

Assignment 1B

Viewing hardware information

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ASU – IFT 103

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Objectives

In this lab we will be looking at how the operating system views the hardware components in your system.

Use commands listed below, from your online research, or other tools you may find online to identify the hardware on the computer of your choice.

In this document below you will see examples of options within the OS itself. Feel free to do your own research on other built-in, or even external tools to conduct this assignment.

Deliverables

A Word or PDF document that contains:

- A list of the hardware present in your machine. We will be expecting to see every major component of your computer. Some parts might not show specific details about model numbers, get as close as you can to real information.
- Screenshots showing evidence of your list of parts is accurate to the machine.
- If you are running windows a complete screenshot of the command ``systeminfo`` in powershell.

Windows 10

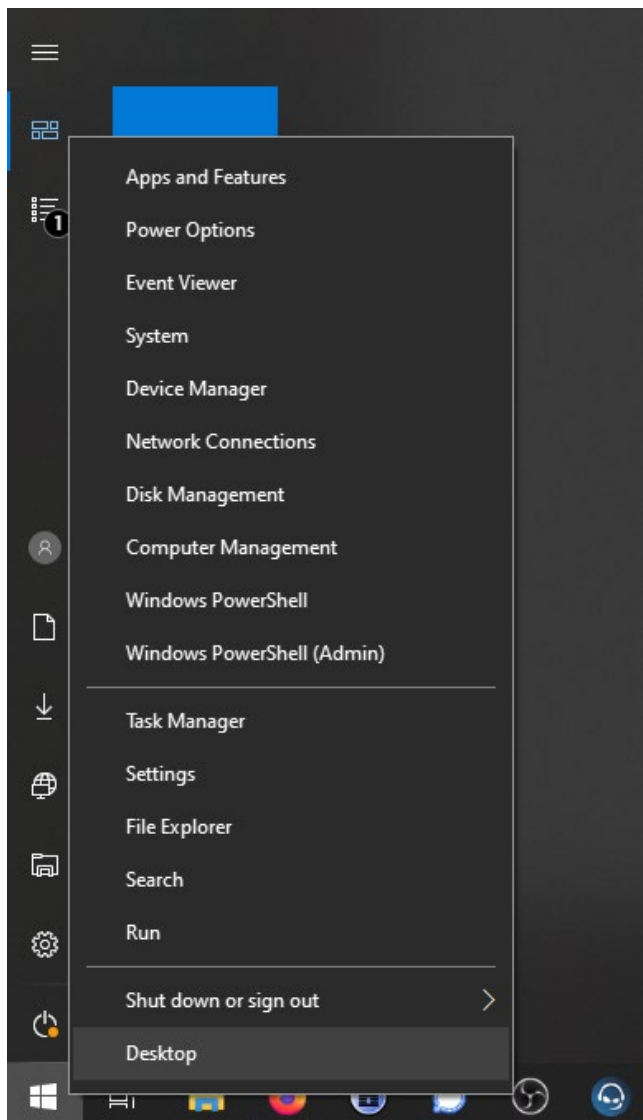
Command Line (CLI):

We will be utilizing a powershell applet called "WmiObject". Wmi stands for Windows management interface. You can see a list of all the options supported by using the command

```
`Get-WmiObject -list`
```

Not every piece of hardware has a call in this tool, but the major devices of any given machine should always be visible using the following commands.

Open PowerShell. Right click on the start icon then click Windows PowerShell (Admin).



