

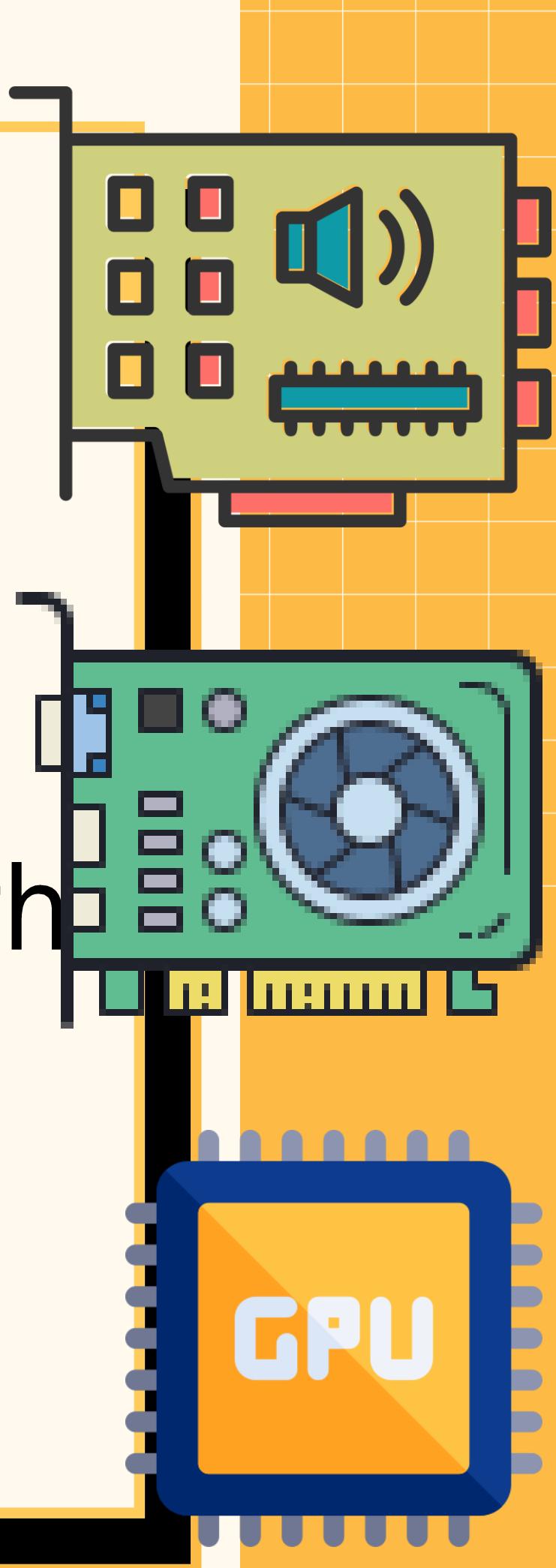
SOUND CARD; VIDEO CARD AND GUI

LESSON Q2.2

MS. LESLIE ARRIO, LPT

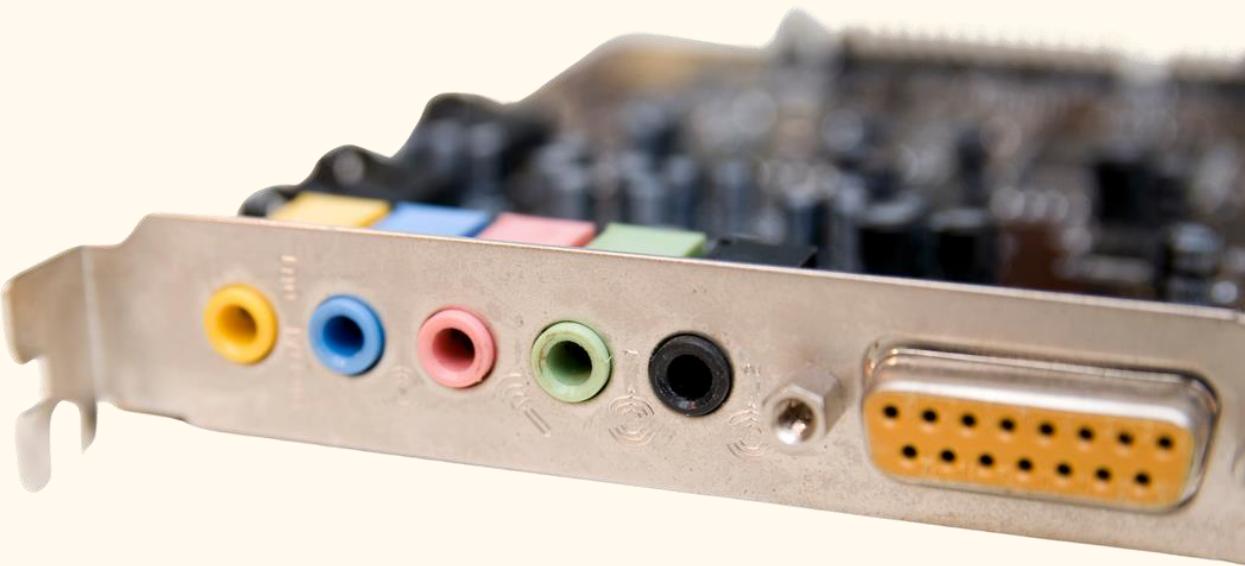
OBJECTIVES:

1. Determine the use of video and sound card ports and connections
2. Apply troubleshooting in dealing with Video Cards and Sound Cards
3. Examine the Parts of a Graphical User Interface (GUI)



SOUND CARD

is an expansion card that allows the computer to send audio information to an audio device, like speakers, a pair of headphones, etc. Unlike the CPU and RAM, the sound card isn't a necessary piece of hardware required to make a computer work.



SOUND CARD

Back of Sound Card

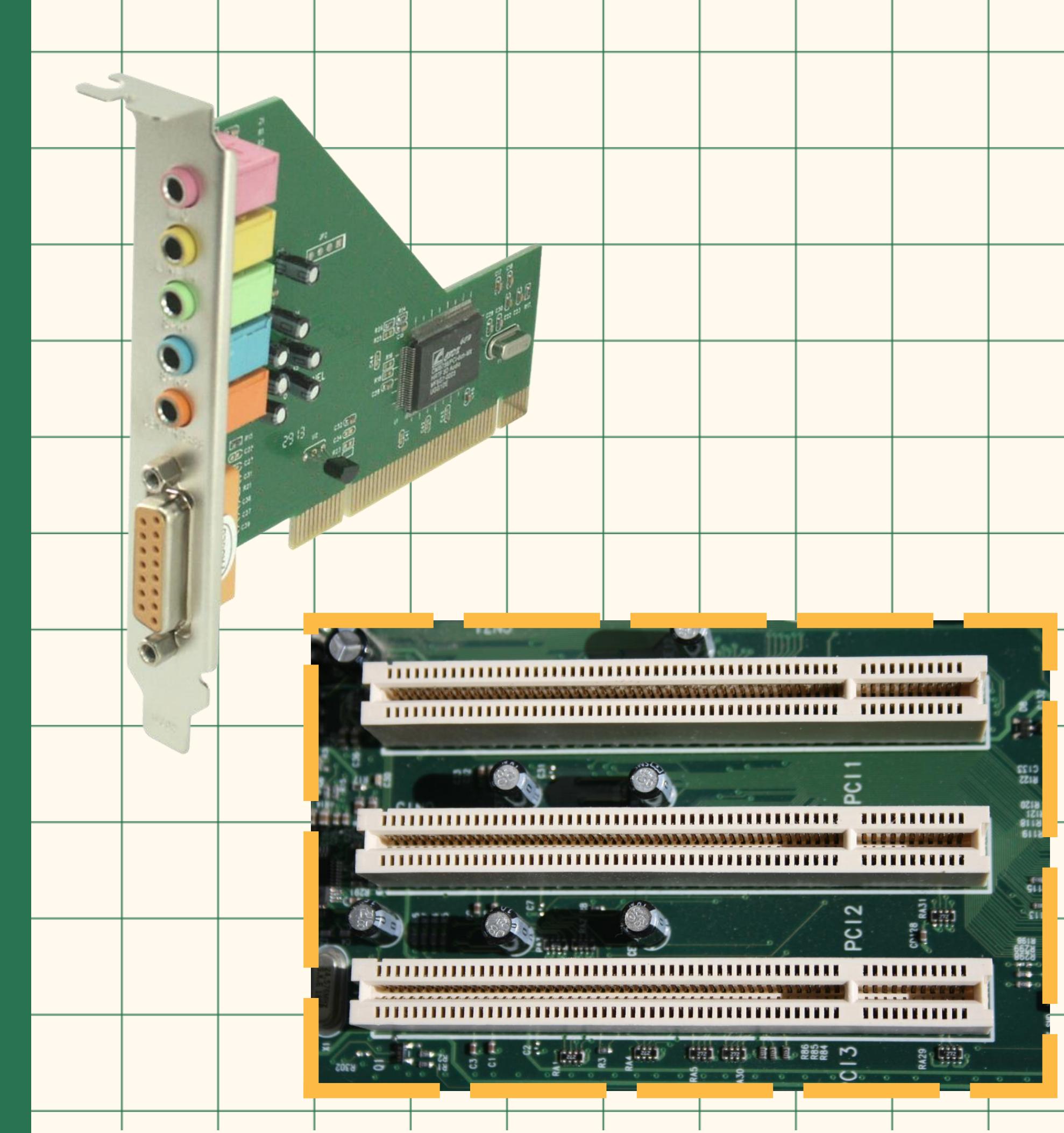


Alternatively called an audio output device, sound board, or audio card.

on the back of your computer, associated colors, and the connector symbols.



The sound card installs in a PCI or PCIe slot on the motherboard for producing sound on a computer



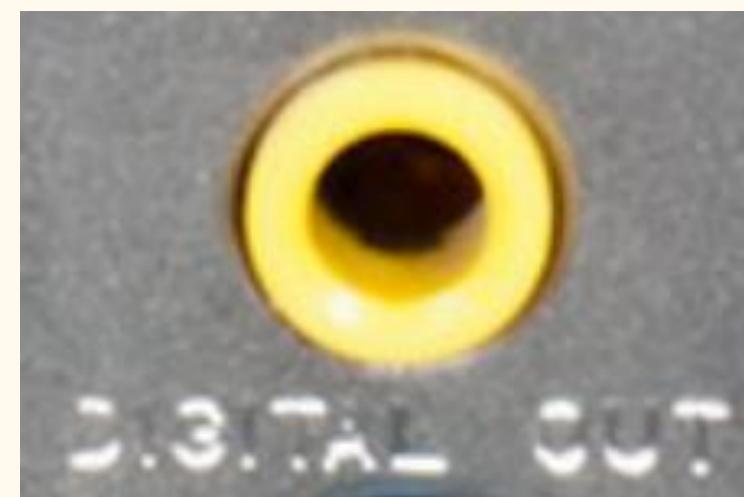
Sound card connections

Five audio jacks are used with devices that use the 3.5 mm **mini plug**.



DIGITAL OUT

Digital Out (white or yellow; words: "Digital" or "Digital Out") - Used with surround sound or loudspeakers.



Sound card connections

Five audio jacks are used with devices that use the 3.5 mm mini plug.



Sound in or line in

(blue; Arrow pointing into waves) - Connection for external audio sources, (e.g., tape recorder, record player, or CD (compact disc) player.)



Sound card connections

Five audio jacks are used with devices that use the 3.5 mm mini plug.



Microphone or Mic

(pink) - The connection for a microphone or headphones.



Sound card connections

Five audio jacks are used with devices that use the 3.5 mm mini plug.

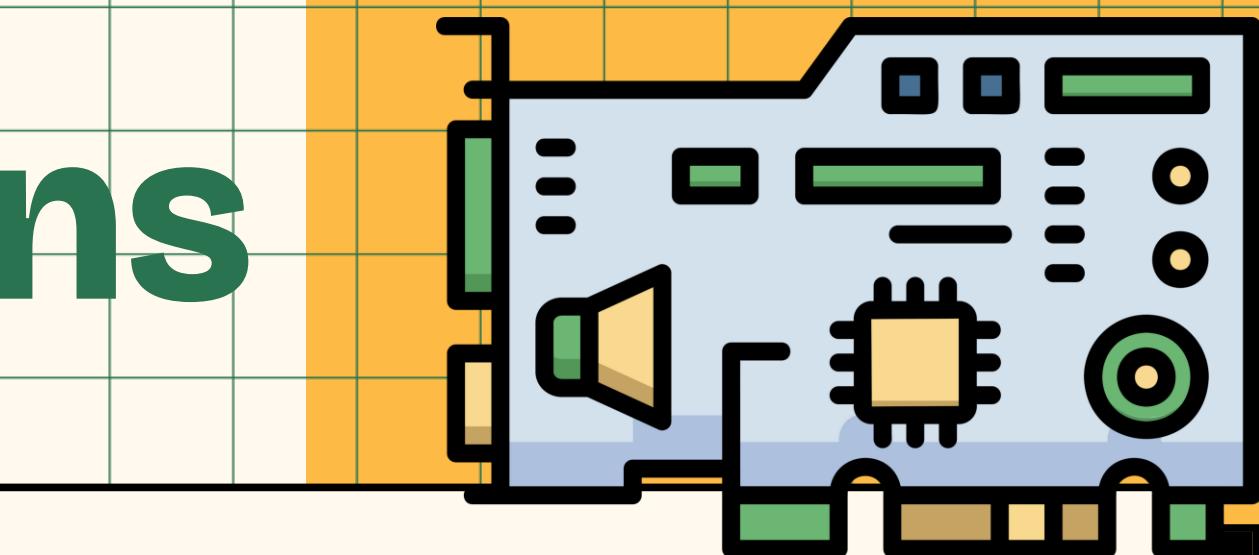


Sound out or line out

(green; Arrow pointing out of waves) - The primary sound connection for your speakers or headphones. This sound card also has a second (black) and third (orange) sound out connector.



Sound card connections

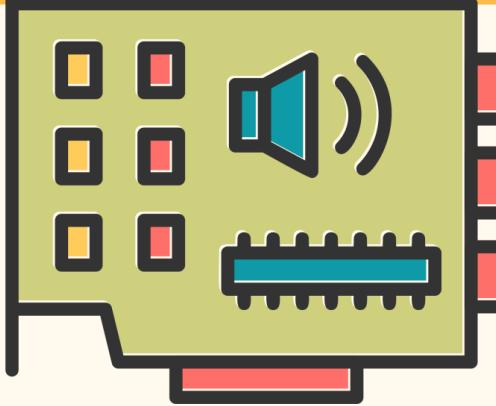


MIDI (Musical Instrument Digital Interface)

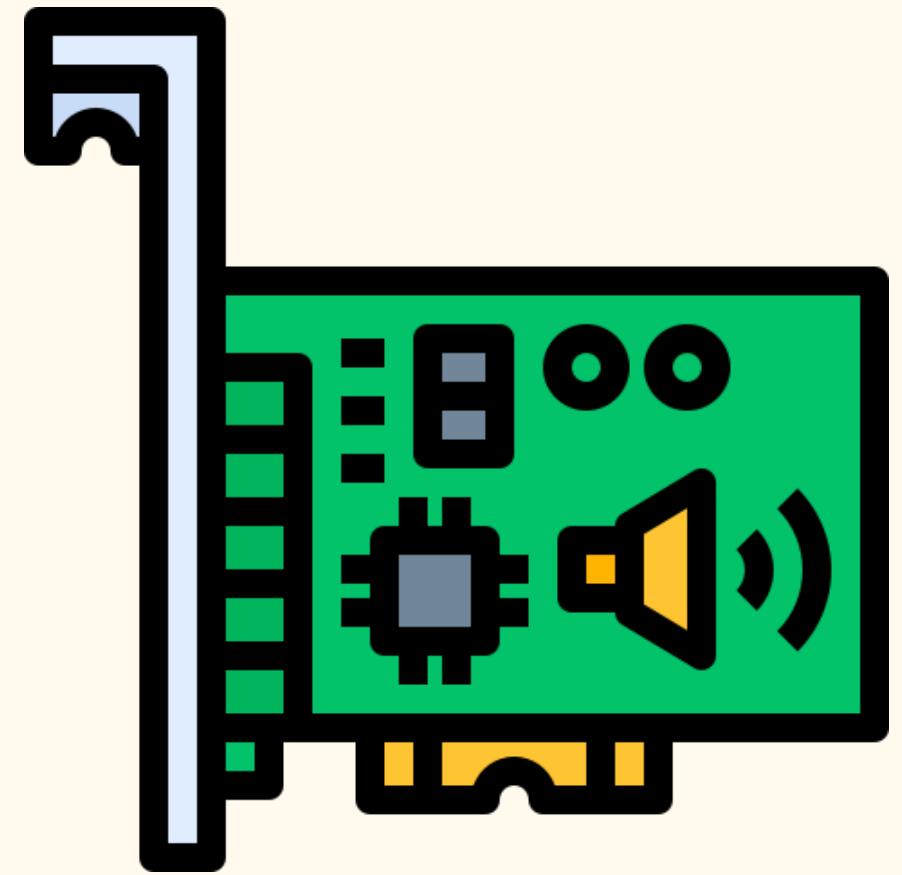


also known joystick (15 pin yellow connector) - Used with earlier sound cards to connect MIDI keyboard or joystick.





Usually, the cables connecting to the devices are also color-coded, and will match or be close to the colors the cables connect to.

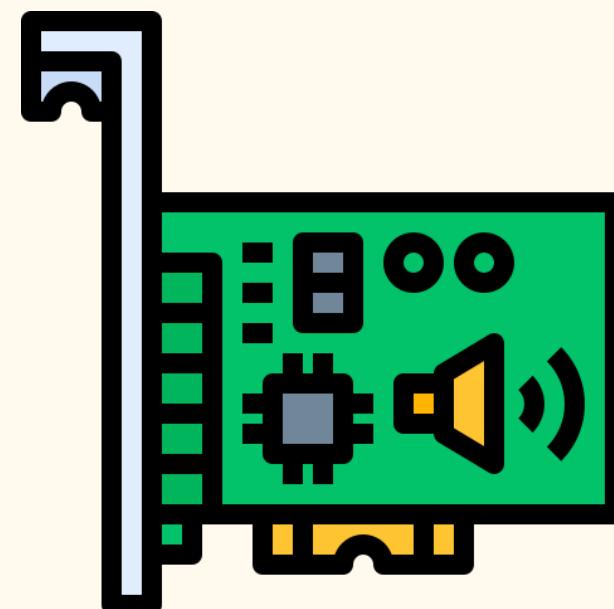


Uses of a computer sound card



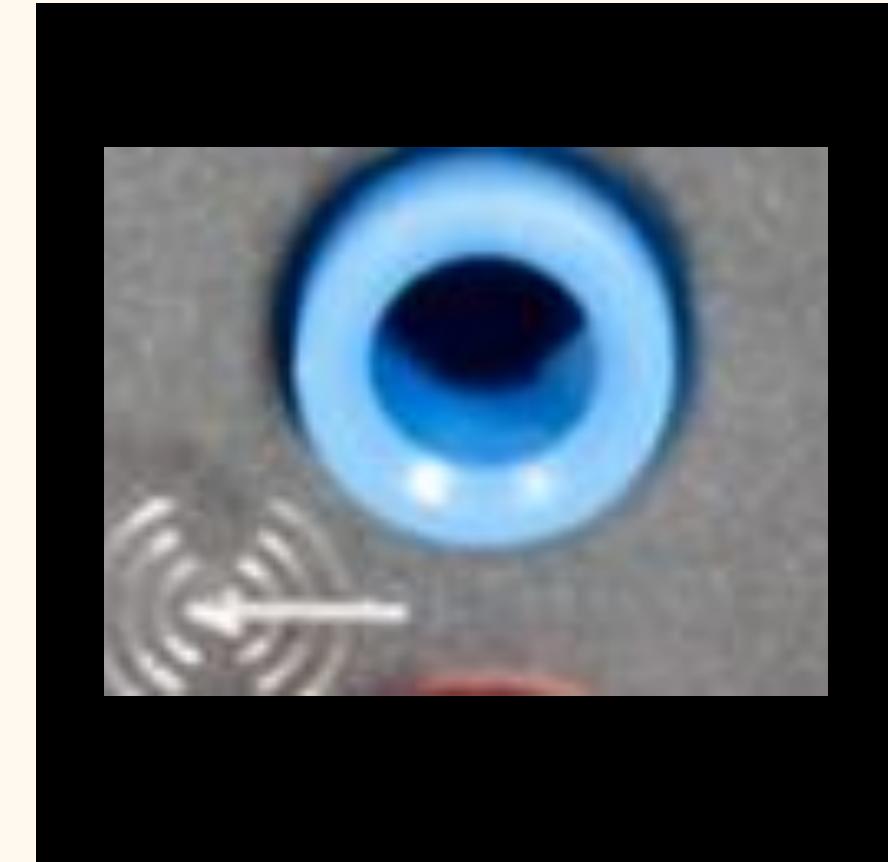
Below are all of the different areas of a computer a sound card can be used:

- Games
- Audio CDs and listening to music; Watch movies.
- Audio and video conferencing.
- Creating and playing MIDI.
- Business presentations.
- Record dictations ; and Voice recognition.



