

STUDY GUIDE FOR MODULE NO. LAB M02**Raspberry Pi Operating System****MODULE OVERVIEW**

The Raspberry Pi is a series of small, affordable single-board computers developed by the Raspberry Pi Foundation, a UK-based charity organization. These credit-card-sized computers are designed to promote computer science education, DIY projects, and experimentation in the field of embedded computing.

**MODULE LEARNING OUTCOMES**

By the end of this module, participants should be able to install and use any of the following Raspberry Pi operating systems:

1. Raspberry Pi OS (formerly Raspbian):
 - a. Raspberry Pi OS is the official operating system for the Raspberry Pi.
 - b. It is based on Debian and optimized for the Raspberry Pi hardware.
 - c. It comes with a desktop environment and a wide range of pre-installed software.
2. Ubuntu Server:
 - a. Ubuntu Server is a lightweight version of the Ubuntu operating system designed for server use.
 - b. There's an official version of Ubuntu Server for Raspberry Pi that you can install.
3. Arch Linux ARM:
 - a. Arch Linux ARM is a lightweight and flexible Linux distribution.
 - b. It follows a rolling release model, providing the latest software updates.
4. Kali Linux:
 - a. Kali Linux is a popular distribution for penetration testing and ethical hacking.
 - b. It comes with various tools for security testing and forensics.
5. DietPi:
 - a. DietPi is a minimalistic distribution that aims to be lightweight and optimized for performance.
 - b. It is designed to be efficient and resource-friendly.
6. RetroPie:
 - a. If you are interested in turning your Raspberry Pi into a retro gaming console, RetroPie is a great option.
 - b. It supports a wide range of classic gaming consoles.
7. Windows 10 IoT Core:
 - a. Windows 10 IoT Core is a version of Windows 10 designed for small, low-cost devices like the Raspberry Pi.
 - b. It is suitable for IoT (Internet of Things) projects.
8. RISC OS:
 - a. RISC OS is a unique operating system designed specifically for ARM architecture, including the one used in Raspberry Pi.

**LEARNING CONTENT (RPi Operating System Installation)**

To install an operating system on your Raspberry Pi, you typically use a microSD card. Each operating system may have slightly different installation procedures, so be sure to follow the instructions provided by the respective OS documentation.

Before choosing an operating system, consider your project requirements, your familiarity with the operating system, and the level of community support available for troubleshooting and development.

To install an operating system on a Raspberry Pi, you'll typically use a microSD card as the storage medium. Here are general steps to install the operating system:



Prerequisites:

1. MicroSD Card:
 - a. Ensure you have a microSD card with sufficient capacity. A minimum of 8GB is recommended.
 - b. It's recommended to use a good-quality and fast microSD card for better performance.
2. Computer:
 - a. You'll need a computer with a microSD card slot or a USB adapter to connect the microSD card.

Steps:

1. Download the Operating System:
 - a. Visit the official Raspberry Pi website or the website of the specific operating system you want to install.
 - b. Download the image file of the operating system.
2. Download and Install Etcher:
 - a. Download and install a tool called Etcher, which is a free and open-source software used for writing images to SD cards and USB drives.
 - b. You can find Etcher at <https://www.balena.io/etcher/>.
3. Insert the MicroSD Card:
 - a. Insert the microSD card into your computer using the built-in slot or a USB adapter.
4. Open Etcher:
 - a. Launch Etcher on your computer.
5. Select Image:
 - a. Click on the "Flash from file" button in Etcher and select the downloaded operating system image file.
6. Select Target:
 - a. Click on the "Select target" button and choose your microSD card.
7. Flash the Image:
 - a. Click on the "Flash!" button to start the process. Etcher will write the operating system image to the microSD card.
8. Wait for Completion:
 - a. The process may take some time. Once completed, Etcher will verify the integrity of the write.
9. Eject the MicroSD Card:
 - a. Safely eject the microSD card from your computer.
10. Insert the MicroSD Card into Raspberry Pi:
 - a. Insert the microSD card into the microSD card slot on your Raspberry Pi.
11. Power Up the Raspberry Pi:
 - a. Connect the necessary peripherals (keyboard, mouse, monitor) and power up your Raspberry Pi using a suitable power supply.
12. Follow Initial Setup:
 - a. Follow any on-screen instructions to complete the initial setup of the operating system on your Raspberry Pi.