PS C:\WINDOWS\system32> systeminfo

Host Name: RESURRECCION
OS Name: Microsoft Windows 10 Education
OS Version: 10.0.18363 N/A Build 18363
OS Manufacturer: Microsoft Corporation
OS Configuration: Standalone Workstation
OS Build Type: Multiprocessor Free
Registered Owner: Windows User
Registered Organization:
Product ID: 00328-00255-34178-AA951
Original Install Date: 2020-01-10, 20:13:18
System Boot Time: 2020-05-06, 01:44:51
System Manufacturer: To Be Filled By O.E.M.
System Model: To Be Filled By O.E.M.
System Type: x64-based PC
Processor(s): 1 Processor(s) Installed.
[01]: Intel64 Family 6 Model 158 Stepping 12 GenuineIntel ~3601 Mhz
BIOS Version: American Megatrends Inc. P4.00, 2019-03-15
Windows Directory: C:\WINDOWS
System Directory: C:\WINDOWS\system32
Boot Device: \Device\HarddiskVolume4
System Locale: en-us;English (United States)
Input Locale: en-us;English (United States)
Time Zone: (UTC-07:00) Arizona
Total Physical Memory: 32,652 MB
Available Physical Memory: 12,973 MB
Virtual Memory: Max Size: 44,408 MB
Virtual Memory: Available: 11,043 MB
Virtual Memory: In Use: 33,365 MB
Page File Location(s): C:\pagefile.sys
Domain: WORKGROUP
Logon Server: \\RESURRECCION
Hotfix(s): 11 Hotfix(s) Installed.
[01]: KB4552931
[02]: KB4516115
[03]: KB4517245
[04]: KB4524244
[05]: KB4524569
[06]: KB4528759
[07]: KB4537759
[08]: KB4538674
[09]: KB4541338
[10]: KB4552152
[11]: KB4556799
Network Card(s): 4 NIC(s) Installed.
[01]: Intel(R) Ethernet Connection (7) I219-V
Connection Name: Ethernet
Status: Media disconnected
[02]: Intel(R) Wireless-AC 9560 160MHz
Connection Name: Wi-Fi
Status: Media disconnected
[03]: QLogic BCM57810 10 Gigabit Ethernet (NDIS VBD Client)
Connection Name: Ethernet 6
DHCP Enabled: Yes
DHCP Server: 10.10.1.254
IP address(es)
[01]: 10.10.1.11
[02]: fe80::bd99:4d1f:d95:dc1e
[03]: 2602:d1:b493:2301:d127:419a:4100:191b
[04]: 2602:d1:b493:2301:90f7:4114:a402:ead0
[05]: 2602:d1:b493:2301:70a7:8d82:c3e6:586b
[06]: 2602:d1:b493:2301:4972:6da7:193e:faa1
[07]: 2602:d1:b493:2301:18fd:39f4:6086:8736
[08]: 2602:d1:b493:2301:bd99:4d1f:d95:dc1e
[04]: QLogic BCM57810 10 Gigabit Ethernet (NDIS VBD Client)
Connection Name: Ethernet 5
DHCP Enabled: Yes
DHCP Server: 10.10.1.254
IP address(es)
[01]: 10.10.1.10
[02]: fe80::50f4:320a:40ba:718a
[03]: 2602:d1:b493:2301:e5d4:5a2b:a441:17bf
[04]: 2602:d1:b493:2301:c4e0:1f43:f34b:8a63
[05]: 2602:d1:b493:2301:8474:1794:8bfc:e772
[06]: 2602:d1:b493:2301:45f0:568a:ecab:23ec
[07]: 2602:d1:b493:2301:de0:7b5:655f:c8c1
[08]: 2602:d1:b493:2301:50f4:320a:40ba:718a
Hyper-V Requirements: VM Monitor Mode Extensions: Yes
Virtualization Enabled In Firmware: Yes
Second Level Address Translation: Yes
Data Execution Prevention Available: Yes

`Get-WmiObject Win32_ComputerSystem`

Intel:

```
PS C:\WINDOWS\system32> Get-WmiObject Win32_ComputerSystem

Domain           : WORKGROUP
Manufacturer     : To Be Filled By O.E.M.
Model            : To Be Filled By O.E.M.
Name             : RESURRECCION
PrimaryOwnerName : Windows User
TotalPhysicalMemory : 34238177280
```

HP Laptop:

```
PS C:\WINDOWS\system32> Get-WmiObject Win32_ComputerSystem

Domain           : WORKGROUP
Manufacturer     : HP
Model            : HP Spectre x360 Convertible 15-b11XX
Name             : ZANPAKUTO
PrimaryOwnerName : HP
TotalPhysicalMemory : 17049735168
```