Learning Check

(blue; Arrow pointing into waves) - Connection for external audio sources, (e.g., tape recorder, record player, or CD compact disc) player.)

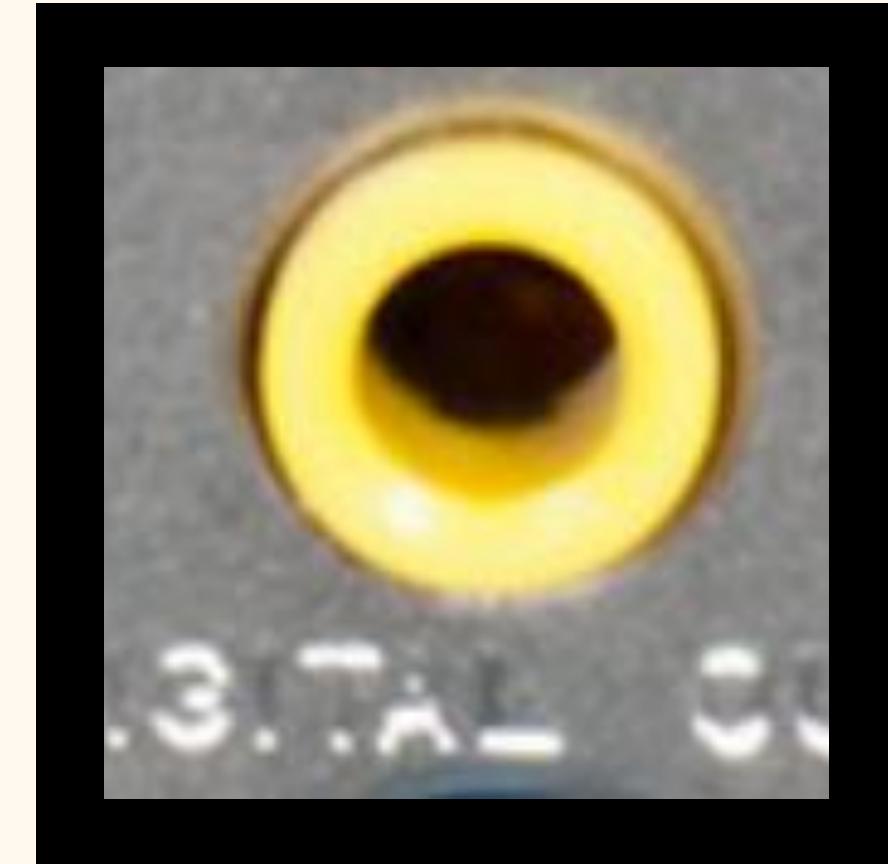


- A DIGITAL OUT
- B SOUND OUT
- C SOUND IN
- D MICROPHONE

Learning Check

(white or yellow)

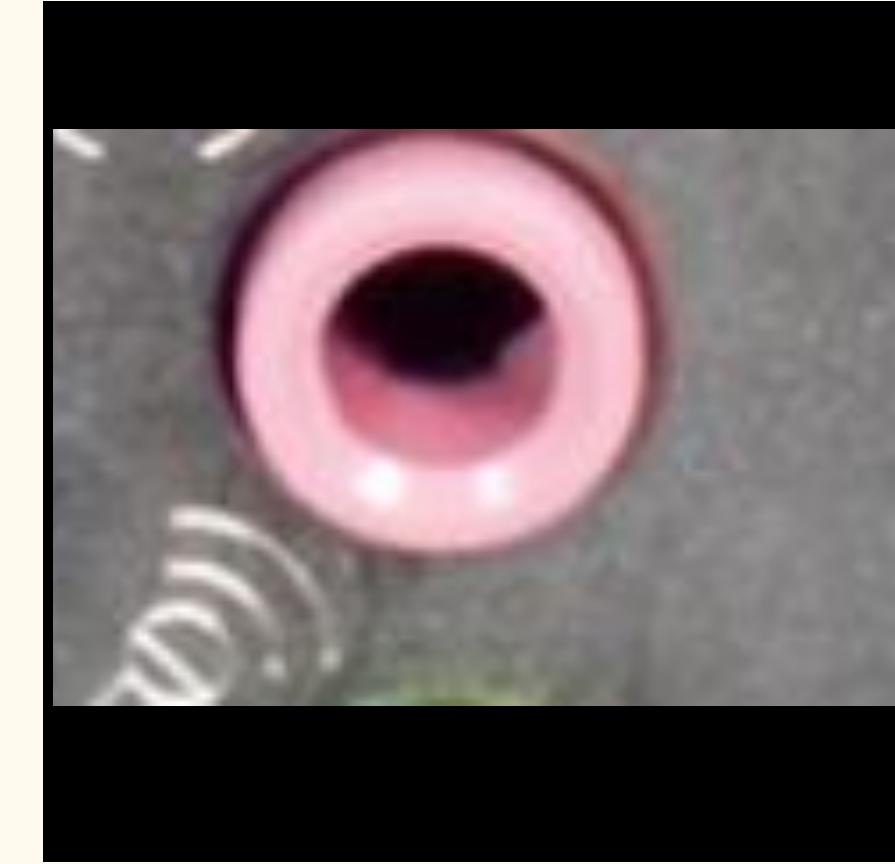
Used with
surround sound or
loudspeakers.



- A DIGITAL OUT
- B SOUND OUT
- C SOUND IN
- D MICROPHONE

Learning Check

(pink) - The connection for a



- A DIGITAL OUT
- B SOUND OUT
- C SOUND IN
- D MICROPHONE

Learning Check

green; Arrow pointing out of waves) - The primary sound connection for your speakers or headphones.

This sound card also has a second (black) and third (orange) sound out connector.



- A DIGITAL OUT
- B SOUND OUT
- C SOUND IN
- D MICROPHONE

Learning Check

What is the size of
five audio jacks
are used with
devices ?

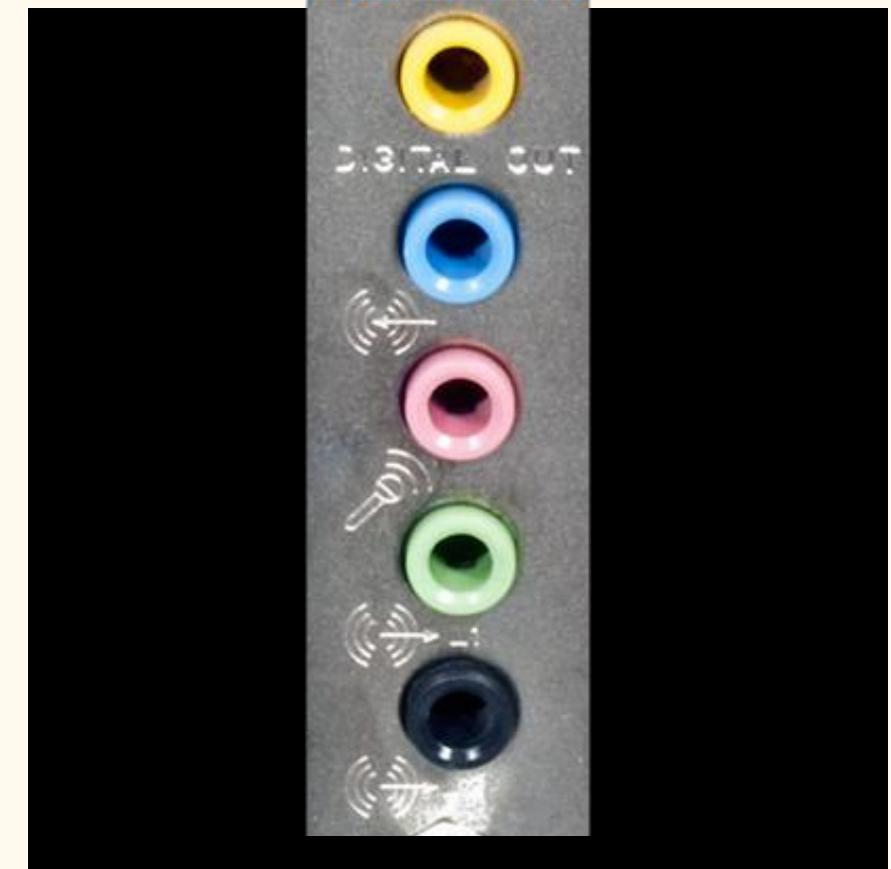


- A 1.5 MM
- B 1.88 MM
- C 3.5 MM
- D 3.8 MM

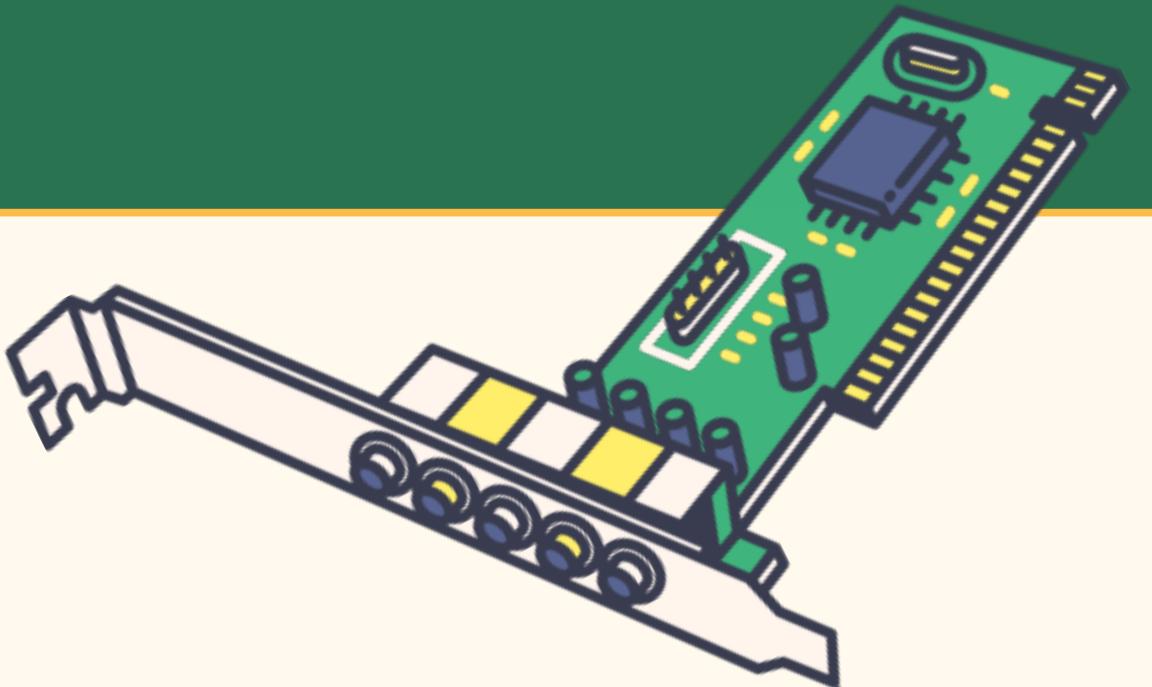
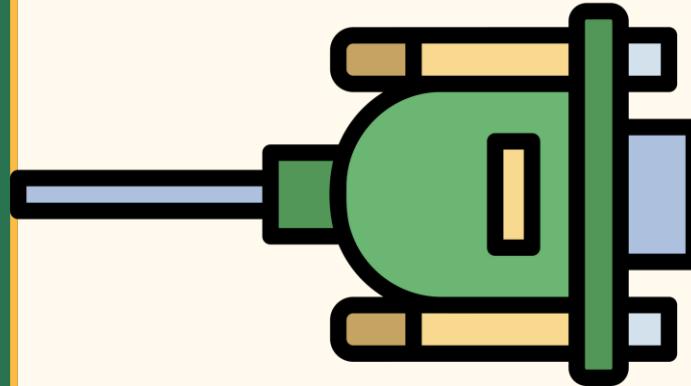
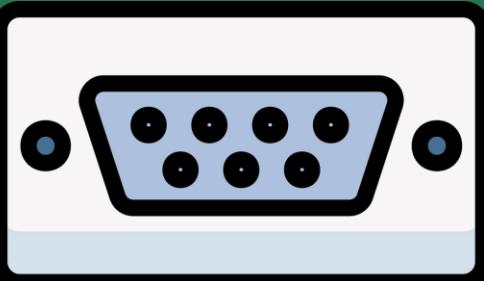
Learning Check

What is the size of
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devices ?

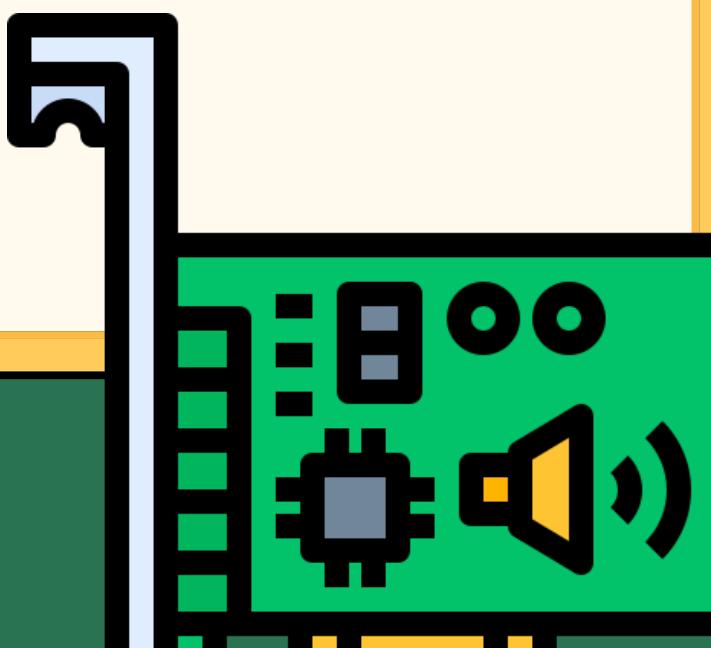
Back of
Sound Card



- A 1.5 MM
- B 1.88 MM
- C 3.5 MM
- D 3.8 MM



HOW TO INSTALL SOUND CARD

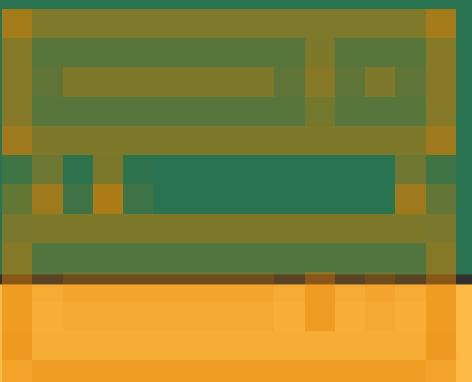


BEFORE GETTING STARTED

- 1. Write down important information from the top or bottom of the card such as the model number, serial number, and specifications.**
- 2. Ensure you are familiar with ESD (ElectroStatic Discharge) and its potential dangers.**
- 3. When physically installing the sound card, ensure the computer is off.**

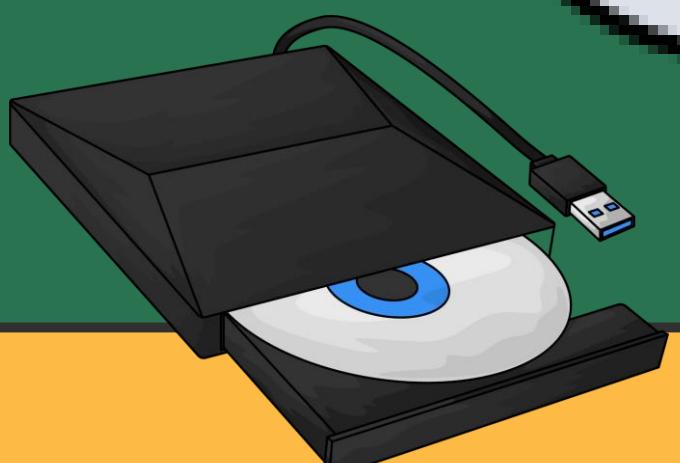
1. INSTALL INTO EXPANSION SLOT

Sound cards are connected into the PCI (Peripheral Component Interconnect) slot. Locate an available expansion slot in the computer and gently push the card into the slot until it snaps and holds place. Once the card is in the slot, place a screw into the back metal plate to hold the card into position.



2. ATTACH INTERNAL CABLES

Most sound cards have the availability of connecting a CD (Compact Disc) audio cable to the card itself. If present, connect the CD audio cable from the back of your CD-ROM (Compact Disc Read-Only Memory) to the sound card now.



3. ATTACH EXTERNAL CABLES

Place the case back onto the computer. Connect the keyboard, monitor, and power. Then, connect either a pair of headphones or speakers to the line out on the back of the sound card.



INSTALLING A SEPARATE SOUND CARD

EXTERNAL SOUND CARD

is a separate audio processing device that connects to a computer via a digital interface, typically USB type. It processes audio signals outside of the computer's internal components, providing improved sound quality, additional features, and enhanced compatibility.



EXTERNAL SOUND CARD

Process Audio Signals independently

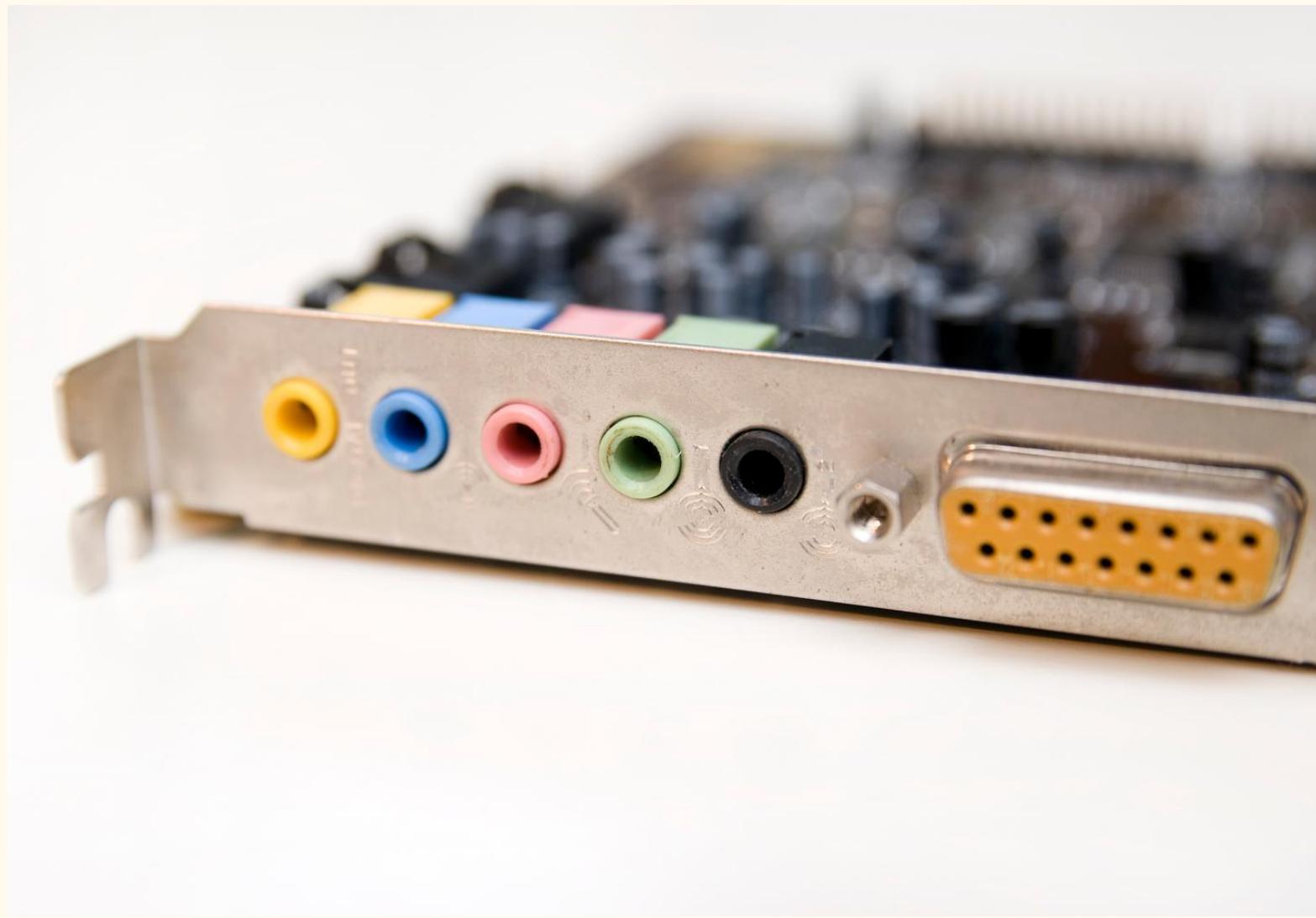
Often used for:

- 1. Audio Production and recording**
- 2. High Fidelity audio playback**
- 3. Audio Conferencing and streaming**

BENEFITS OF EXTERNAL SOUND CARD

- 1. Improved sound quality**
- 2. Increased audio resolution**
- 3. Expanded audio connectivity options**
- 4. Portability and convenience**

INTERNAL



EXTERNAL



INTERNAL

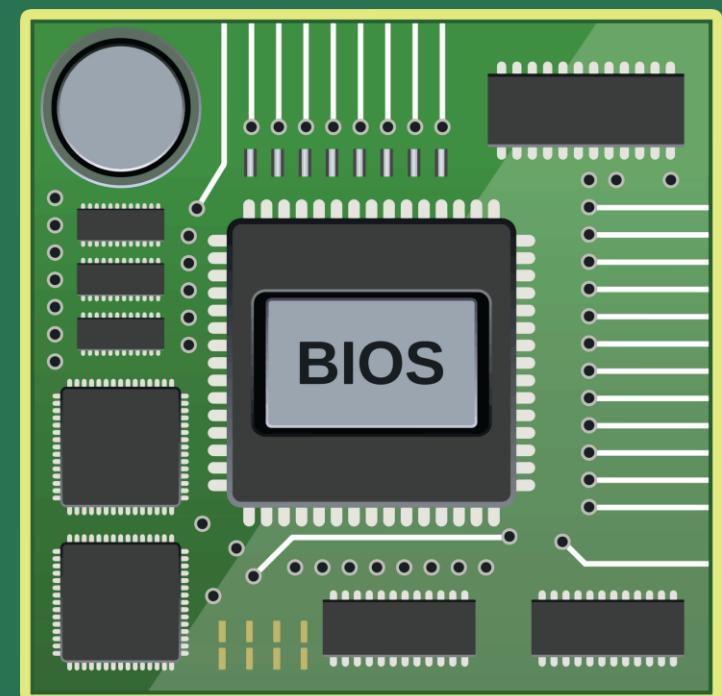
- Installs inside the computer case.
- Typically a PCIe or PCI card
- Requires screwing into a slot on the motherboard
- May require BIOS setup (depending on motherboard)
- Requires driver installation

EXTERNAL

- Connects via USB
- Typically compact, rectangular, or box-shaped
- No installation required inside the computer case
- Plug-and-play
- No BIOS setup required

4. BIOS SET-UP UTILITY

It is necessary to enter BIOS setup if computer has an onboard/internal sound card. If present, the onboard sound card must be **ENABLED** before it works properly.