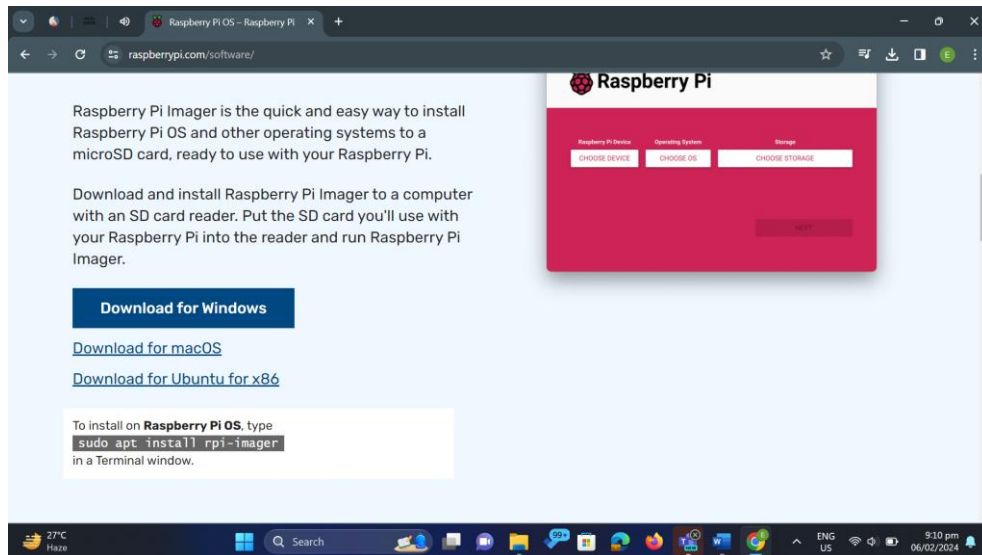
The specific steps might vary slightly depending on the operating system you choose, so it's always a good idea to check the official documentation for the OS for any additional instructions.



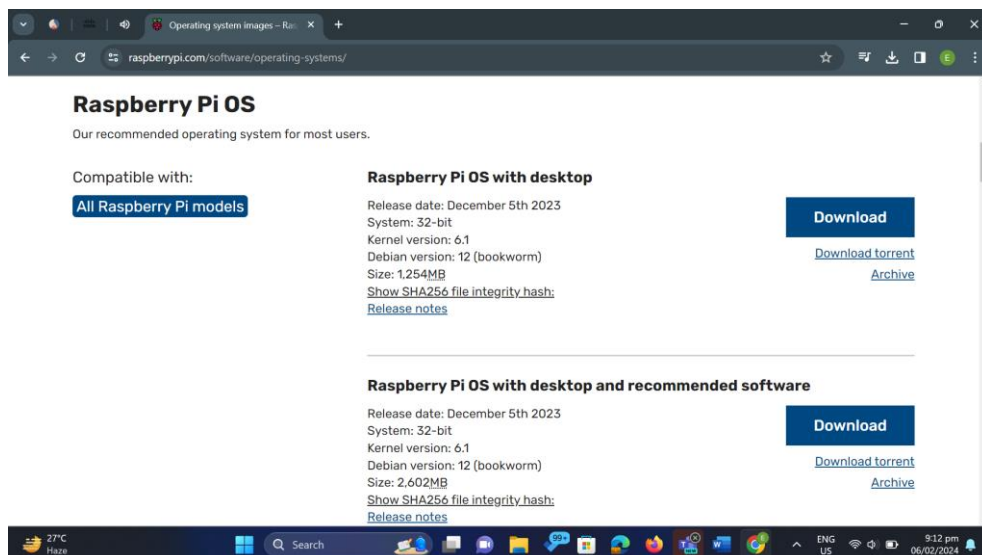
LEARNING ACTIVITY 1

Name: Cerujano, Erman Ace M.Due date: February 12, 2024

STEP 1: Install the Raspberry Pi Imager. (Link: <https://www.raspberrypi.com/software/>). Select your preferred operating system.



STEP 2: Install the Raspberry Pi ISO. (Link: <https://www.raspberrypi.com/software/operating-systems/>). Select the OS that supports your device (Raspberry Pi).