`Get-WmiObject Win32_BaseBoard`

Intel:

```
PS C:\WINDOWS\system32> Get-WmiObject Win32_BaseBoard

Manufacturer : ASRock
Model        :
Name         : Base Board
SerialNumber : M80-BB021100261
SKU          :
Product      : Z390 Phantom Gaming-ITX/ac
```

Amd:

```
PS C:\WINDOWS\system32> Get-WmiObject Win32_BaseBoard

Manufacturer : ASRock
Model        :
Name         : Base Board
SerialNumber : M80-CB012100927
SKU          :
Product      : X570M Pro4

PS C:\WINDOWS\system32> █
```

`Get-WmiObject Win32_Bios`

Intel:

```
PS C:\WINDOWS\system32> Get-WmiObject Win32_Bios

SMBIOSBIOSVersion : P4.00
Manufacturer      : American Megatrends Inc.
Name              : P4.00
SerialNumber      : To Be Filled By O.E.M.
Version           : ALASKA - 1072009
```

AMD:

```
PS C:\WINDOWS\system32> Get-WmiObject Win32_Bios

SMBIOSBIOSVersion : P1.90
Manufacturer      : American Megatrends Inc.
Name              : P1.90
SerialNumber      : To Be Filled By O.E.M.
Version           : ALASKA - 1072009

PS C:\WINDOWS\system32> █
```

HP Laptop:

```
PS C:\WINDOWS\system32> Get-WmiObject Win32_Bios

SMBIOSBIOSVersion : F.40
Manufacturer      : American Megatrends Inc.
Name              : F.40
SerialNumber      : 5CD75094MN
Version           : HPQOEM - 1072009
```

`Get-WmiObject Win32_Processor`

Intel:

```
PS C:\WINDOWS\system32> Get-WmiObject Win32_Processor

Caption           : Intel64 Family 6 Model 158 Stepping 12
DeviceID          : CPU0
Manufacturer      : GenuineIntel
MaxClockSpeed     : 3601
Name              : Intel(R) Core(TM) i9-9900K CPU @ 3.60GHz
SocketDesignation : CPU Socket
```

AMD:

```
PS C:\WINDOWS\system32> Get-WmiObject Win32_Processor
```

```
Caption          : AMD64 Family 23 Model 113 Stepping 0
DeviceID         : CPU0
Manufacturer     : AuthenticAMD
MaxClockSpeed    : 3800
Name             : AMD Ryzen 9 3900X 12-Core Processor
SocketDesignation : AM4
```

`Get-WmiObject Win32_PhysicalMemory`

```
PS C:\WINDOWS\system32> Get-WmiObject Win32_PhysicalMemory
```

```
__GENUS          : 2
__CLASS           : Win32_PhysicalMemory
__SUPERCLASS      : CIM_PhysicalMemory
__DYNASTY         : CIM_ManagedSystemElement
__RELPATH         : Win32_PhysicalMemory.Tag="Physical Memory 0"
__PROPERTY_COUNT  : 36
__DERIVATION      : {CIM_PhysicalMemory, CIM_Chip, CIM_PhysicalComponent, CIM_PhysicalElement...}
__SERVER          : RESURRECCION
__NAMESPACE       : root\cimv2
__PATH            : \\RESURRECCION\root\cimv2:Win32_PhysicalMemory.Tag="Physical Memory 0"
Attributes       : 2
BankLabel         : BANK 0
Capacity          : 17179869184
Caption           : Physical Memory
ConfiguredClockSpeed : 3200
```

<partial output>

`Get-WmiObject Win32_DiskDrive`

Intel:

```
PS C:\WINDOWS\system32> Get-WmiObject Win32_DiskDrive
```

```
Partitions : 1
DeviceID    : \\.\PHYSICALDRIVE2
Model       : Samsung SSD 850 EVO M.2 500GB
Size        : 500105249280
Caption     : Samsung SSD 850 EVO M.2 500GB
```

```
Partitions : 1
DeviceID    : \\.\PHYSICALDRIVE1
Model       : ST3000DM001-1CH166
Size        : 10000830067200
Caption     : ST3000DM001-1CH166
```

```
Partitions : 4
DeviceID    : \\.\PHYSICALDRIVE0
Model       : Samsung SSD 970 PRO 512GB
Size        : 512105932800
Caption     : Samsung SSD 970 PRO 512GB
```