HOW TO ENABLED SOUND CARD IN BIOS

- 1. Restart your computer and enter BIOS setup (usually by pressing F2, F12, Del, or Esc).**

HOW TO ENABLED SOUND CARD IN BIOS

**2. Navigate to the "Advanced"
look for "Audio" or "Sound"
settings/ "Onboard HD Audio"**

~~Onboard LAN~~
~~Onboard HD Audio~~
Front Panel

[Enabled]
[Enabled]
[Disabled]
[Auto]
[PCI Express]

Share Memory
Primary Graphics Adapter

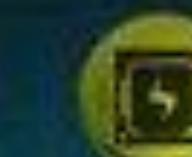
CPU Thermal Throttle



ASROCK UEFI SETUP UTILITY



Main



OC Tweaker



Advanced



H/W Monitor



Boot



Security



Exit

Advanced\North Bridge Configuration

Internal Graphics Mode

UMA

Share Memory

Auto

Onboard HDMI HD Audio

Disabled

Primary Graphics Adapter

Onboard

PCIE2 Link ASPM

Disabled

Onboard HDMI HD Audio

Disabled

Enabled

HOW TO ENABLED SOUND CARD IN BIOS

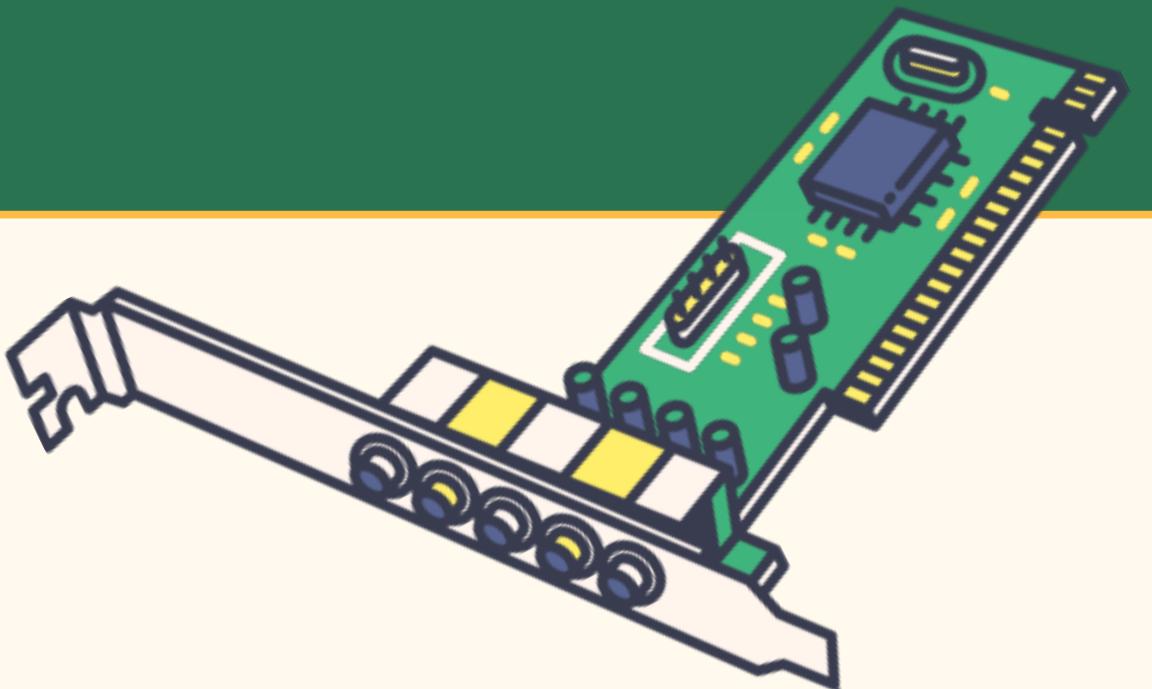
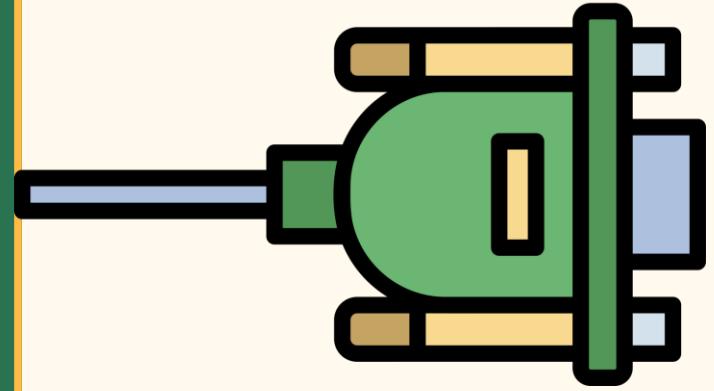
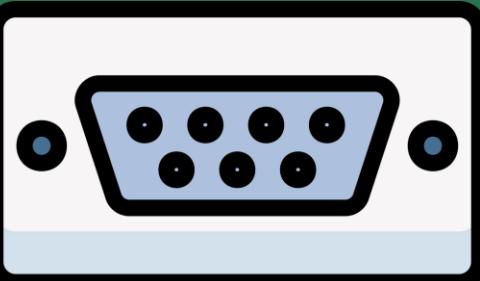
**3. Save changes and exit BIOS
setup (usually F10).**

**DISABLING THE SOUND
CARD IN BIOS SETUP
MAY BE NECESSARY IN
CERTAIN SITUATIONS:**

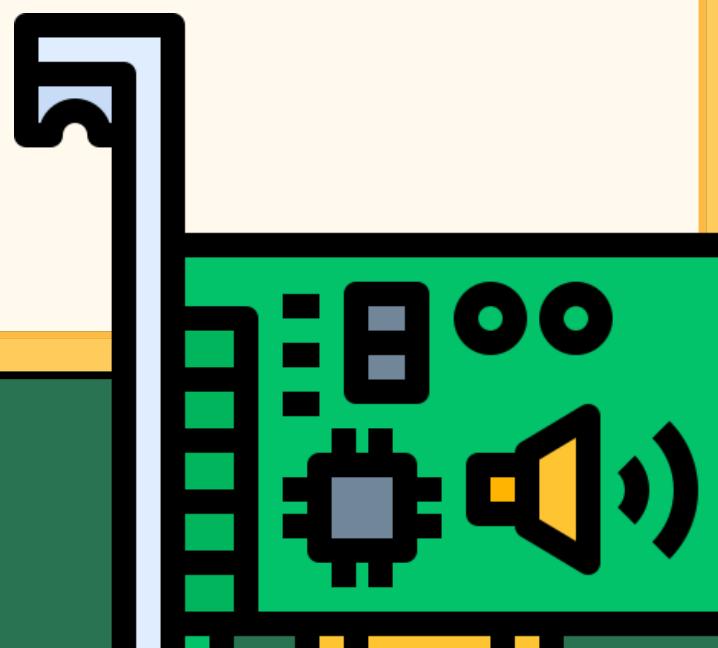
1. Conflict with external sound cards: If you're using a separate sound card, disabling the onboard audio in BIOS prevents conflicts and ensures the external card is used.

2. Power management:
Disabling unused devices, like sound cards, can help reduce power consumption.

3. Troubleshooting: Disabling onboard audio can help diagnose issues with external sound cards or audio software.

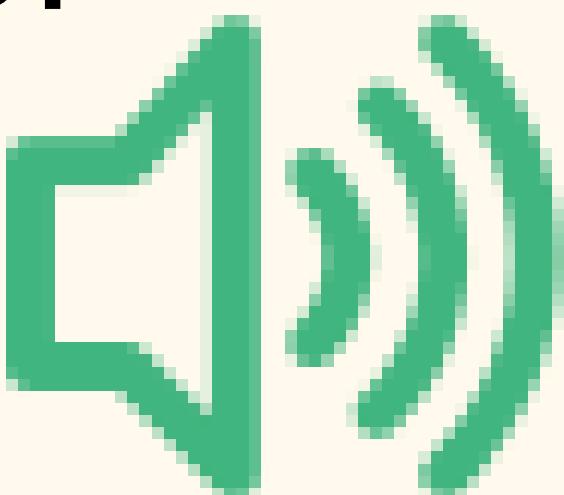
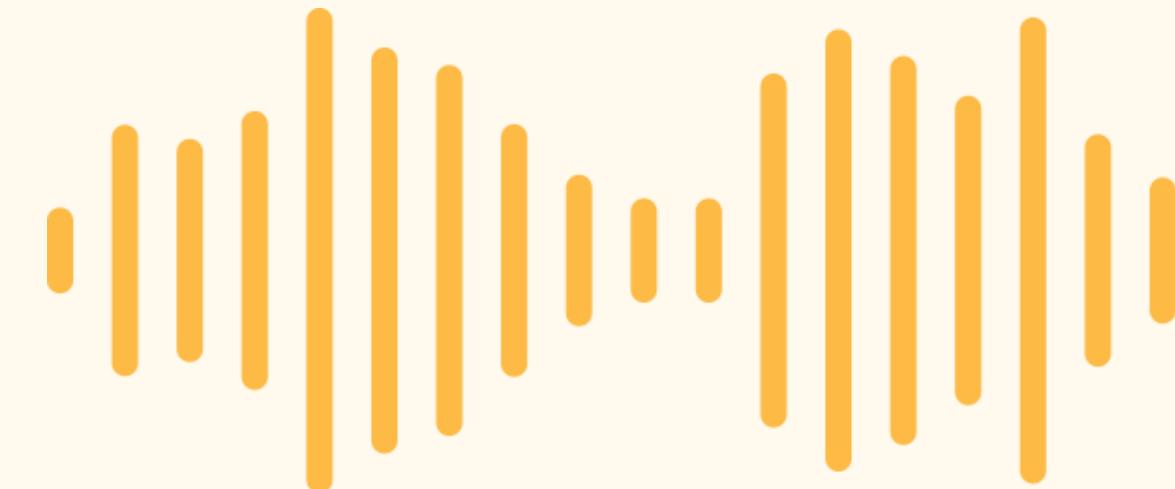


AUDIO TROUBLESHOOTING



Audio troubleshooting

refers to the process of identifying, diagnosing, and resolving issues related to audio devices, systems, or software



Why should we learn troubleshooting?

1. Identifying symptoms: Recognizing audio problems, such as distortions, dropouts, or noise.

Why should we learn troubleshooting?

- 2. Diagnostic testing:** Using tools and techniques to isolate the cause.

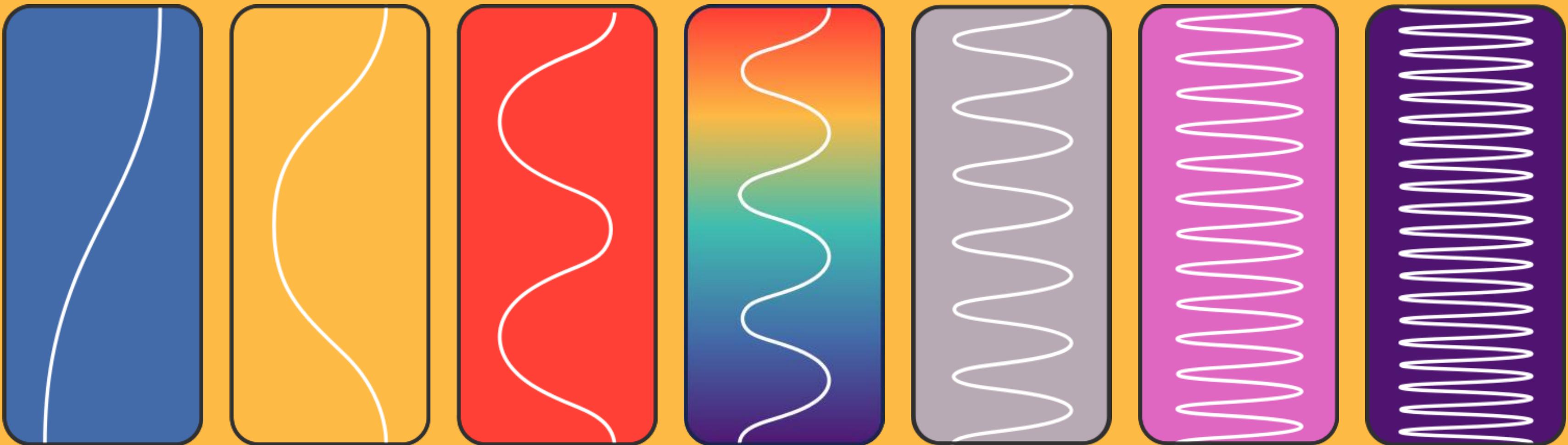
- 3. Analysis:** Examining audio signals, settings, and configurations.

Why should we learn troubleshooting?

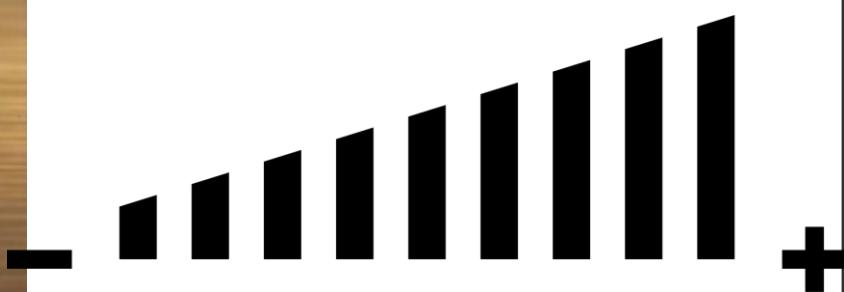
- 4. Repair/adjustment:** Fixing or adjusting faulty equipment, settings, or software.

- 5. Verification:** Confirming the issue is resolved.

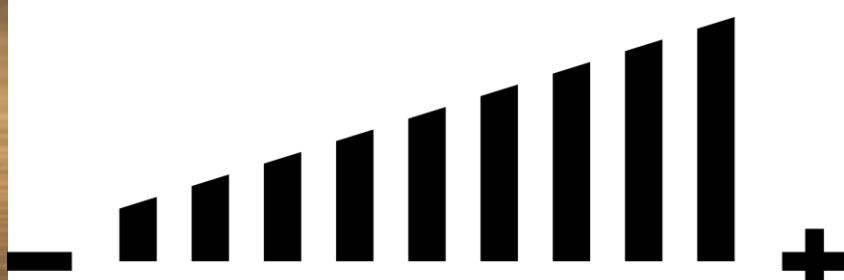
WHAT COMES FIRST IN AUDIO TROUBLESHOOT



NO SOUND FROM SPEAKER

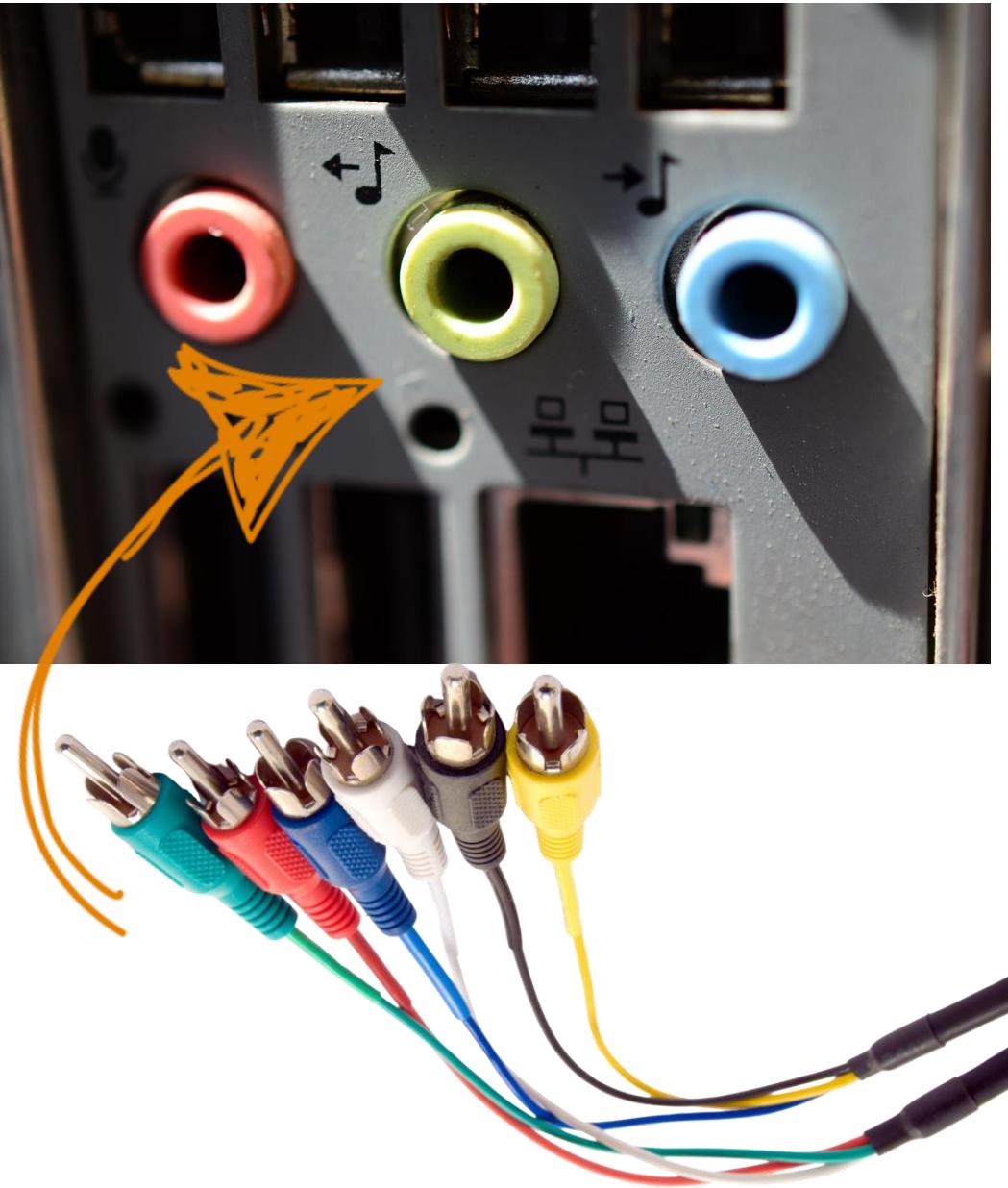


Symptoms: No sounds from speakers but headphones work fine.
The speaker already connected via 3.5 mm jack.