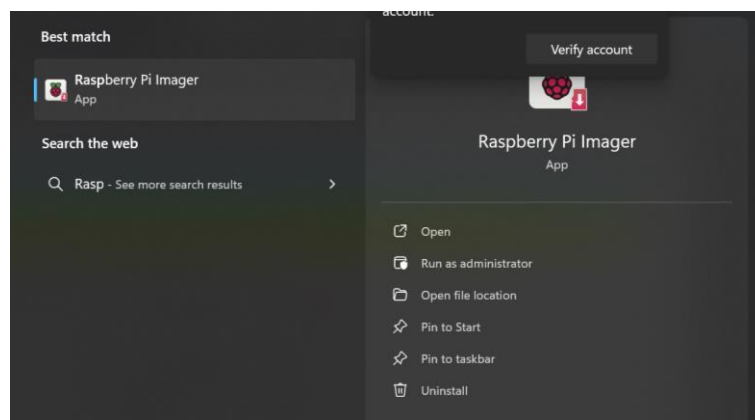


STEP 3: Use the Raspberry Pi Imager to boot your sd card.
a. Insert your SD card into your computer.

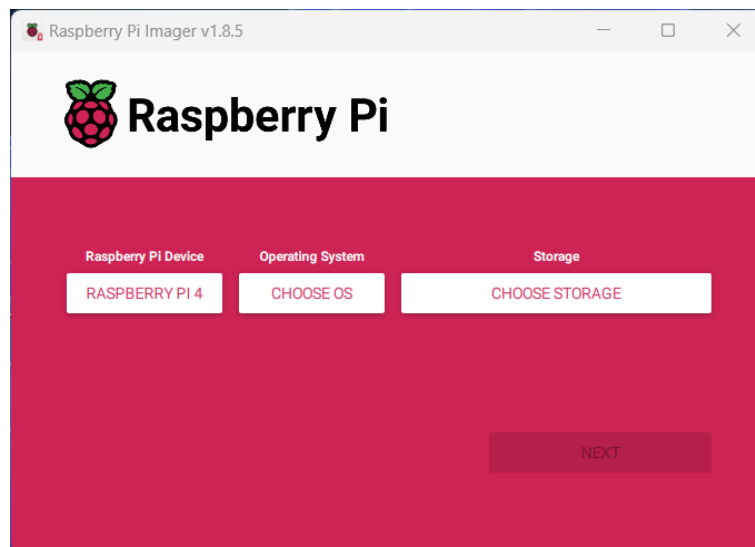


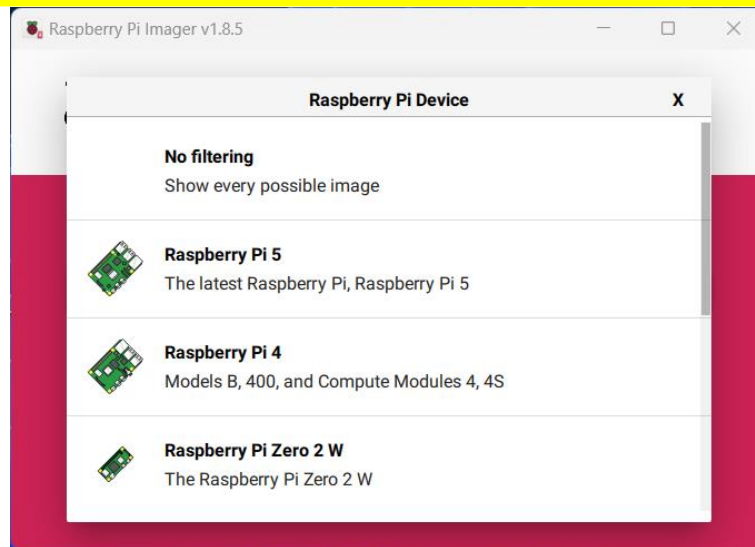


b. Open the Raspberry Pi Imager.

