

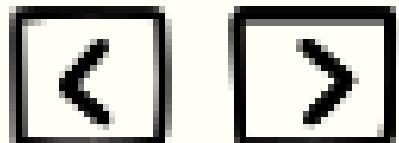
COMPUTER SYSTEMS SERVICING I

# **Power On Self-Test (POST); Basic Input/output System (BIOS) and CMOS**



Ms. Leslie Arrio, LPT

# OBJECTIVES

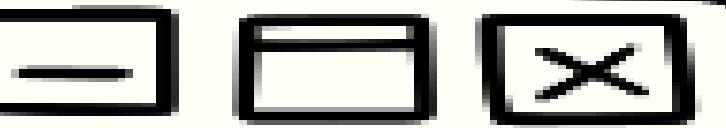


- 01 Identify the roles of POST during the startup process
- 02 Determine the problems arising during the POST phase.
- 03 Identify the functions of a CMOS in a computer system.
- 04 Acquire the steps in entering the BIOS Setup Utility



# Power On Self -Test (POST)

is the first step of the boot sequence. It doesn't matter if you've just restarted your computer or if you've just powered it on for the first time in days; the POST is going to run, regardless.



# TURN ON



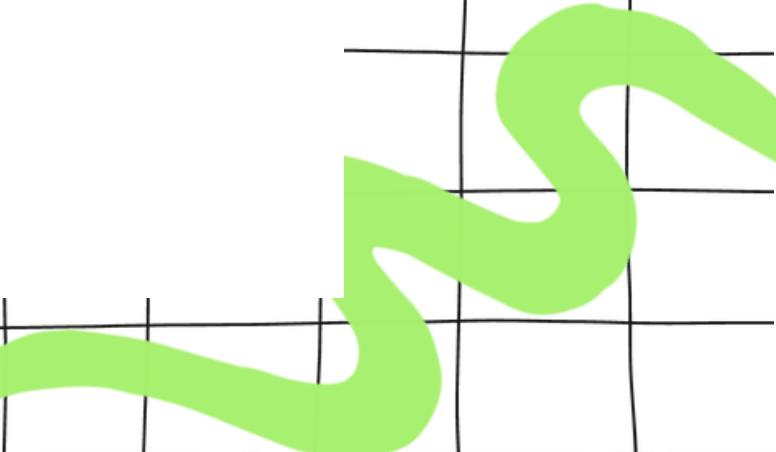
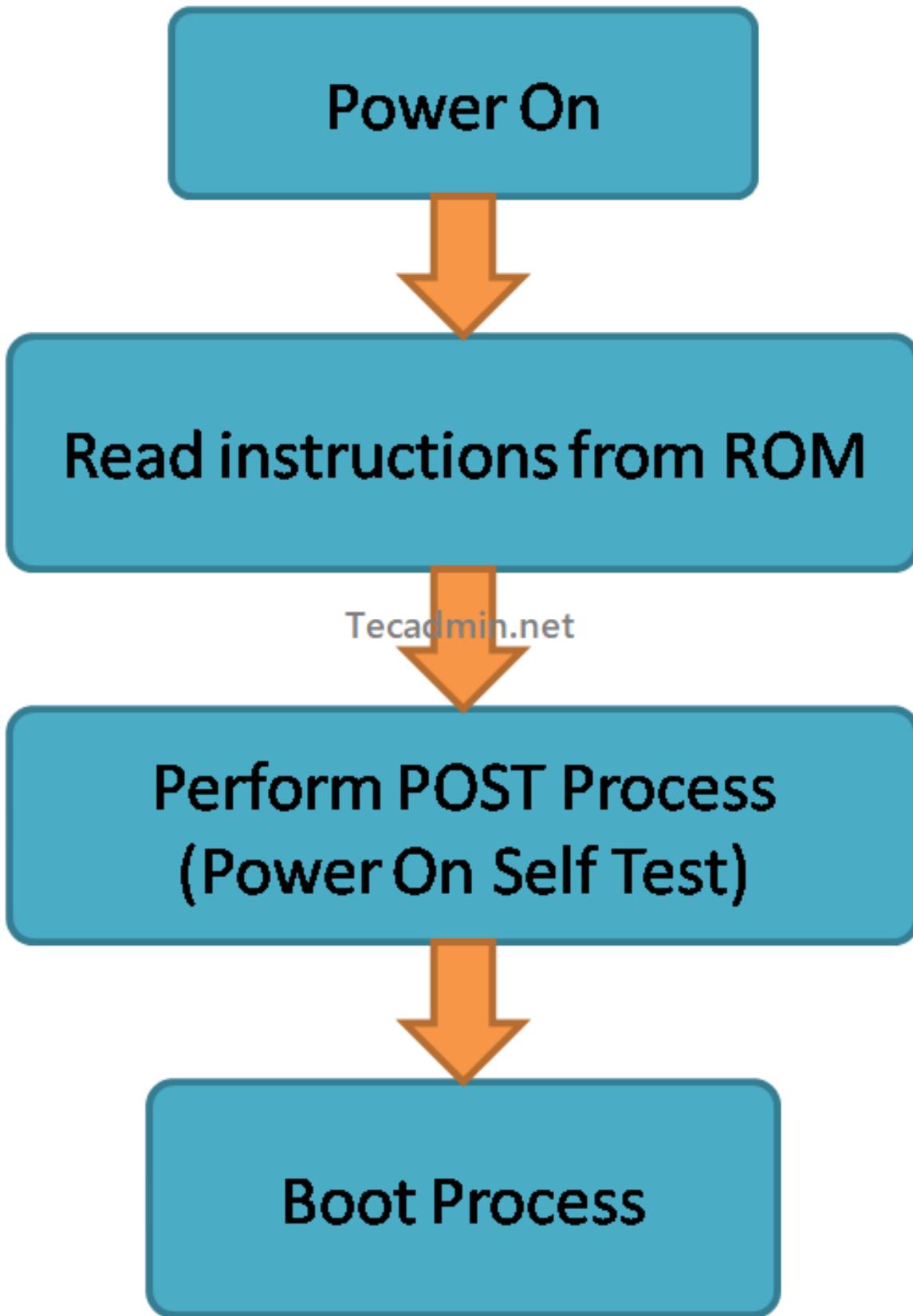
# POST

ng Up

Starting



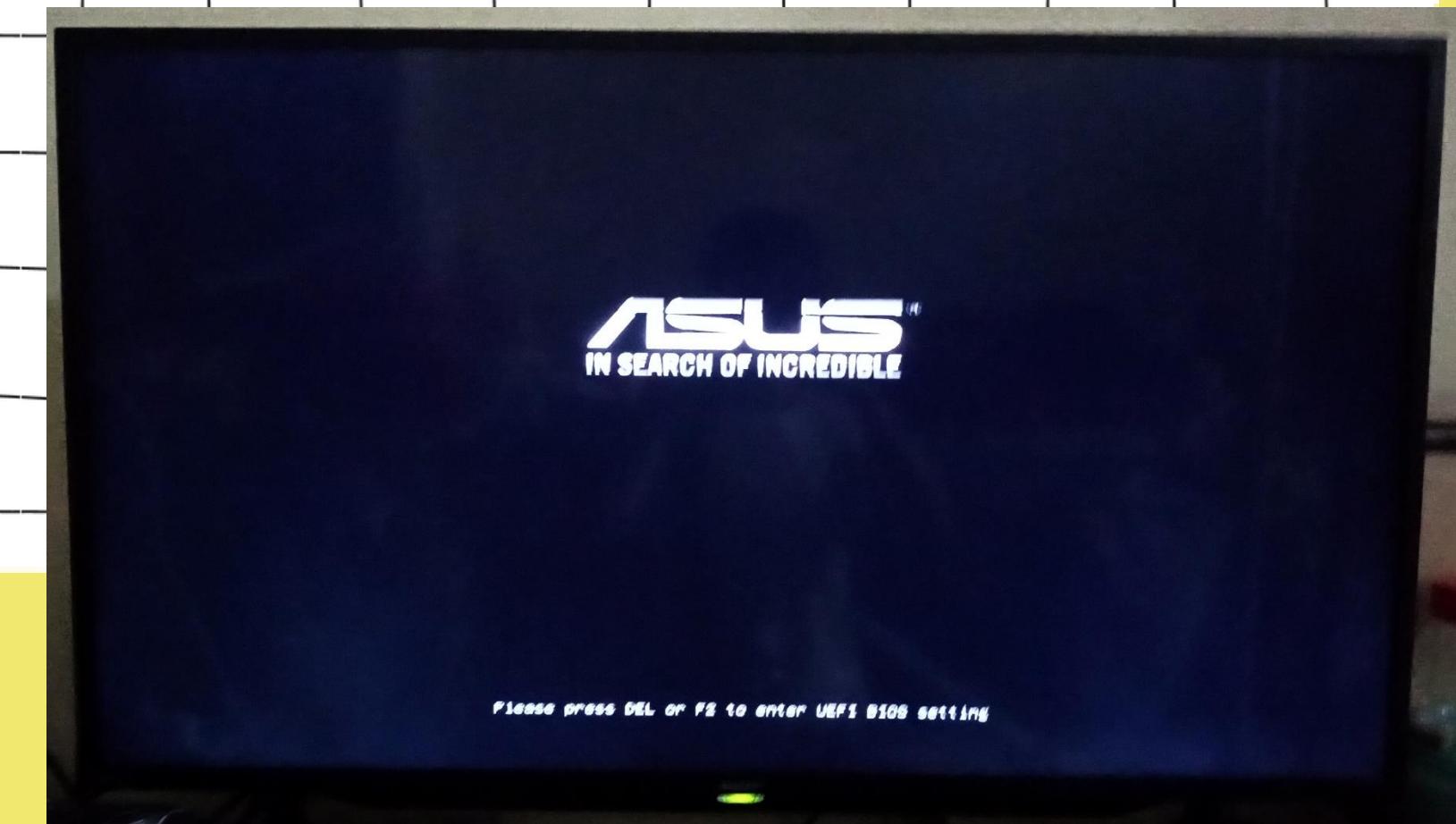
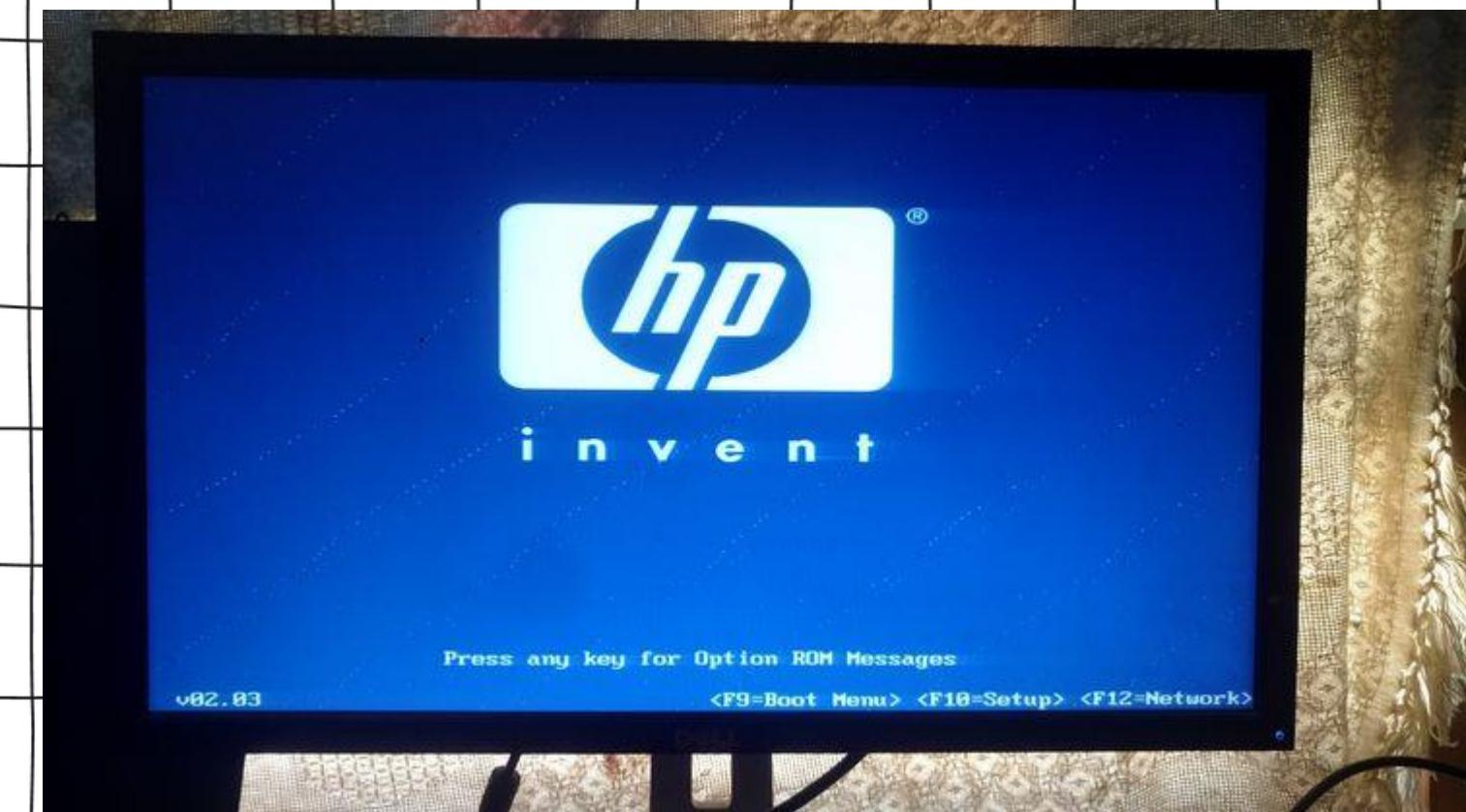
**S** POST checks the integrity of the computer's hardware components and ensures that no errors exist, allowing the system to boot up correctly.



**POST** doesn't rely on any specific operating system. In fact, there doesn't even need to be an OS installed on a hard drive for the POST to run. This is because the test is handled by the system's BIOS, no any installed software.

**TRIVIA:** Computers aren't the only devices that run a POST. Some appliances, medical equipment, and other devices also run very similar self-tests after being powered on.





## Primary steps and checks that occur during the POST:

- 1. CPU Check:** The POST begins with a test on the computer's processor to ensure it's functioning correctly. If the CPU passes this test, the POST proceeds to the next step.
- 2. ROM Check:** The POST then verifies the integrity of the ROM code itself, ensuring it's been properly loaded and hasn't been corrupted.



- 3. Memory Check:** The POST process checks the computer's Random Access Memory (RAM). It tests the integrity of memory chips, ensuring there are no errors.
- 4. Device Check:** The process then checks for the presence and functionality of critical hardware components, such as the keyboard, mouse, hard disk, and others.
- 5. Hardware Configuration Check:** The BIOS checks that the system settings are correct, cross-verifying them against the data in the Complementary Metal-Oxide-Semiconductor (CMOS) memory, which stores the system's hardware configuration settings.



# Problems During the POST

Errors might come in the form of flashing LEDs, audible beeps, or error messages on the monitor, all of which are technically referred to as POST codes, beep codes, and on-screen POST error messages, respectively (Fisher, 2020).

## **Points to Remember ✓**

*The Power On Self -Test is just that: a self-test. Just about anything that might prevent the computer from continuing to start will prompt some kind of error (Fisher, 2020).*



# Problems During the POST

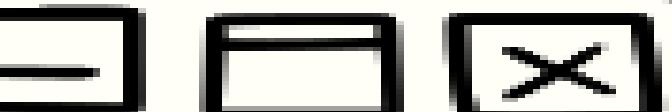
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## **Points to Remember ✓**

*The Power On Self -Test is just that: a self-test. Just about anything that might prevent the computer from continuing to start will prompt some kind of error (Fisher, 2020).*

# Flashing LEDs





# Common Beep Codes and their Meanings

Beeps	Meaning
<b>1 short beep</b>	Normal POST - system is ok
<b>2 short beeps</b>	POST Error - error code shown on screen
<b>No beep</b>	Power supply or system board problem
<b>Continuous beep</b>	Power supply, system board, or keyboard problem
<b>Repeating short beeps</b>	Power supply or system board problem
<b>1 long, 1 short beep</b>	System board problem
<b>1 long, 2 short beeps</b>	Display adapter problem
<b>1 long, 3 short beeps</b>	Enhanced Graphics Adapter



# Common Beep Codes and their Meanings

Beeps	Meaning
<b>Short Beep</b>	Normal POST - system is ok
<b>2/3/4 short beeps</b>	Memory Problem
<b>5 short beeps</b>	System board problem
<b>6 short beeps</b>	System board or keyboard problem
<b>7 Short beeps</b>	CPU or BIOS problem, Cache memory chips on motherboard problem
<b>1 long, 3 short beeps</b>	Memory Chips
<b>1 long, 8 short beeps</b>	Video card problem



# Common Beep Codes and their Meanings

Beeps	Meaning
<b>1 long, 2 short</b>	Video adapter error: Bad or improperly seated video card
<b>Repeating beeps</b>	Memory error: Bad or improperly seated RAM
<b>1 long, 3 short</b>	Bad video RAM or video card not present
<b>High-frequency beeps</b>	Overheated CPU: Check fans
<b>Repeating high/low beeps</b>	CPU: Improperly seated or defective CPU



# POST error messages

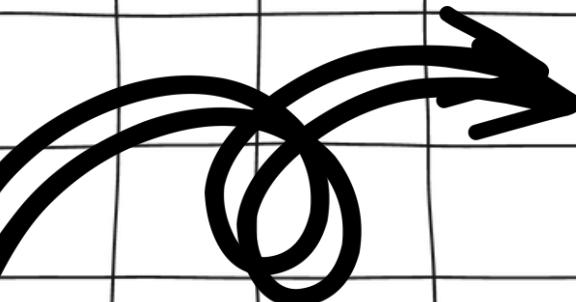


# Blue Screen of Death (BSOD)



Your PC ran into a problem and needs to restart. We're just collecting some error info, and then we'll restart for you. (0% complete)

If you'd like to know more, you can search online later for this error: FDP\_DETECTED\_FATAL\_ERROR



# What causes BSOD?

- Poorly written or incompatible device drivers.
- Bugs in the OS kernel.
- Corrupted system files.
- Conflicts between system processes.
- Malware Infection
- Recent software updates.

# Prevention measures for BSOD

- Keep Windows and drivers updated. Regularly update the Windows OS and device drivers to ensure compatibility and fix known issues.

# Prevention measures for BSOD

- Use reliable antivirus/antimalware software. Install and maintain up-to-date antivirus software with an active scanner and firewall to protect against malware that can potentially trigger a BSOD.