AMD:

```
PS C:\WINDOWS\system32> Get-WmiObject Win32_DiskDrive
```

```
Partitions : 3
DeviceID    : \\.\PHYSICALDRIVE2
Model       : Samsung SSD 970 PRO 512GB
Size        : 512105932800
Caption     : Samsung SSD 970 PRO 512GB

Partitions : 1
DeviceID    : \\.\PHYSICALDRIVE0
Model       : Samsung SSD 850 EVO M.2 250GB
Size        : 250056737280
Caption     : Samsung SSD 850 EVO M.2 250GB

Partitions : 1
DeviceID    : \\.\PHYSICALDRIVE1
Model       : WDC WD100EMAZ-00WJTA0
Size        : 10000830067200
Caption     : WDC WD100EMAZ-00WJTA0
```

`Get-WmiObject Win32_LogicalDisk`

```
PS C:\WINDOWS\system32> Get-WmiObject Win32_LogicalDisk
```

```
DeviceID    : C:
DriveType   : 3
ProviderName :
FreeSpace   : 279732592640
Size        : 510961205248
VolumeName  :

DeviceID    : D:
DriveType   : 3
ProviderName :
FreeSpace   : 6366888058880
Size        : 10000829247488
VolumeName  : 10TB WD
```

```
PS C:\WINDOWS\system32> Get-WmiObject Win32_LogicalDisk_
```

```
DeviceID    : C:
DriveType   : 3
ProviderName :
FreeSpace   : 391256055808
Size        : 460254605312
VolumeName  :

DeviceID    : D:
DriveType   : 3
ProviderName :
FreeSpace   : 4764419932160
Size        : 10000829247488
VolumeName  : 10TB WD
```


`Get-WmiObject Win32_NetworkAdapter`

```
PS C:\WINDOWS\system32> Get-WmiObject Win32_NetworkAdapter

ServiceName      : kdnic
MACAddress       :
AdapterType      :
DeviceID         : 0
Name             : Microsoft Kernel Debug Network Adapter
NetworkAddresses :
Speed           :

ServiceName      : eldexpress
MACAddress       : 70:85:C2:B3:DC:BF
AdapterType      : Ethernet 802.3
DeviceID         : 1
Name             : Intel(R) Ethernet Connection (7) I219-V
NetworkAddresses :
Speed           : 1000000000
```

<partial output>

`Get-WmiObject Win32_OperatingSystem`

```
PS C:\WINDOWS\system32> Get-WmiObject Win32_OperatingSystem

SystemDirectory : C:\WINDOWS\system32
Organization    :
BuildNumber     : 18363
RegisteredUser  : Windows User
SerialNumber    : 00328-00255-34178-AA951
Version        : 10.0.18363
```

`Get-WmiObject Win32_Videocontroller`

```
PS C:\WINDOWS\system32> Get-WmiObject Win32_Videocontroller

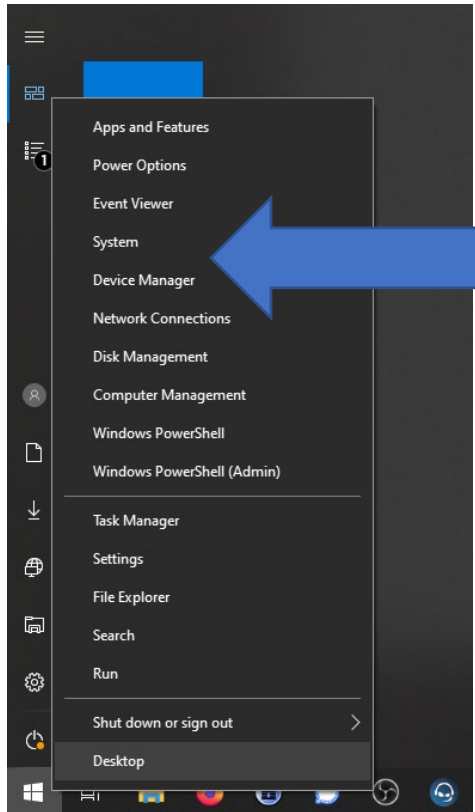
__GENUS          : 2
__CLASS          : Win32_VideoController
__SUPERCLASS     : CIM_PCVideoController
__DYNASTY        : CIM_ManagedSystemElement
__RELPATH        : Win32_VideoController.DeviceID="VideoController1"
__PROPERTY_COUNT : 59
__DERIVATION     : {CIM_PCVideoController, CIM_VideoController, CIM_Controller, CIM_LogicalDevice...}
__SERVER         : RESURRECCION
__NAMESPACE     : root\cimv2
__PATH           : \\RESURRECCION\root\cimv2:Win32_VideoController.DeviceID="VideoController1"
AcceleratorCapabilities :
AdapterCompatibility    : NVIDIA
AdapterDAType           : Integrated RAMDAC
AdapterRAM              : 4293918720
Availability             : 3
CapabilityDescriptions  :
Caption                 : NVIDIA GeForce GTX 1080 Ti
```