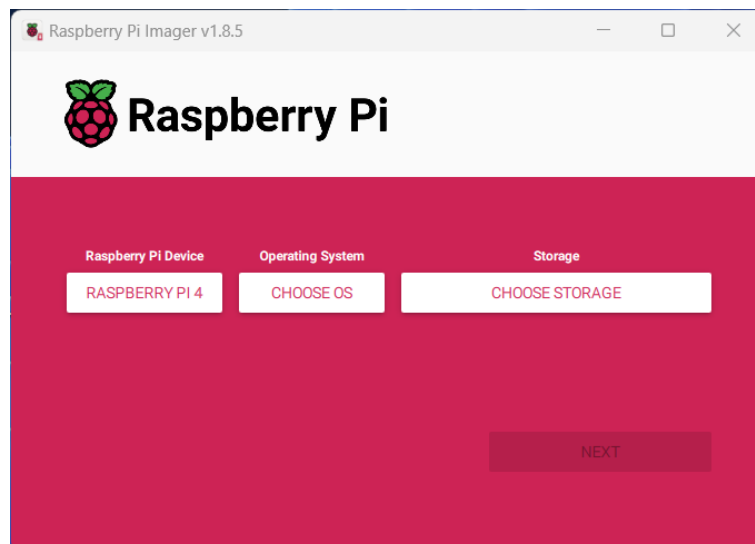


c. Select your Raspberry Pi Device

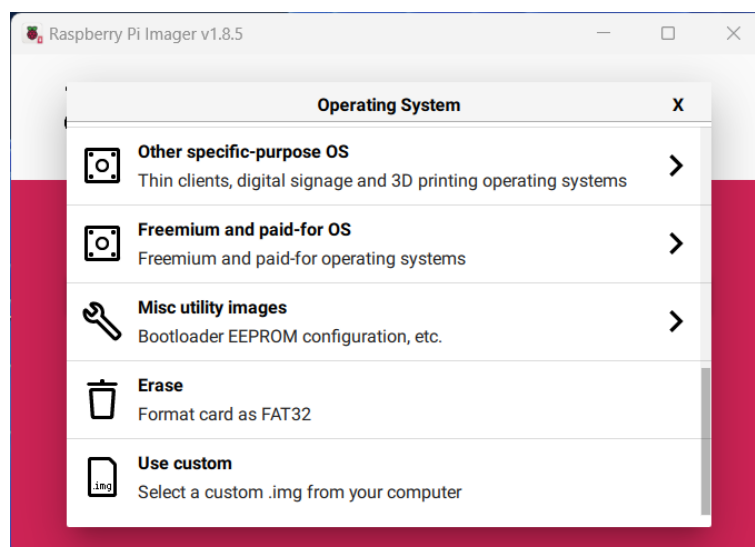




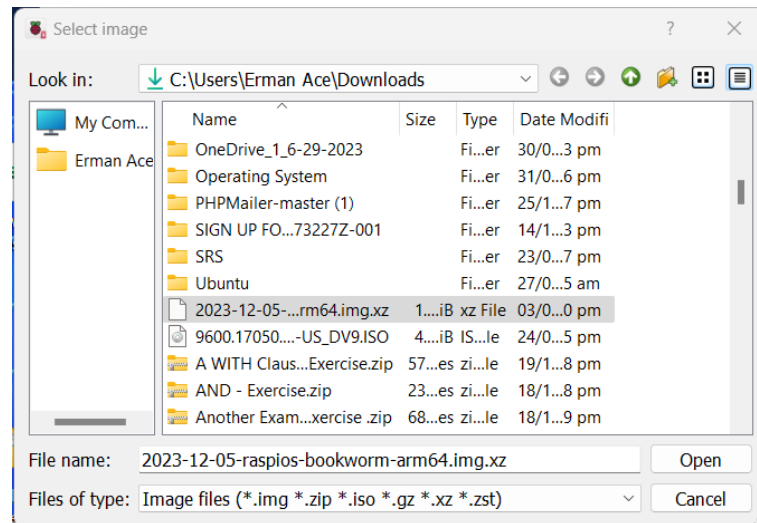
d. Select your Operating System.



