

Task 1 – Introduction to System Exploration

Purpose of system inspection.

Overview of laptop architecture (CPU, chipset, buses, memory, I/O).

Practical:

Identify OS and hardware using:

Windows: `systeminfo`, `Get-ComputerInfo`

Linux: `uname -a`, `lsb_release -a`, `lshw -short`

macOS: `system_profiler`

Outcome: Students can generate a high-level report of their laptop configuration

identifying OS type, version, and manufacturer.

Expected Output:

OS version, kernel version, hostname, basic hardware info (CPU, RAM, disk).

Windows

systeminfo

Microsoft Windows [Version 10.0.26100.4946]

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C:\Users\krish>systeminfo

Host Name:	LAPTOP-JK8MKUQQ
OS Name:	Microsoft Windows 11 Home Single Language
OS Version:	10.0.26100 N/A Build 26100
OS Manufacturer:	Microsoft Corporation
OS Configuration:	Standalone Workstation
OS Build Type:	Multiprocessor Free
Registered Owner:	krishnarathore2792005@gmail.com
Registered Organization:	N/A
Product ID:	00342-45344-67677-FFMAO
Original Install Date:	22-06-2025, 06:13:30
System Boot Time:	28-08-2025, 23:53:30

System Manufacturer: LENOVO
System Model: 83DV
System Type: x64-based PC
Processor(s): 1 Processor(s) Installed.
[01]: Intel64 Family 6 Model 183 Stepping 1 GenuineIntel ~2400 Mhz
BIOS Version: LENOVO NECN39WW, 06-09-2024
Windows Directory: C:\Windows
System Directory: C:\Windows\system32
Boot Device: \Device\HarddiskVolume1
System Locale: en-us;English (United States)
Input Locale: 00004009
Time Zone: (UTC+05:30) Chennai, Kolkata, Mumbai, New Delhi
Total Physical Memory: 16,092 MB
Available Physical Memory: 2,741 MB
Virtual Memory: Max Size: 20,956 MB
Virtual Memory: Available: 5,981 MB
Virtual Memory: In Use: 14,975 MB
Page File Location(s): C:\pagefile.sys
Domain: WORKGROUP
Logon Server: \\LAPTOP-JK8MKUQQ
Hotfix(s): 5 Hotfix(s) Installed.
[01]: KB5056579
[02]: KB5050575
[03]: KB5059093
[04]: KB5063878
[05]: KB5065381
Network Card(s): 5 NIC(s) Installed.
[01]: Realtek PCIe GbE Family Controller
Connection Name: Ethernet
Status: Media disconnected
[02]: Bluetooth Device (Personal Area Network)
Connection Name: Bluetooth Network Connection
Status: Media disconnected
[03]: Intel(R) Wi-Fi 6 AX203
Connection Name: Wi-Fi
DHCP Enabled: Yes
DHCP Server: 10.40.93.21
IP address(es)
[01]: 10.40.93.25
[02]: fe80::c443:85a1:9dc0:4f0b
[03]: 2402:8100:2730:8d81:d98d:2d69:ad41:9bd
[04]: 2402:8100:2730:8d81:e30b:8e16:7dbd:4cbd
[04]: VMware Virtual Ethernet Adapter for VMnet1
Connection Name: VMware Network Adapter VMnet1

DHCP Enabled: Yes
DHCP Server: 192.168.249.254
IP address(es)
[01]: 192.168.249.1
[02]: fe80::490:dab2:236f:23ae
[05]: VMware Virtual Ethernet Adapter for VMnet8
Connection Name: VMware Network Adapter VMnet8
DHCP Enabled: Yes
DHCP Server: 192.168.198.254
IP address(es)
[01]: 192.168.198.1
[02]: fe80::b1a3:4423:433a:54dc

Virtualization-based security: Status: Running

Required Security Properties:

Base Virtualization Support

Available Security Properties:

Base Virtualization Support

Secure Boot

DMA Protection

UEFI Code Readonly

SMM Security Mitigations 1.0

Mode Based Execution Control

APIC Virtualization

Services Configured:

Hypervisor enforced Code Integrity

Services Running:

Hypervisor enforced Code Integrity

App Control for Business policy: Enforced

App Control for Business user mode policy: Off

Security Features Enabled:

Hyper-V Requirements: A hypervisor has been detected. Features required for Hyper-V will not be displayed.

GET-COMMANDINFO

Windows PowerShell

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Install the latest

PowerShell for new features and improvements! <https://aka.ms/PSWindows>

Loading personal and system profiles took 4366ms.