<partial output>

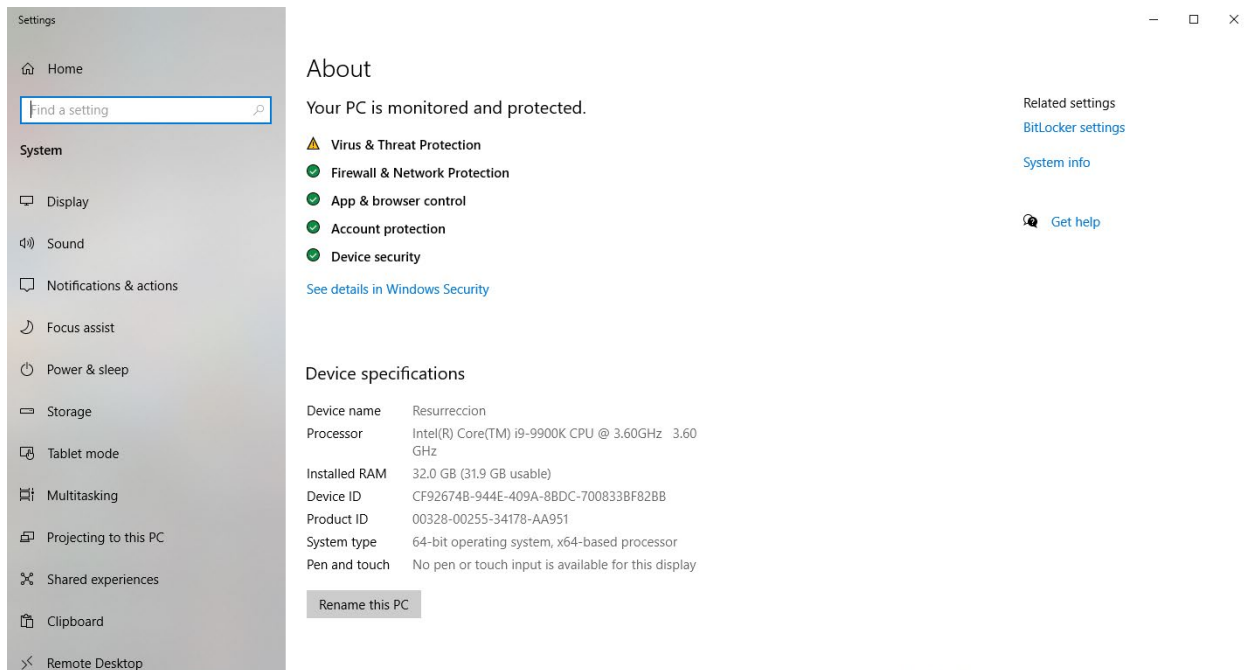
Graphical User Interface (GUI):

Another option for viewing the devices that are present in Windows is the device manager.

If you right click the windows icon (start menu) you will be presented with some options to aid in identification of hardware.