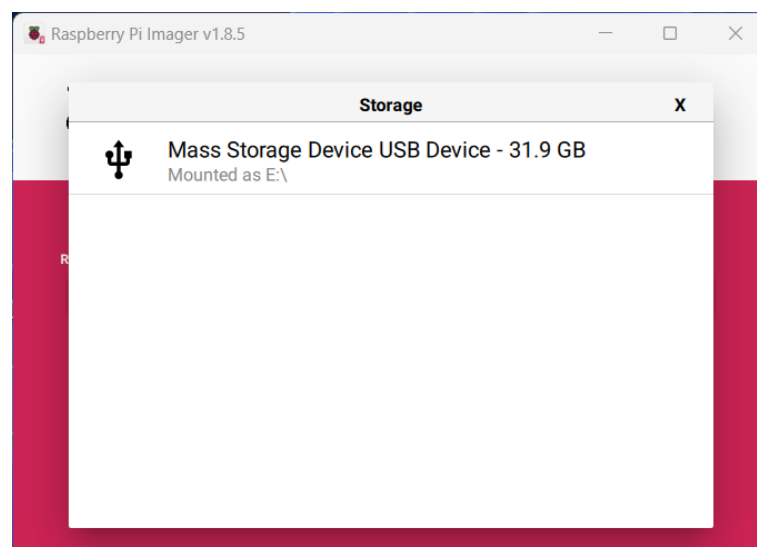
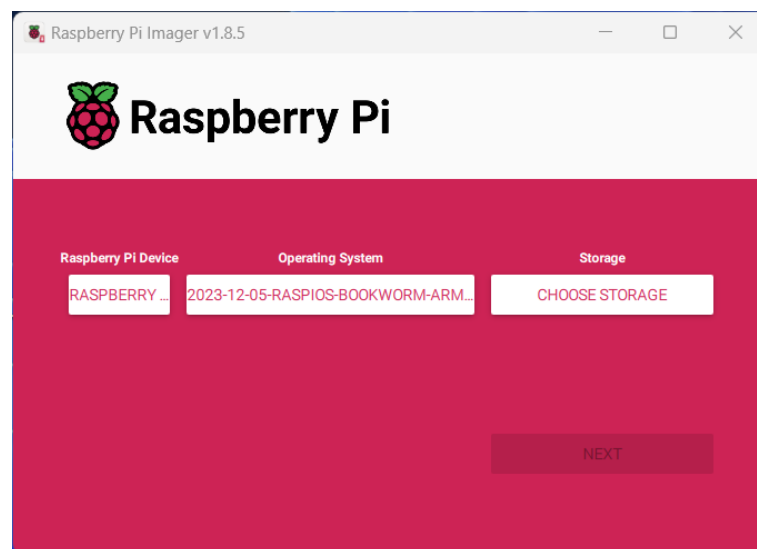
e. Then click the “Use Custom.”



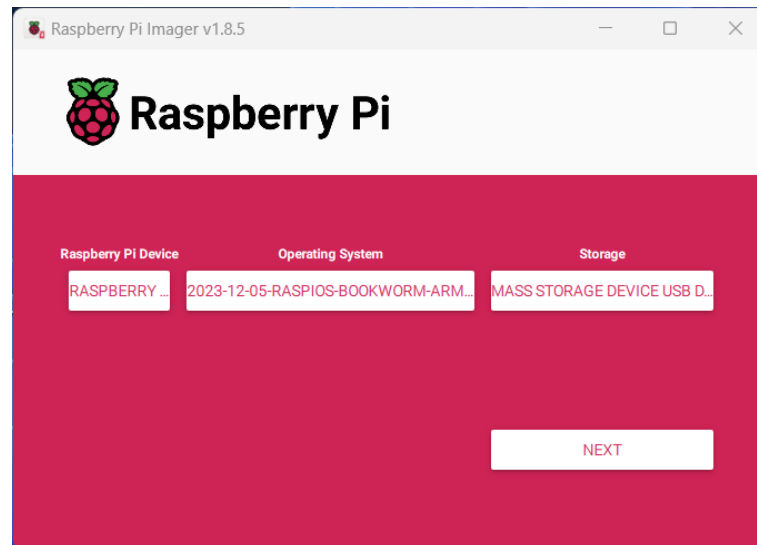
- f. Select Raspberry Pi image that you install. (Use the operating system that you install in your STEP 2.)



