



دانشگاه صنعتی امیرکبیر



# آزمایشگاه سیستم عامل

جلسه اول: آشنایی با لینوکس

مدرس: مینا یوسف نژاد

|  |                              |
|--|------------------------------|
| پیش گزارش‌های تحویل داده‌شده                       | مجموع آزمایش‌ها حدود ۱۰ درصد |
| نمره پرسش‌های شفاهی/کتبی قبل از شروع هر آزمایش     | مجموع آزمایش‌ها حدود ۱۵ درصد |
| انجام کامل هر آزمایش                               | مجموع آزمایش‌ها حدود ۳۰ درصد |
| کیفیت انجام هر آزمایش و پیاده‌سازی آن              | مجموع آزمایش‌ها حدود ۳۰ درصد |
| حضور فعال، مؤثر در گروه همکاری با مدرس (کار کلاسی) | حدود ۱۵ درصد                 |
| موارد دیگر (با صلاحدید مدرس آزمایشگاه)             | به انتخاب مدرس آزمایشگاه     |



# نقشه راه

برنامه نویسی ماژول های  
هسته

و آشنایی با ساختمانهای  
داده در هسته

آشنایی لینوکس

۱

۳

۵

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۱۱

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۱۰

۱۲

دستور نویسی در  
سیستم عامل

ارتباط بین پردازها

برنامه نویسی چند نخی

زمانبندی CPU

شرایط مسابقه و بن بیت

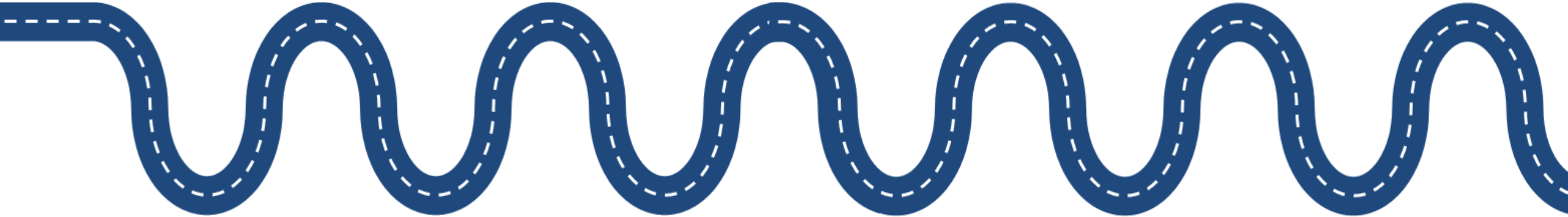
جایگزینی صفحه در  
حافظه

مدیریت حافظه

سمافور

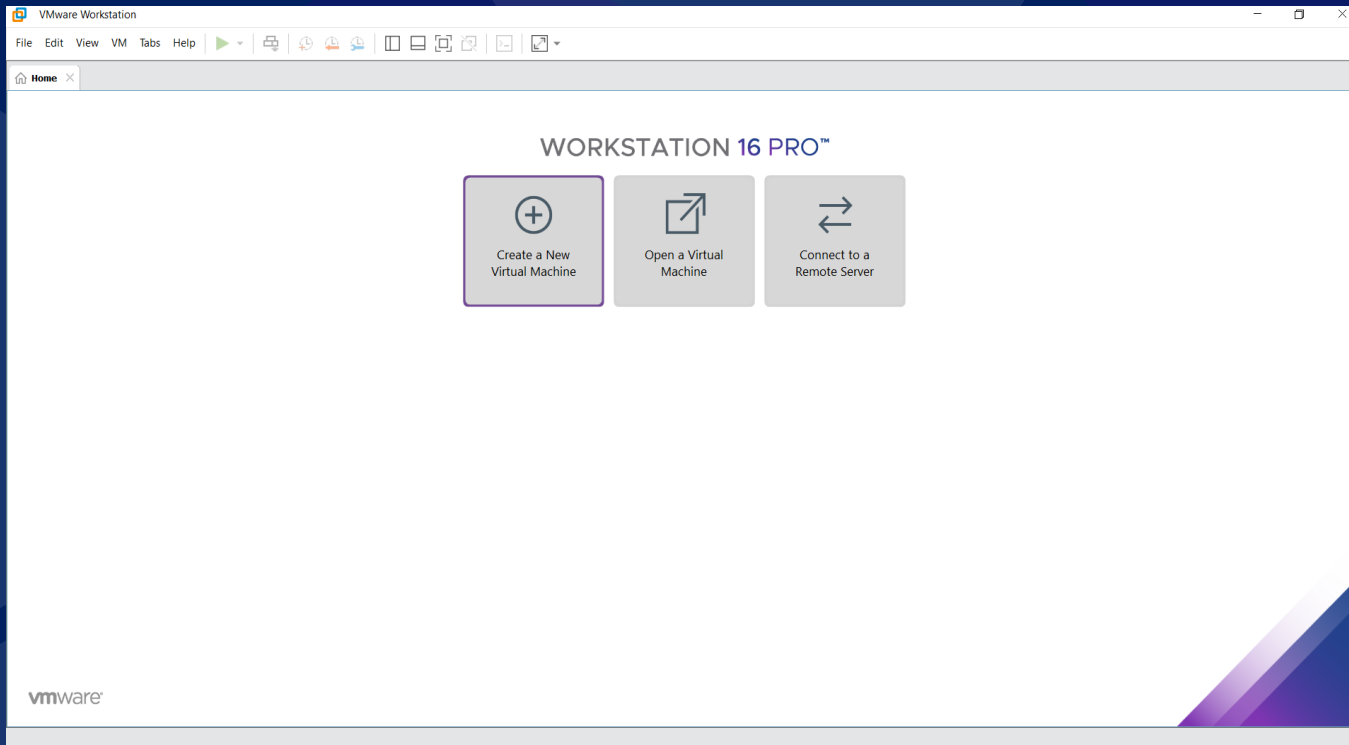
لوله Pipe

برنامه نویسی چند  
فرآیندی





آموزش نصب ابونتو با ماشین مجازی



New Virtual Machine Wizard

Choose the Virtual Machine Hardware Compatibility

Which hardware features are needed for this virtual machine?

Virtual machine hardware compatibility