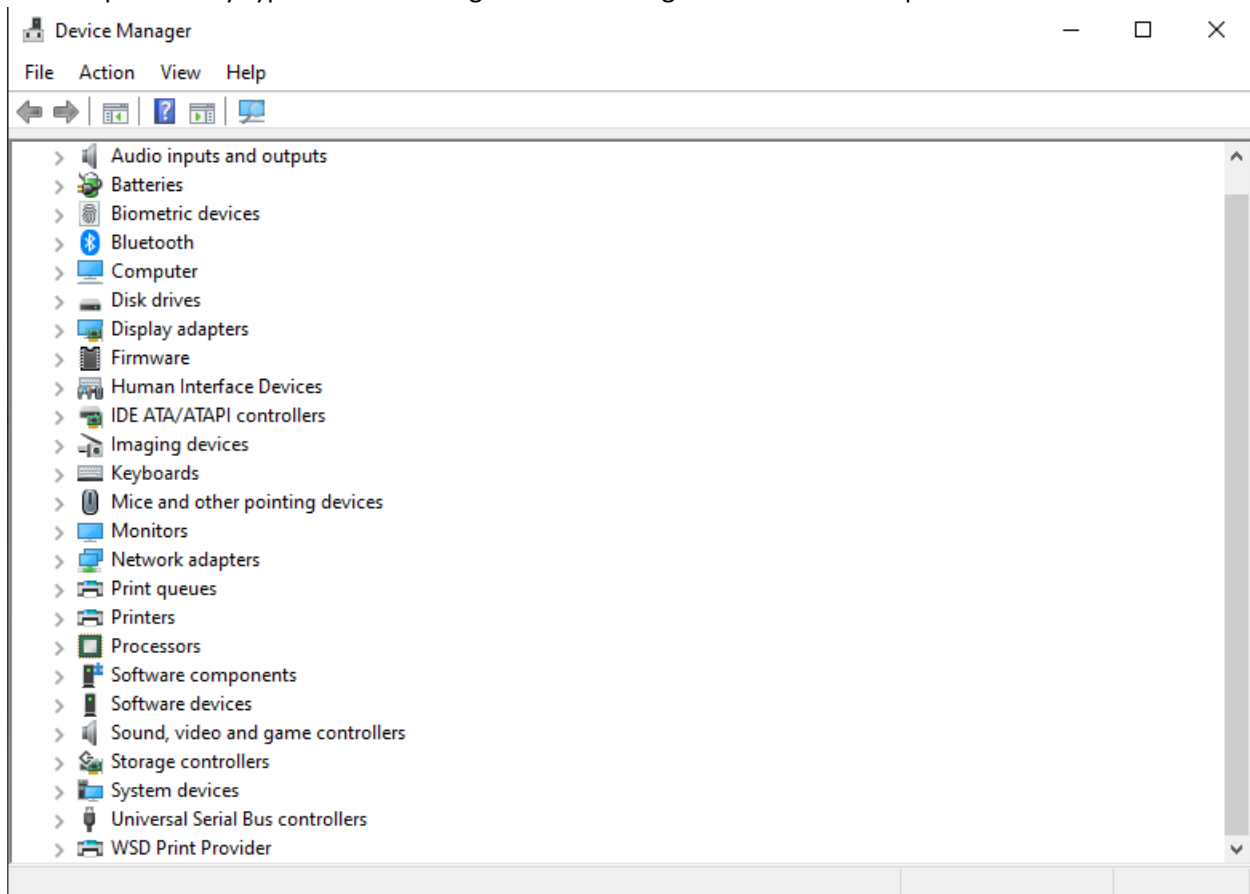


The System option will give you a general overview of the system. Typically you will see CPU and ram basics on this page.



Device Manager will outline all the devices in your system as windows sees them. You can click the arrows to the left to open and close individual line items. In this default view windows will categorize

the components by type. You can change the view using the menu in the top labeled "View"