# Prevention measures for BSOD

- Avoid overclocking. Refrain from overclocking system resources beyond manufacturer specifications, as this can lead to system instability and a BSOD.

## Prevention measures for BSOD

- Maintain proper hardware cooling. Monitor system temperature and ensure the system is functioning correctly to prevent overheating. Part of that effort can be as easy as cleaning dust from fans and vents regularly.

# ACTIVITY # 3 ARRANGE THE POST TROUBLESHOOTING STEPS

CHECK THE COMPONENTS

REMOVE ANY DISKS OR USB DEVICES

RECONNECT ALL THE CABLE AND CORDS

DISCONNECT EXTERNAL DEVICES

DISCONNECT CABLE FROM MOTHER BOARD

OPEN SYSTEM CASE

CHECK AND CLEAN THE SPECIFIC COMPONENTS

IDENTIFY THE BEEP CODES

UNPLUG THE POWER CABLE

# POST TROUBLESHOOTING STEPS

IDENTIFY THE BEEP CODES

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CORDS

# CMOS

**complementary metal-oxide-semiconductor**

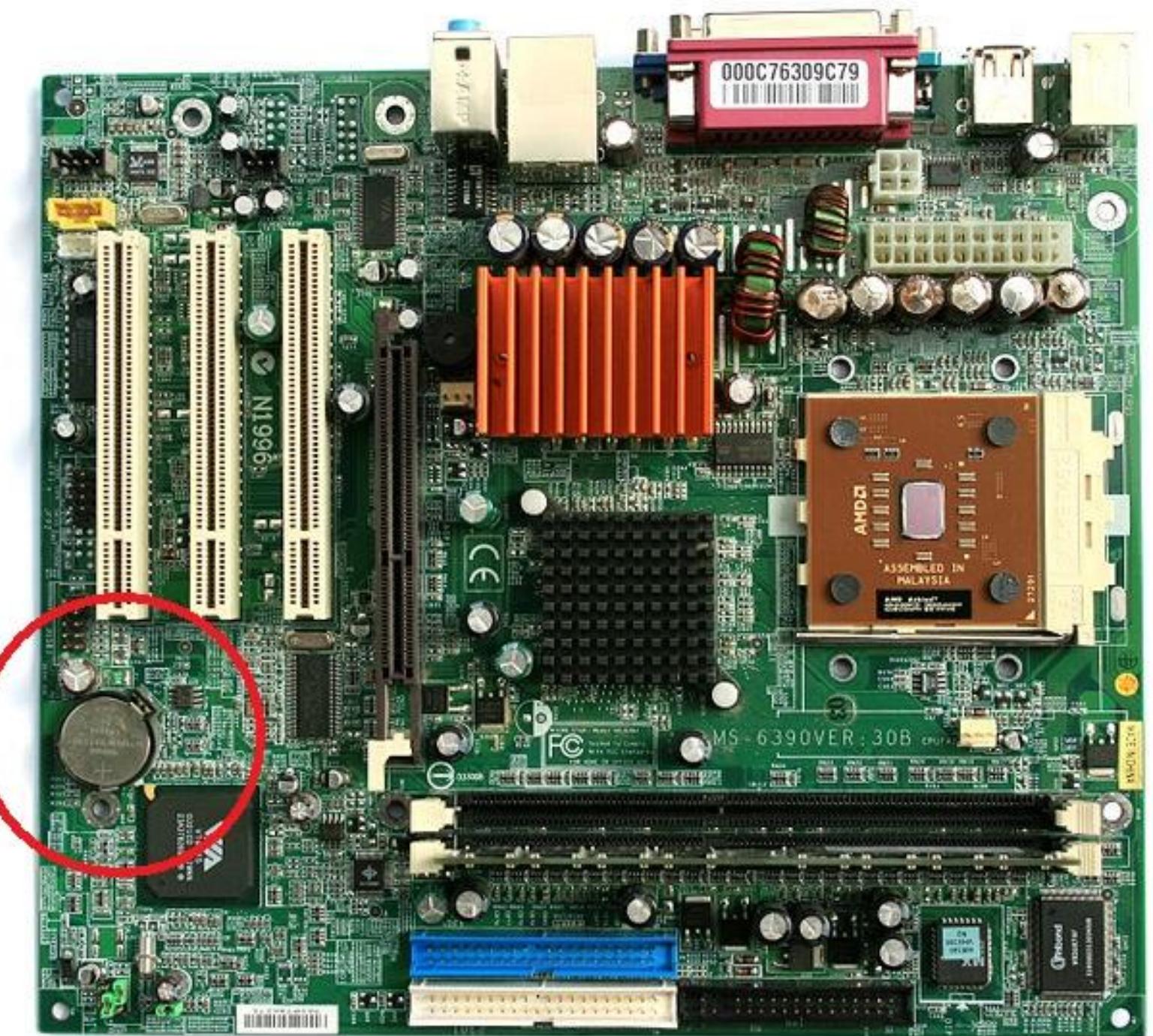
Main purpose of CMOS in computers is to store important system settings and configurations such as the **date and time, boot order, hardware settings, and password information**. This information is stored in a small battery-powered chip on the motherboard called the CMOS battery.

# CMOS



CMOS (CR20302)

Electronics Hub



# CMOS Battery Failure

**CMOS battery failure can trigger multiple computer issues. When the battery dies, it affects the performance ability of the computer because it can no longer recognize the hardware drivers.**



The CMOS chip needs constant power to maintain its contents or settings.

The CMOS chip is volatile.



The CMOS chip needs constant power to maintain its contents or settings.

The CMOS battery maintains these settings.

# signs and symptoms of a failing CMOS battery

**1. Time And Date Keeps Resetting To Its Default** - can no longer set the correct date and time, which is why it keeps resetting every time you shut down the device.

## signs and symptoms of a failing CMOS battery

**2. Drivers Not Responding And Various Hardware Failures** - CMOS battery is about to fail, the computer can no longer recognize some of its hardware due to the unresponsive drivers. This can cause hardware abnormalities that will occur all of a sudden.

## signs and symptoms of a failing CMOS battery

**3. Keyboard Acting Weird-** peripheral keys are not responding. The cursor is not moving and the keyboard has stopped taking keyboard inputs.

## signs and symptoms of a failing CMOS battery

**4. Random Shutdowns And Booting Issues-** Your PC is crashing because the drivers have stopped responding while the PC operates.

## signs and symptoms of a failing CMOS battery

**5. Constant Beeping Noise And No Internet Connection-** constant beeping noise from the hardware, it's a sign that your CMOS battery needs a replacement.



**NOTE:** If CMOS battery is removed, the BIOS will reset back to its's default settings.

A. FILL IN THE BLANKS Directions: Read each sentence carefully. Supply the missing word or group of words to make each sentence correct. Write your answers in a  $\frac{1}{4}$  sheet of paper.

1. The primary function of a \_\_\_\_\_ is to handle and store configuration of Date and Time.
2. While working with your old desktop computer, you noticed it to be too slow. Associating it to CMOS, give the signs and symptoms of a failing CMOS battery \_\_\_\_\_.
3. When a CMOS fails to function, you may hear a constant beeping sound while working with your computer. This is an indication that CMOS needs to \_\_\_\_\_.
4. A user installed a new memory to his motherboard. The slot where it is inserted is known as \_\_\_\_\_.
5. Modern hard disk drives, solid state and optical drives for data transfer uses the \_\_\_\_\_ connector for data transfer.

## ACTIVITY #4

Directions: **Study the given scenario.**

Scenario: You have recently installed /motherboard in your desktop computer. When you pressed the power on, the computer does not proceed to booting process.

Choose beep codes problem, **Write and draw the steps on how are you going to troubleshoot the problem.**

Note: You may write your answers in a paragraph or Bulleted numbered format. Please be guided by the rubrics provided below.

The content of your output will be evaluated using the Scoring Rubrics provided below. The first component is Correctness and Completeness while the second one is Familiarity. The score for each component ranges from 5 (highest) to 1(lowest). The scores for both components will be added to determine your final score.

Correctness and Completeness	5
Familiarity	5
Total Points	10



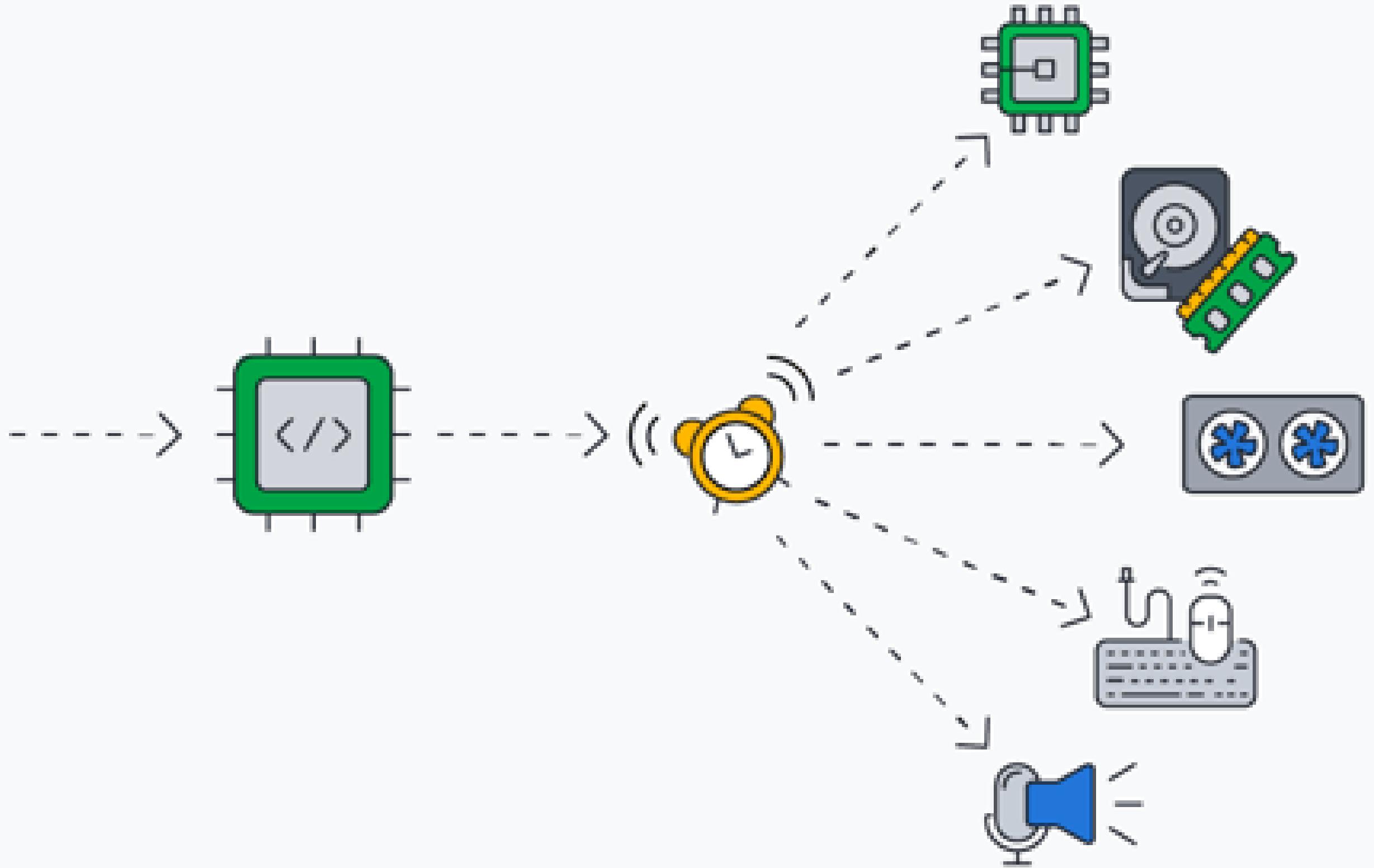
# **Basic Input Output System (BIOS)**

is a small piece of code programmed on an erasable, programmable, read-only memory (EPROM) chip on the motherboard. BIOS that's responsible for the POST and therefore makes it the very first software to run when a computer is started.



The BIOS is stored on the BIOS chip on the motherboard.

The BIOS chip is non-volatile.



works by delivering communications between the operating system and the hardware

# BIOS VS CMOS

BIOS is the **firmware** or program that comes with your motherboard.

BIOS is stored in the **BIOS Chip**

BIOS setting is retained in **CMOS** chip

# **Unified Extensible Firmware Interface (UEFI)**

SECURE BOOT that stops any digitally unsigned drivers from loading and helps to stop malicious software, such as rootkits

A rootkit is a type of malware designed to give hackers access to and control over a target device.

# Unified Extensible Firmware Interface (UEFI)

SECURE BOOT that stops any digitally unsigned drivers from loading and helps to stop malicious software, such as **rootkits**

# ROOTKITS

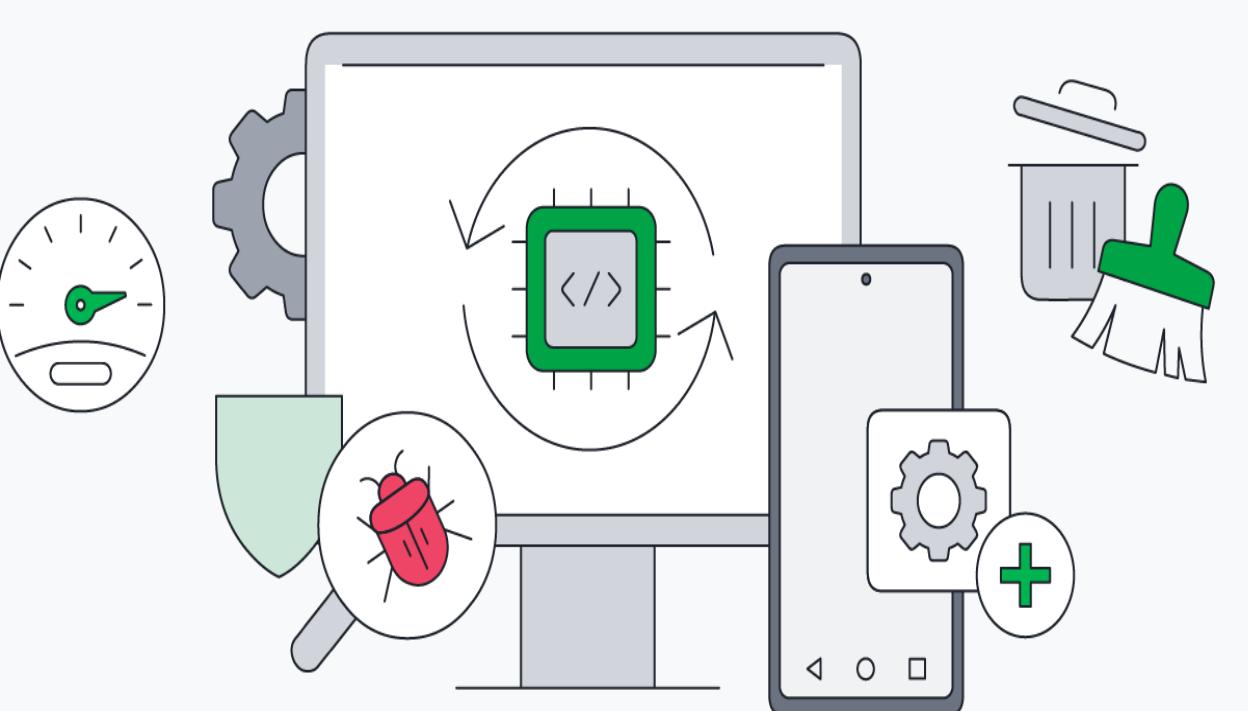
A rootkit is software used by cybercriminals to gain control over a target computer or network. Rootkits can sometimes appear as a single piece of software but are often made up of a collection of tools that allow hackers administrator-level control over the target device.

# Firmware updates important

Firmware updates resolve glitches and bugs, prevent crashes , and help stop computers getting slower over time. In addition to fixing performance issues, firmware updates also contribute to **enhancing device security**.

# Firmware updates important

**Firmware updates are important** because they allow manufacturers to ensure their devices remain compatible with new software formats.



## BIOS (OLD)



## UEFI (NEW)



- Blue screen that resembles the BSOD.
- Cannot recognize larger storage drives.
- Only able to use a keyboard.
- User friendly, graphical user interface.
- Recognizes larger storage drives.
- Able to use a mouse in the interface.

# Configuring the BIOS

supports several hardware configurations that can be changed through the setup utility. Saving these changes and restarting the computer applies the changes to the BIOS and alters the way BIOS instructs the hardware to function.

# Entering the BIOS Setup Utility

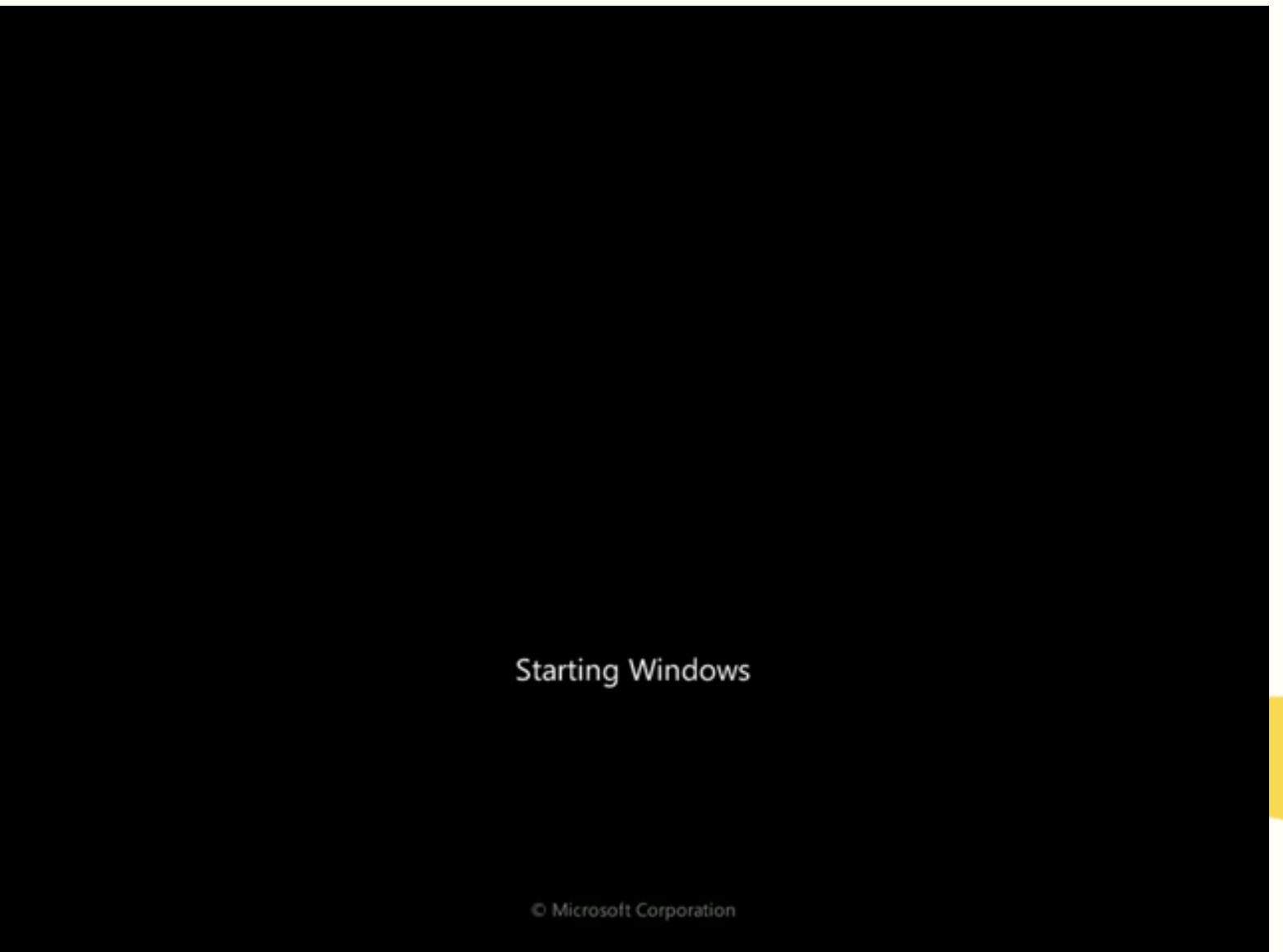
BIOS **Setup Utility or Hot Keys** could be F1, F2, Delete or Esc. Some systems also require holding down the Fn key while tapping the F1 and F2 keys. You may refer to your hardware documentation or do a simple google search

## Note:

Before configuring the BIOS, check what version is currently running on your computer.