Hardware

Workstation 16.2.x

Compatible

Workstation 16.2.x

Compatible products:

Fusion 12.2.x

Workstation 16.2.x

Workstation 16.x

ESXi 7.0

Workstation 15.x

ESXi 6.7

Workstation 14.x

ESXi 6.5

Workstation 12.x

Workstation 11.x

Workstation 10.x

Workstation 9.x

Workstation 8.x

Workstation 6.5-7.x

Workstation 6.0

Workstation 5.x

Help

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Cancel

New Virtual Machine Wizard

Choose the Virtual Machine Hardware Compatibility

Which hardware features are needed for this virtual machine?

Virtual machine hardware compatibility

Hardware

Workstation 16.2.x

Compatible

☒ ESX Server

Compatible products:

Fusion 12.2.x

Workstation 16.2.x

Limitations:

128 GB memory

32 processors

10 network adapters

8 TB disk size

8 GB shared graphics memory

Help

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Cancel

New Virtual Machine Wizard

Guest Operating System Installation

A virtual machine is like a physical computer; it needs an operating system. How will you install the guest operating system?

Install from:

Installer disc:

No drives available

Installer disc image file (iso):

D:\iso file\ubuntu-22.04.3-desktop-amd64.iso

Browse...

Ubuntu 64-bit 22.04.3 detected.

This operating system will use Easy Install. [\(What's this?\)](#)

I will install the operating system later.

The virtual machine will be created with a blank hard disk.