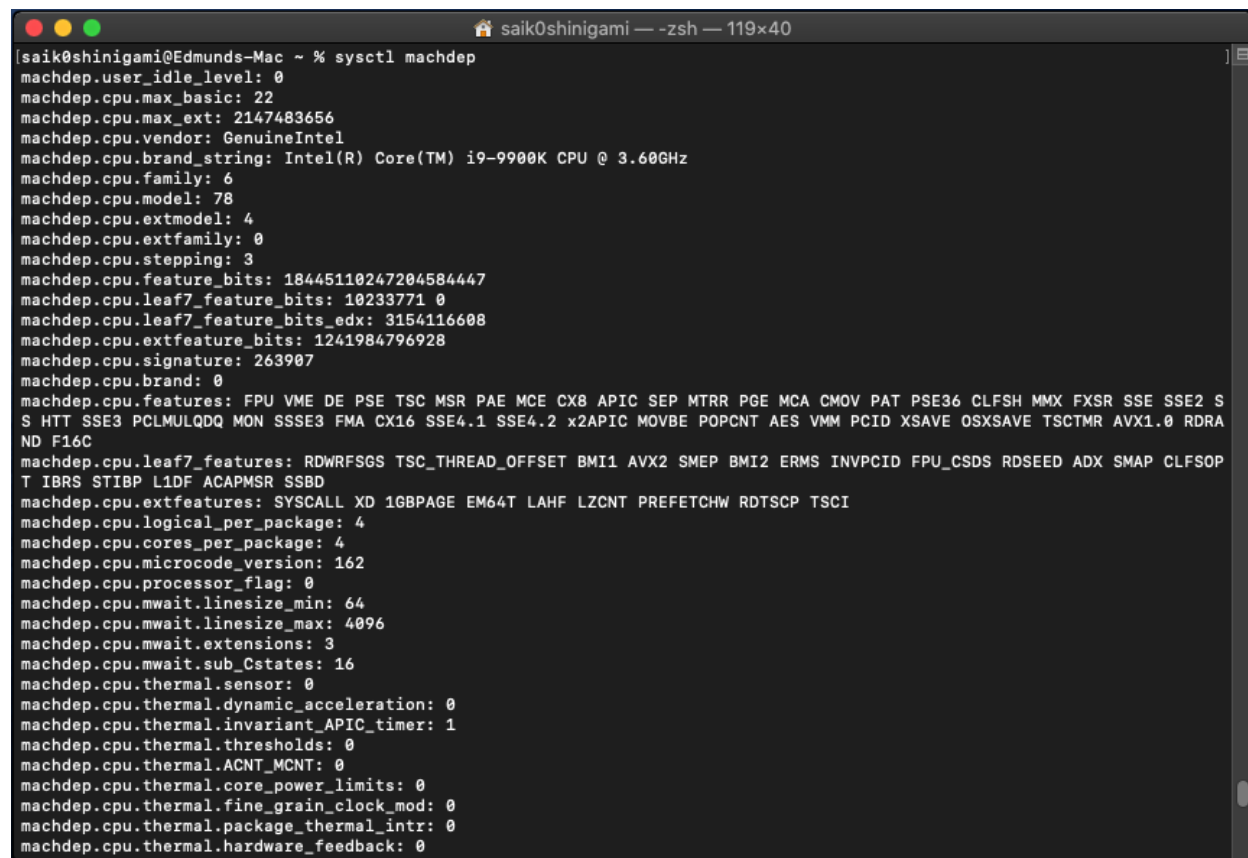
Mac

Note: Screenshots here are from an emulated machine, your output will be significantly different.

CLI:

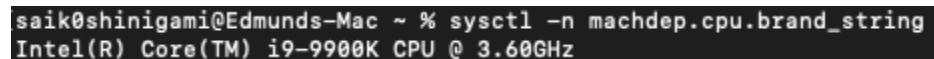
`sysctl -a` is the command used to output "all" (-a) of your systems information. Additional information on it's usage can be found at <https://ss64.com/osx/sysctl.html>

`sysctl machdep` You can have sysctl return specific fields of information by giving it the "name" you're looking for. "machdep" being machine dependent information.

A terminal window titled 'saik0shinigami — zsh — 119x40' showing the output of the command 'sysctl machdep'. The output lists various machine-dependent parameters such as user idle level, CPU max basic/extended, vendor (GenuineIntel), brand string (Intel(R) Core(TM) i9-9900K CPU @ 3.60GHz), family, model, extmodel, extfamily, stepping, feature bits, leaf7 feature bits, leaf7 feature bits edx, extfeature bits, signature, brand, features, leaf7 features, extfeatures, logical per package, cores per package, microcode version, processor flag, mwait linesize min/max, mwait extensions, mwait sub-Cstates, thermal sensor, thermal dynamic acceleration, thermal invariant APIC timer, thermal thresholds, thermal ACNT_MCNT, thermal core power limits, thermal fine grain clock mod, thermal package thermal intr, and thermal hardware feedback.