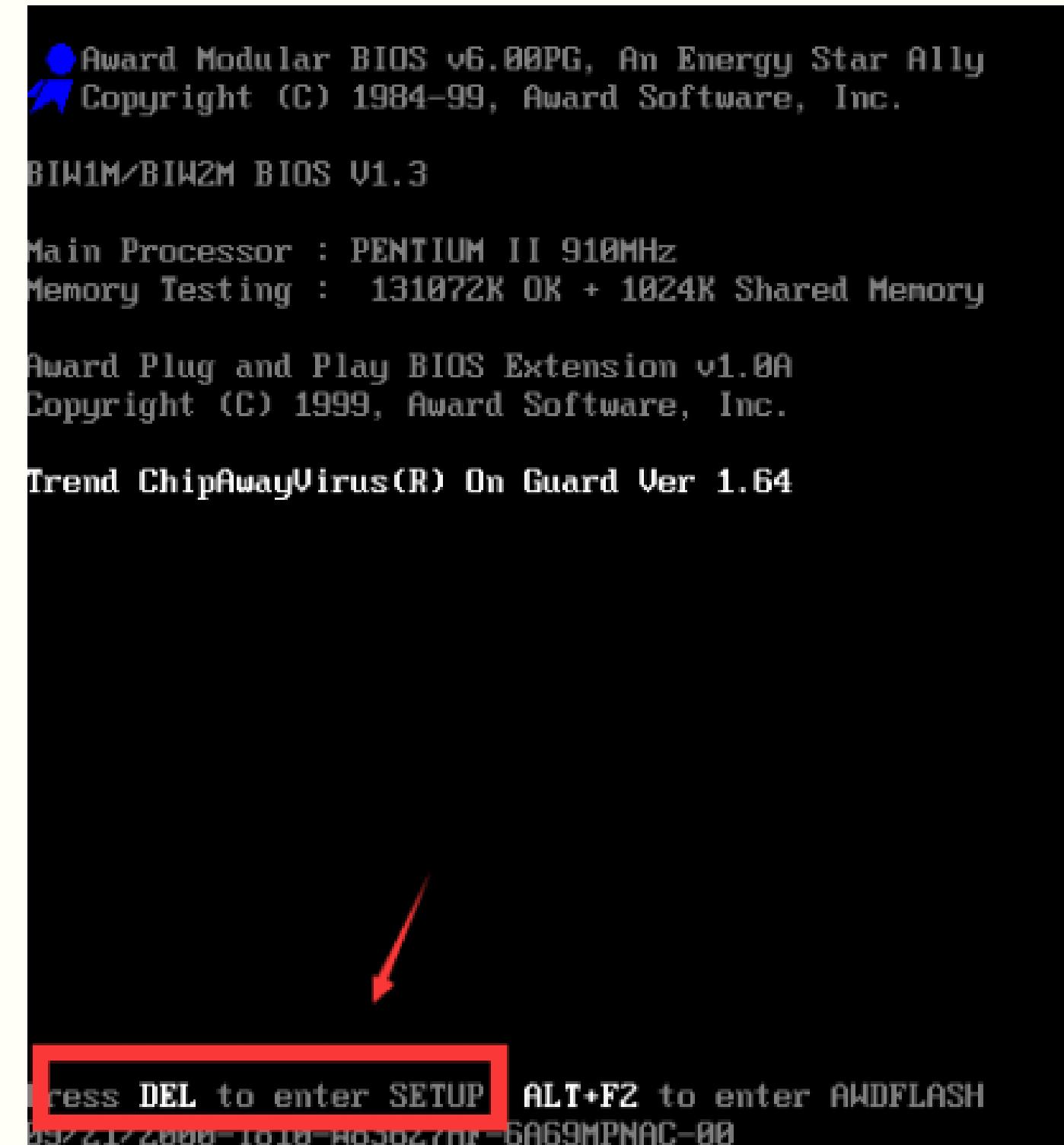
# FOR WINDOWS 7

1. Turn off your computer. You can only open the BIOS right before you see the Microsoft Windows 7 logo when starting your computer.



# FOR WINDOWS 7

2. Common keys to open the BIOS are **F2, F12, Delete, or Esc.** Many computers will display the key you need to press to open the BIOS before loading the **Windows 7** operating system.



# FOR WINDOWS 8

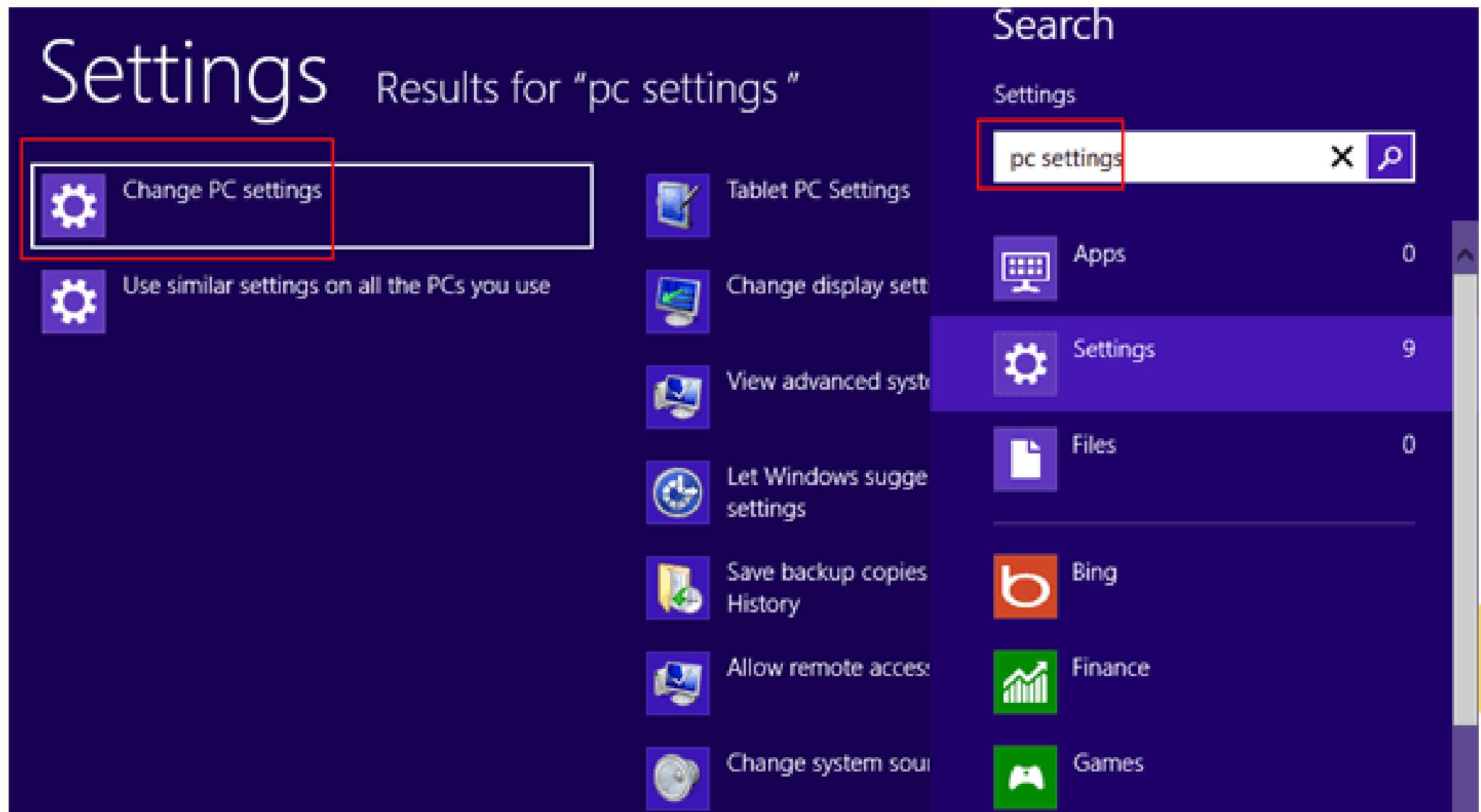
1. Open the charms bar in the upper right corner of the screen with a mouse cursor or you can press the Windows Key and the C key.

1 To display the charms bar, press Windows+C on your keyboard.



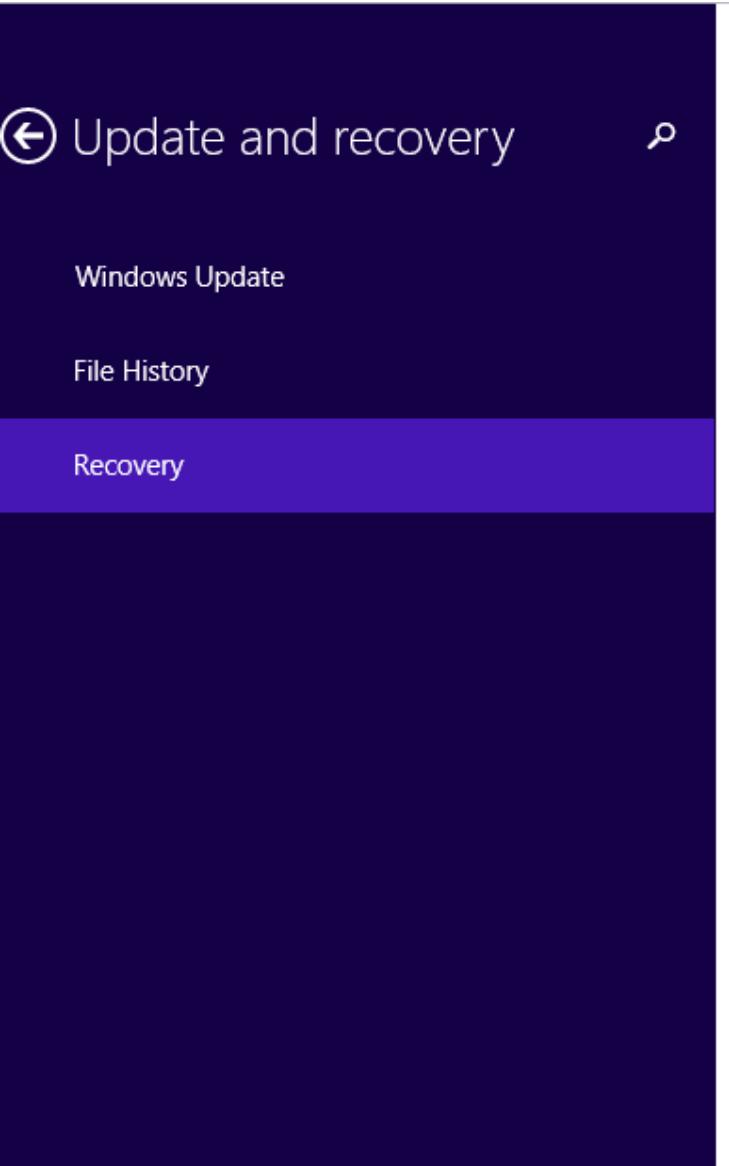
# FOR WINDOWS 8

2. Click on Settings  
then select Change  
PC settings from the  
Menu.



# FOR WINDOWS 8

3. Click Update and Recovery then select Recovery.



Refresh your PC without affecting your files

If your PC isn't running well, you can refresh it without losing your photos, music, videos, and other personal files.

[Get started](#)

Remove everything and reinstall Windows

If you want to recycle your PC or start over completely, you can reset it to its factory settings.

[Get started](#)

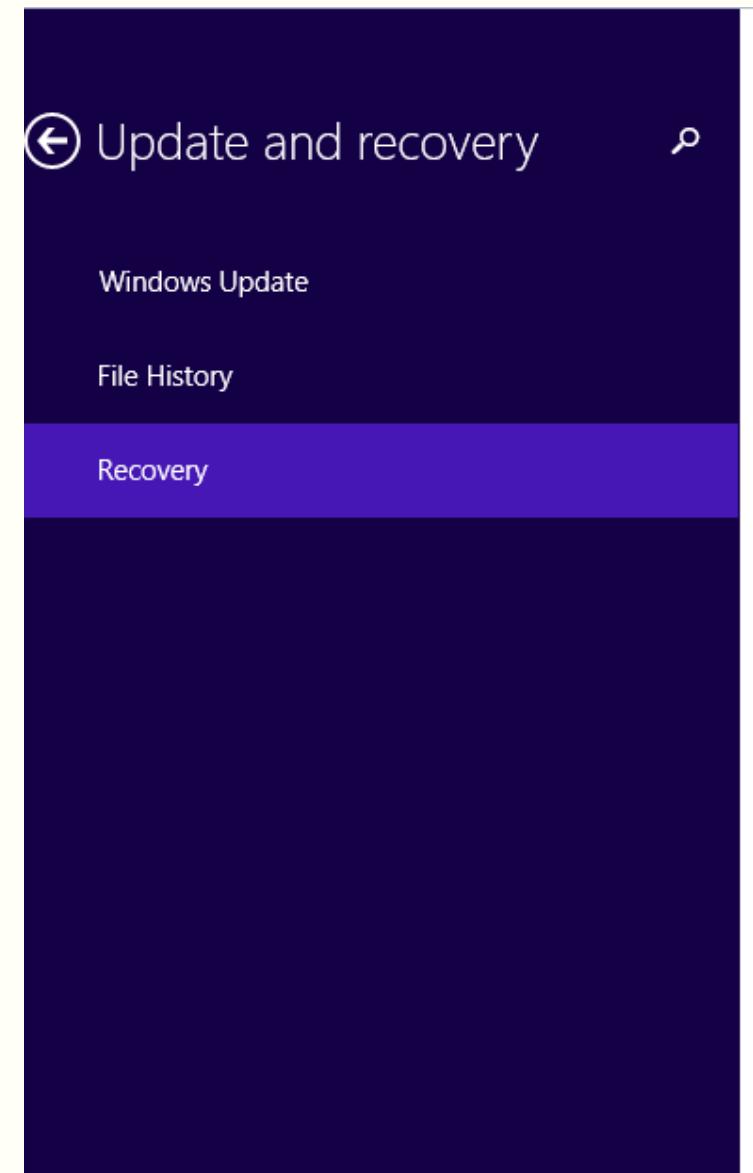
Advanced startup

Start up from a device or disc (such as a USB drive or DVD), change Windows startup settings, or restore Windows from a system image. This will restart your PC.