Help

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Cancel

Browse for ISO Image

<

>

▼

▲

» This PC » DATA (D:) » iso file »

Search iso file

Organize

New folder

mina

سارا

Screenshots

This PC

OS (C:)

DATA (D:)

Network

| Name                                      | Date modified      | Type            | Size          |
|---|--------------------|-----------------|---------------|
| Windows.11.Business.22H2.22621.2134.x6... | 10/1/2023 7:54 PM  | File folder     |               |
| ubuntu-18.04.2-desktop-amd64.iso          | 10/2/2019 12:46 PM | Disc Image File | 1,949,696 ... |
| ubuntu-22.04.3-desktop-amd64.iso          | 8/26/2023 3:23 PM  | Disc Image File | 4,919,592 ... |

File name: ubuntu-22.04.3-desktop-amd64.iso

CD-ROM images (\*.iso)

Open

Cancel

7

New Virtual Machine Wizard

**Easy Install Information**  
This is used to install Ubuntu 64-bit.

Personalize Linux

Full name:

OS Lab

User name:

os

Password:

●●●●●●●●

Confirm:

●●●●●●●●

Help

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Next >

Cancel

New Virtual Machine Wizard

**Name the Virtual Machine**  
What name would you like to use for this virtual machine?

Virtual machine name:

OS Lab

Location:

C:\Users\Asus\OneDrive\Documents\Virtual Machines\OS Lab

Browse...

The default location can be changed at Edit > Preferences.

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Cancel



New Virtual Machine Wizard

Processor Configuration

Specify the number of processors for this virtual machine.

Processors

Number of processors:

2

Number of cores per processor:

4

Total processor cores:

8

Help

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Cancel

New Virtual Machine Wizard

Memory for the Virtual Machine

How much memory would you like to use for this virtual machine?

Specify the amount of memory allocated to this virtual machine. The memory size must be a multiple of 4 MB.

128 GB

64 GB

32 GB

16 GB

8 GB

4 GB

2 GB

1 GB

512 MB

256 MB

128 MB

64 MB

32 MB

16 MB

8 MB

4 MB

4096

MB

Maximum recommended memory:

13.4 GB

Recommended memory:

4 GB

Guest OS recommended minimum:

2 GB

Help

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Cancel

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New Virtual Machine Wizard

**Network Type**  
What type of network do you want to add?

Network connection

☒ Use bridged networking  
Give the guest operating system direct access to an external Ethernet network. The guest must have its own IP address on the external network.

☐ Use network address translation (NAT)  
Give the guest operating system access to the host computer's dial-up or external Ethernet network connection using the host's IP address.

☐ Use host-only networking  
Connect the guest operating system to a private virtual network on the host computer.

☐ Do not use a network connection

Help < Back Next > Cancel

New Virtual Machine Wizard

**Select I/O Controller Types**  
Which SCSI controller type would you like to use for SCSI virtual disks?

I/O controller types

SCSI Controller:

☐ BusLogic (Not available for 64-bit guests)

☒ LSI Logic (Recommended)

☐ LSI Logic SAS

☐ Paravirtualized SCSI

Help < Back Next > Cancel

New Virtual Machine Wizard

**Select a Disk Type**  
What kind of disk do you want to create?

Virtual disk type

☐ IDE

☒ SCSI (Recommended)

☐ SATA

☐ NVMe

Help < Back Next > Cancel

New Virtual Machine Wizard

**Select a Disk**  
Which disk do you want to use?

Disk

☒ Create a new virtual disk

A virtual disk is composed of one or more files on the host file system, which will appear as a single hard disk to the guest operating system. Virtual disks can easily be copied or moved on the same host or between hosts.

☐ Use an existing virtual disk

Choose this option to reuse a previously configured disk.

☐ Use a physical disk (for advanced users)

Choose this option to give the virtual machine direct access to a local hard disk. Requires administrator privileges.

Help < Back Next > Cancel

New Virtual Machine Wizard

Specify Disk Capacity

How large do you want this disk to be?

Maximum disk size (GB): 20.0

Recommended size for Ubuntu 64-bit: 20 GB

☐ Allocate all disk space now.

Allocating the full capacity can enhance performance but requires all of the physical disk space to be available right now. If you do not allocate all the space now, the virtual disk starts small and grows as you add data to it.