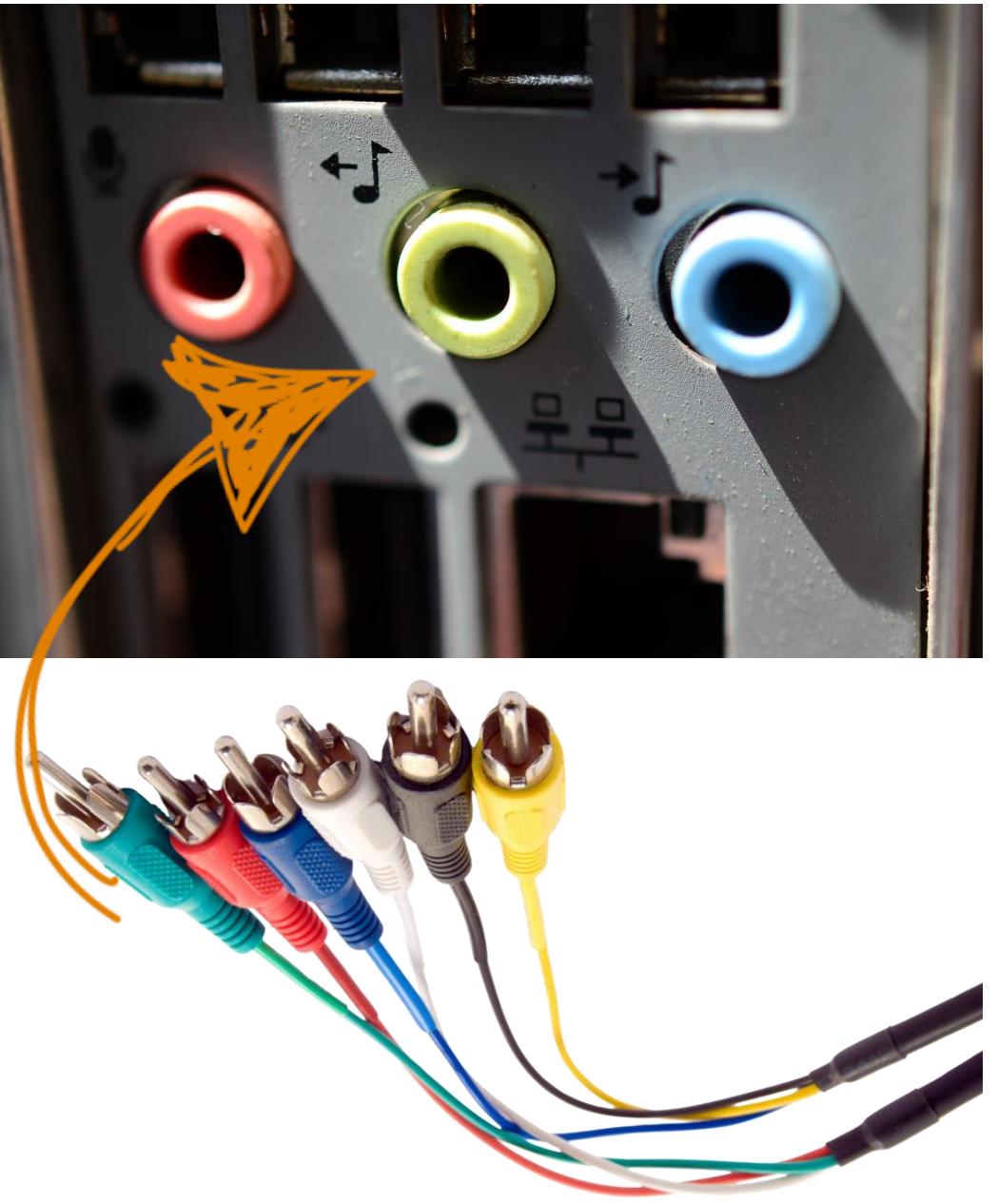


CHECKED THE VOLUME

DISTORTED SOUND FROM HEADPHONE

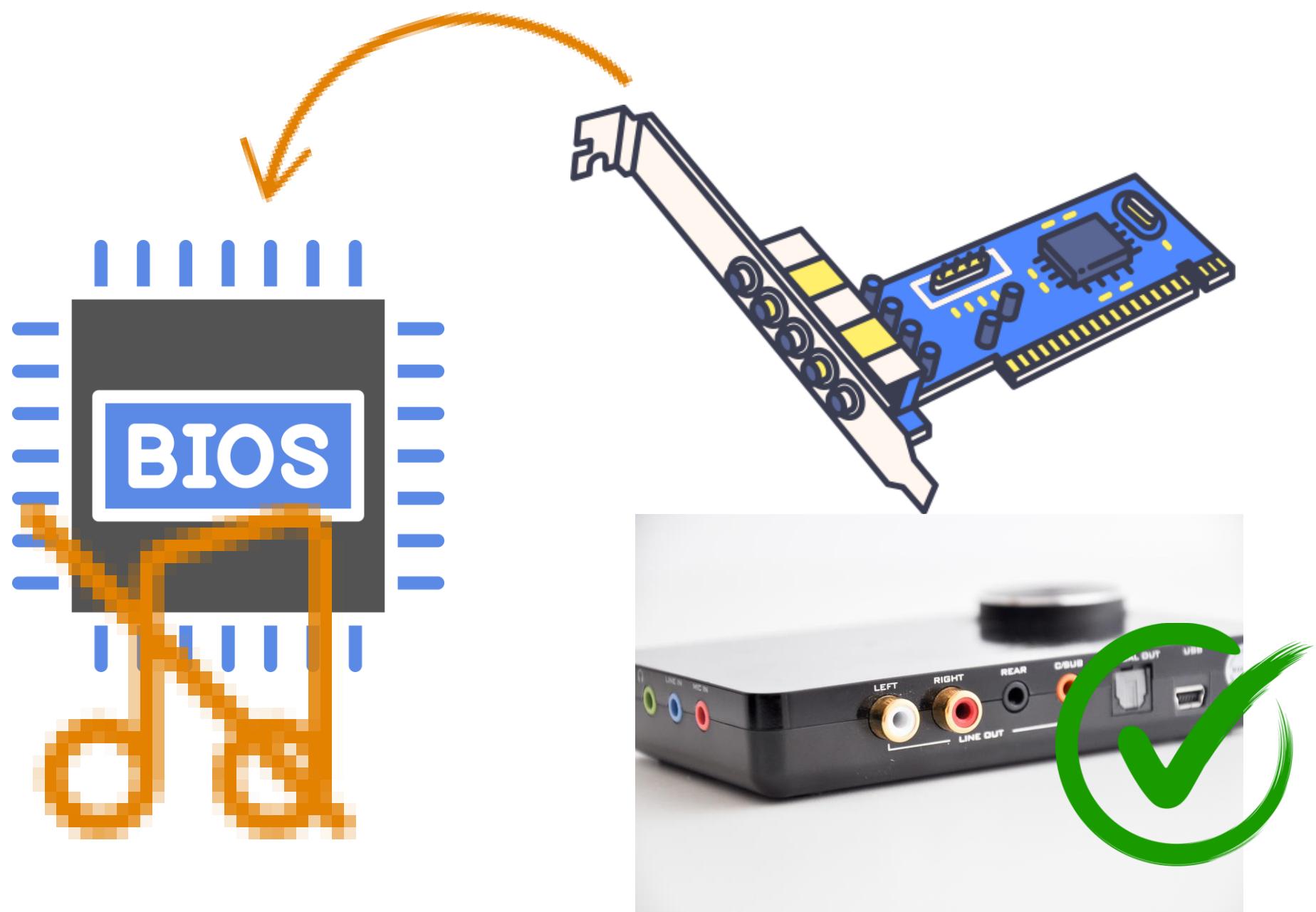


Symptoms: Distorted sound from headphones, volume fluctuations



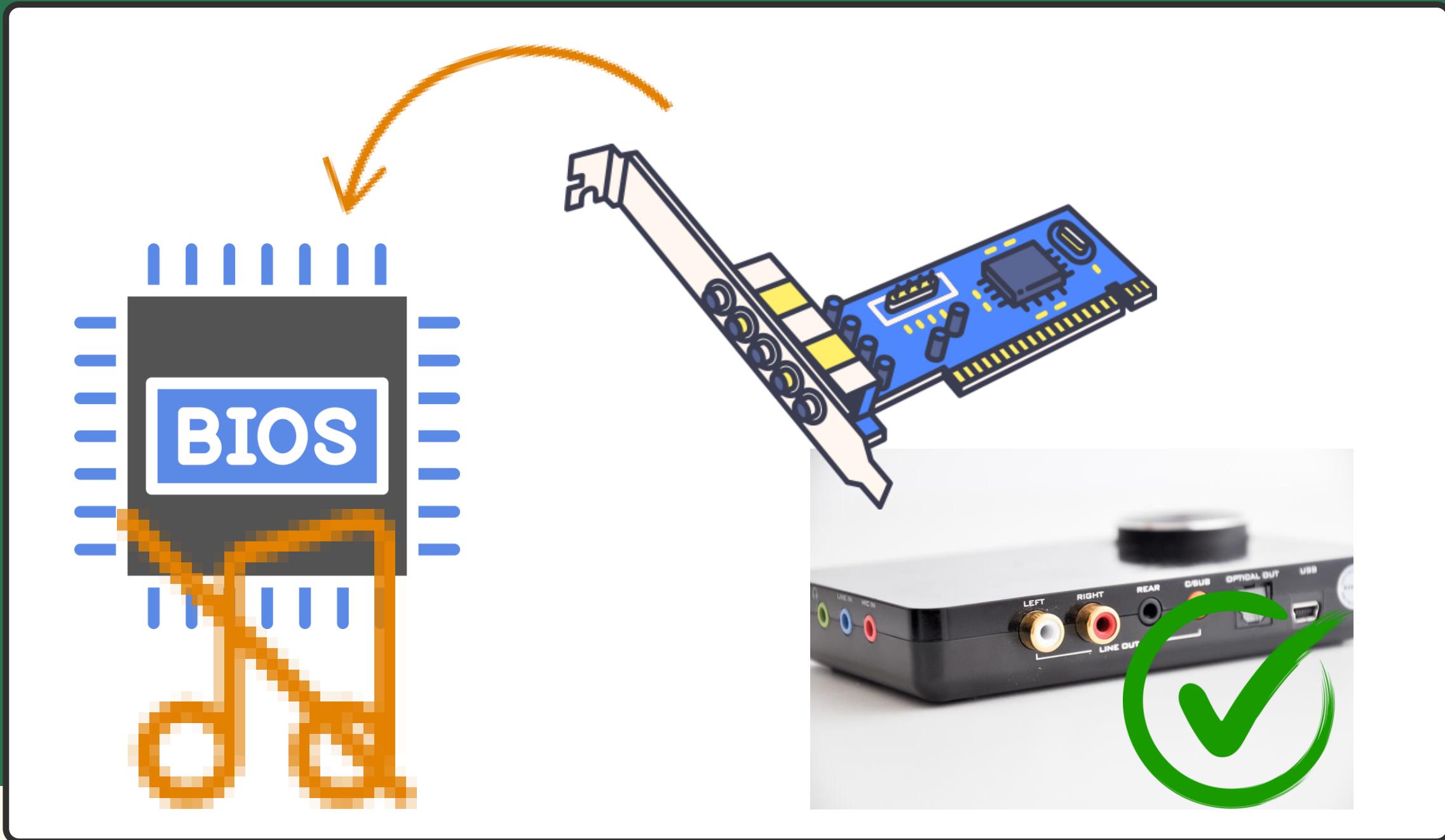
**ENSURE CABLES SECURELY
INSERTED INTO THE CORRECT PORTS**

AUDIO DEVICE NOT RECOGNIZED



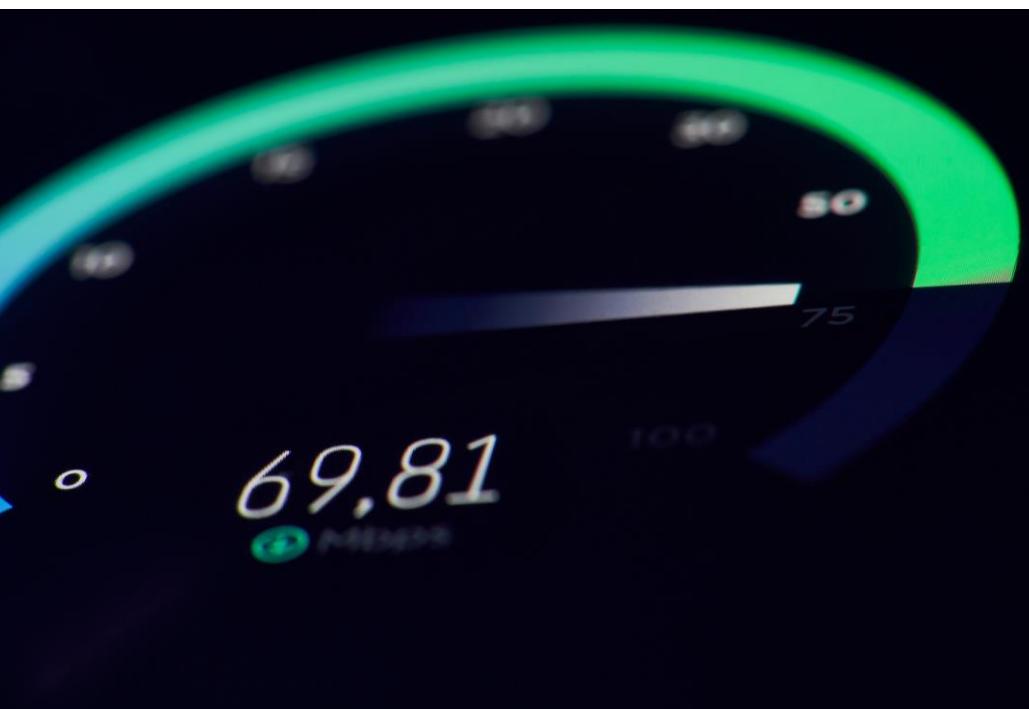
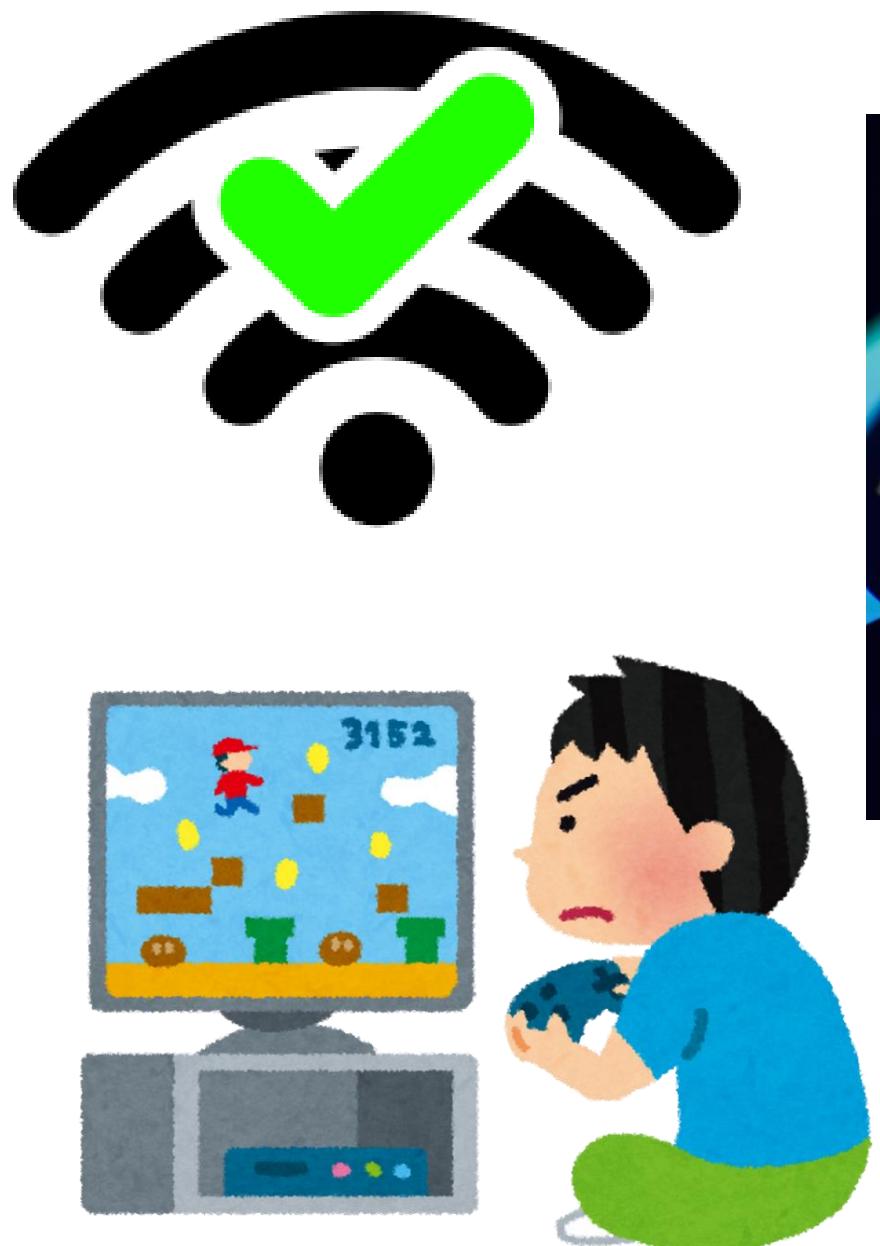
Symptoms: Audio Device
are not recognized by
the computer systems.

External Card and
Internal card are
inserted at the same time



DISABLE AUDIO SETTING IN BIOS SET-UP UTILITY

AUDIO LAG OR DELAY IN ONLINE GAMING



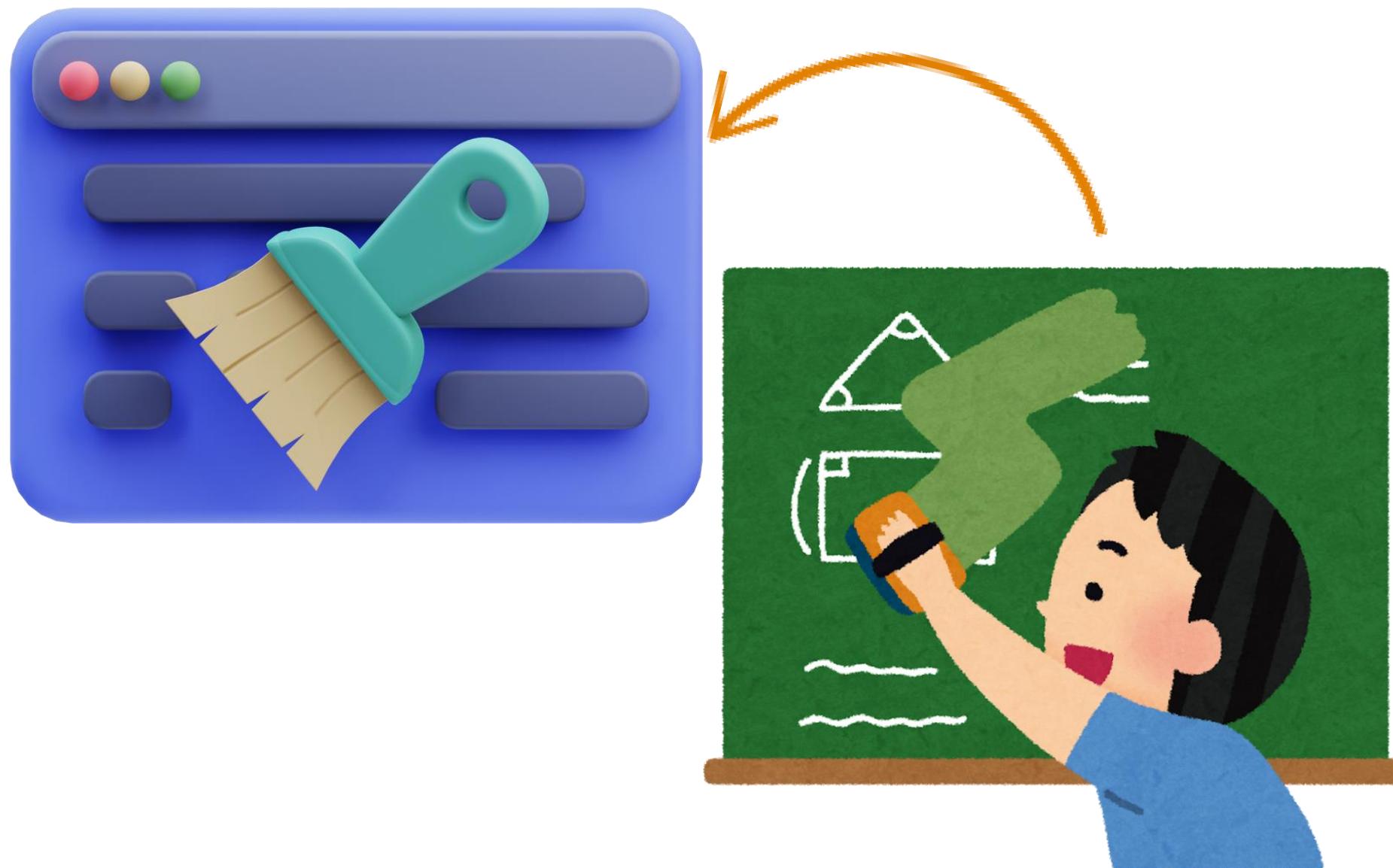
Symptoms: Audio LAG, Delay, desynchronize while playing online games.