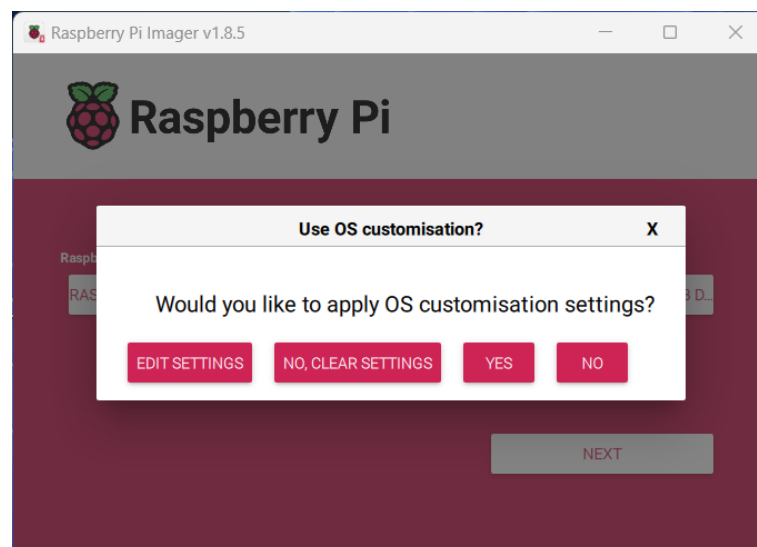
- g. Select your storage to be boot.



h. Click Next.



i. Select "Edit Settings"



j. Configure some of information that you want to change then select save.

OS Customisation

GENERAL SERVICES OPTIONS

☒ Set hostname: erman09.local

☒ Set username and password

Username: erman

Password:

☒ Configure wireless LAN

SSID: WIFI11111

Password:

☐ Show password ☐ Hidden SSID

Wireless LAN country: GB

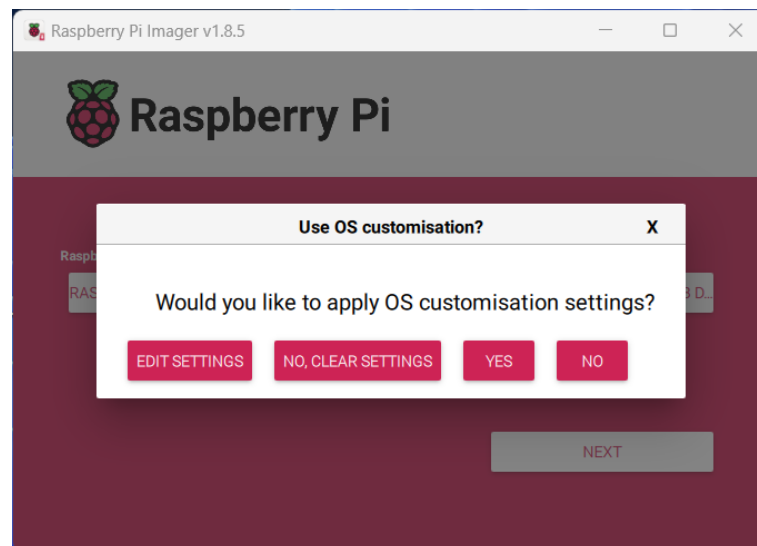
☐ Set locale settings

Time zone: Asia/Manila

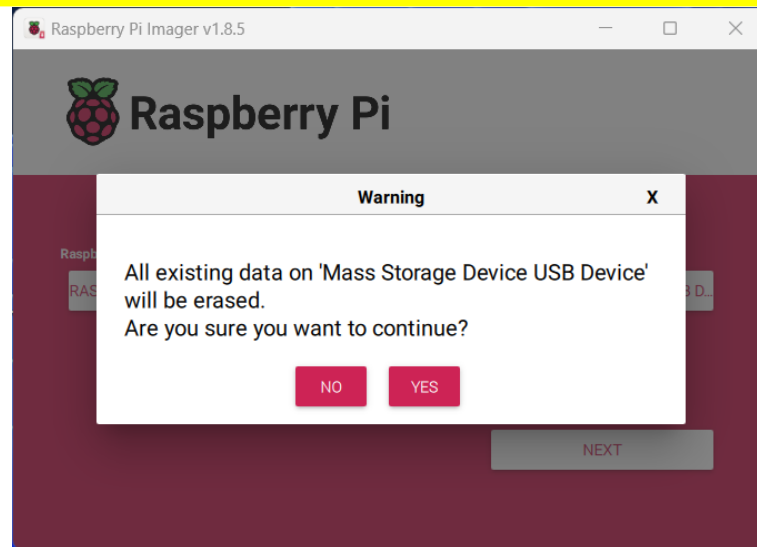
Keyboard layout: us

SAVE

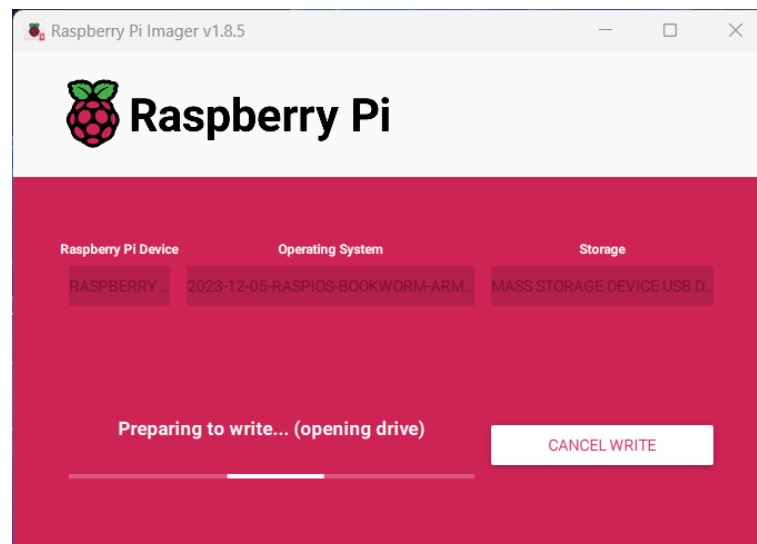
k. Then select "YES"



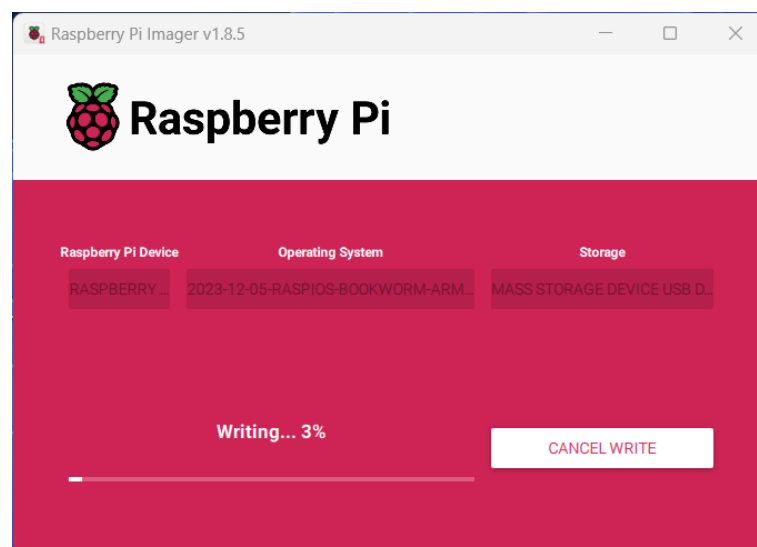
l. Click "Yes." This will format your SD card and make it bootable device.

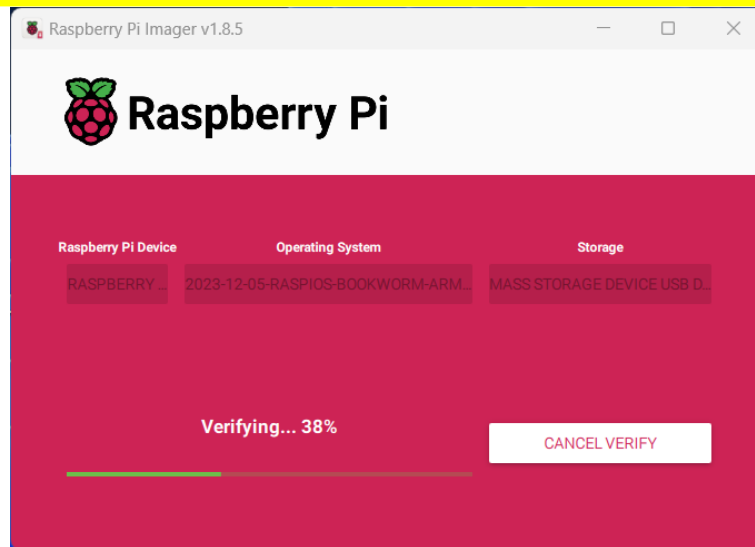


m. Wait for it to write.