[Restart now](#)

# FOR WINDOWS 8

4. Choose Restart now on the Advanced Startup Settings



Refresh your PC without affecting your files

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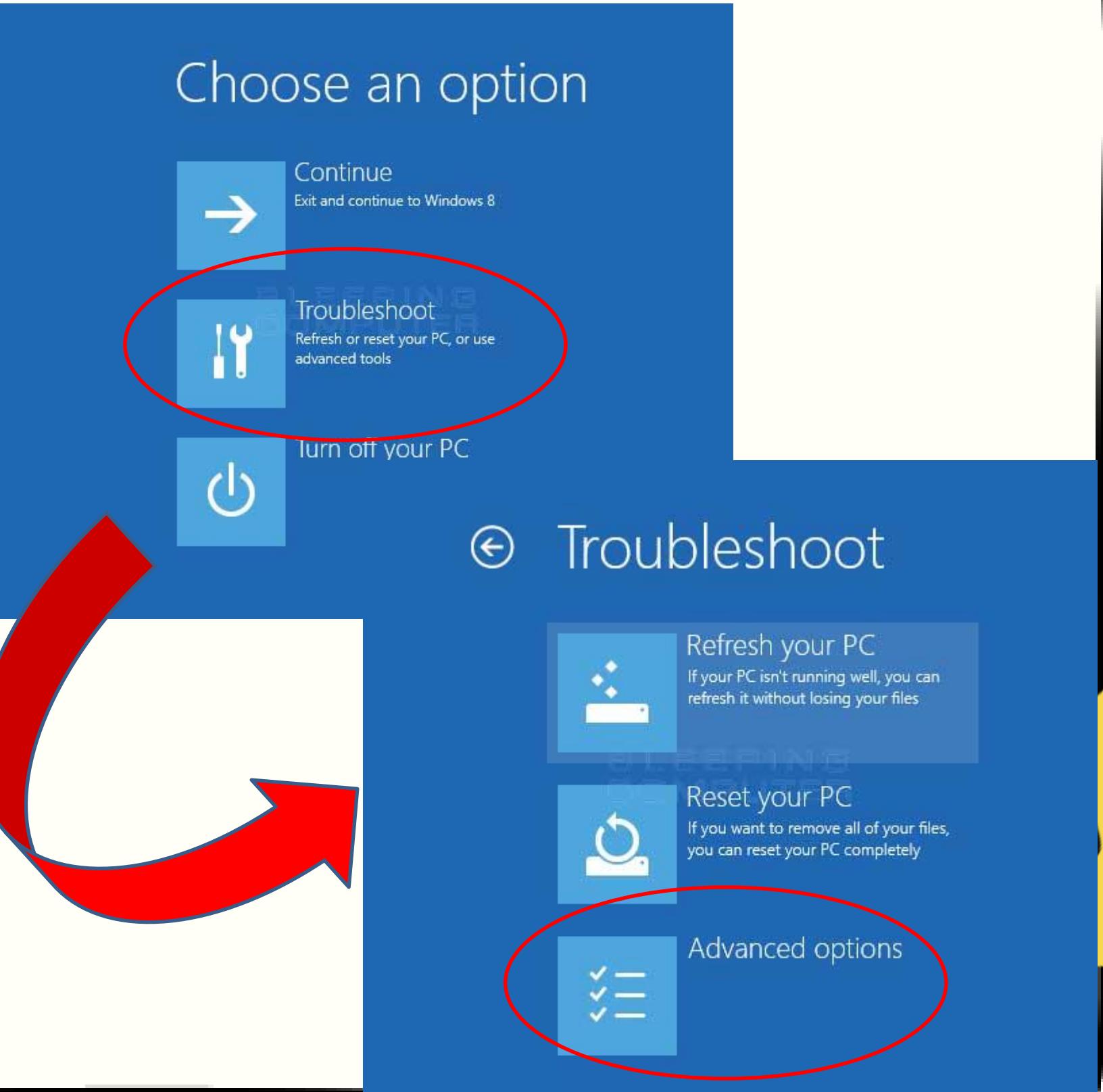
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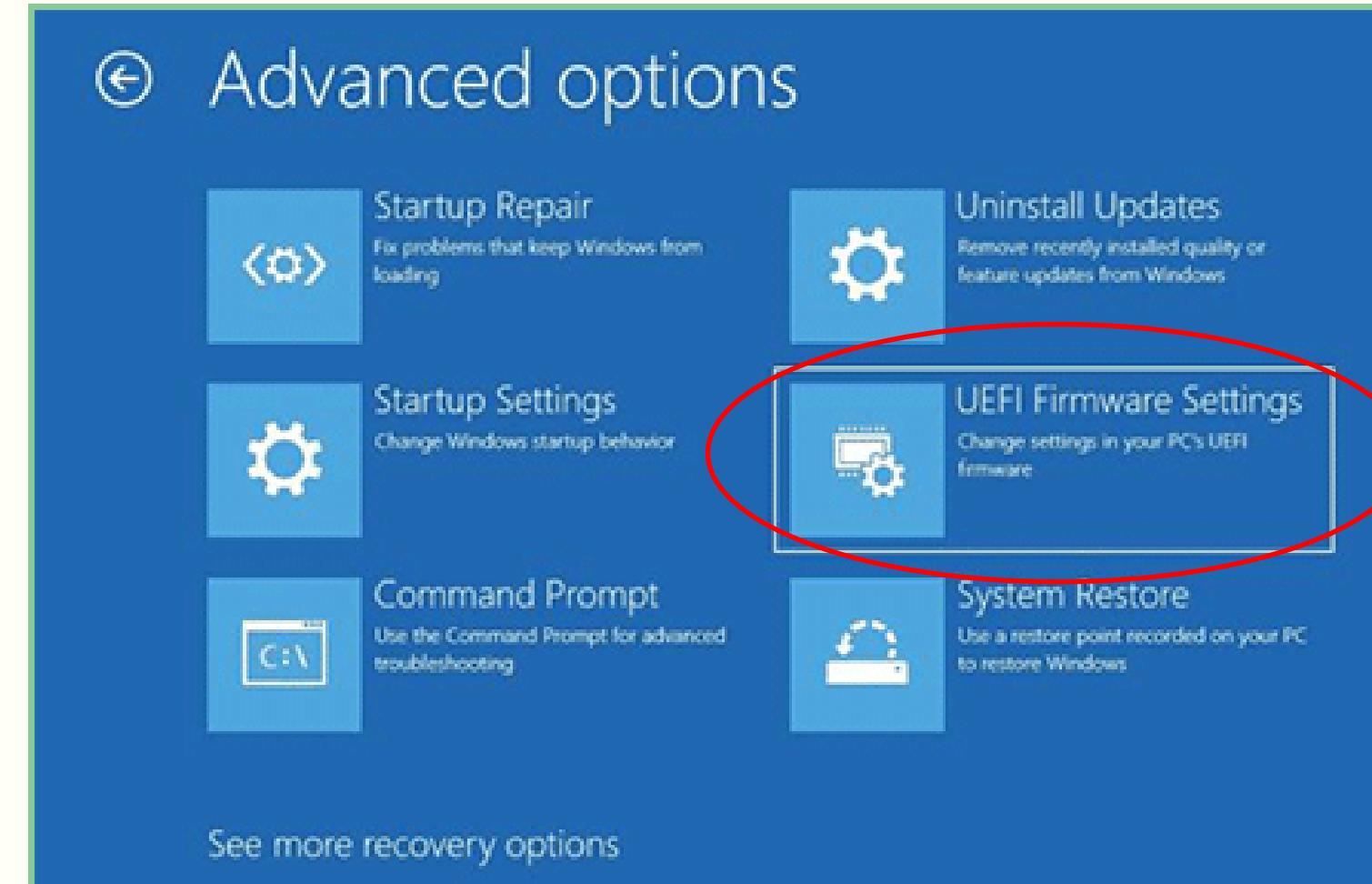
# FOR WINDOWS 8

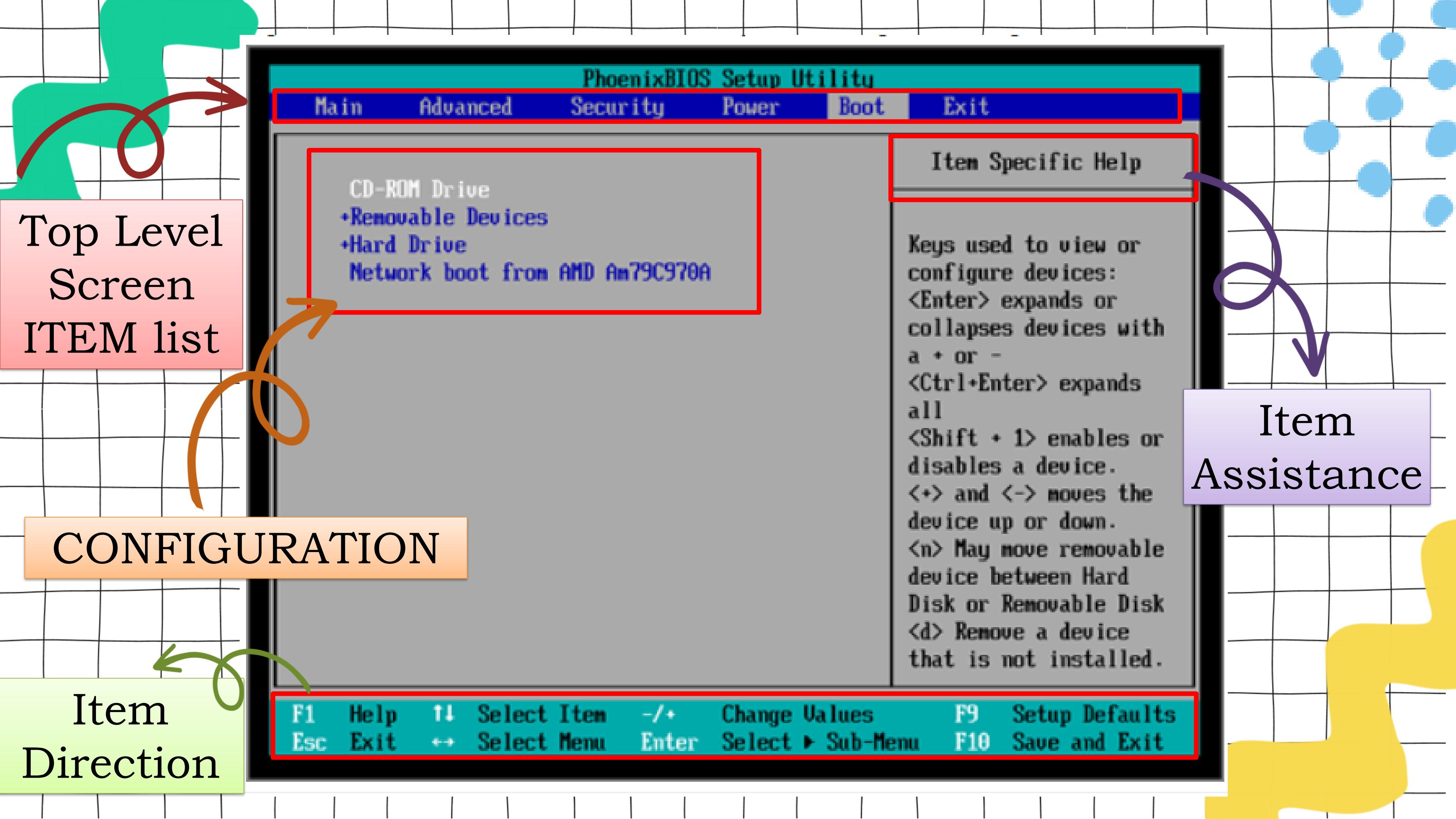
5. Select Troubleshoot  
then go to Advanced  
Options



# FOR WINDOWS 8

6. Choose UEFI Firmware Settings and press Restart.





# BIOS Setup Screen Overview

Screen	Description	See this section (Press Ctrl + Mouse Left Click)
Main	Provides general product information, including BIOS, processor, system memory, and system time/date.	<a href="#">BIOS Main Menu Screen</a>
Advanced	Configuration information for the CPU, memory, IDE, Super IO, trusted computing, USB, PCI, MPS and other information.	<a href="#">BIOS Advanced Menu Screens</a>
Security	Set or change the user and supervisor passwords.	<a href="#">BIOS Security Menu Screens</a>
Boot	Configure the boot device priority (storage drives and the DVD-ROM drive)	<a href="#">BIOS Setup Utility: Boot Settings</a>
Exit	Save changes and exit, discard changes and exit, discard changes, or load optimal or fail-safe default s.	<a href="#">BIOS Exit Menu Screens</a>

**Main**

Advanced Security Boot Exit

System Time: [09:36:09]  
System Date: [03/12/2016]

Legacy Diskette A: [1.44/1.25 MB 3½"]  
Legacy Diskette B: [Disabled]

► Primary Master  
► Primary Slave  
► Secondary Master  
► Secondary Slave

► Keyboard Features

System Memory: 640 KB  
Extended Memory: 1047552 KB  
Boot-time Diagnostic Screen: [Disabled]

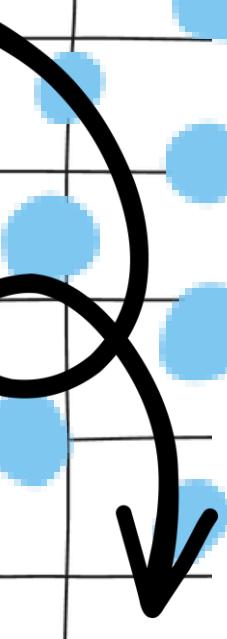
Item Specific Help

<Tab>, <Shift-Tab>, or <Enter> selects field.

J

<Tab>, <Shift-Tab>, or <Enter> selects field.

Provides general product information, including BIOS, processor, system memory, and system time/date.



PhoenixBIOS Setup Utility

Main Advanced Security Boot Exit

Item Specific Help

System Time: [02:36:09]  
System Date: [03/12/2016]

Legacy Diskette A: [1.44/1.25 MB 3½"]  
Legacy Diskette B: [Disabled]

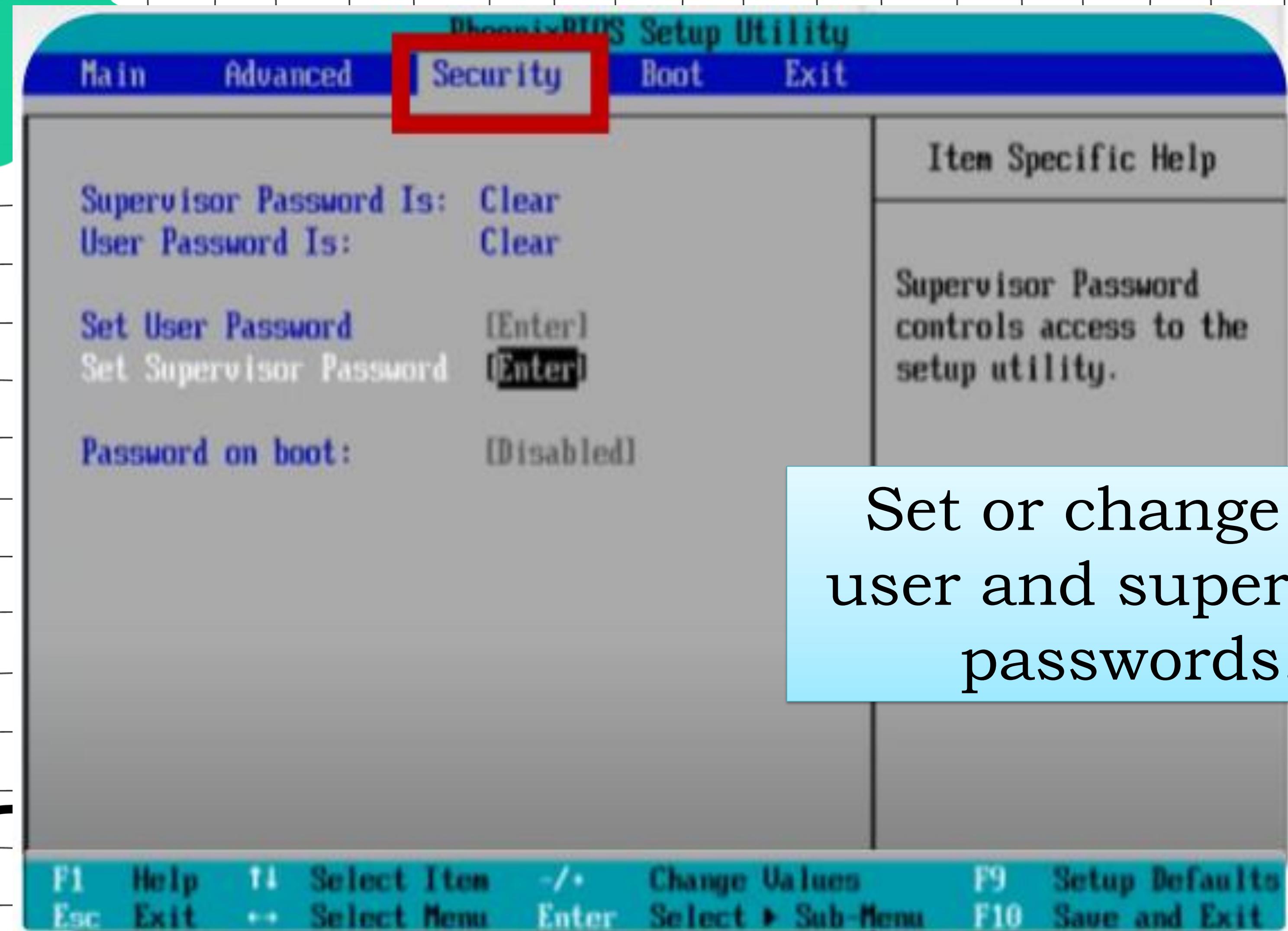
► Primary Master [None]  
► Primary Slave [None]  
► Secondary Master [None]  
► Secondary Slave [None]

► Keyboard Features

System Memory: 640 KB  
Extended Memory: 1047552 KB  
Boot-time Diagnostic Screen: [Disabled]

F1 Help F2 Select Item -/+ Change Us  
Esc Exit -- Select Menu Enter Select > Sub-Menu F10 Save and Exit

Configuration information for the CPU, memory, IDE, Super IO, trusted computing, USB, PCI, and other information.



Set or change the user and supervisor passwords.

## Item Specific Help

- Removable Devices
- Hard Drive
- CD-ROM Drive
- Network boot from Intel E1000

Configure the boot device priority  
(storage drives and the DVD-ROM drive)

Keys used to view or configure devices:  
• <Enter> expands or collapses devices with a + or -  
• <Ctrl+Enter> expands all  
• <+> and <-> moves the device up or down.  
• <n> May move removable device between Hard Disk or Removable Disk  
• <d> Remove a device that is not installed.

## Item Specific Help

- Exit Saving Changes
- Exit Discarding Changes**
- Load Setup Defaults
- Discard Changes
- Save Changes

Exit System Setup and save your changes to CMOS.

Save changes and exit, discard changes and exit, discard BIOS Exit Menu Screens changes, or load optimal or fail-safe default s.