Cable are connected correctly in ports

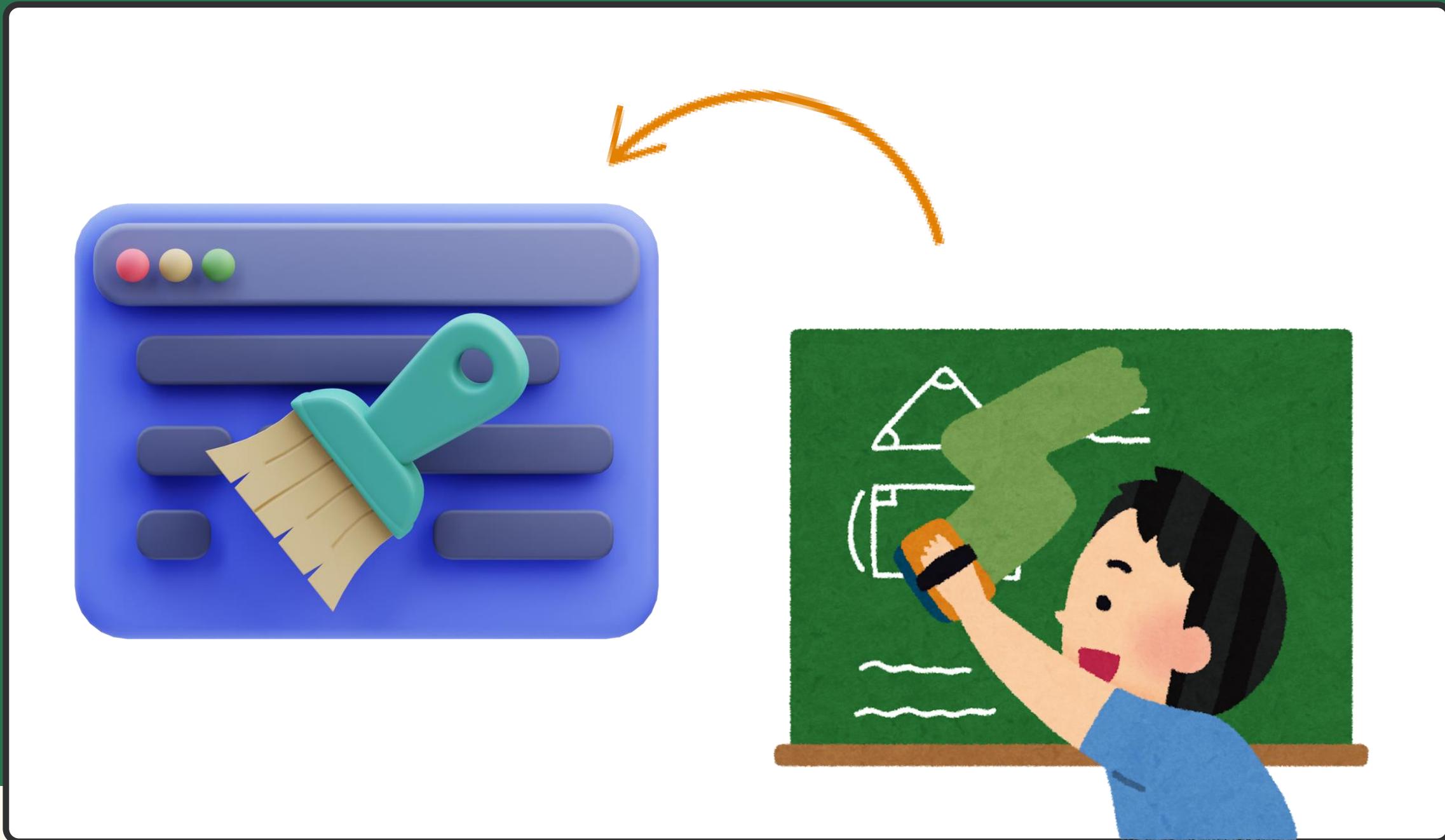


CHECKED THE INTERNET SPEED

NO AUDIO FROM BROWSER



Symptoms: No Audio from Browser but the other applications from computer works



ERASED THE CACHED MEMORY

STEP-STEP TO TROUBLESHOOT AUDIO/ SOUND CARD

HARDWARE CHECKS:

1. Ensure the volume is turned on and is up.
2. Verify the connection 3.5mm inserted correctly
3. Check the device cable for damage.

STEP-STEP TO TROUBLESHOOT AUDIO/ SOUND CARD

BIOS AND FIRMWARE CHECKS:

4. Ensure audio settings are enabled if using an internal sound card; disable them if using external sound card

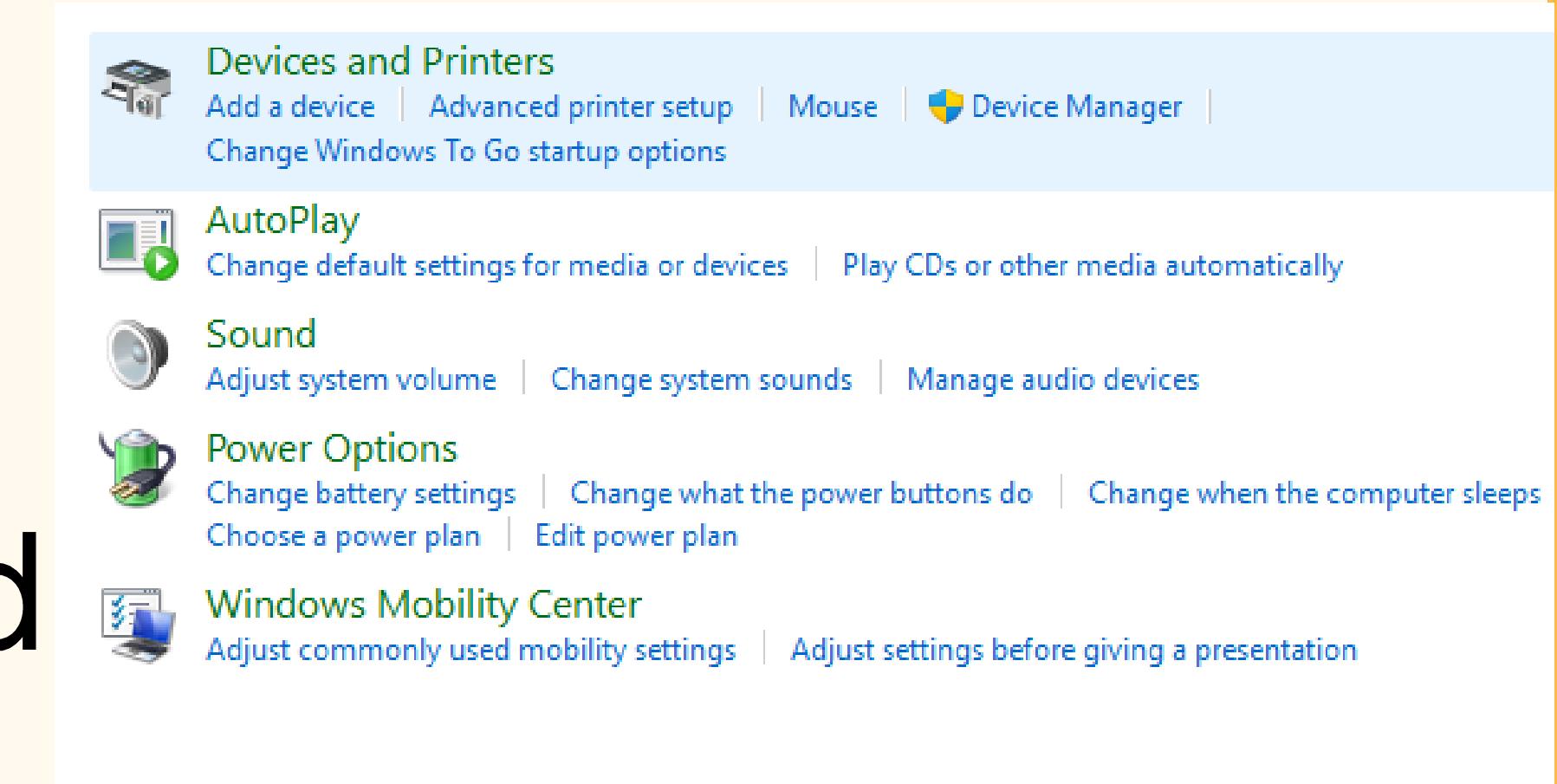
STEP-STEP TO TROUBLESHOOT AUDIO/ SOUND CARD

ADDITIONAL STEPS:

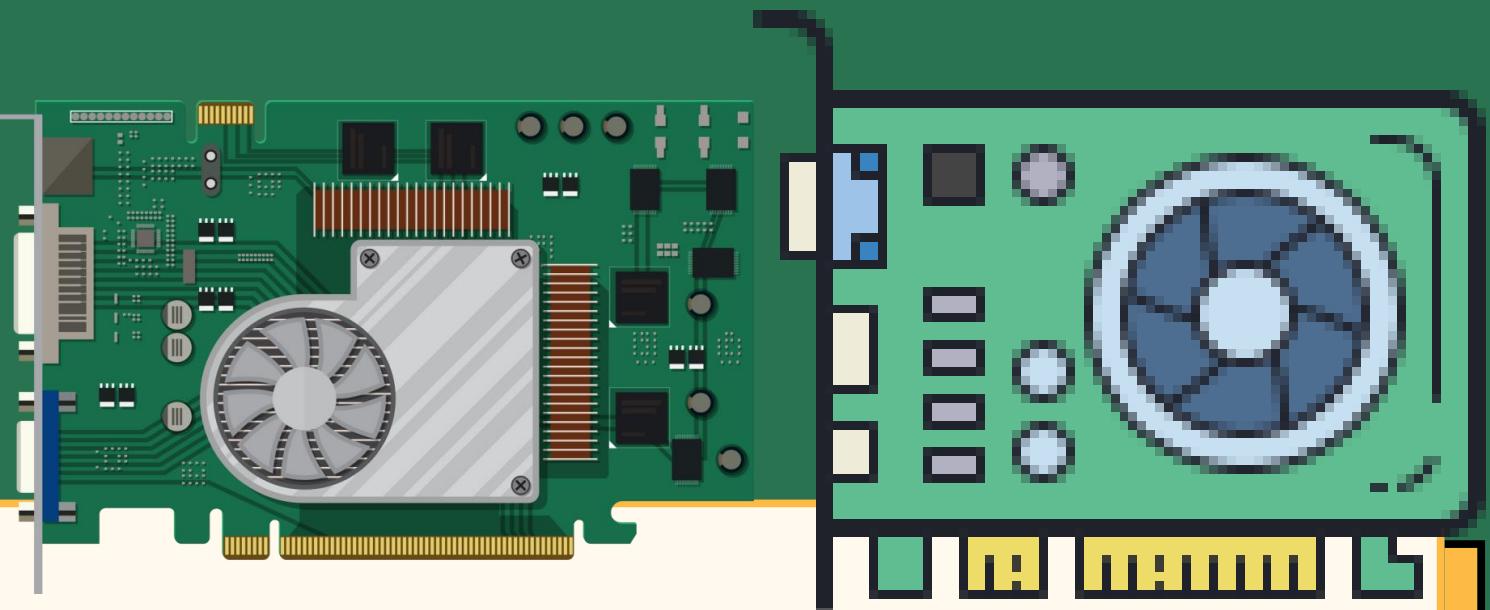
5. Checks for conflicts with other audio software
6. Restart the computer
7. Reinstalling the sound card

Verify sound and audio properties

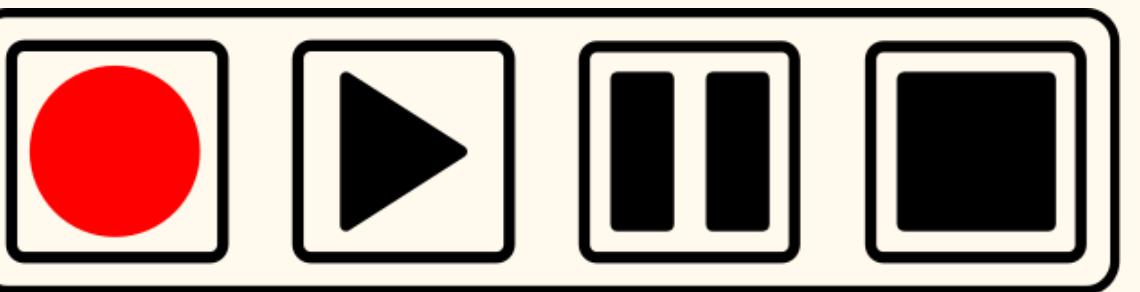
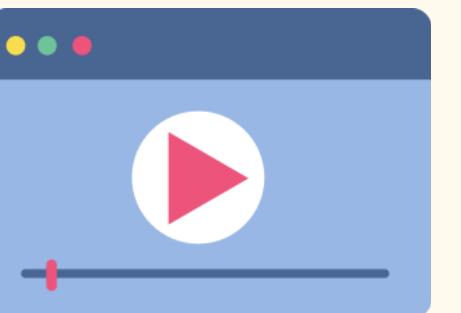
1. Click Start, Settings, Control Panel and Hardware and Sound

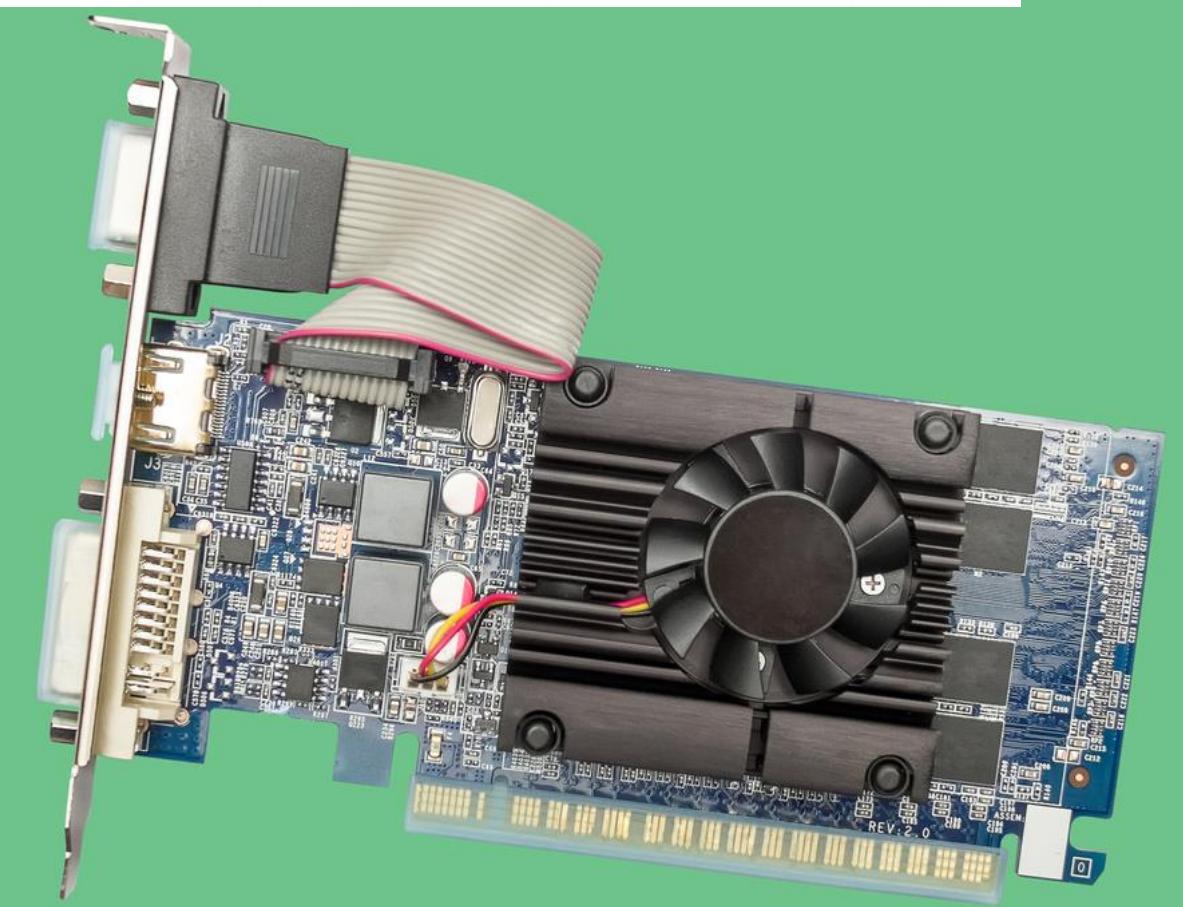
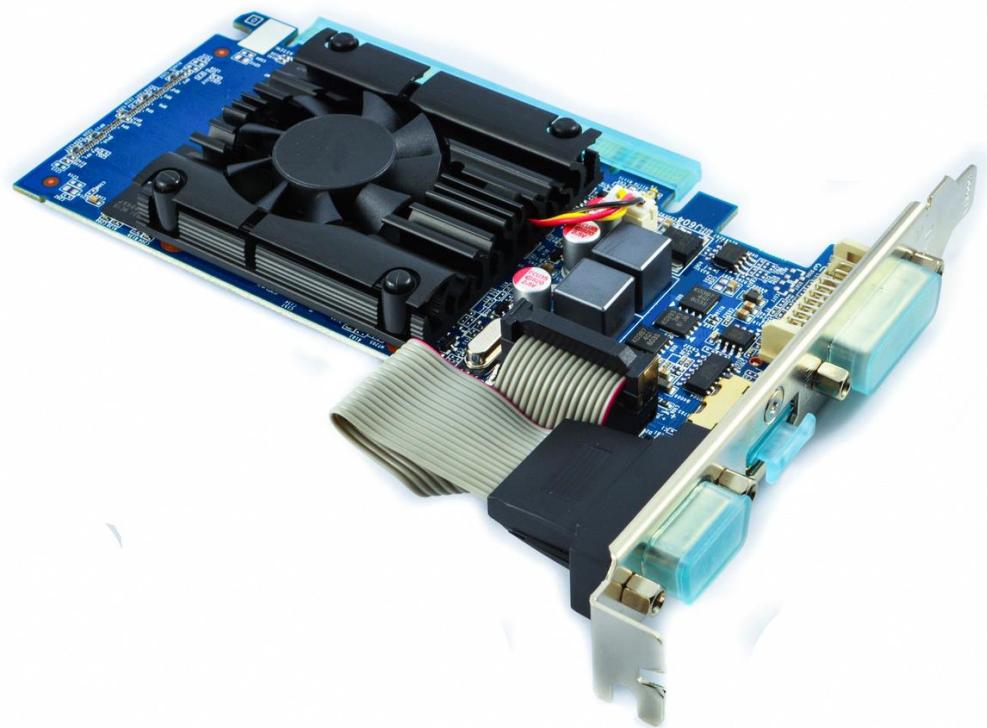