☐ Store virtual disk as a single file

☒ Split virtual disk into multiple files

Splitting the disk makes it easier to move the virtual machine to another computer but may reduce performance with very large disks.

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Cancel

New Virtual Machine Wizard

Specify Disk File

Where would you like to store the disk file?

Disk file

A 20 GB virtual disk be created using multiple disk files. The disk files will be automatically named based on this file name.

OS Lab.vmdk

Browse...

Help

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Cancel

New Virtual Machine Wizard

✕

**Ready to Create Virtual Machine**  
Click Finish to create the virtual machine and start installing Ubuntu 64-bit and then VMware Tools.

The virtual machine will be created with the following settings:

|                   |  |
|-------------------|--|
| Name:             | OS Lab   |
| Location:         | C:\Users\Asus\OneDrive\Documents\Virtual Machines\O...   |
| Version:          | Workstation 16.2.x                                       |
| Operating System: | Ubuntu 64-bit  |
| Hard Disk:        | 20 GB, Split   |
| Memory:           | 4096 MB  |
| Network Adapter:  | Bridged (Automatic)                                      |
| Other Devices:    | 8 CPU cores, CD/DVD, USB Controller, Printer, Sound C... |

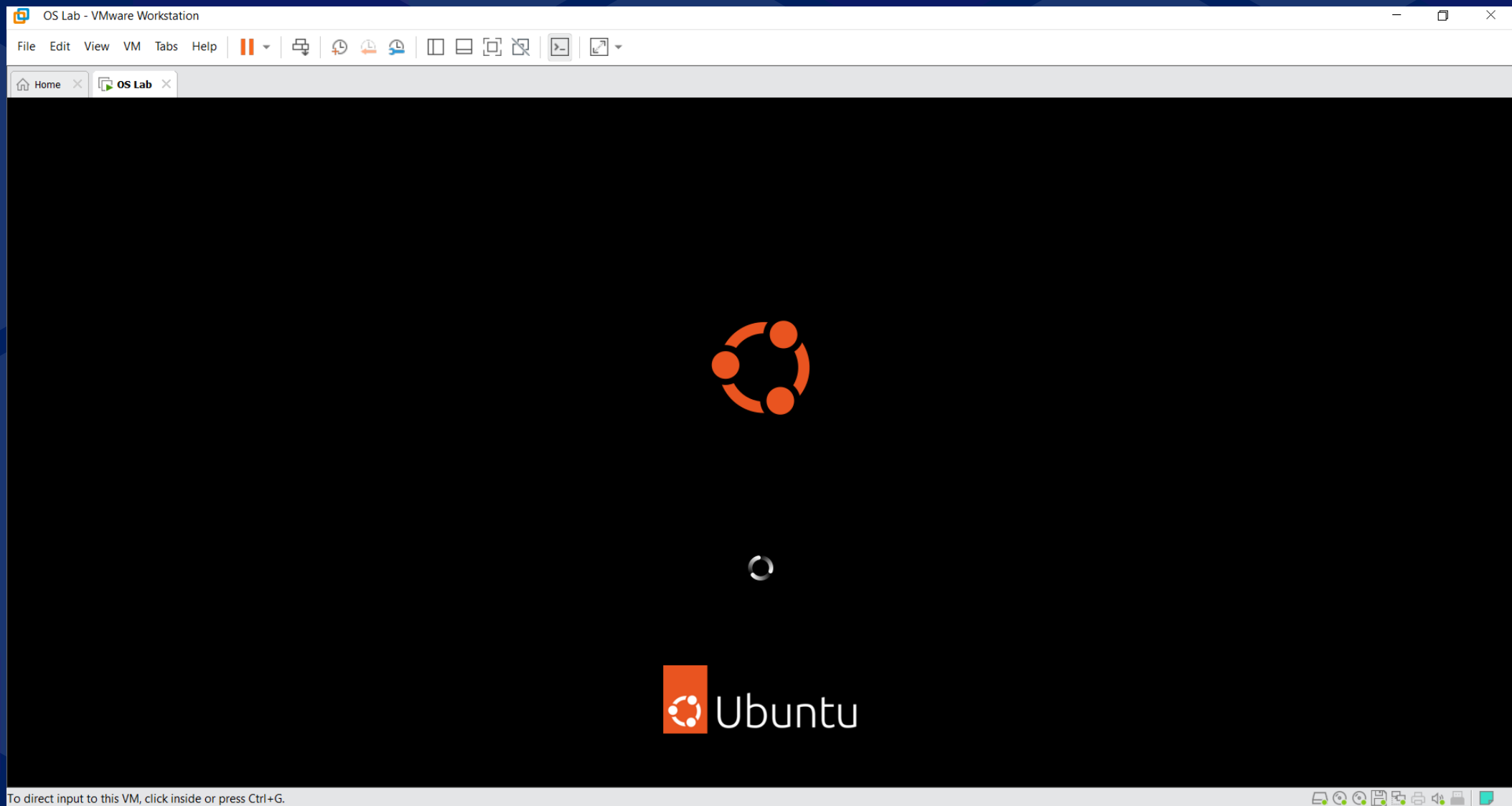
Customize Hardware...