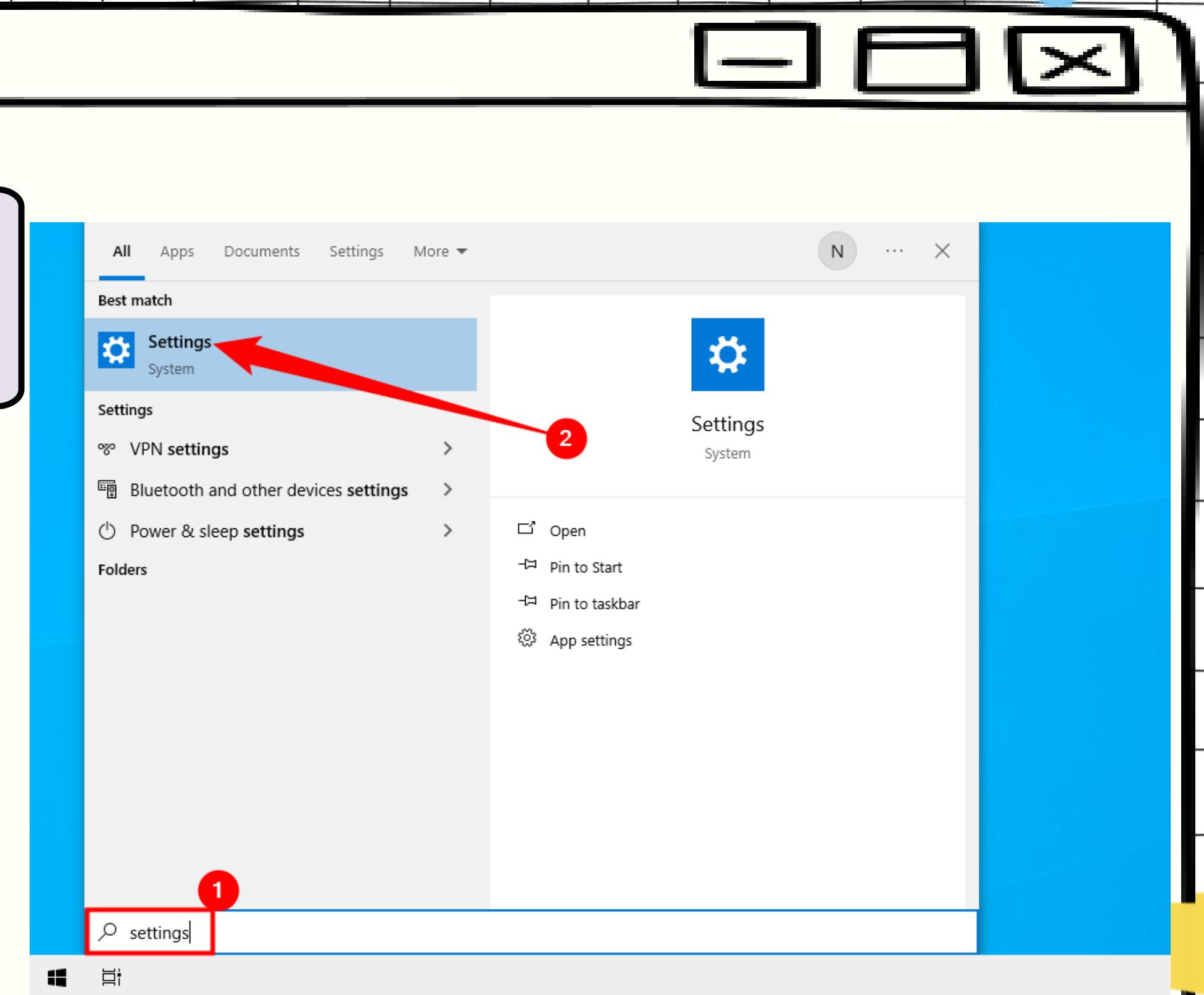
# QUIZ # 6: MODIFIED TRUE OR FALSE

**Directions: Read each sentence carefully. In a  $\frac{1}{4}$  sheet of paper, write TRUE if the statement is correct. If it is false, replace the underlined word or group of words with the correct answer.**

1. When power is turned on, **POST** runs to determine if the computer keyboard, random access memory, disk drives, and other hardware are working correctly.
2. **1 long and 3 short beeps** indicates that the computer system is in good condition.
3. The **Advanced** in BIOS set up provides general product information, including BIOS, processor, system memory, and system time/date.
4. **BIOS** supports several hardware configurations that can be manipulated or altered
5. The **Mouse** functions allow a user to change values or select different menu options in the BIOS setup Utility.

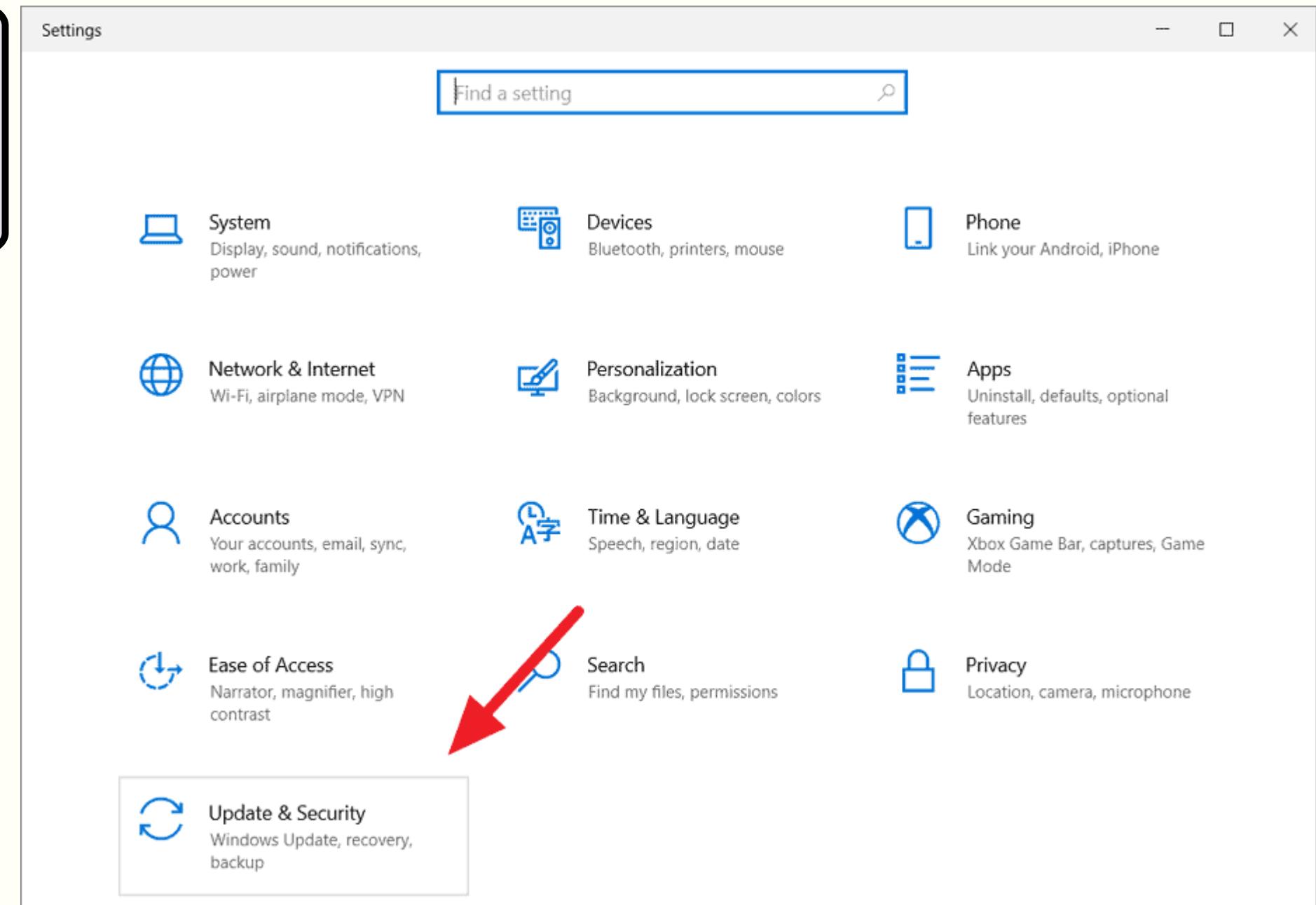
# For Windows 10

1. Open the Start Menu  
then click on Settings.



# For Windows 10

2. Click on Update and Security then select Recovery.

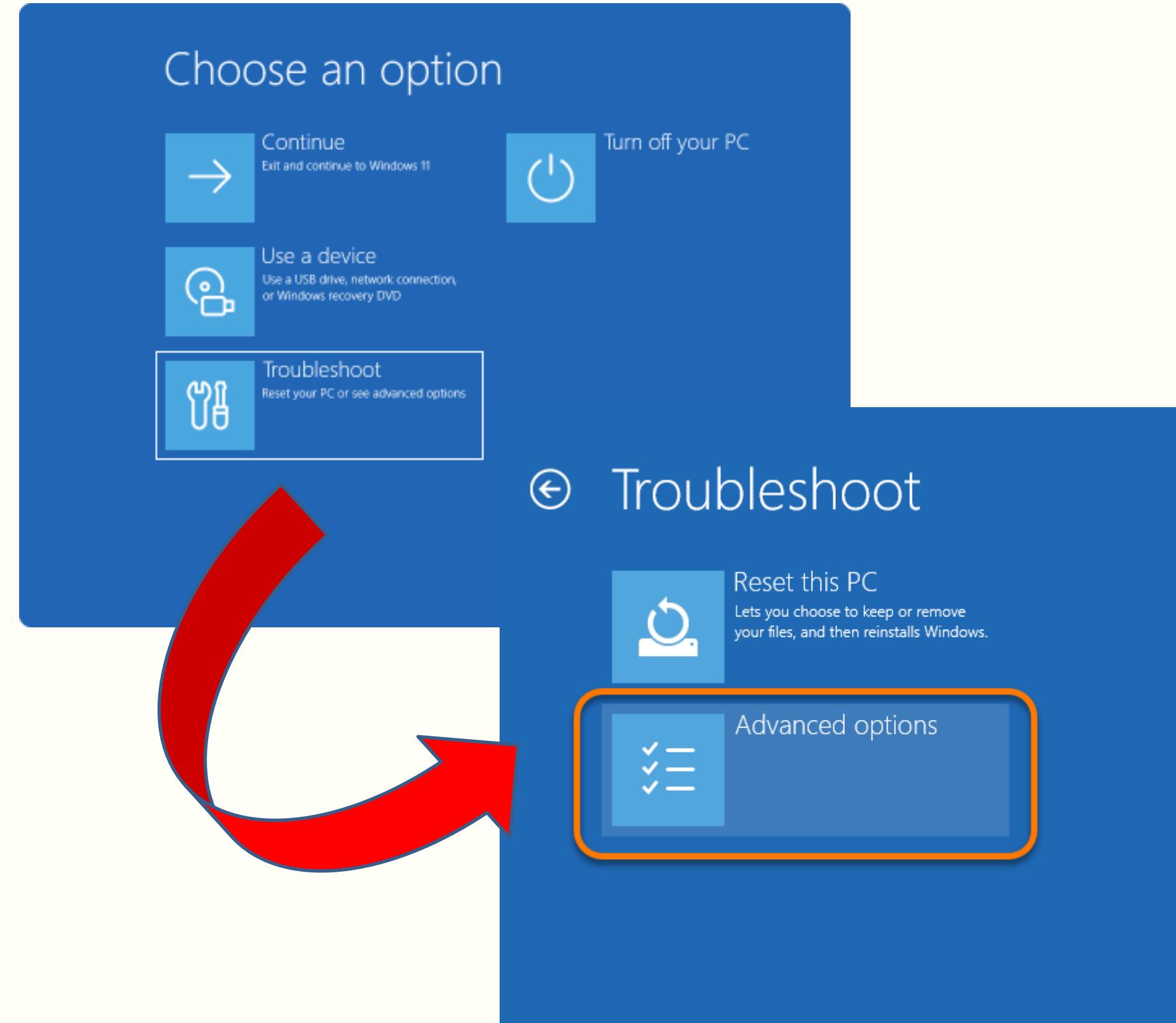


## For Windows 10

3. Choose Restart now on the Advanced Startup  
Settings

# For Windows 10

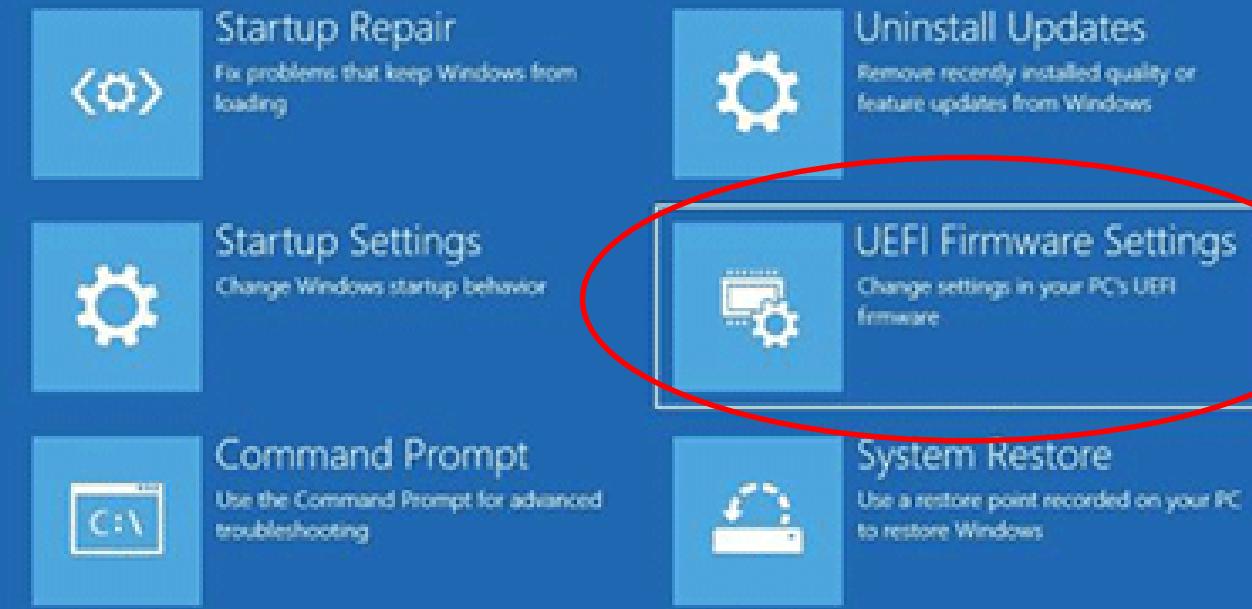
4. Select Troubleshoot  
then go to Advanced  
Options



# For Windows 10

5. Choose UEFI  
Firmware Settings and  
press Restart.

## Advanced options



## UEFI Firmware Settings

Restart to change UEFI firmware settings

Restart



Information  
HS10M KV2 F2  
CPU Ver.  
Intel(R) Core(TM) i5-10400  
CPU @ 2.90GHz  
BGB

CPU Frequency	CPU Temp.	CPU Voltage	PCH
4007.49 MHz	65.0 °C	1.152 v	40.0 °C
Memory Frequency	System Temp.	Memory Voltage	VRM MOS
2660.80 MHz	39.0 °C	1.212 v	42.0 °C

ULTRA DURABLE

DRAM Status  
DDR4\_A1: TeamGroup 8GB 2667MHz  
DDR4\_B1: N/A

SATA      PCIE      M.2  
P2: ST1000DM003-1S (1000.2GB)

## Boot Sequence

Windows Boot Manager (P2:  
ST1000DM003-1SB102)

## Smart Fan 5

CPU\_FAN  
N/A

SYS\_FAN  
N/A

## Intel Rapid Storage Tech.

ON      OFF

English

Help (F1)

Advanced Mode (F2)

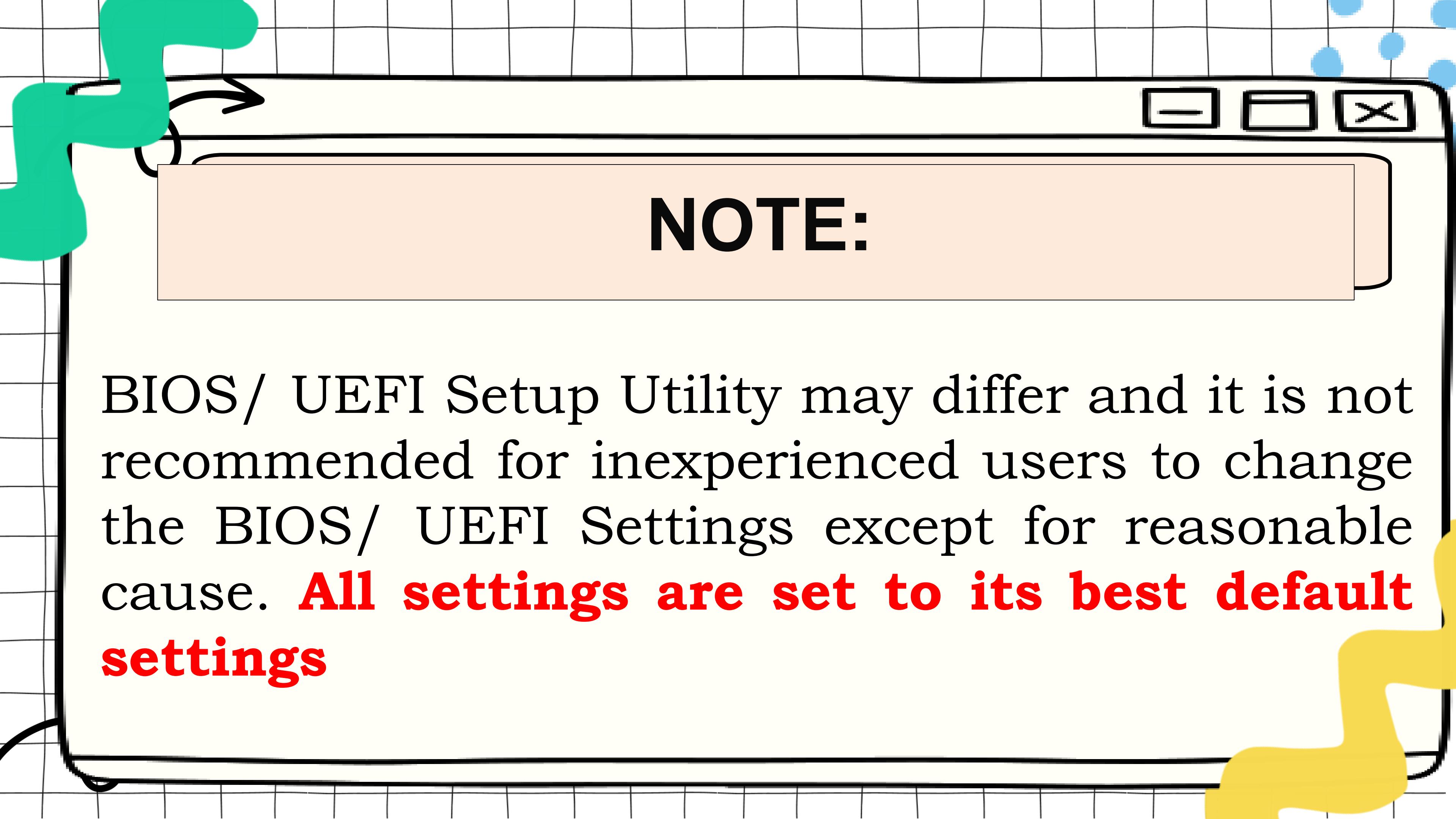
Smart Fan 5 (F6)

Load Optimized Defaults (F7)

Q-Flash (F8)