VIDEO CARD

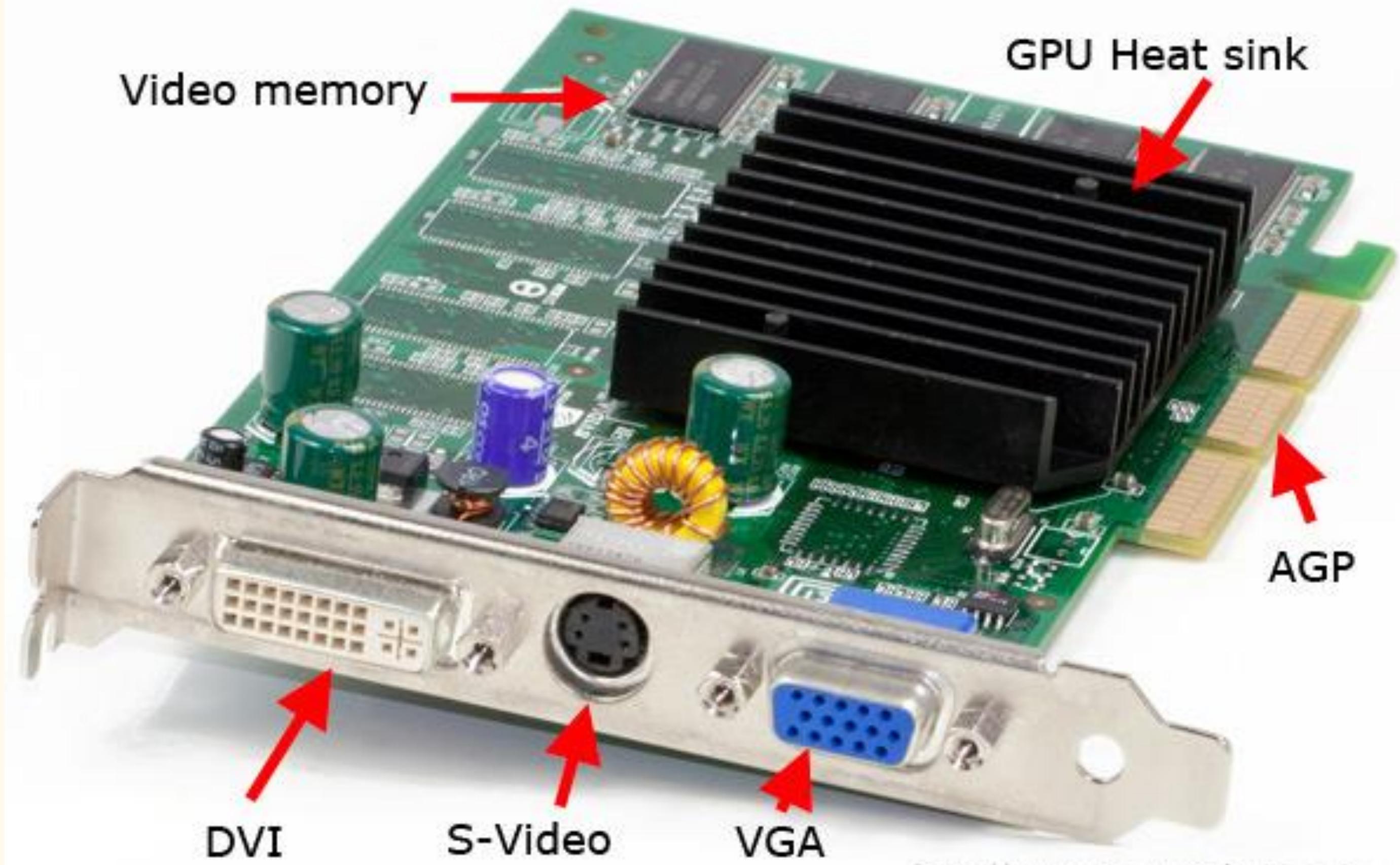


is an expansion card that allows the computer to send graphical information to a video display device such as a monitor, TV, or projector. A video card is a piece of computer hardware that's rectangular in shape with numerous contacts on the bottom of the card and one or more ports on the side for connection to video displays and other devices





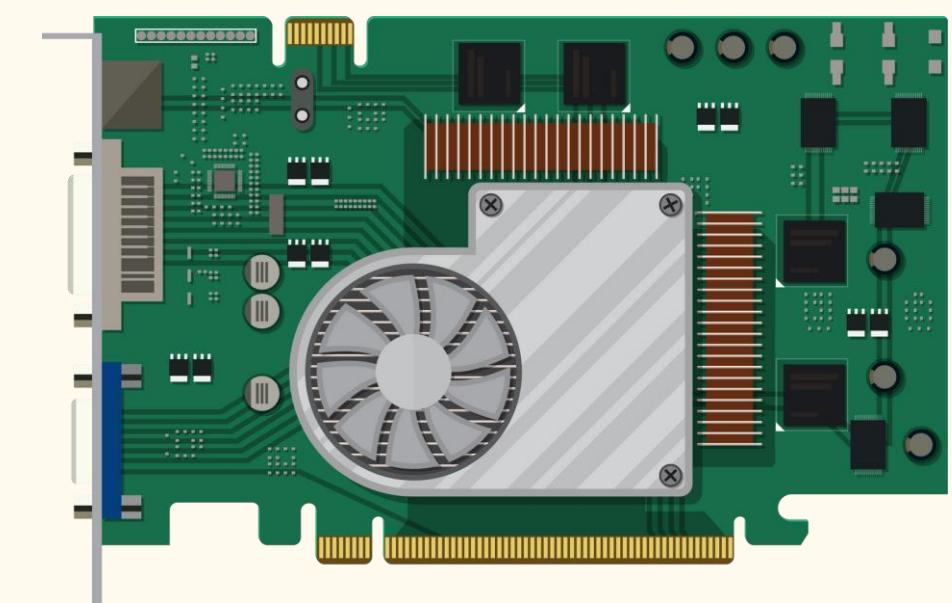
Internal computer video expansion card



PARTS OF VIDEO CARD

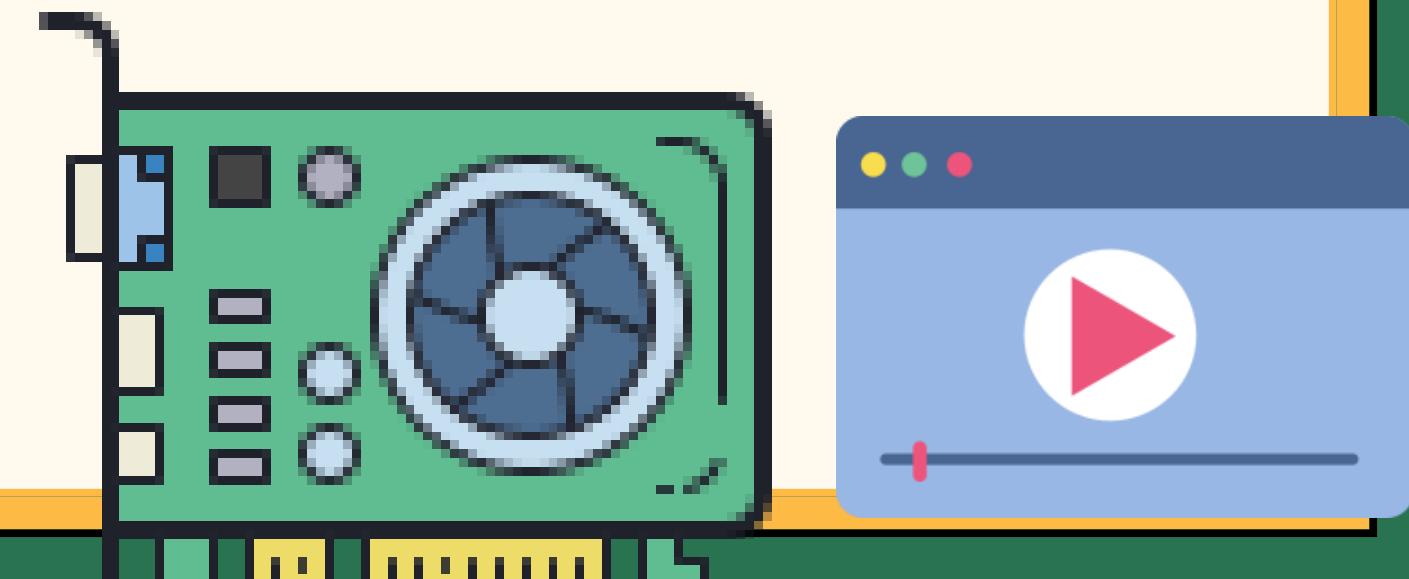
1. VIDEO MEMORY

also known as video random access memory (VRAM), is a dedicated memory on a computer's graphics card or graphics processing unit (GPU) that stores and manages data related to graphics and video processing.

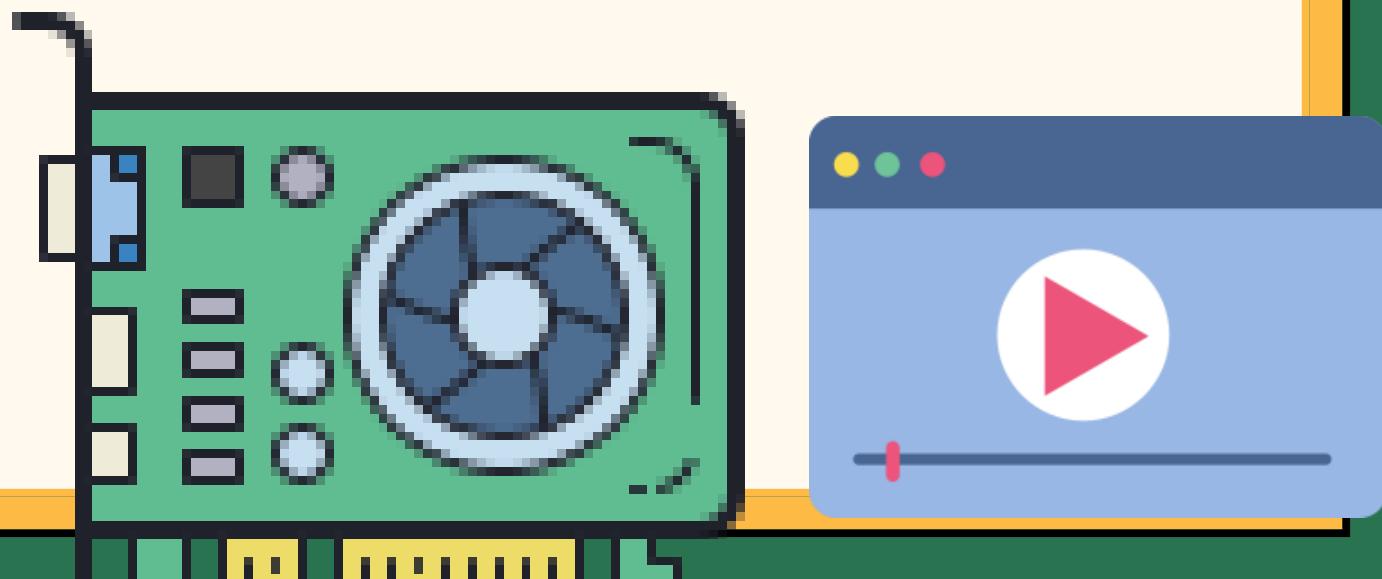




**What is the difference
between video memory
and system memory?**

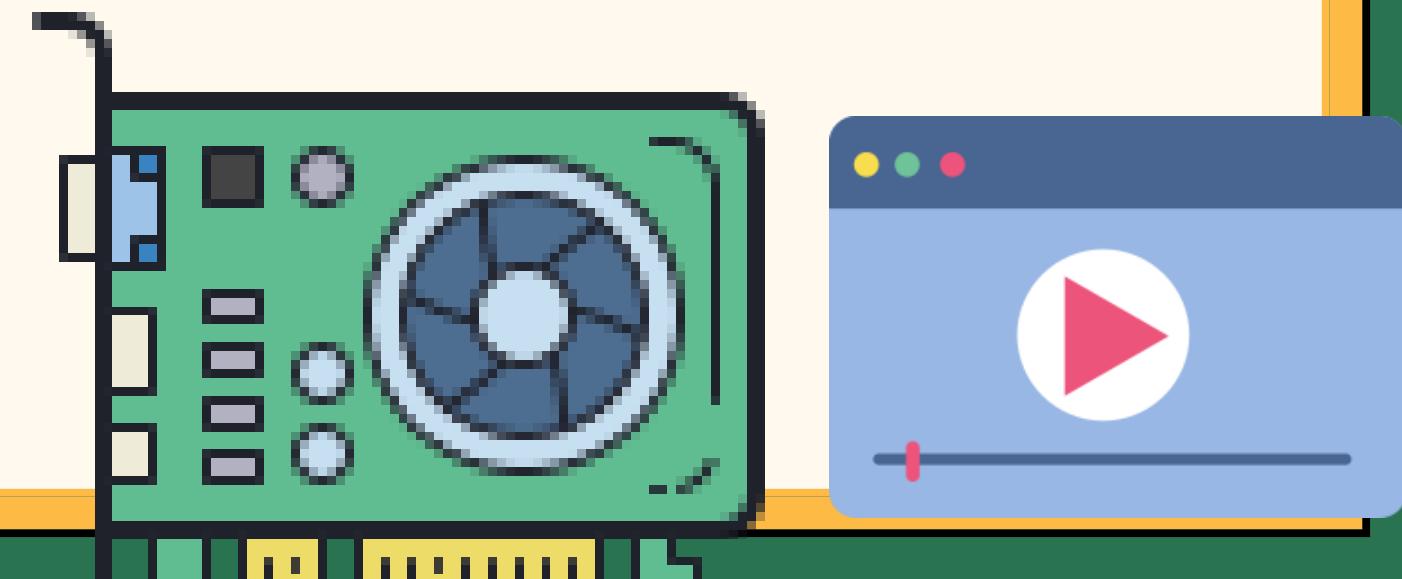


Video memory is dedicated memory on the graphics card, solely responsible for handling graphics-related data. In contrast, random access memory (RAM) is used for general computing tasks and serves as a temporary workspace for both the control processing unit (CPU)



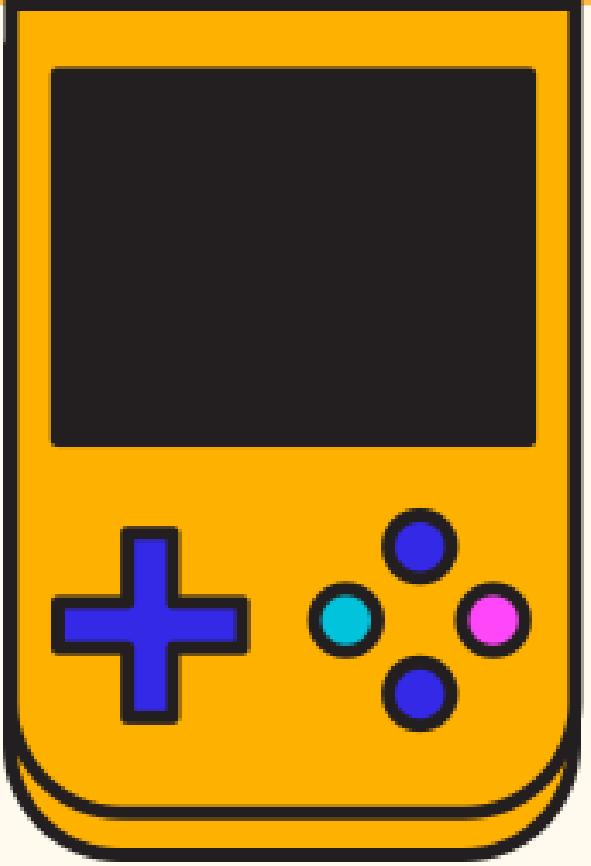
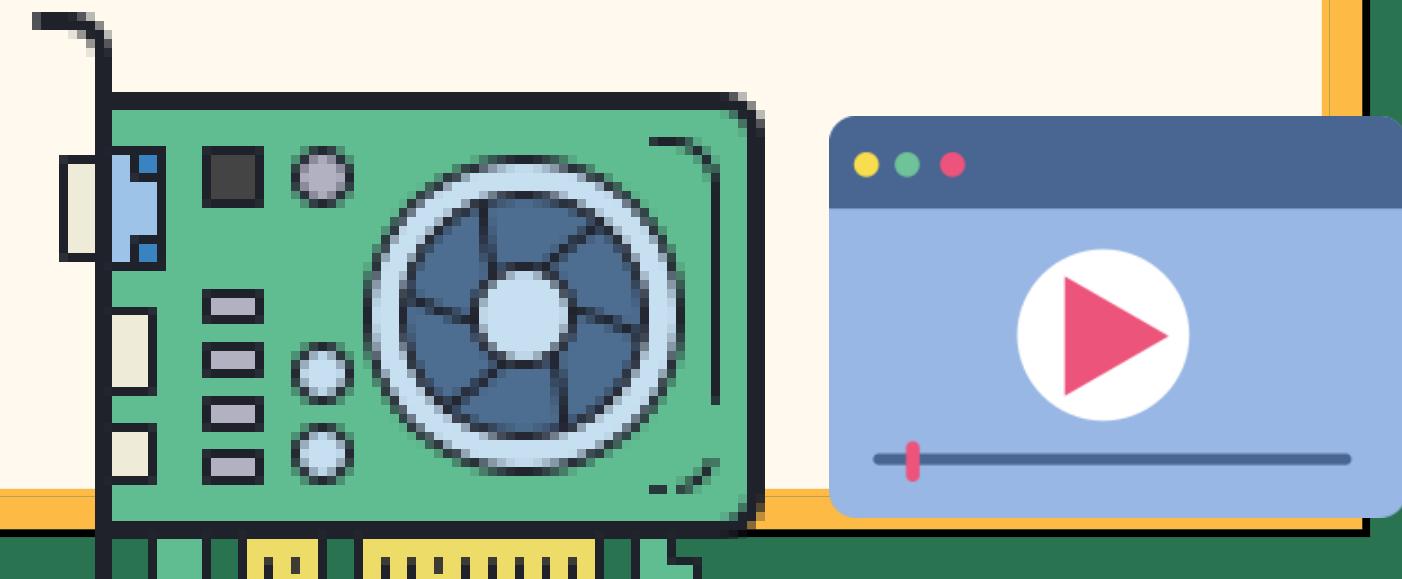
How does video memory affect graphics performance?

Video memory directly affects graphics performance by determining the amount of data that can be stored and accessed by the graphics processing unit (GPU). Insufficient video memory can lead to reduced frame rates, lower resolution textures, and overall degradation in graphical quality.



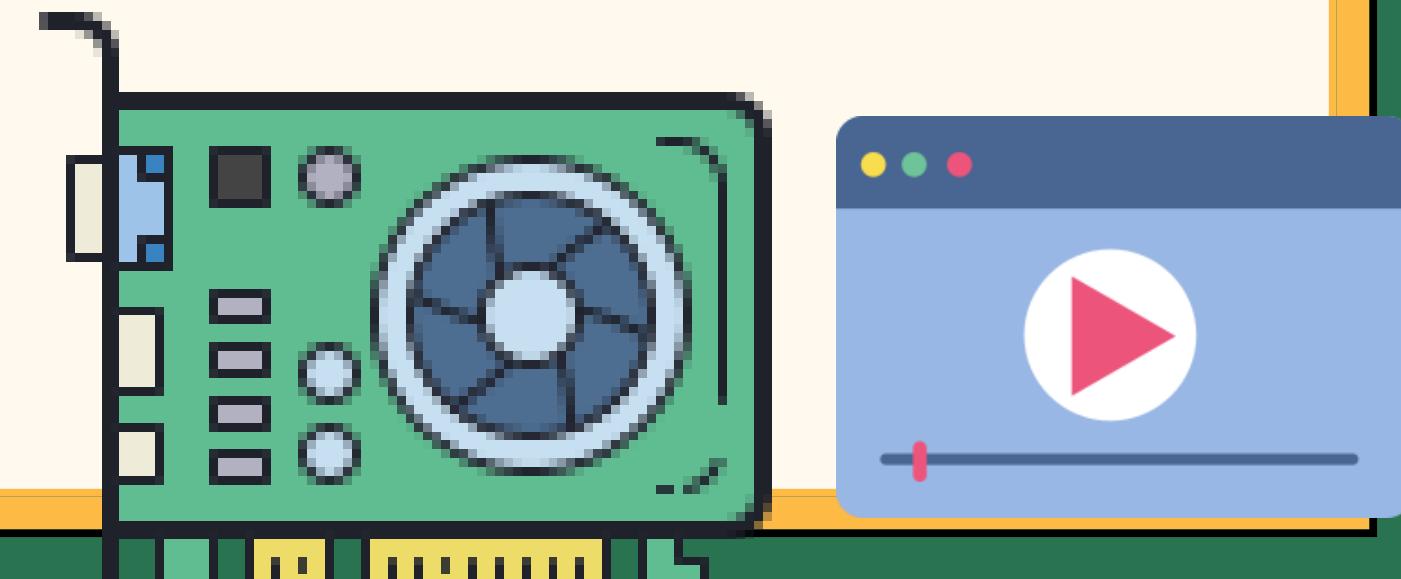
PLAY

GAMING



What Does a Video Card Do for Gaming?

we usually encounter large, high-resolution/high-definition or even 3D graphics. To render a better image it should be able to deliver image data at an acceptable frame rate. If the frame rate of your graphics card is very low, it won't be able to display you with smooth game actions.

