall VritualBox Drivers and VirtualBox Program

Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

Solution 4:

- Find the **VirtualBox.xml** file in your File Explorer: C:\Users\...
- If the file is empty or corrupt, rename it to **VirtualBox.xml.bak**.
- **Restart VirtualBox** to let it generate a new configuration file.



Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

✓ Things to Remember:

- Follow the steps carefully.
- If you face errors, double-check your settings and ensure you downloaded the correct files.
- Take notes on issues and how you fixed them – this will help in troubleshooting future problems.
- **Final Tip:** Always back up important data before making significant changes to your system!

Summary of Lab 2 (Week 4)

- **Step 1: Install VirtualBox**
 - Download **Oracle VirtualBox**.
 - Install it on your **Windows** computer.
- **Step 2: Download Kali Linux**
 - We need the **right version** for VirtualBox.
 - There are **two ways** to do this:
 1. **Easier Method (Recommended):** Download the **Kali Linux VirtualBox Image** (.iso file).
 2. **Harder Method:** Download the **Kali Linux ISO** file and install it manually.

Summary of Lab 2 (Week 4)

- **Step 3: Import Kali Linux into VirtualBox**
 - If you downloaded the .ova file, just **import** it into VirtualBox.
 - If you downloaded the .iso file, you will **install Kali Linux manually** in VirtualBox.
- **Step 4: Start and Use Kali Linux**
 - Once installed, **start Kali Linux inside VirtualBox**.
 - Use Kali Linux to complete the lab tasks.

Summary of Lab 2 (Week 4)

- **Step 5: Complete Lab Questions**
 - Take a **screenshot** of Kali Linux running inside VirtualBox.
 - **List any problems** you faced and how you solved them.

Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

Summary of Lab 2 (Week 4)

This lab helps us:

- ✓ Understand **virtualization** and how to run different operating systems.
- ✓ Learn how to install and configure **VirtualBox** and **Kali Linux**.
- ✓ Prepare for **cybersecurity tasks** in a safe virtual environment.
- ✓ Use **Kali Linux tools** without affecting our main Windows system.

Summary of Lab 2 (Week 4)

Final Thought

Think of **Oracle VirtualBox** as a **TV** and **Kali Linux** as a **video game console**.

- **VirtualBox (TV)** is the platform that runs different operating systems.
- **Kali Linux (Game Console)** is the system we use inside VirtualBox to practice cybersecurity

Submission of Labs & Assessments

- These guidelines are designed to **support your learning** and help you apply necessary techniques effectively. For **lab or assessment submissions**, please follow instructions and complete tasks based on **Canvas**. If you have any questions, feel free to ask—I'm happy to help!

Thank You

- *Have a Great Learning Day!*
- Feel free to reach out with any questions!
- Dr. Farshid Keivanian