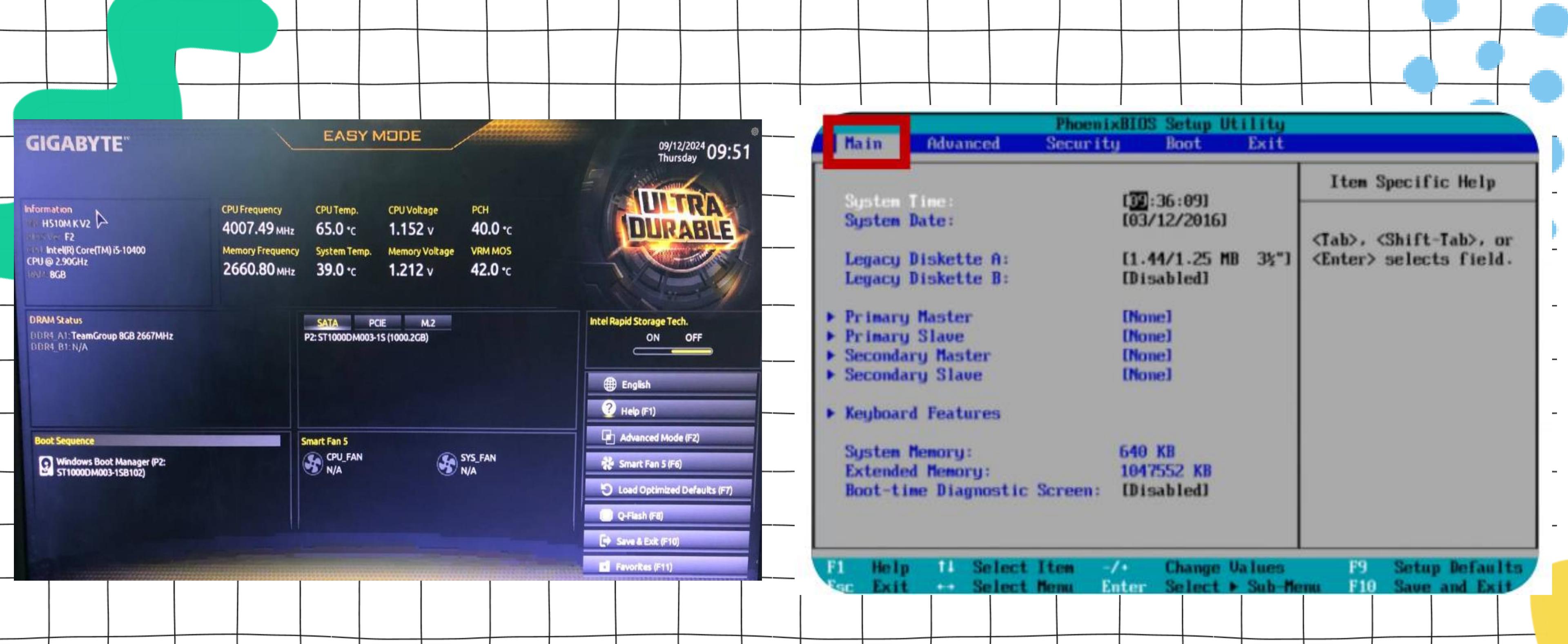
Save & Exit (F10)

Favorites (F11)



## NOTE:

BIOS/ UEFI Setup Utility may differ and it is not recommended for inexperienced users to change the BIOS/ UEFI Settings except for reasonable cause. **All settings are set to its best default settings**



•UEFI improved graphical interface and mouse support compared to BIOS.

Information  
HS10M KV2 F2  
CPU Ver.  
Intel(R) Core(TM) i5-10400  
CPU @ 2.90GHz  
BGB

CPU Frequency	CPU Temp.	CPU Voltage	PCH
4007.49 MHz	65.0 °C	1.152 v	40.0 °C
Memory Frequency	System Temp.	Memory Voltage	VRM MOS
2660.80 MHz	39.0 °C	1.212 v	42.0 °C

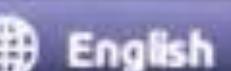
ULTRA DURABLE

DRAM Status  
DDR4\_A1: TeamGroup 8GB 2667MHz  
DDR4\_B1: N/A

SATA      PCIE      M.2  
P2: ST1000DM003-1S (1000.2GB)

Intel Rapid Storage Tech.

ON      OFF



English



Help (F1)



Advanced Mode (F2)



Smart Fan 5 (F6)



Load Optimized Defaults (F7)



Q-Flash (F8)



Save & Exit (F10)



Favorites (F11)

Boot Sequence

Windows Boot Manager (P2:  
ST1000DM003-1SB102)

Smart Fan 5

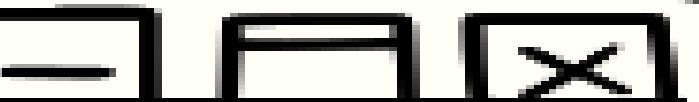
CPU\_FAN  
N/A

SYS\_FAN  
N/A

# INFORMATION

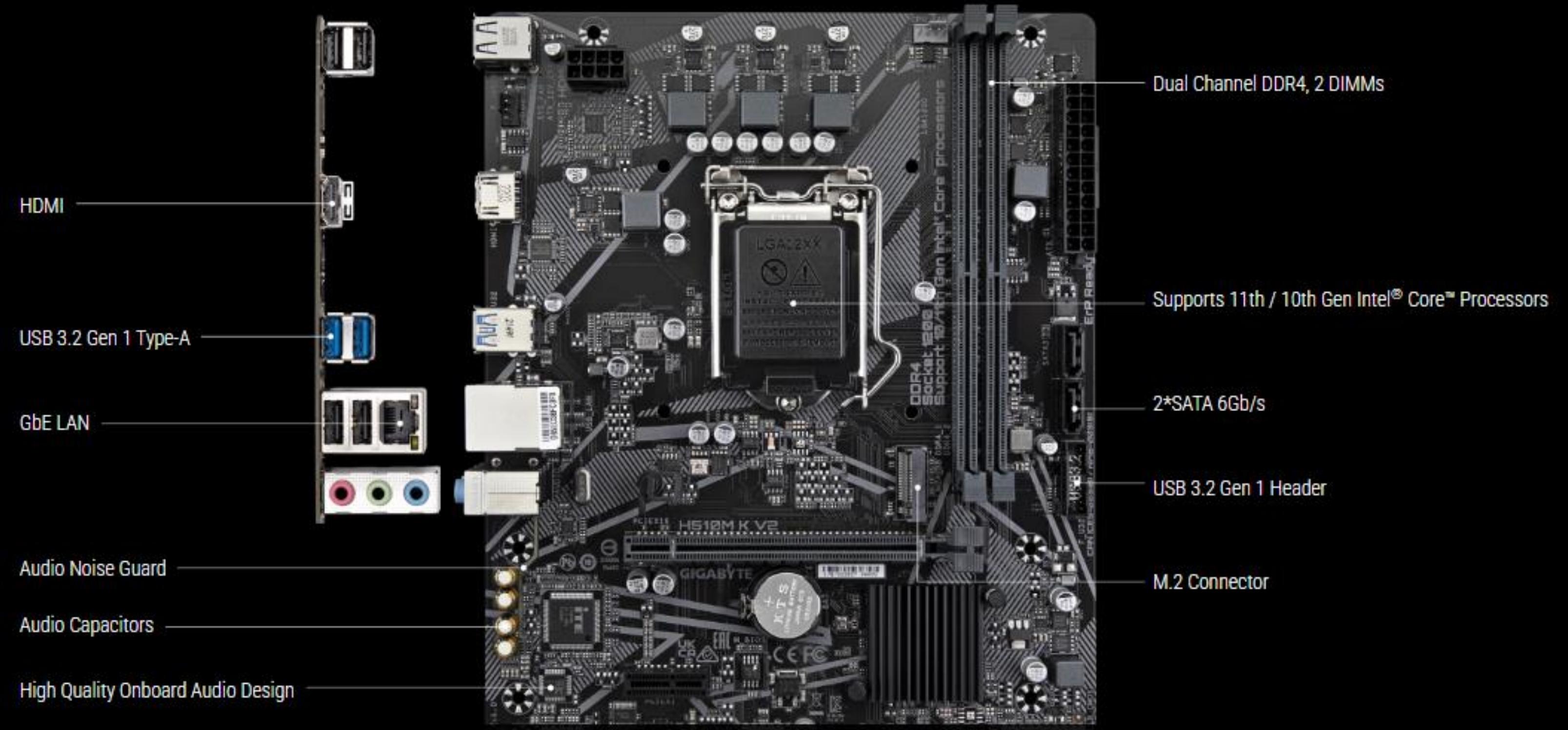
MB – MOTHER  
BOARD MODEL

Information  
MB: H510M KV2  
BIOS Ver. F2  
CPU: Intel(R) Core(TM) i5-10400  
CPU @ 2.90GHz  
RAM: 8GB



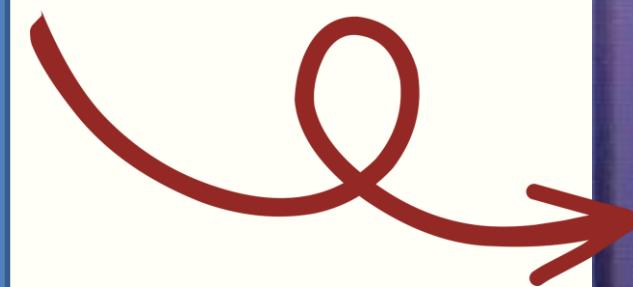
# H510M K V2 (rev. 1.0) rev. 2.0

[Key Features](#) [Specification](#) [Support](#) [Buy](#)



# INFORMATION

numbering is  
usually a series  
starting with F1 or  
firmware 1 (1st  
version of firmware  
for a given board)



## Information

MB: H510M KV2

BIOS Ver. F2

CPU: Intel(R) Core(TM) i5-10400

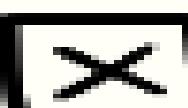
CPU @ 2.90GHz

RAM: 8GB

# INFORMATION

CPU MODEL

Information  
MB: H510M KV2  
BIOS Ver. F2  
CPU: Intel(R) Core(TM) i5-10400  
CPU @ 2.90GHz  
RAM: 8GB



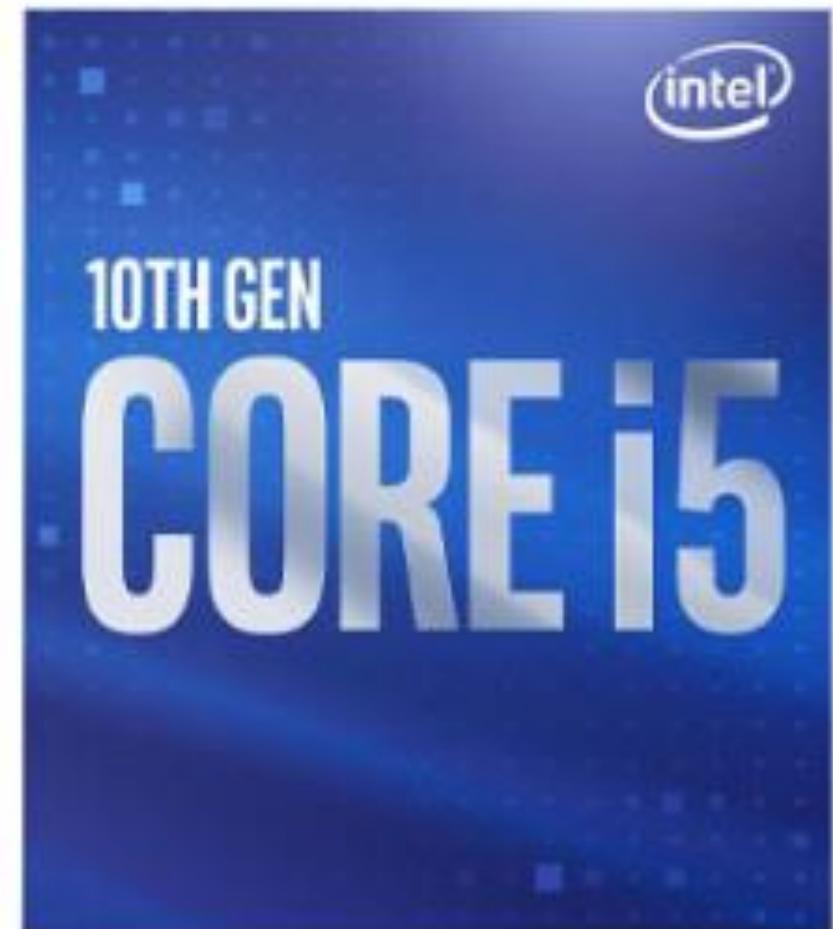
# Intel Core i5-10400 Processor 2.90 GHz 12M Cache, up to 4.30 GHz 14nm Desktop Processor

## Brands In Category

AMD 10

Intel 33

Intel Core 2



Price: 11,499

## Product Description:

Intel Core i5-10400 Processor 12M Cache, up to 4.30 GHz

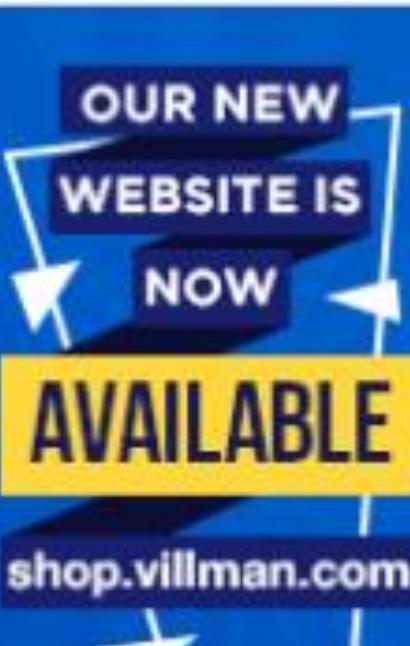
add to cart

[shop.villman.com](http://shop.villman.com)



Located in the Philippines!

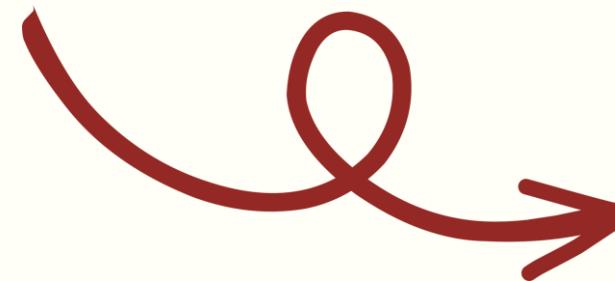
▼ advertisements



# INFORMATION

FREQUENCY- the number of waves that pass a fixed point in unit time.

GHz, short for **gigahertz**, is a unit of frequency



Information  
MB: H510M KV2  
BIOS Ver. F2  
CPU: Intel(R) Core(TM) i5-10400  
CPU @ 2.90GHz  
RAM: 8GB

The **higher the GHz**, the faster the instructions are processed, which translates into better performance and less downtime.

The **2.4 GHz** band provides the most coverage but transmits data at slower speeds. The **6 GHz** band, exclusive to the newest WiFi standards, provides the least coverage but transmits data at the **fastest speeds** of the frequencies.

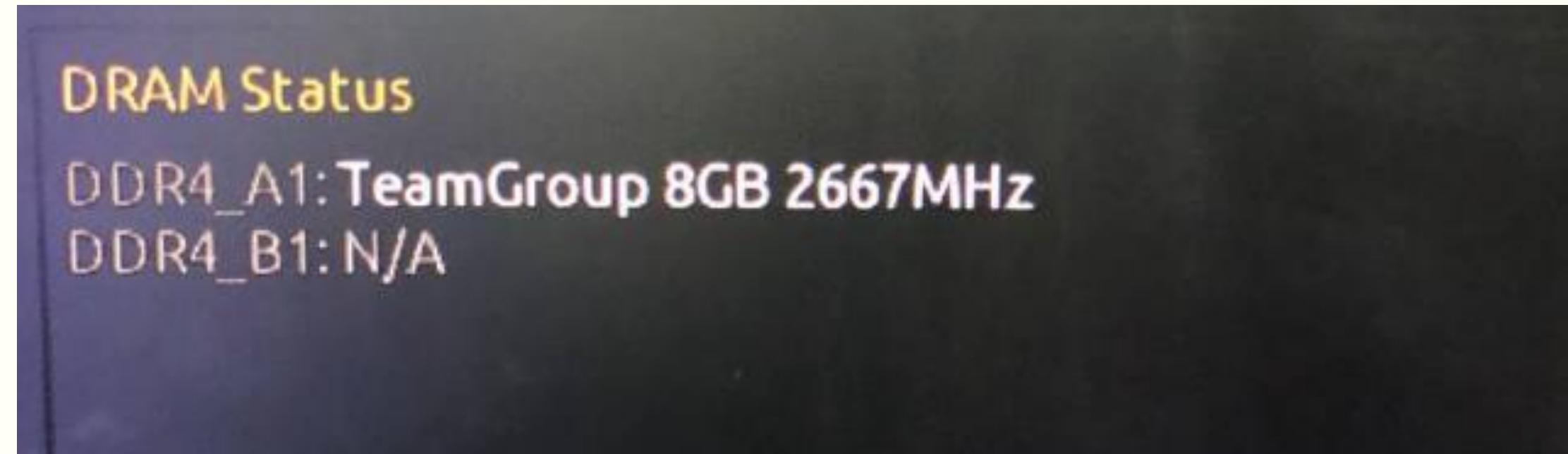
# INFORMATION

File transfer speed or data transfer speed refers to the speed at which data is transmitted from one source to another.