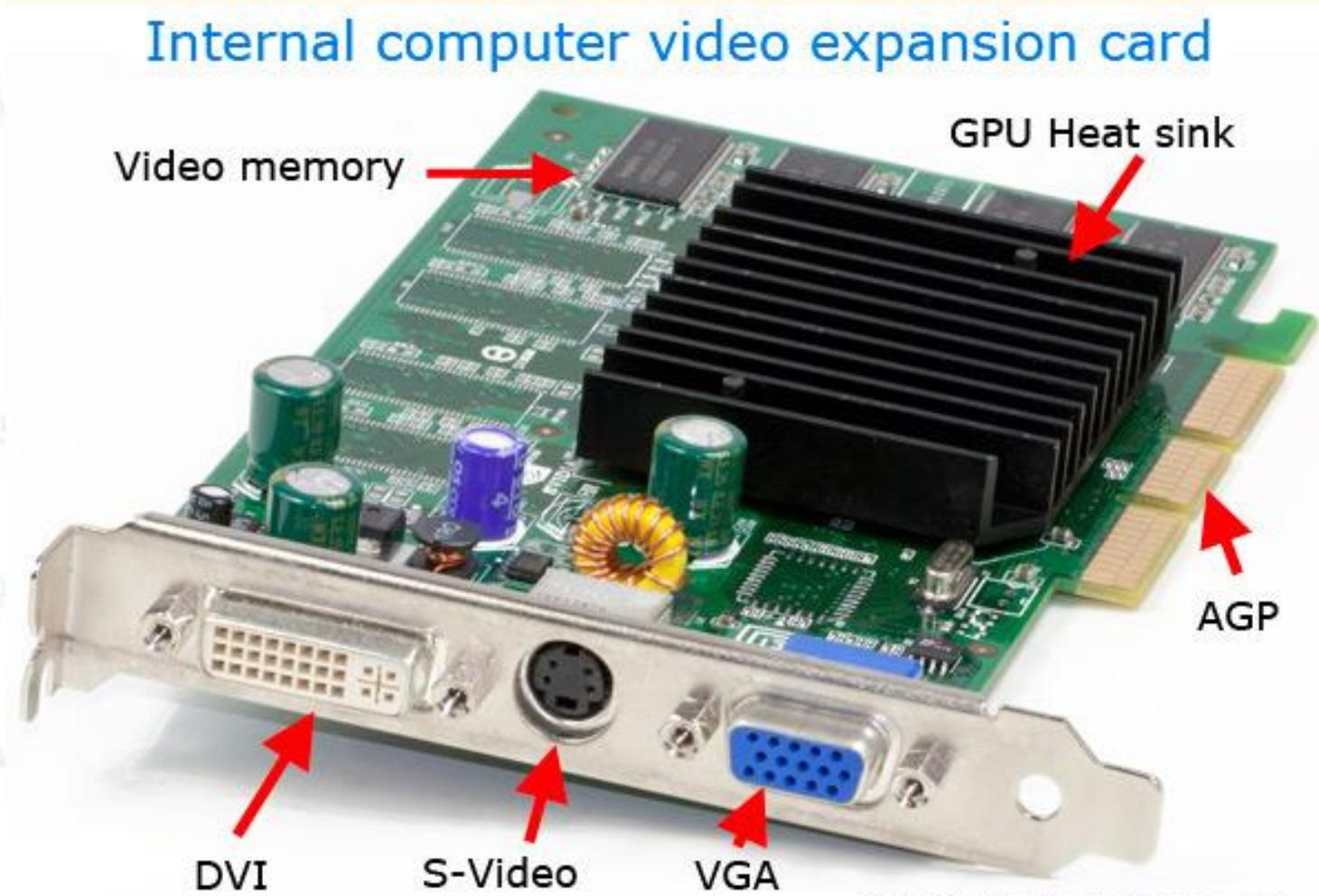
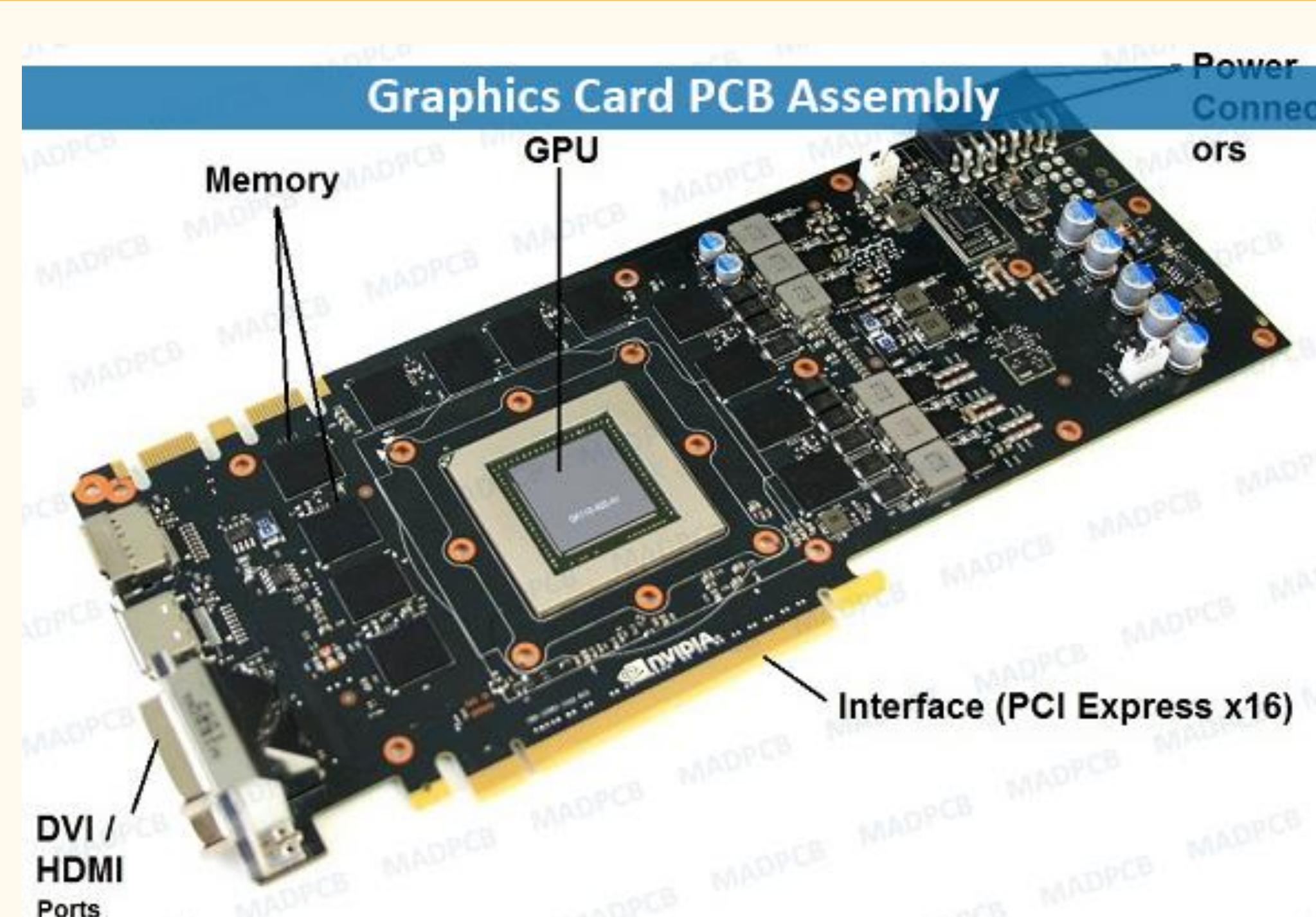


2. GRAPHICAL PROCESSING UNIT (GPU)

is a specialized type of processor designed specifically for performing computational operations associated with computer graphics and video processing.

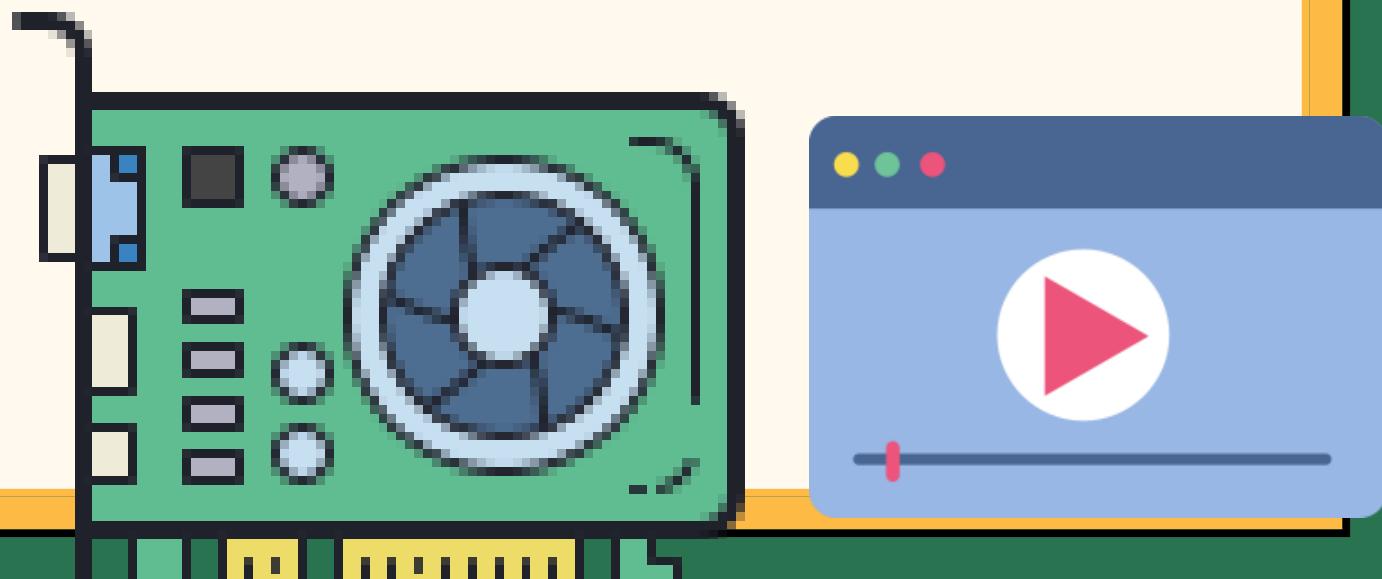
GPUs can be used for a variety of tasks including image and video editing, gaming, computer-aided design (CAD) software

GRAPHICAL PROCESSING UNIT (GPU)

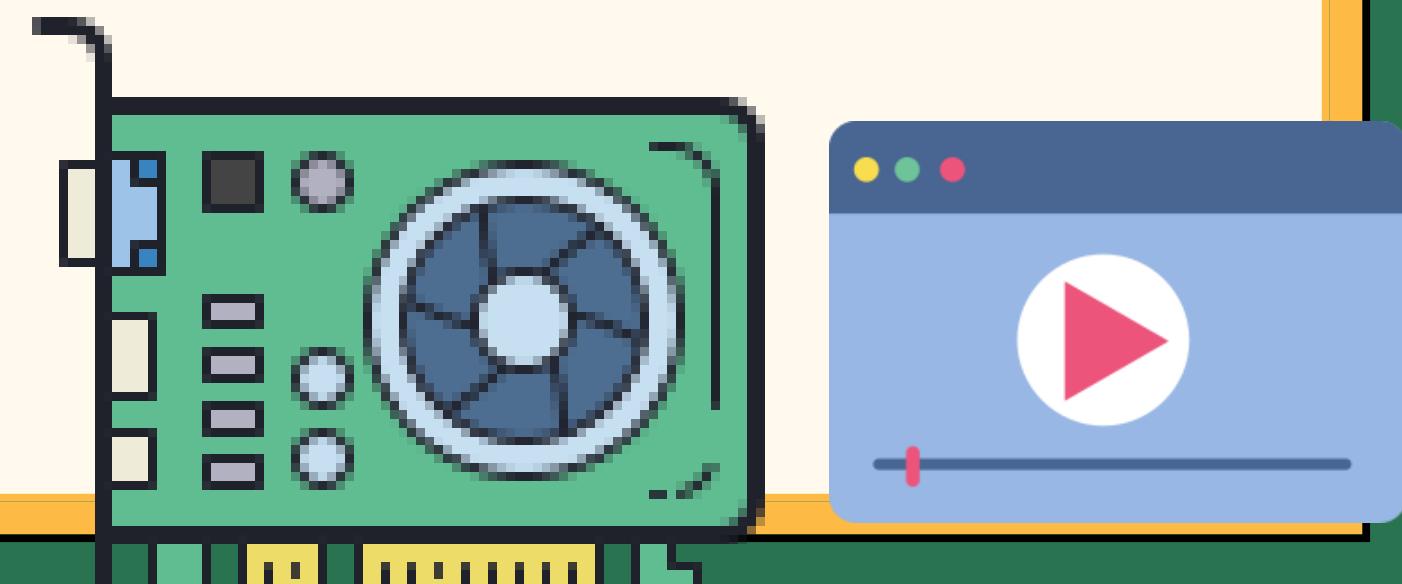


<http://www.computerhope.com>

What is the difference between CPU & GPU



CPUs (central processing units), which are found in every computer, are designed to handle general-purpose tasks such as running applications and managing system resources. On the other hand, GPUs are optimized for specific tasks such as rendering 3D graphics and video decoding.



3. Output Interfaces

common connection systems between the graphics card and the display device.

Types of video ports used with video cards:

1. Digital visual interface (DVI)
2. High-Definition Multimedia Interface (HDMI)
3. Super Video (S-Video)
4. Video Graphics Array (VGA)

DVI cables are most commonly used to transmit video data from older PCs.



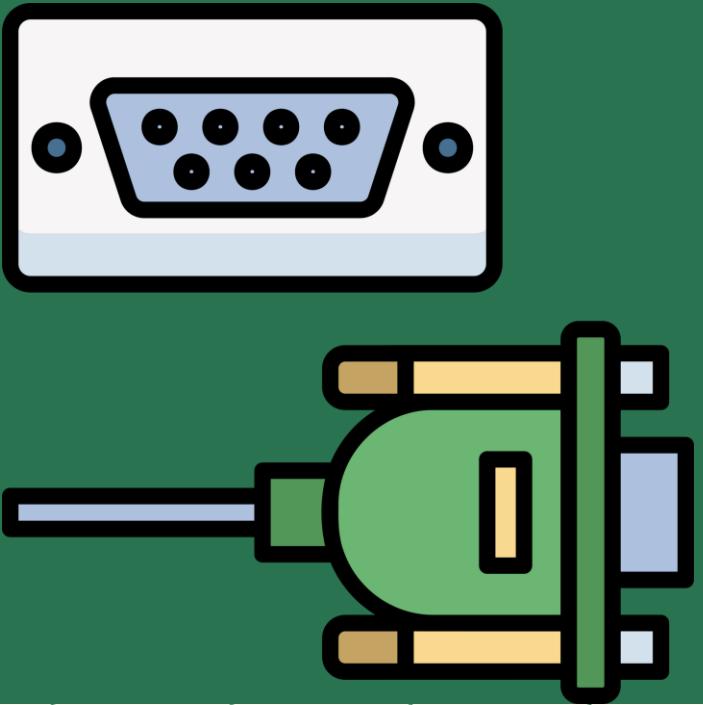
Common devices that utilize the connection are computer monitors and projectors

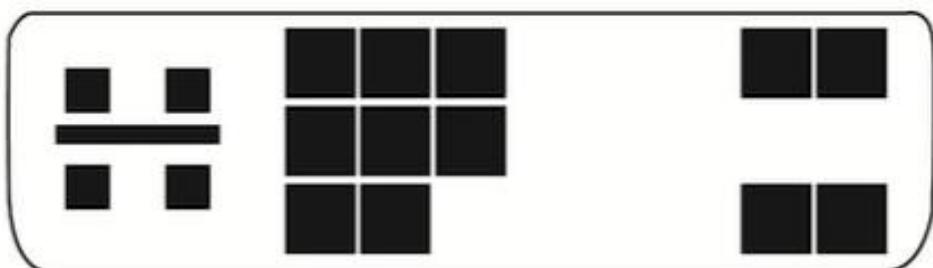




The DVI connector may have one of three names depending on the signals it supports:

- DVI-A (analog only)
- DVI-D (digital only)
- DVI-I (digital and analog)





DVI-A (Analog)



DVI-I (Single Link)



DVI-I (Dual Link)



DVI-D (Single Link)



DVI-D (Dual Link)

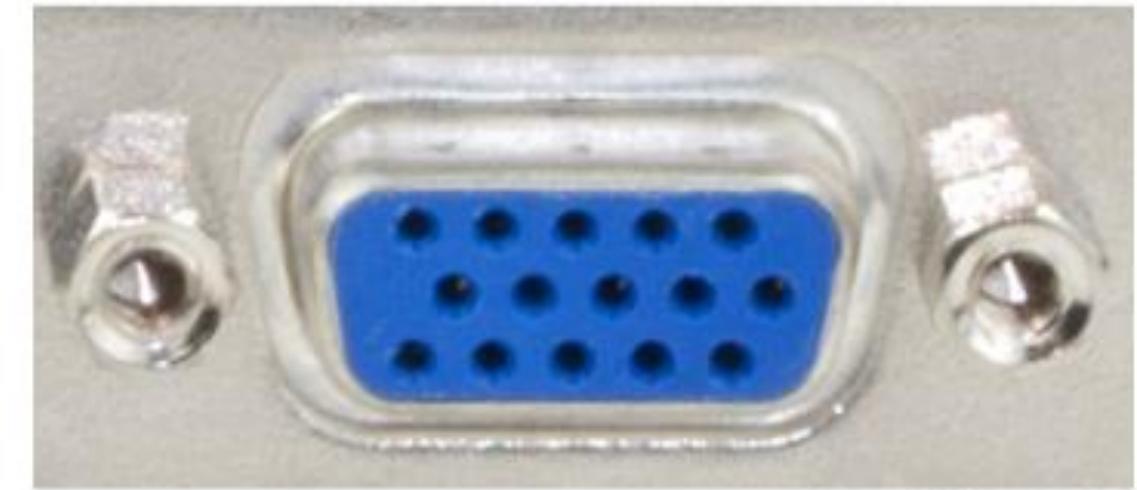
VGA - is a standard display interface used to connect video output devices to computers and projectors to displays to monitors and TVs.

VGA utilizes analog signals, which means it's only capable of lower resolutions and a lower quality display on screens.

VGA cable and connector



VGA cable



VGA connector

HDMI Short for High-Media Interface

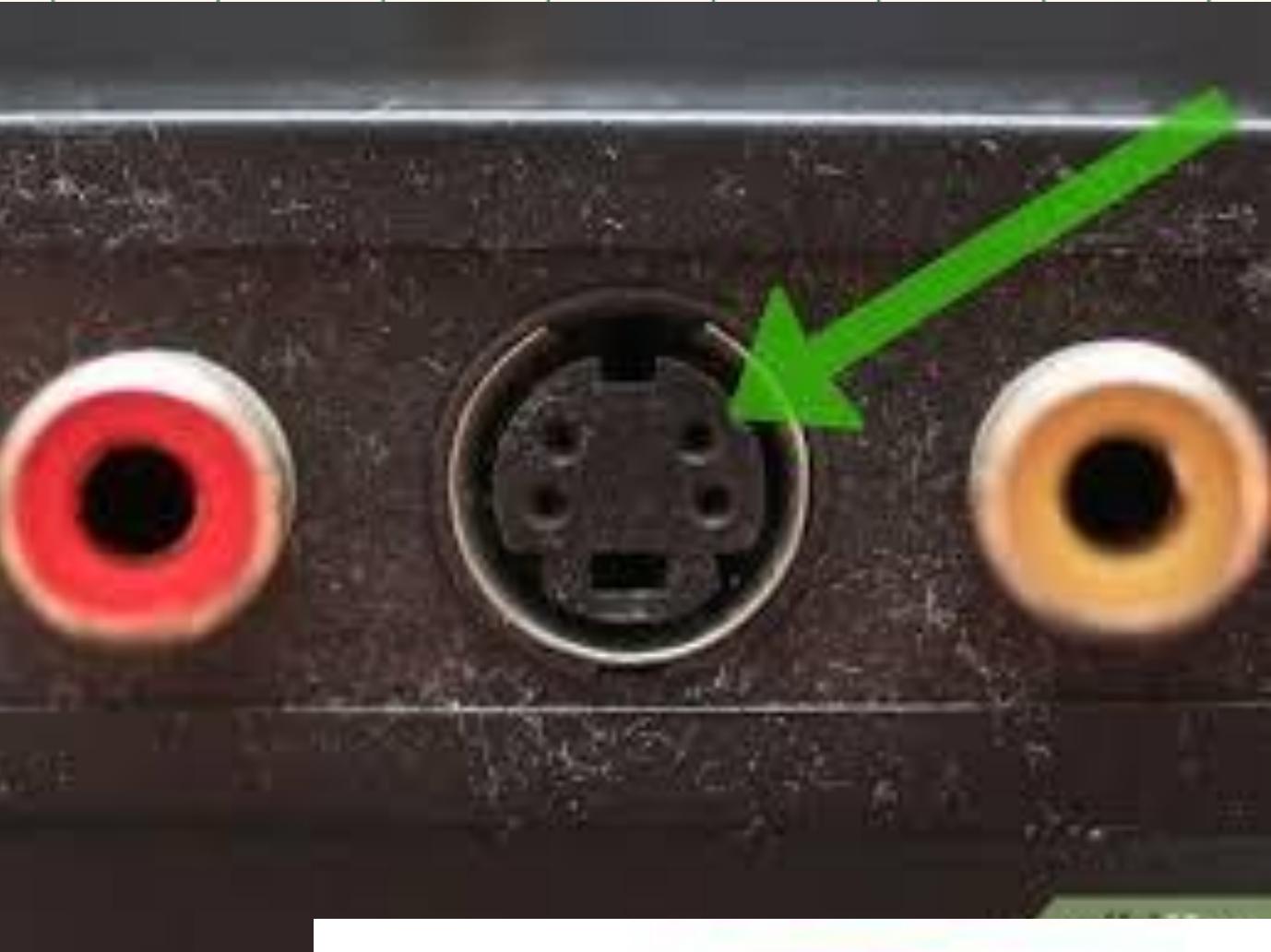
is a connector and cable capable of transmitting high-quality and high-bandwidth audio and video streams between devices.

The HDMI technology is used with devices such as an HDTV (High-Definition TeleVision) and Projector.