(base) PS C:\Users\krish> Get-ComputerInfo

WindowsBuildLabEx : 26100.1.amd64fre.ge_release.240331-1435

WindowsCurrentVersion : 6.3

WindowsEditionId	: CoreSingleLanguage
WindowsInstallationType	: Client
WindowsInstallDateFromRegistry	: 22-06-2025 00:43:30
WindowsProductId	: 00342-42720-51923-AAOEM
WindowsProductName	: Windows 10 Home Single Language
WindowsRegisteredOrganization	:
WindowsRegisteredOwner	: krishnarathore2792005@gmail.com
WindowsSystemRoot	: C:\Windows
WindowsVersion	: 2009
OSDisplayVersion	: 24H2
BiosCharacteristics	: {7, 11, 12, 15...}
BiosBIOSVersion	: {LENOVO - 1, NECN39WW, INSYDE Corp. - 76066039}
BiosBuildNumber	:
BiosCaption	: NECN39WW
BiosCodeSet	:
BiosCurrentLanguage	: en US iso8859-1,0
BiosDescription	: NECN39WW
BiosEmbeddedControllerMajorVersion	: 1
BiosEmbeddedControllerMinorVersion	: 39
BiosFirmwareType	: Uefi
BiosIdentificationCode	:
BiosInstallableLanguages	: 8
BiosInstallDate	:
BiosLanguageEdition	:
BiosListOfLanguages	: {en US iso8859-1,0, fr FR iso8859-1,0, zh TW unicode,0, ja JP unicode,0...}
BiosManufacturer	: LENOVO
BiosName	: NECN39WW
BiosOtherTargetOS	:
BiosPrimaryBIOS	: True
BiosReleaseDate	: 06-09-2024 05:30:00
BiosSeralNumber	: MP2QAFX7
BiosSMBIOSBIOSVersion	: NECN39WW
BiosSMBIOSMajorVersion	: 3
BiosSMBIOSMinorVersion	: 4
BiosSMBIOSPresent	: True
BiosSoftwareElementState	: Running
BiosStatus	: OK
BiosSystemBiosMajorVersion	: 1
BiosSystemBiosMinorVersion	: 39
BiosTargetOperatingSystem	: 0
BiosVersion	: LENOVO - 1

CsAdminPasswordStatus	: Disabled
CsAutomaticManagedPagefile	: True
CsAutomaticResetBootOption	: True
CsAutomaticResetCapability	: True
CsBootOptionOnLimit	:
CsBootOptionOnWatchDog	:
CsBootROMSupported	: True
CsBootStatus	: {0, 0, 0, 39...}
CsBootupState	: Normal boot
CsCaption	: LAPTOP-JK8MKUQQ
CsChassisBootupState	: Safe
CsChassisSKUNumber	: SKU Number
CsCurrentTimeZone	: 330
CsDaylightInEffect	:
CsDescription	: AT/AT COMPATIBLE
CsDNSHostName	: LAPTOP-JK8MKUQQ
CsDomain	: WORKGROUP
CsDomainRole	: StandaloneWorkstation
CsEnableDaylightSavingsTime	: True
CsFrontPanelResetStatus	: Disabled
CsHypervisorPresent	: True
CsInfraredSupported	: False
CsInitialLoadInfo	:
CsInstallDate	:
CsKeyboardPasswordStatus	: Disabled
CsLastLoadInfo	:
CsManufacturer	: LENOVO
CsModel	: 83DV
CsName	: LAPTOP-JK8MKUQQ
CsNetworkAdapters	: {Ethernet, Bluetooth Network Connection, Wi-Fi,
VMware	Network Adapter VMnet1...}
CsNetworkServerModeEnabled	: True
CsNumberOfLogicalProcessors	: 16
CsNumberOfProcessors	: 1
CsProcessors	: {13th Gen Intel(R) Core(TM) i5-13450HX}
CsOEMStringArray	: {Country - ýý, Modern Preload}
CsPartOfDomain	: False
CsPauseAfterReset	: -1
CsPCSystemType	: Mobile
CsPCSystemTypeEx	: Mobile
CsPowerManagementCapabilities	:
CsPowerManagementSupported	:
CsPowerOnPasswordStatus	: Disabled