Information  
MB: H510M KV2  
BIOS Ver. F2  
CPU: Intel(R) Core(TM) i5-10400  
CPU @ 2.90GHz  
RAM: 8GB

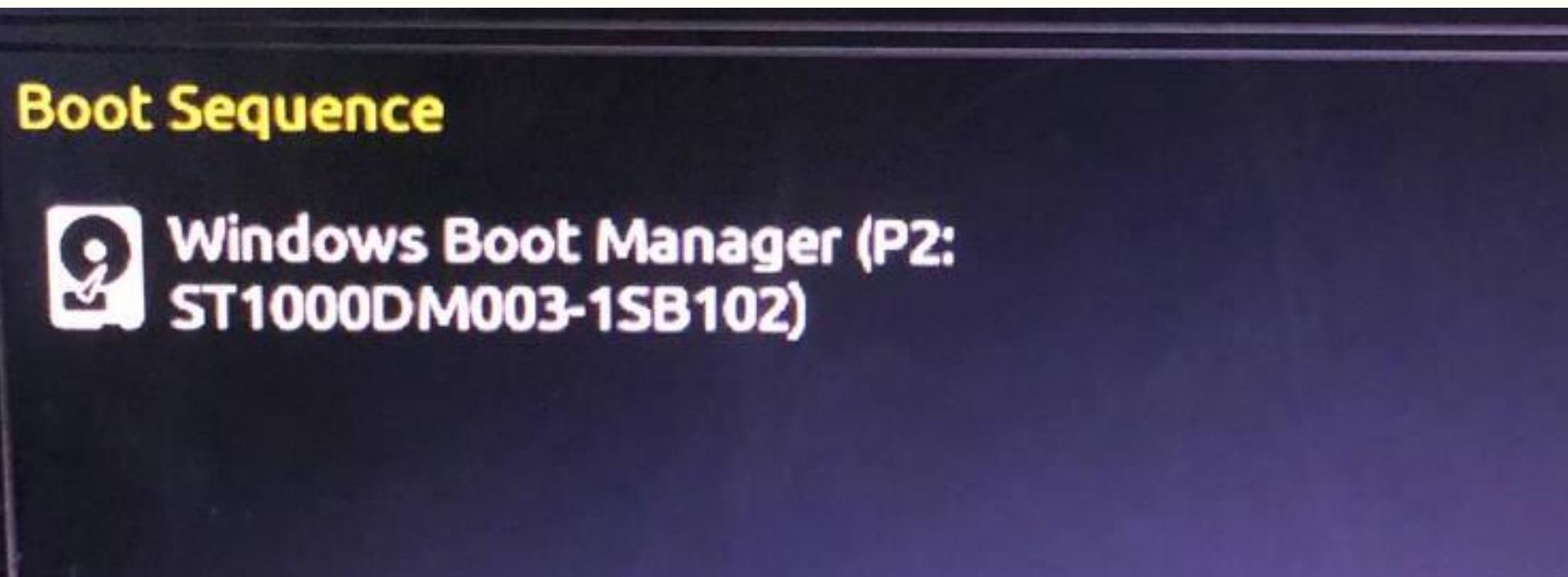
# DRAM STATUS

(Dynamic Random Access Memory) is a type of semiconductor memory that is typically used for the data or program code needed by a computer processor to function. DRAM is a common type of random access memory (RAM) that is used in PCs



# BOOT SEQUENCE

According to the bootable devices on the motherboard, the default boot sequence will be listed first in the BIOS screen, which determines which device the computer will boot first.



# UEFI BIOS Utility – EZ Mode

03/29/2024 08:56 | English | AI OC Guide | Search | AURA | ReSize BAR | MemTest86

**Information**

ROG MAXIMUS Z790 HERO BIOS Ver. 2102  
13th Gen Intel(R) Core(TM) i9-13900K  
Speed: 5500 MHz  
Memory: 32768 MB (DDR5 4200MHz)

**CPU Temperature** 1.447 V  
**CPU Core Voltage** 60°C  
**Motherboard Temperature** 26°C

**AI Overclocking**  
Click the icon below to enable the AI Overclocking feature. This feature can only be enabled when using an unlocked CPU.

**DRAM Status**

DIMM\_A1: SK Hynix 8192MB 4800MHz  
DIMM\_A2: SK Hynix 8192MB 4800MHz  
DIMM\_B1: SK Hynix 8192MB 4800MHz  
DIMM\_B2: SK Hynix 8192MB 4800MHz

**Storage Information**

AHCI:  
SATA6G\_3: SanDisk SD7SB3Q256G1002 (256.0GB)  
SATA6G\_E1: ST3808110AS (80.0GB)

NVME:  
M.2\_1: SAMSUNG MZVL22T0HBLB-00B00 (2048.4GB)

USB:  
Sony Storage Media PMAP (15.5GB)

**Intel Rapid Storage Technology**

On Off

**AEMP II**

Disabled

**FAN Profile**

CPU FAN 2611 RPM  
CPU OPT FAN N/A  
CHA1 FAN N/A  
CHA2 FAN N/A  
CHA3 FAN N/A  
CHA4 FAN N/A  
W\_PUMP+ N/A  
AIO PUMP N/A

**CPU FAN**

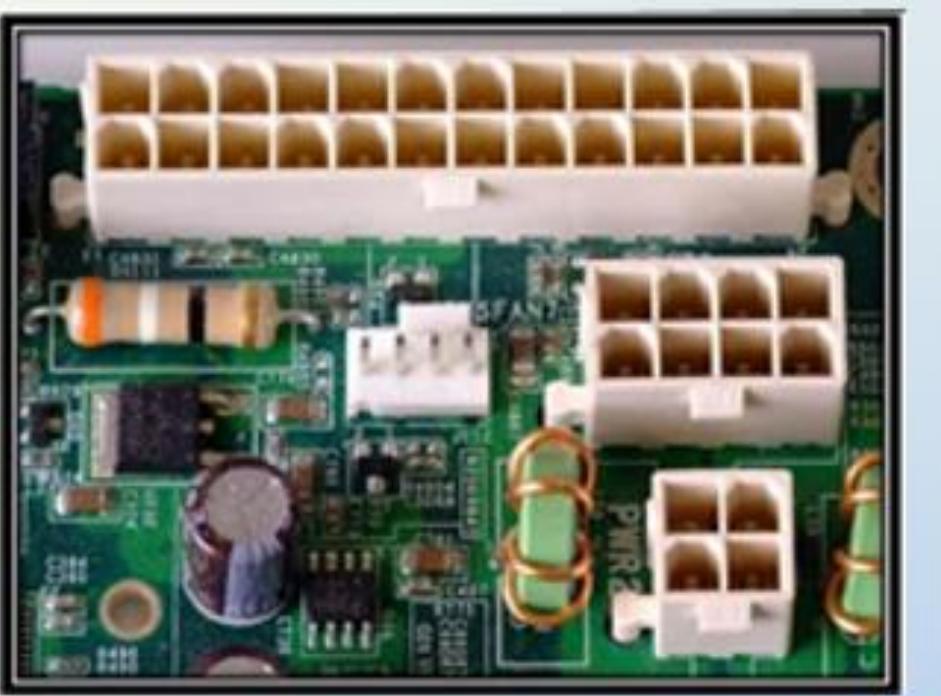
QFan Control

Default(F5) | Save & Exit(F10) | Advanced Mode(F7) | ↗

- Windows Boot Manager (M.2\_1: SAMSUNG MZVL22T0HBLB-00B00) (2048.4GB) ⋮
- Windows Boot Manager (SATA6G\_E1: ST3808110AS) (80.0GB) ⋮
- Windows Boot Manager (SATA6G\_3: SanDisk SD7SB3Q256G1002) (256.0GB) ⋮
- UEFI: KingstonDataTraveler 3.0, Partition 1 (15.4GB) ⋮
- UEFI: Sony Storage Media PMAP, Partition 1 (15.5GB) ⋮
- UEFI: ADATA USB Flash Drive 1.00, Partition 1 (7.9GB) ⋮
- UEFI: SMI USB DISK 1100 (15.8GB) ⋮

## Types of PSU Connector

- 24 pins- main power connector that provides power to the motherboard.
- 4 Pins - provides power to the CPU
- 8 pins- provides power for faster dedicated graphics cards



CPU Frequency

**4007.49 MHz**

CPU Temp.

**67.0 °C**

CPU Voltage

**1.152 v**

PCH

**40.0 °C**

Memory Frequency

**2660.80 MHz**

System Temp.

**39.0 °C**

Memory Voltage

**1.212 v**

VRM MOS

**43.0 °C**

Voltage is the pressure from an electrical circuit's power source that pushes charged electrons (current)

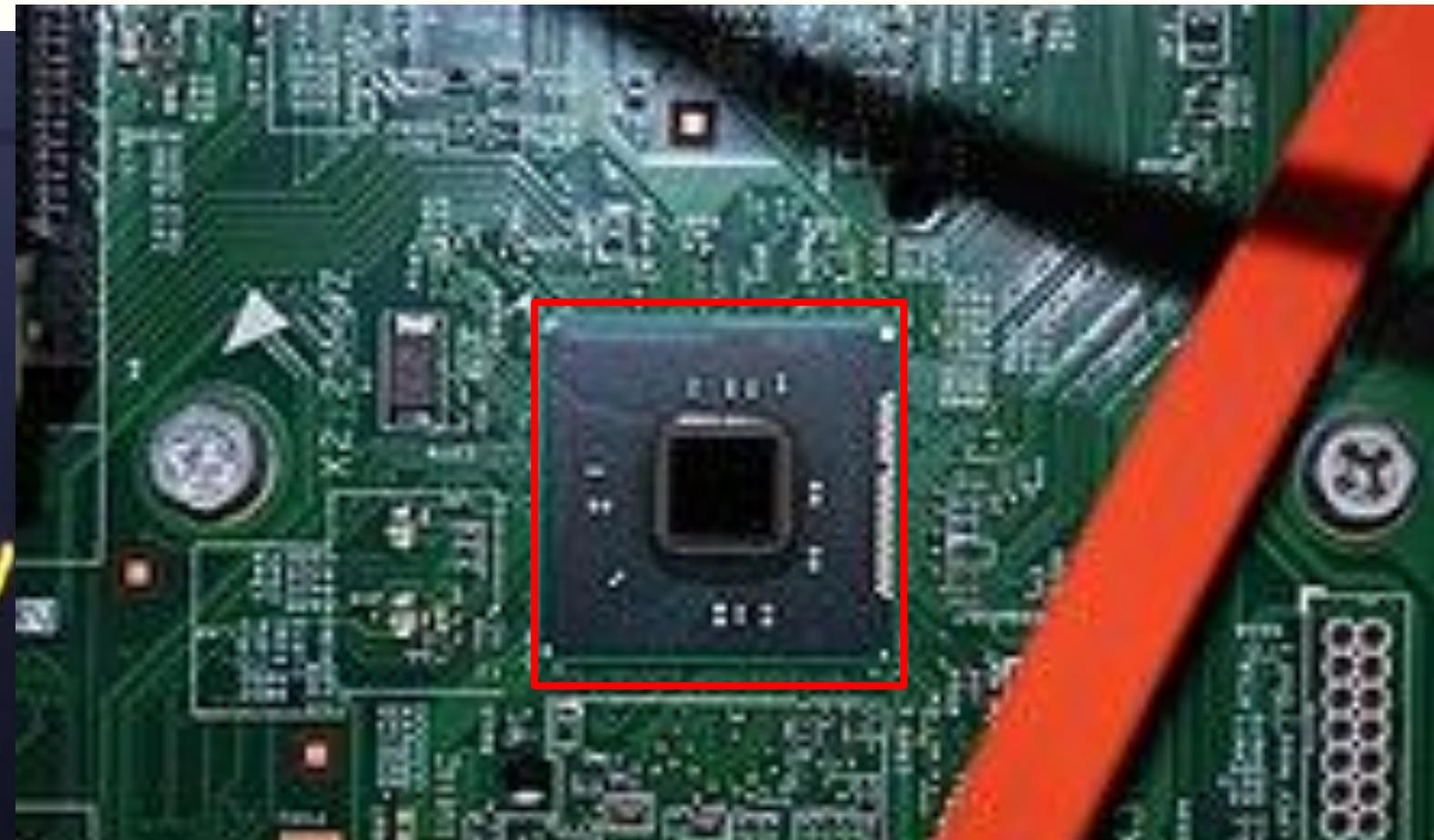
# INTERNAL PARTS INFO

CPU Frequency

**4007.49 MHz**

Memory Frequency

**2660.80 MHz**



PCH

**40.0 °C**

VRM MOS

**43.0 °C**

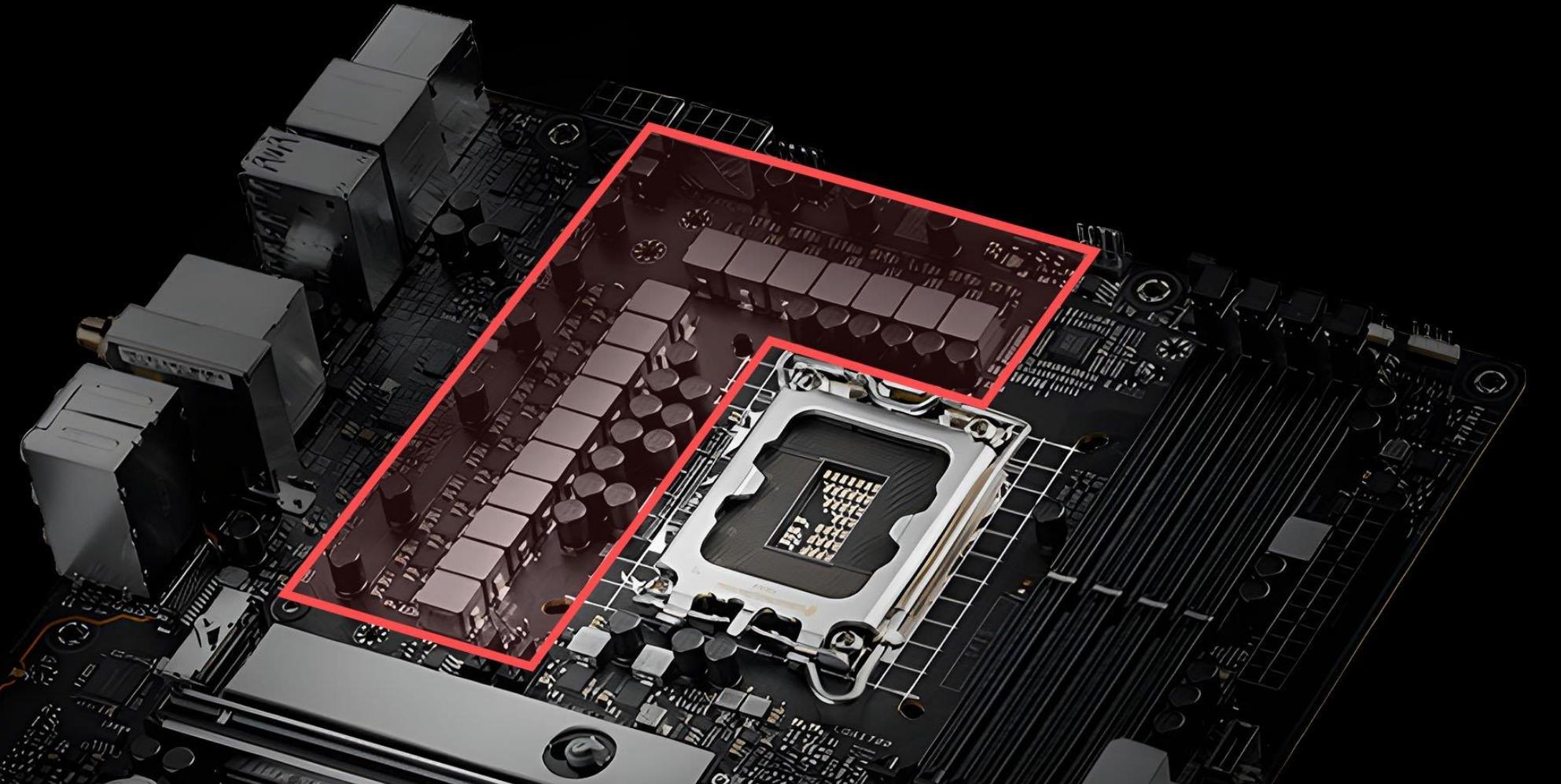
Platform Controller Hub (PCH) 75C to 80C is a normal operating temperature for the PCH

MOS = Mosfets (Power Delivery) the components that feed power to the CPU so will be there temp.