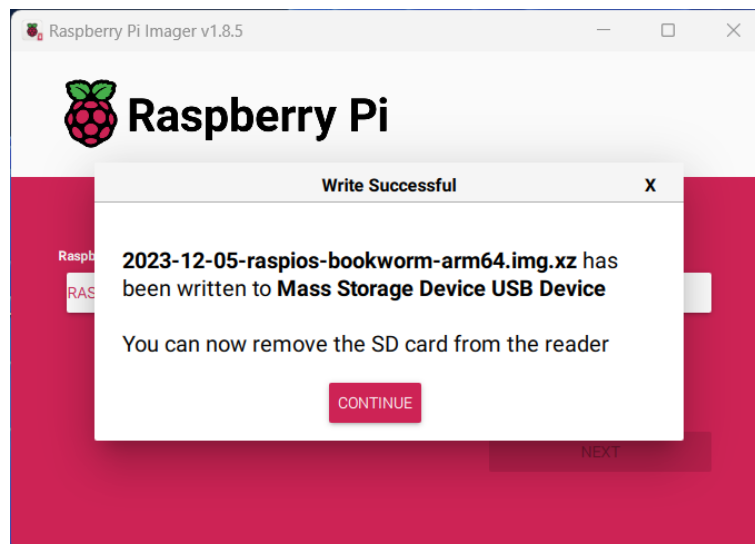


n. Then wait for a couple of minutes.





- o. You now successfully write your Raspberry Pi OS then click “Continue.”



STEP 4: Remove your SD Card into your computer. Prepare your Raspberry Pi and insert the SD card.



STEP 5: Power on your Raspberry Pi then it will start booting.



STEP 6: Wait for it to boot.



STEP 7: You now successfully install Raspberry Pi OS into your Raspberry Pi Device.



SUMMARY / CONCLUSION

In conclusion, the Raspberry Pi operating system, combined with the Raspberry Pi hardware, presents an unparalleled opportunity for individuals to delve into the world of computing and electronics. With its user-friendly interface and extensive documentation, setting up the Raspberry Pi OS becomes an accessible endeavor even for beginners. The abundance of available distributions, including Raspbian, Ubuntu, and others, ensures that users can tailor their Raspberry Pi experience to suit their specific needs and preferences.

Furthermore, the process of installing the Raspberry Pi operating system is straightforward and well-supported, thanks to a robust community and official resources provided by the Raspberry Pi Foundation. Whether installing via NOOBS (New Out Of Box Software) or flashing an image directly onto an SD card, users are guided through the steps with clear instructions and troubleshooting resources readily available. This simplicity, coupled with the affordability of Raspberry Pi hardware, democratizes access to computing resources and empowers individuals from diverse backgrounds to engage with technology in meaningful ways.

Overall, the combination of the Raspberry Pi operating system and the installation process epitomizes the ethos of accessibility and empowerment that lies at the heart of the Raspberry Pi project. By lowering barriers to entry and providing a platform for experimentation and innovation, Raspberry Pi fosters a community of learners, makers, and inventors eager to explore the boundless possibilities of computing. As the Raspberry Pi ecosystem continues to evolve and expand, its impact on education, DIY projects, and beyond is poised to grow, shaping the future of technology enthusiasts worldwide.

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- Instructables. (2017, September 24). *HOW TO INSTALL RASPBIAN OS IN YOUR RASPBERRY PI*. Instructables. <https://www.instructables.com/HOW-TO-INSTALL-RASPBIAN-OS-IN-YOUR-RASPBERRY-PI/>
- KI, A. (2023, December 12). *Step-by-Step guide to install Raspberry Pi OS on a Raspberry Pi single board computer!* The Sec Master. <https://thesecmaster.com/step-by-step-guide-to-install-raspberry-pi-os-on-a-raspberry-pi-single-board-computer/>



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