☒ Power on this virtual machine after creation

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Finish

Cancel



## Install

## Keyboard layout

Choose your keyboard layout:

English (Australian)  
English (Cameroon)  
English (Ghana)  
English (Nigeria)  
English (South Africa)  
English (UK)  
**English (US)**  
Esperanto  
Estonian  
Faroese  
Filipino  
Finnish  
French  
French (Canada)

**English (US)**

English (US) - Cherokee  
English (US) - English (Colemak)  
English (US) - English (Colemak-DH ISO)  
English (US) - English (Colemak-DH)  
English (US) - English (Dvorak)  
English (US) - English (Dvorak, alt. intl.)  
English (US) - English (Dvorak, intl., with dead keys)  
English (US) - English (Dvorak, left-handed)  
English (US) - English (Dvorak, right-handed)  
English (US) - English (Macintosh)  
English (US) - English (Norman)  
English (US) - English (US, Symbolic)  
English (US) - English (US, alt. intl.)

Type here to test your keyboard

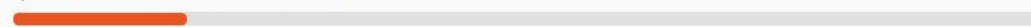
Detect Keyboard Layout

Quit

Back

Continue

&gt; Verifying the installation configuration...



Install

✕

## Updates and other software

**What apps would you like to install to start with?**

☒ Normal installation  
Web browser, utilities, office software, games, and media players.

☐ Minimal installation  
Web browser and basic utilities.

**Other options**

☒ Download updates while installing Ubuntu  
This saves time after installation.

☐ Install third-party software for graphics and Wi-Fi hardware and additional media formats  
This software is subject to license terms included with its documentation. Some is proprietary.

Quit

Back

Continue

> Verifying the installation configuration...



Install

✕

## Installation type

This computer currently has no detected operating systems. What would you like to do?

☒ Erase disk and install Ubuntu  
**Warning:** This will delete all your programs, documents, photos, music, and any other files in all operating systems.  

Advanced Features... None selected

☐ Something else  
You can create or resize partitions yourself, or choose multiple partitions for Ubuntu.

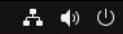
Quit

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Install Now

> Verifying the installation configuration...

Aug 29 22:36



## Install

Where are you?



Tehran

Back

Continue

› Creating ext4 file system for / in partition #3 of SCSI33 (0,0,0) (sda)...



Aug 30 02:07

Install

Who are you?

Your name:

Your computer's name:

The name it uses when it talks to other computers.

Pick a username:

Choose a password:

Confirm your password:

☐ Log in automatically

☒ Require my password to log in

☐ Use Active Directory

You'll enter domain and other details in the next step.

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Continue

> Copying files...

Aug 30 02:09



## Install

### Welcome to Ubuntu

Fast and full of new features, the latest version of Ubuntu makes computing easier than ever. Here are just a few cool new things to look out for...



> Copying files...