CsPowerState : Unknown
CsPowerSupplyState : Safe
CsPrimaryOwnerContact :
CsPrimaryOwnerName : krishnarathore2792005@gmail.com
CsResetCapability : Other
CsResetCount : -1
CsResetLimit : -1
CsRoles : {LM_Workstation, LM_Server, NT}
CsStatus : OK
CsSupportContactDescription :
CsSystemFamily : LOQ 15IRX9
CsSystemSKUNumber : LENOVO_MT_83DV_BU_idea_FM_LOQ
15IRX9
CsSystemType : x64-based PC
CsThermalState : Safe
CsTotalPhysicalMemory : 16873545728
CsPhysicallyInstalledMemory : 16777216
CsUserName : LAPTOP-JK8MKUQQ\krish
CsWakeUpType : PowerSwitch
CsWorkgroup : WORKGROUP
OsName : Microsoft Windows 11 Home Single Language
OsType : WINNT
OsOperatingSystemSKU : 100
OsVersion : 10.0.26100
OsCSDVersion :
OsBuildNumber : 26100
OsHotFixes : {KB5056579, KB5050575, KB5059093,
KB5063878...}
OsBootDevice : \Device\HarddiskVolume1
OsSystemDevice : \Device\HarddiskVolume3
OsSystemDirectory : C:\Windows\system32
OsSystemDrive : C:
OsWindowsDirectory : C:\Windows
OsCountryCode : 1
OsCurrentTimeZone : 330
OsLocaleID : 0409
OsLocale : en-US
OsLocalDateTime : 29-08-2025 09:47:06
OsLastBootUpTime : 28-08-2025 23:53:30
OsUptime : 09:53:35.7907617
OsBuildType : Multiprocessor Free
OsCodeSet : 1252
OsDataExecutionPreventionAvailable : True
OsDataExecutionPrevention32BitApplications : True

OsDataExecutionPreventionDrivers : True
OsDataExecutionPreventionSupportPolicy : OptIn
OsDebug : False
OsDistributed : False
OsEncryptionLevel : 256
OsForegroundApplicationBoost : Maximum
OsTotalVisibleMemorySize : 16478072
OsFreePhysicalMemory : 2386960
OsTotalVirtualMemorySize : 21458808
OsFreeVirtualMemory : 5753216
OsInUseVirtualMemory : 15705592
OsTotalSwapSpaceSize :
OsSizeStoredInPagingFiles : 4980736
OsFreeSpaceInPagingFiles : 4900588
OsPagingFiles : {C:\pagefile.sys}
OsHardwareAbstractionLayer : 10.0.26100.1
OsInstallDate : 22-06-2025 06:13:30
OsManufacturer : Microsoft Corporation
OsMaxNumberOfProcesses : 4294967295
OsMaxProcessMemorySize : 137438953344
OsMuiLanguages : {en-US}
OsNumberOfLicensedUsers :
OsNumberOfProcesses : 291
OsNumberOfUsers : 2
OsOrganization :
OsArchitecture : 64-bit
OsLanguage : en-US
OsProductSuites : {TerminalServicesSingleSession, HomeEdition}
OsOtherTypeDescription :
OsPAEEnabled :
OsPortableOperatingSystem : False
OsPrimary : True
OsProductType : WorkStation
OsRegisteredUser : krishnarathore2792005@gmail.com
OsSerialNumber : 00342-42720-51923-AAOEM
OsServicePackMajorVersion : 0
OsServicePackMinorVersion : 0
OsStatus : OK
OsSuites : {TerminalServices, TerminalServicesSingleSession, HomeEdition}
OsServerLevel :
KeyboardLayout : en-IN
TimeZone : (UTC+05:30) Chennai, Kolkata, Mumbai, New Delhi
LogonServer : \\LAPTOP-JK8MKUQQ

PowerPlatformRole : Mobile
HyperVisorPresent : True
HyperVRequirementDataExecutionPreventionAvailable :
HyperVRequirementSecondLevelAddressTranslation :
HyperVRequirementVirtualizationFirmwareEnabled :
HyperVRequirementVMMonitorModeExtensions :
DeviceGuardSmartStatus : Off
DeviceGuardRequiredSecurityProperties : {BaseVirtualizationSupport}
DeviceGuardAvailableSecurityProperties : {BaseVirtualizationSupport, SecureBoot,
DMAProtection, 5...}
DeviceGuardSecurityServicesConfigured : {HypervisorEnforcedCodeIntegrity}
DeviceGuardSecurityServicesRunning : {HypervisorEnforcedCodeIntegrity}
DeviceGuardCodeIntegrityPolicyEnforcementStatus : EnforcementMode
DeviceGuardUserModeCodeIntegrityPolicyEnforcementStatus : Off