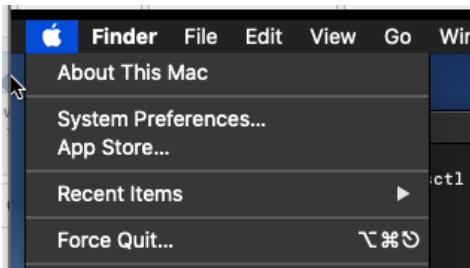
```
saik0shinigami@Edmunds-Mac ~ % sysctl machdep
machdep.user_idle_level: 0
machdep.cpu.max_basic: 22
machdep.cpu.max_ext: 2147483656
machdep.cpu.vendor: GenuineIntel
machdep.cpu.brand_string: Intel(R) Core(TM) i9-9900K CPU @ 3.60GHz
machdep.cpu.family: 6
machdep.cpu.model: 78
machdep.cpu.extmodel: 4
machdep.cpu.extfamily: 0
machdep.cpu.stepping: 3
machdep.cpu.feature_bits: 18445110247204584447
machdep.cpu.leaf7_feature_bits: 10233771 0
machdep.cpu.leaf7_feature_bits_edx: 3154116608
machdep.cpu.extfeature_bits: 1241984796928
machdep.cpu.signature: 263907
machdep.cpu.brand: 0
machdep.cpu.features: FPU VME DE PSE TSC MSR PAE MCE CX8 APIC SEP MTRR PGE MCA CMOV PAT PSE36 CLFSH MMX FXSR SSE SSE2 S
S HTT SSE3 PCLMULQDQ MON SSSE3 FMA CX16 SSE4.1 SSE4.2 x2APIC MOVBE POPCNT AES VMM PCID XSAVE OSXSAVE TSCTMR AVX1.0 RDRA
ND F16C
machdep.cpu.leaf7_features: RDWRFSGS TSC_THREAD_OFFSET BMI1 AVX2 SMEP BMI2 ERMS INVPCID FPU_CSDS RDSEED ADX SMAP CLFSOP
T IBRS STIBP L1DF ACAPMSR SSBD
machdep.cpu.extfeatures: SYSCALL XD 1GBPAGE EM64T LAHF LZCNT PREFETCHW RDTSCP TSCI
machdep.cpu.logical_per_package: 4
machdep.cpu.cores_per_package: 4
machdep.cpu.microcode_version: 162
machdep.cpu.processor_flag: 0
machdep.cpu.mwait.linesize_min: 64
machdep.cpu.mwait.linesize_max: 4096
machdep.cpu.mwait.extensions: 3
machdep.cpu.mwait.sub_Cstates: 16
machdep.cpu.thermal.sensor: 0
machdep.cpu.thermal.dynamic_acceleration: 0
machdep.cpu.thermal.invariant_APIC_timer: 1
machdep.cpu.thermal.thresholds: 0
machdep.cpu.thermal.ACNT_MCNT: 0
machdep.cpu.thermal.core_power_limits: 0
machdep.cpu.thermal.fine_grain_clock_mod: 0
machdep.cpu.thermal.package_thermal_intr: 0
machdep.cpu.thermal.hardware_feedback: 0
```

`sysctl -n machdep.cpu.brand_string` example of a command that pulls just the cpu name string out of sysctl.

A terminal window showing the output of the command 'sysctl -n machdep.cpu.brand_string'. The output is 'Intel(R) Core(TM) i9-9900K CPU @ 3.60GHz'.

```
saik0shinigami@Edmunds-Mac ~ % sysctl -n machdep.cpu.brand_string
Intel(R) Core(TM) i9-9900K CPU @ 3.60GHz
```

GUI:



Select the "About this Mac" option.



After selecting "System Report..." you'll be presented with all sorts of information about your computer.