NFO

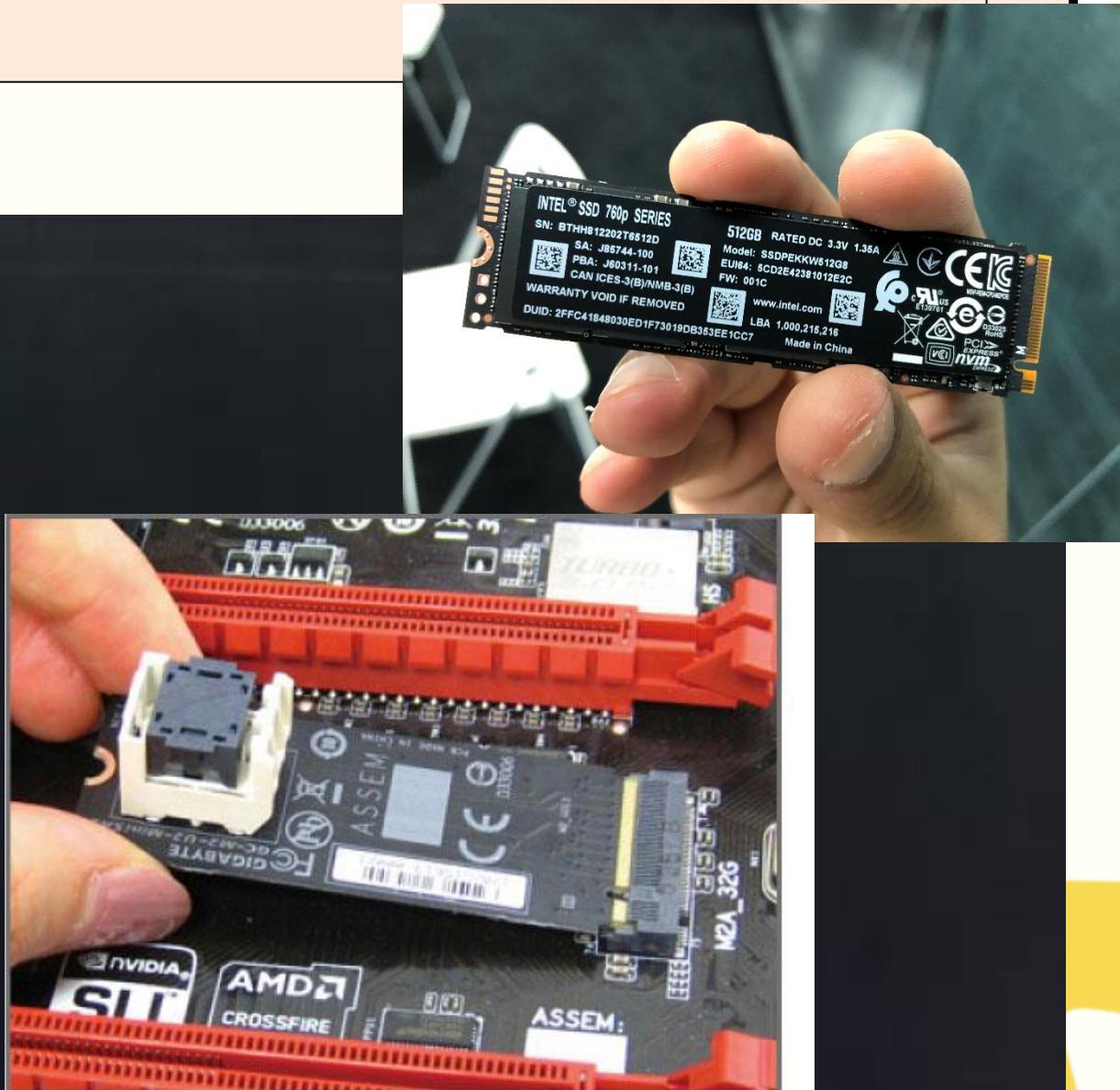
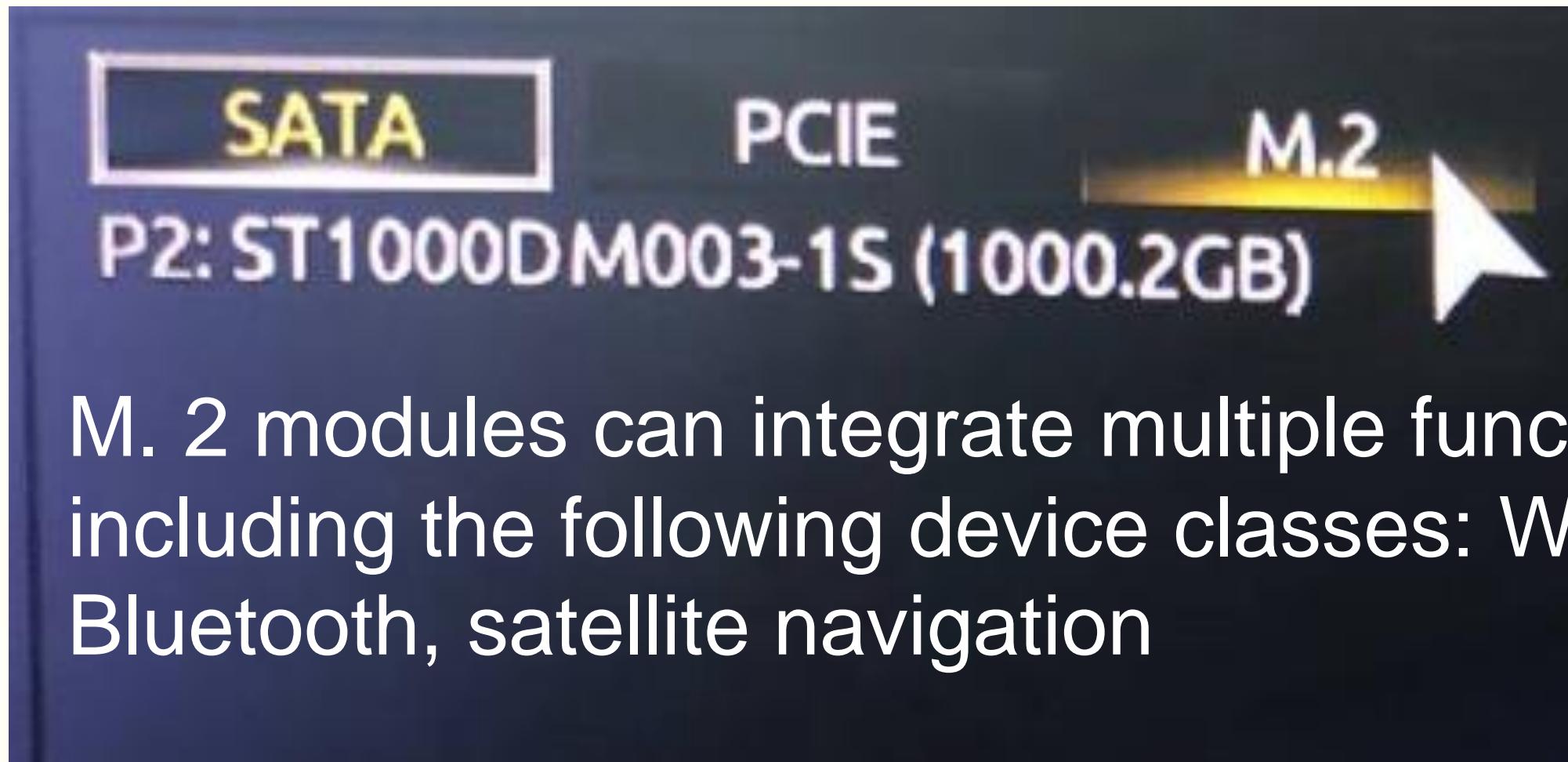
### Motherboard VRMs



PCH  
40.0 °C  
VRM MOS  
43.0 °C

It stands for Voltage Regulator Module, which regulates the voltage supplied to the CPU and Graphic card on the motherboard.

# INTERNAL PARTS INFO



# INTERNAL PARTS INFO

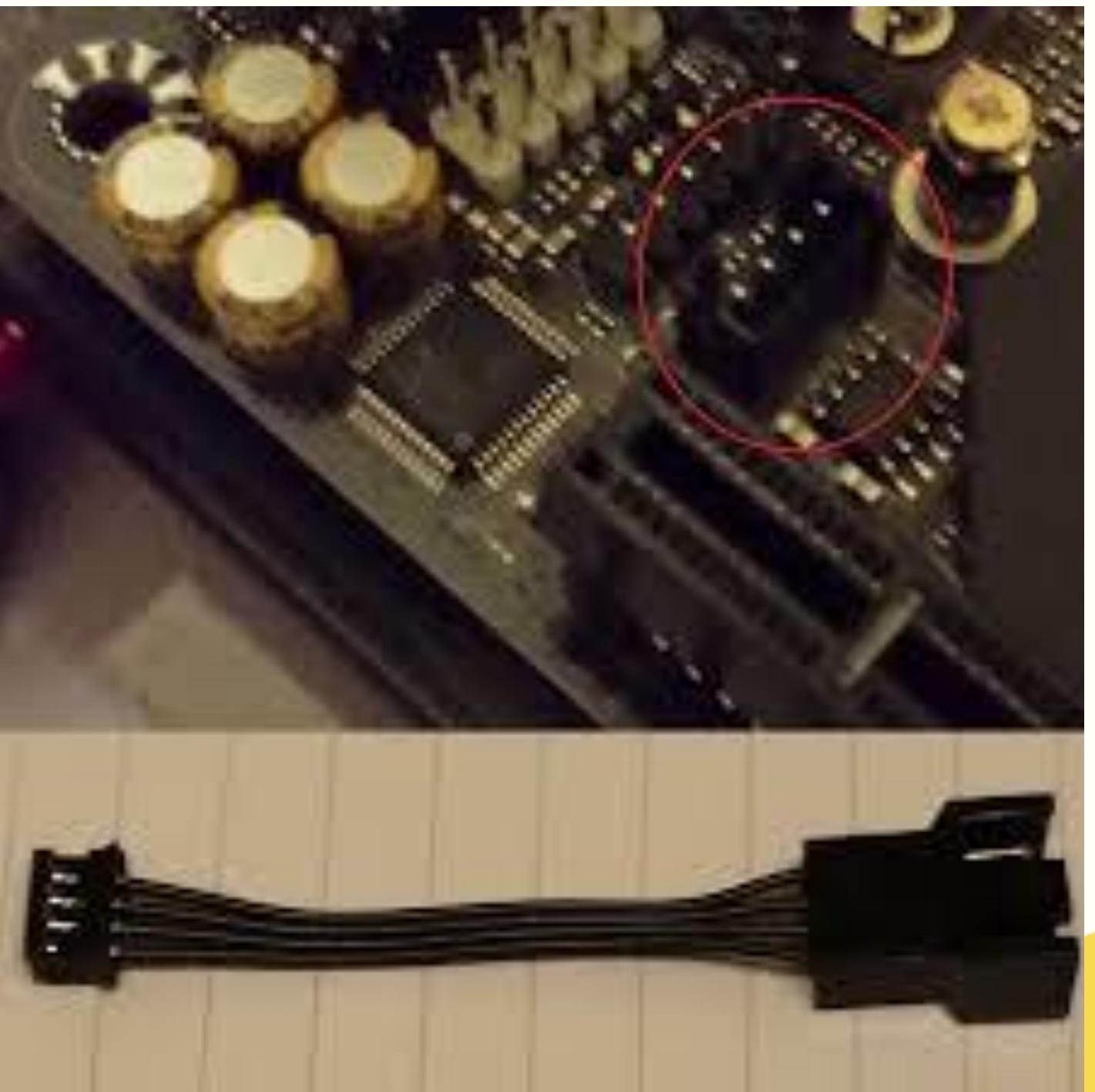
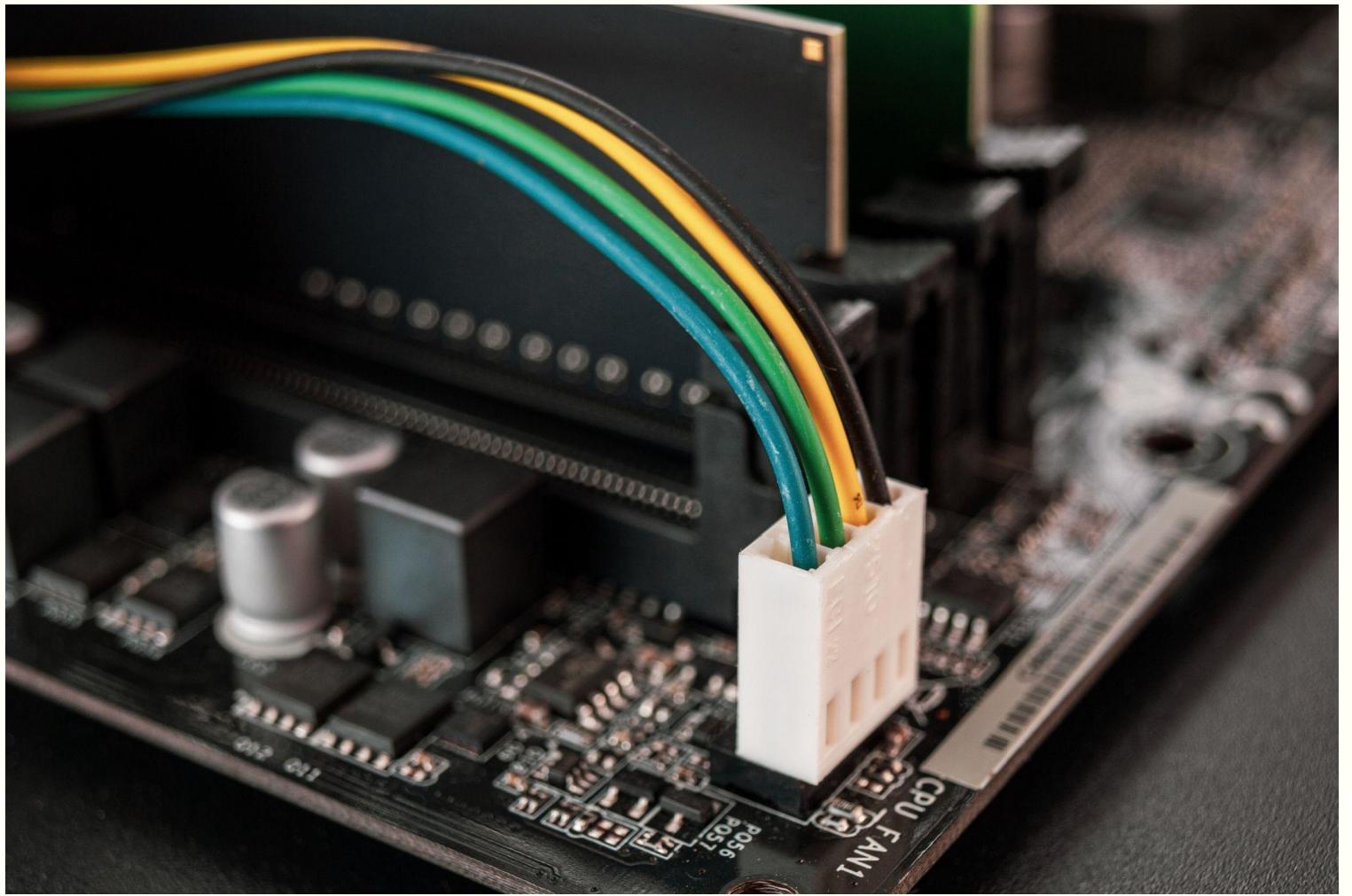
Smart Fan 5



CPU\_FAN  
N/A



SYS\_FAN  
N/A



Including the following features:  
Bluetooth, satellite navigation

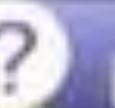
## Intel Rapid Storage Tech.

ON

OFF



English



Help (F1)



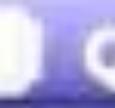
Advanced Mode (F2)



Smart Fan 5 (F6)



Load Optimized Defaults (F7)



Q-Flash (F8)



Save & Exit (F10)



Favorites (F11)

# Top Level Screen ITEM list

The image shows the PhoenixBIOS Setup Utility interface on a computer screen. The title bar reads "PhoenixBIOS Setup Utility". Below it is a menu bar with tabs: Main, Advanced, Security, Power, Boot (which is highlighted in blue), and Exit. The main content area displays a list of boot devices:

- CD-ROM Drive
- \*Removable Devices
- \*Hard Drive
- Network boot from AMD Am79C970A

To the right of the device list is a "Item Specific Help" panel containing the following text:

Keys used to view or configure devices:  
• <Enter> expands or collapses devices with a + or -  
• <Ctrl+Enter> expands all  
• <Shift + 1> enables or disables a device.  
• <+> and <-> moves the device up or down.  
• <n> May move removable device between Hard Disk or Removable Disk  
• <d> Remove a device that is not installed.

At the bottom of the screen is a keyboard legend:

F1	Help	↑↓	Select Item	-/+	Change Values	F9	Setup Defaults
Esc	Exit	++	Select Menu	Enter	Select ▶ Sub-Menu	F10	Save and Exit

Intel Rapid Storage Tech.

ON

OFF

English

? Help (F1)

Advanced Mode (F2)

Smart Fan 5 (F6)

Load Optimized Defaults (F7)

Q-Flash (F8)

Save & Exit (F10)

Favorites (F11)

ITEM list

**HELP (F1)**

General Help X

Enter : Select  
← ↑ ↓ → : Move Cursor  
F1 : Help  
F2 : Advanced Mode  
F3 : Save Profile  
F4 : Load Profile  
F5 : Previous Values  
F6 : Smart Fan 5  
F7 : Optimized Defaults  
F8 : Q-Flash (BIOS Update Tool)  
F10 : Save/Exit  
F11 : Go to Favorites Page  
F12 : Print Screen  
Ctrl-S : Show SPD Info.  
ESC : Save/Exit

**Ok**

# ADVANCE MODE / F2

**GIGABYTE™**

09/12/2024 Thursday 09:5

**ADVANCED MODE**

Favorites (F11)      Tweaker      Settings      System Info.      Boot      Save & Exit

**CPU Clock Ratio**      ★ Auto      29  
Ring Ratio      ★ Auto      40

**Advanced CPU Settings**

**System Memory Multiplier**      ★ Auto      2667

**Memory Ref Clock**      Auto  
**Memory Odd Ratio (100/133 or 200/266)**      Auto

**Advanced Memory Settings**

**Vcore Voltage Mode**      Auto  
**CPU Vcore**      ★ Auto      1.200V  
**Dynamic Vcore(DVID)**      Auto  
**BCLK Adaptive Voltage**      Auto  
**CPU Graphics Voltage (VAXG)**      Auto  
**DRAM Voltage (CH A/B)**      ★ Auto      1.200V  
**CPU VCCIO**      Auto      0.950V  
**CPU System Agent Voltage**      Auto      1.050V

**Advanced Voltage Settings**

**CPU**  
Frequency      BCLK      99.78MHz  
Temperature      Voltage      1.152V

**Memory**  
Frequency      Size      8192MB  
Ch A/B Volt      2660.80MHz

**Voltage**  
+5V      +12V  
5.070V      12.024V

# SMART FAN

Smart Fan 5

Monitor

CPU FAN

Temperature

Fan Speed

80.0 °C

0 RPM

Temperature Warning Control

CPU Temperature

Disabled

CPU Fan Fail Warning

Disabled Enabled

41.0 °C

47.0 °C

System

VRM MOS

Normal

CPU

1

Auto

Disabled

0% 100%

0°C 100°C

Apply to ...

Temperature

CPU Fan Speed Control

Fan Control Use Temperature Input

Temperature Interval

CPU Fan Control mode

CPU FAN Stop

The image shows the 'Smart Fan 5' software interface. On the left, a graph plots PWM (0% to 100%) against Temperature (0°C to 100°C). A curve shows fan speed increasing from 0% at 0°C to 100% at 100°C. Below the graph are five configuration options: CPU Fan Speed Control, Fan Control Use Temperature Input, Temperature Interval, CPU Fan Control mode, and CPU FAN Stop. To the right, a 'CPU FAN' section shows a yellow LED icon and a dropdown menu set to 'CPU'. A 'Temperature' section displays 80.0 °C and 0 RPM. A 'Fan Speed' section shows a fan icon and a dropdown menu set to 'Disabled'. A 'Temperature Warning Control' section includes a thermometer icon and a dropdown menu also set to 'Disabled'. A 'CPU Fan Fail Warning' section includes a fan icon and two radio button options: 'Disabled' (selected) and 'Enabled'. At the bottom, system temperatures are listed: CPU at 41.0 °C, System at 47.0 °C, PCH at 41.0 °C, and VRM MOS at 47.0 °C.

# LOAD OPTIMIZED DEFAULTS

Loading Optimized Defaults is just loading factory settings in the bios. Like if you turned on a bunch of stuff and couldn't remember what you did, this would set it back to factory settings.



# Q FLASH

Task      File      Run      Done

**Q-Flash**

**Current Flash**

**Model Name : H510M KV2**

**BIOS Version : F2**

**BIOS Date : 06/07/2023**

**Flash Type/Size**

**MXIC 25L/U Series 16MB**

**Update BIOS**

**Save BIOS**

## Intel Rapid Storage Tech.

ON

OFF



English



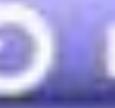
Help (F1)



Advanced Mode (F2)



Smart Fan 5 (F6)



Load Optimized Defaults (F7)



Q-Flash (F8)



Save & Exit (F10)



Favorites (F11)

## ACTIVITY # 5: Let's Test Your Skills!

**Assuming that you are a technician working at a PC repair bench and. . .**

**Scenario A:** you need to see the general information of the computer you are working with

**Scenario B:** you need to change the password previously set in the BIOS

**Scenario C:** you did some modifications in the BIOS of the computer and decided to disregard or discard all of the changes you did.

# ACTIVITY # 5: Let's Test Your Skills!

## TASK MECHANICS:

- Study the three scenarios given above. Scenario A, B and C
- Review the BIOS Setup Utility Screen we already discuss
- Read the questions below.

## Guide Questions:

1. Which menu screen is most applicable to each situation? Justify your answers.
2. As a CSS student, why is it necessary to give importance to these concepts?
3. Evaluate yourself. What impacts have this lesson brought you?