LINUX : `uname -a`, `lsb_release -a`, `lshw -short`

```
krishna@krishna:~/Downloads/OS mini project 1 september deadline$ uname -a
Linux krishna 6.8.0-65-generic #68-22.04.1-Ubuntu SMP PREEMPT_DYNAMIC Tue Jul 15 18:06:34 UTC 2 x86_64 x86_64 x86_64 GNU/Linux
krishna@krishna:~/Downloads/OS mini project 1 september deadline$ lsb_release
No LSB modules are available.
krishna@krishna:~/Downloads/OS mini project 1 september deadline$ lsb_release -a
No LSB modules are available.
Distributor ID: Ubuntu
Description:    Ubuntu 22.04.5 LTS
Release:        22.04
Codename:       jammy
krishna@krishna:~/Downloads/OS mini project 1 september deadline$ lshw -short
WARNING: you should run this program as super-user.
H/W path          Device              Class          Description
=====
/0                 system              Computer
/0                 bus                 Motherboard
/0/0               memory              4GiB System memory
/0/1               processor            13th Gen Intel(R) Core(TM) i5-13450HX
/0/2               processor            13th Gen Intel(R) Core(TM) i5-13450HX
/0/3               processor            13th Gen Intel(R) Core(TM) i5-13450HX
/0/4               processor            13th Gen Intel(R) Core(TM) i5-13450HX
/0/100             bridge               440BX/ZX/DX - 82443BX/ZX/DX Host bridge
/0/100/1           bridge               440BX/ZX/DX - 82443BX/ZX/DX AGP bridge
/0/100/7           bridge               82371AB/EB/MB PIIX4 ISA
/0/100/7/0         system              PnP device PNP0C02
/0/100/7/1         system              PnP device PNP0B00
/0/100/7/2         input               PnP device PNP0303
/0/100/7/3         generic             PnP device VMW0003
/0/100/7/4         system              PnP device PNP0103
/0/100/7/5         system              PnP device PNP0C02
/0/100/7.1         storage              82371AB/EB/MB PIIX4 IDE
/0/100/7.3         bridge               82371AB/EB/MB PIIX4 ACPI
/0/100/7.7         generic             Virtual Machine Communication Interface
/0/100/f           /dev/fb0            display        SVGA II Adapter
/0/100/10          storage              53c1030 PCI-X Fusion-MPT Dual Ultra320 SCSI
/0/100/11          bridge               PCI bridge

/0/100/11/4/0.0.0 /dev/cdrom disk             VMware SATA CD01
/0/100/15          bridge               PCI Express Root Port
/0/100/15.1        bridge               PCI Express Root Port
/0/100/15.2        bridge               PCI Express Root Port
/0/100/15.3        bridge               PCI Express Root Port
/0/100/15.4        bridge               PCI Express Root Port
/0/100/15.5        bridge               PCI Express Root Port
/0/100/15.6        bridge               PCI Express Root Port
/0/100/15.7        bridge               PCI Express Root Port
/0/100/16          bridge               PCI Express Root Port
/0/100/16.1        bridge               PCI Express Root Port
/0/100/16.2        bridge               PCI Express Root Port
/0/100/16.3        bridge               PCI Express Root Port
/0/100/16.4        bridge               PCI Express Root Port
/0/100/16.5        bridge               PCI Express Root Port
/0/100/16.6        bridge               PCI Express Root Port
/0/100/16.7        bridge               PCI Express Root Port
/0/100/17          bridge               PCI Express Root Port
/0/100/17.1        bridge               PCI Express Root Port
/0/100/17.2        bridge               PCI Express Root Port
/0/100/17.3        bridge               PCI Express Root Port
/0/100/17.4        bridge               PCI Express Root Port
/0/100/17.5        bridge               PCI Express Root Port
/0/100/17.6        bridge               PCI Express Root Port
/0/100/17.7        bridge               PCI Express Root Port
/0/100/18          bridge               PCI Express Root Port
/0/100/18.1        bridge               PCI Express Root Port
/0/100/18.2        bridge               PCI Express Root Port
/0/100/18.3        bridge               PCI Express Root Port
/0/100/18.4        bridge               PCI Express Root Port
/0/100/18.5        bridge               PCI Express Root Port
/0/100/18.6        bridge               PCI Express Root Port
/0/100/18.7        bridge               PCI Express Root Port
/1                 scsi32              storage
/2                 input0              input           Power Button
/3                 input1              input           AT Translated Set 2 keyboard
/4                 input3              input           VirtualPS/2 VMware VMMouse
/5                 input4              input           VirtualPS/2 VMware VMMouse
/6                 input5              input           VMware VMware Virtual USB Mouse
/7                 input6              input           VMware DnD UInput pointer
WARNING: output may be incomplete or inaccurate, you should run this program as super-user.
```