S-VIDEO

It is a video transmission format, and a type of connection found on video devices.



DISPLAYPORTS

DisplayPort is a digital display interface to connect a video source to a display device. It can also transfer audio and other sort of data.

USB

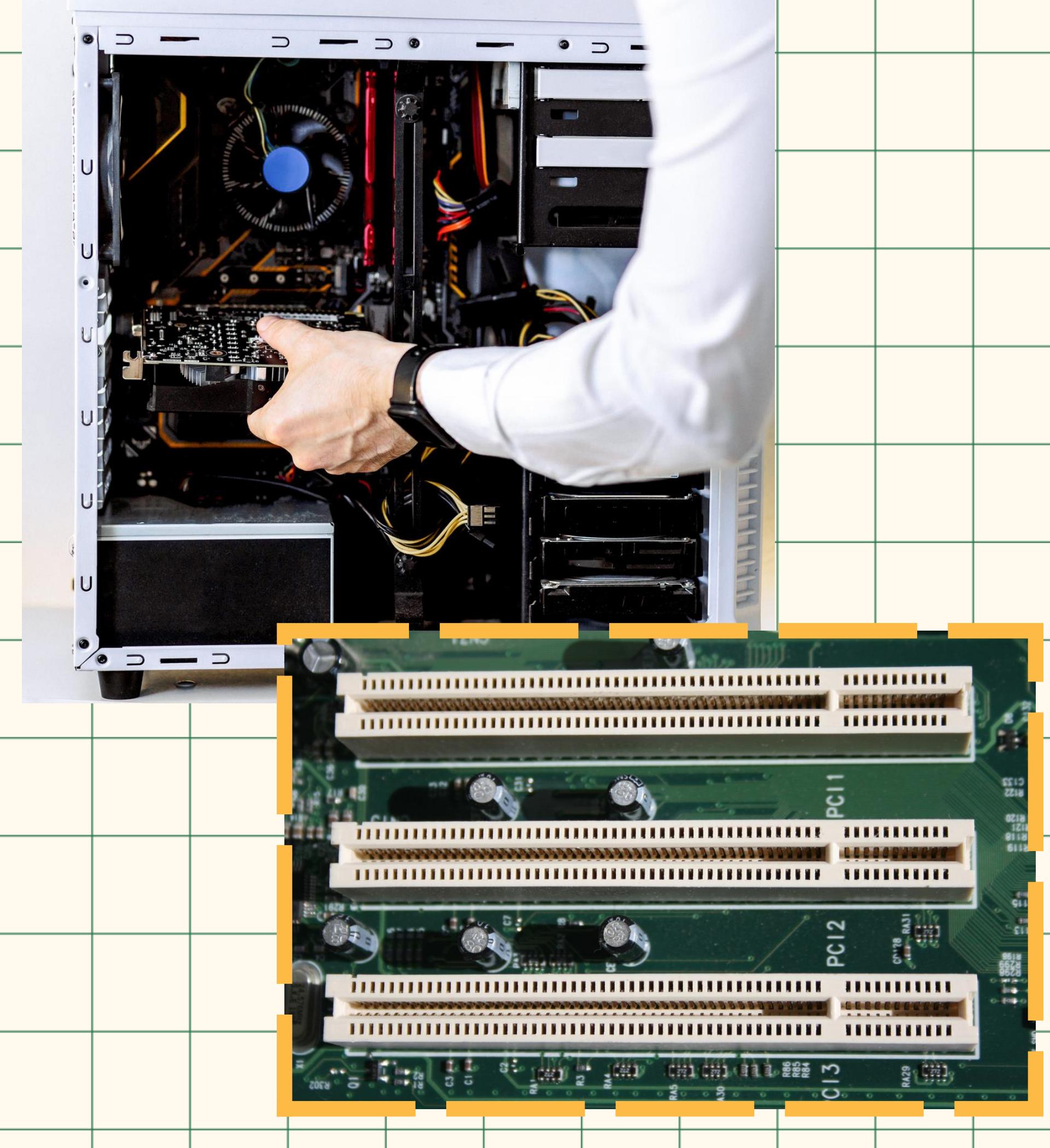


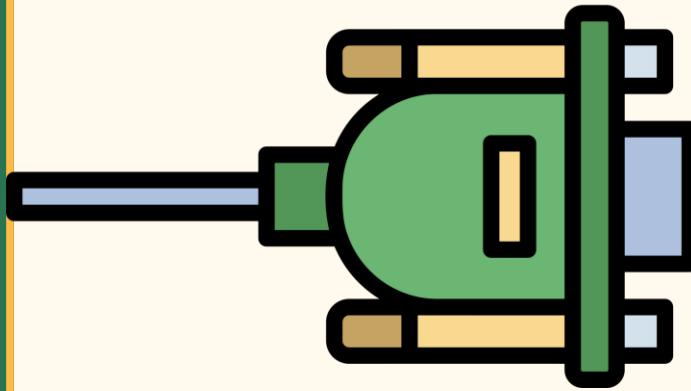
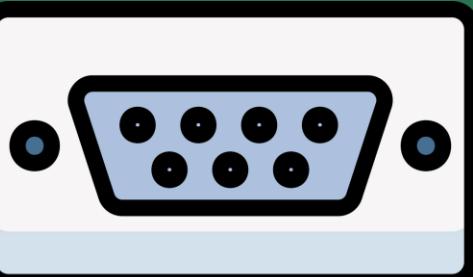


HOW TO INSTALL VIDEO CARD

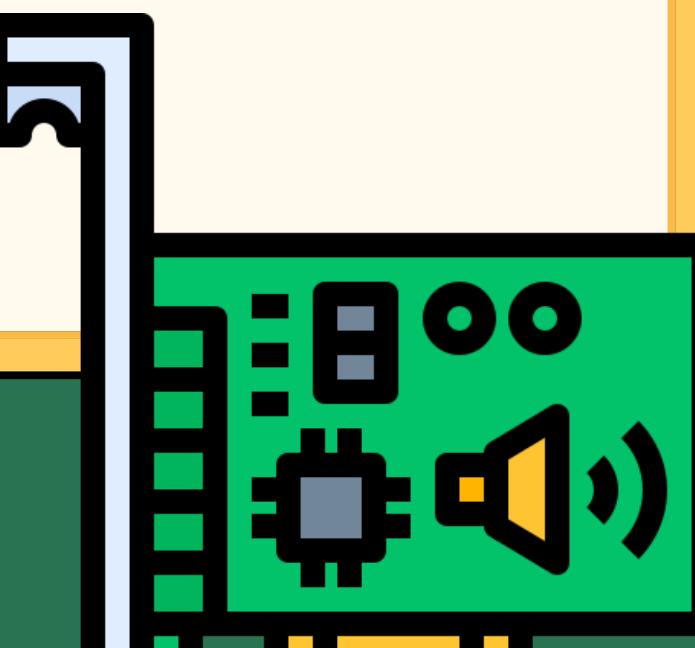


1. Locate the PCIe slot (x16 or x8).
2. Align the new video card with the slot.
3. Gently push the card into the slot until it clicks.
4. Secure the card with screws.
5. Reconnect power cables.





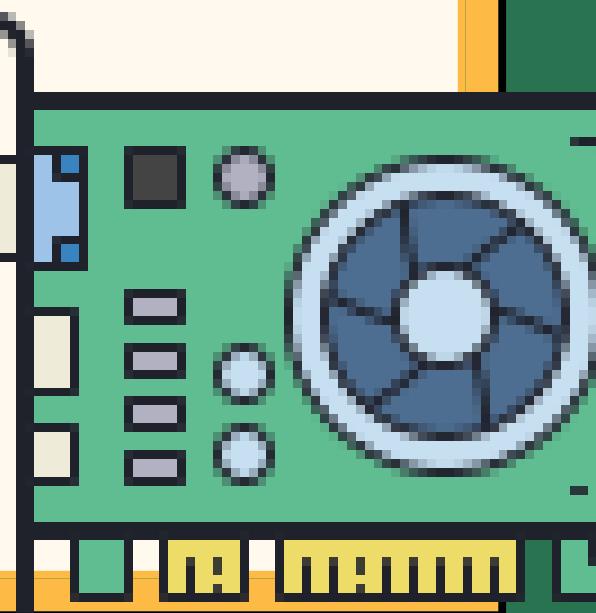
VIDEO CARD TROUBLESHOOTING



Emily, a graphic designer, was working on a tight deadline to finish a project for a major client. She was using her trusty desktop computer, equipped with a high-end video card, to run demanding design software.

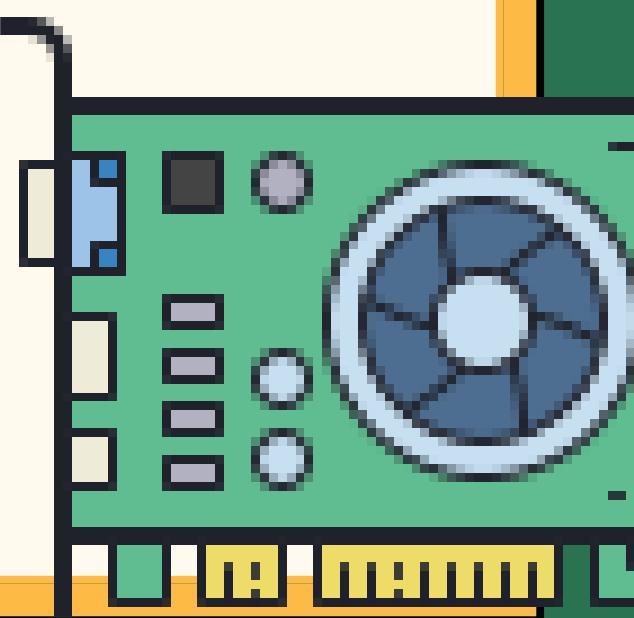
One morning, Emily booted up her computer and noticed:

- 1. The monitor displayed a distorted, pixelated image.**
- 2. The computer took longer than usual to start up.**
- 3. The design software crashed repeatedly.**



Clues:

- 1. Recent software installations.**
- 2. No hardware changes or upgrades recently.**



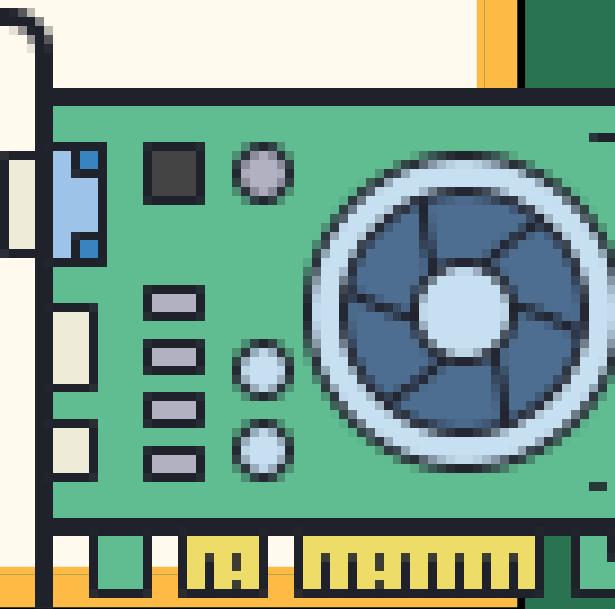
Possible Solutions:

1. Update video card drivers to the latest version.
2. Run a system file checker to detect corrupted files.
3. Consider upgrading the video card or RAM.



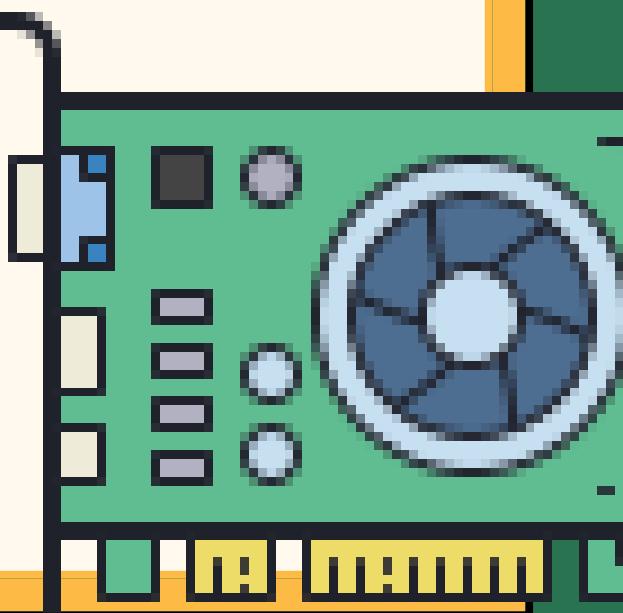
Sundave, a competitive gamer, noticed issues with his gaming laptop:

- 1. FPS (frames per second) drops during intense gameplay.**
- 2. Graphics appear pixelated and blurry.**
- 3. Laptop overheats, causing shutdowns.**



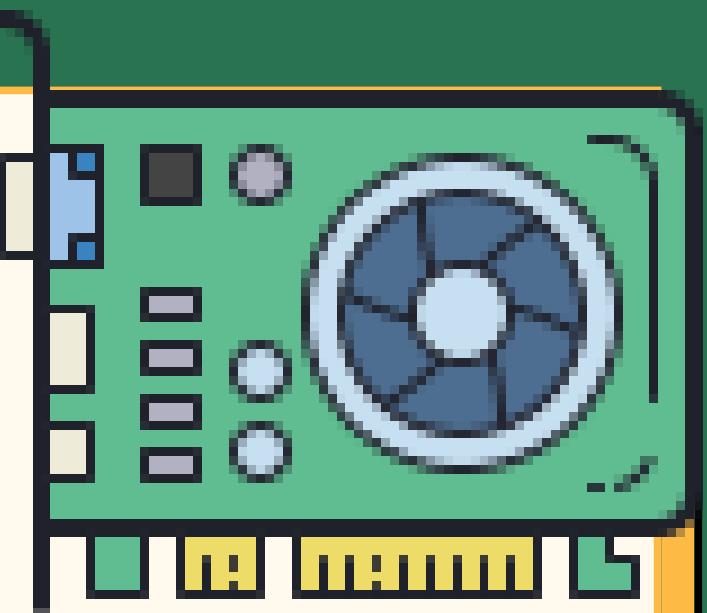
Clues:

- 1. Recently Installed new games (Cyberpunk 2077, Call of Duty)**
- 2. Graphic Cards has 16 GB VRAM**



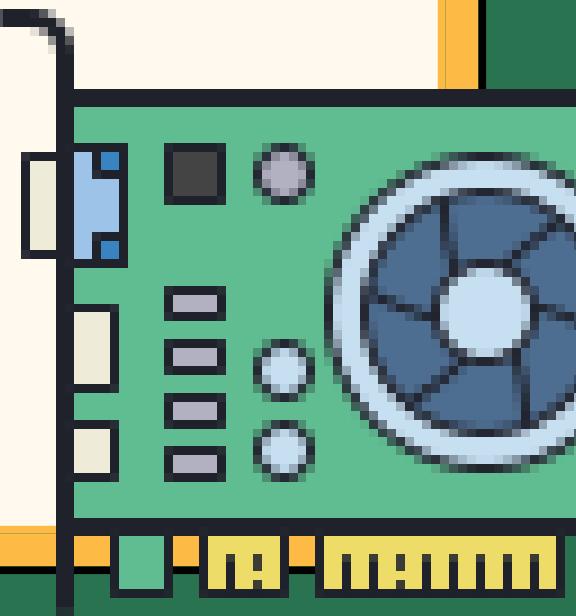
Possible Solutions:

1. Update graphics cards to the latest version.
2. Consider upgrading RAM or storage.
3. Clean dust from laptop vents and fans.
4. Monitor temperature and adjust cooling settings.



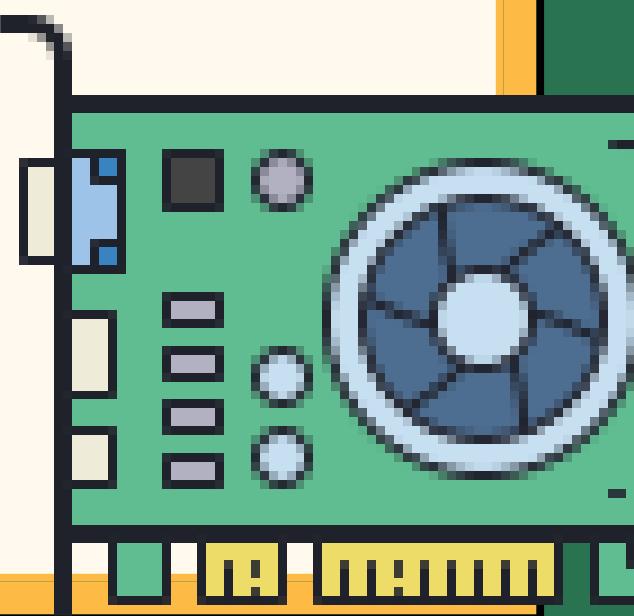
Sarah, a home theater enthusiast, encountered issues with her setup:

- 1. No audio output from the rear surround speakers.**
- 2. Video playback stuttering on her TV.**
- 3. HDMI connectivity issues with TV player**



Clues:

1. Recent change or bought a new HDMI cable
2. Updated receiver firmware



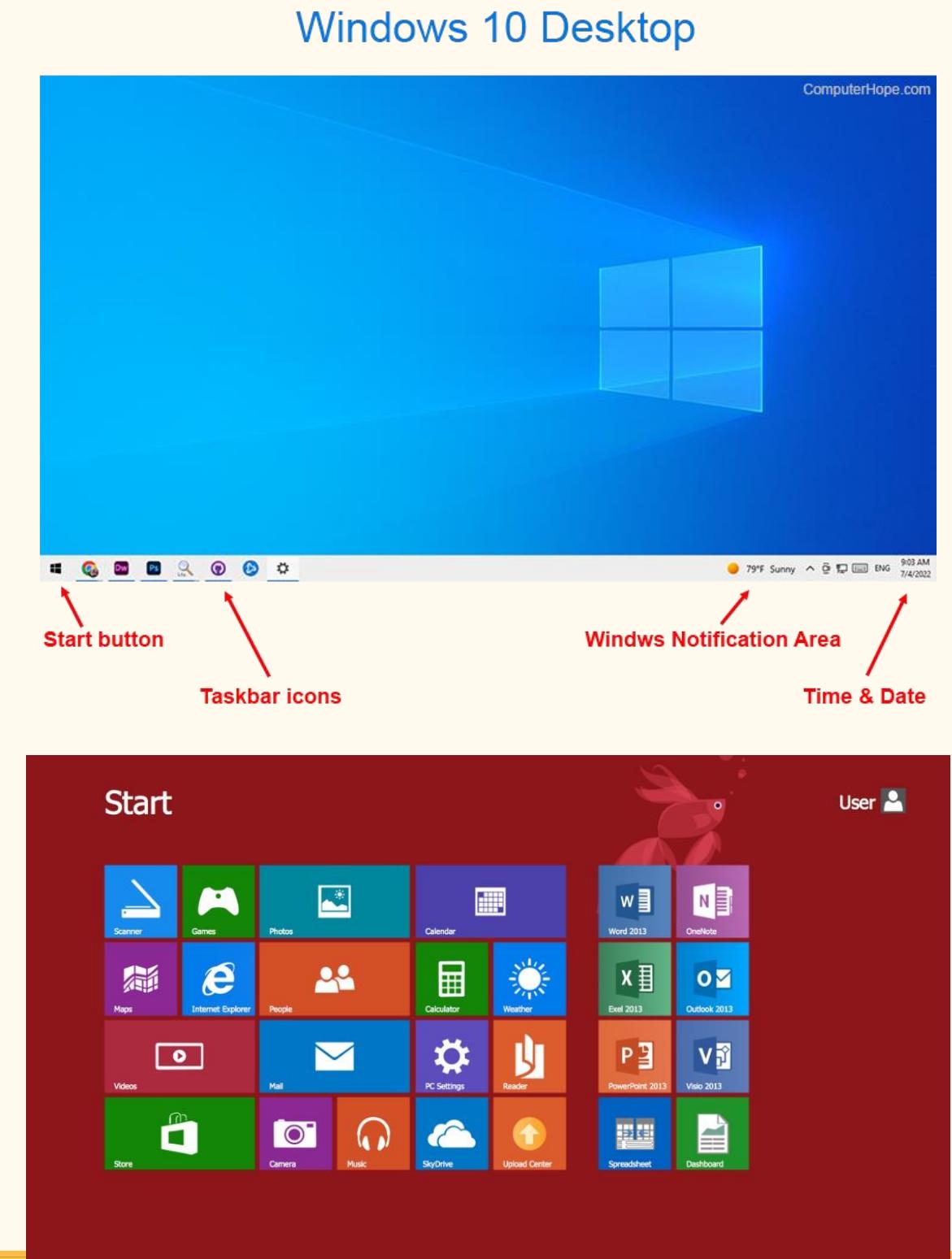
Possible Solutions:

1. Update TV firmware/Setting for HDMI compatibility.
2. Replace HDMI cable with a higher-quality one.



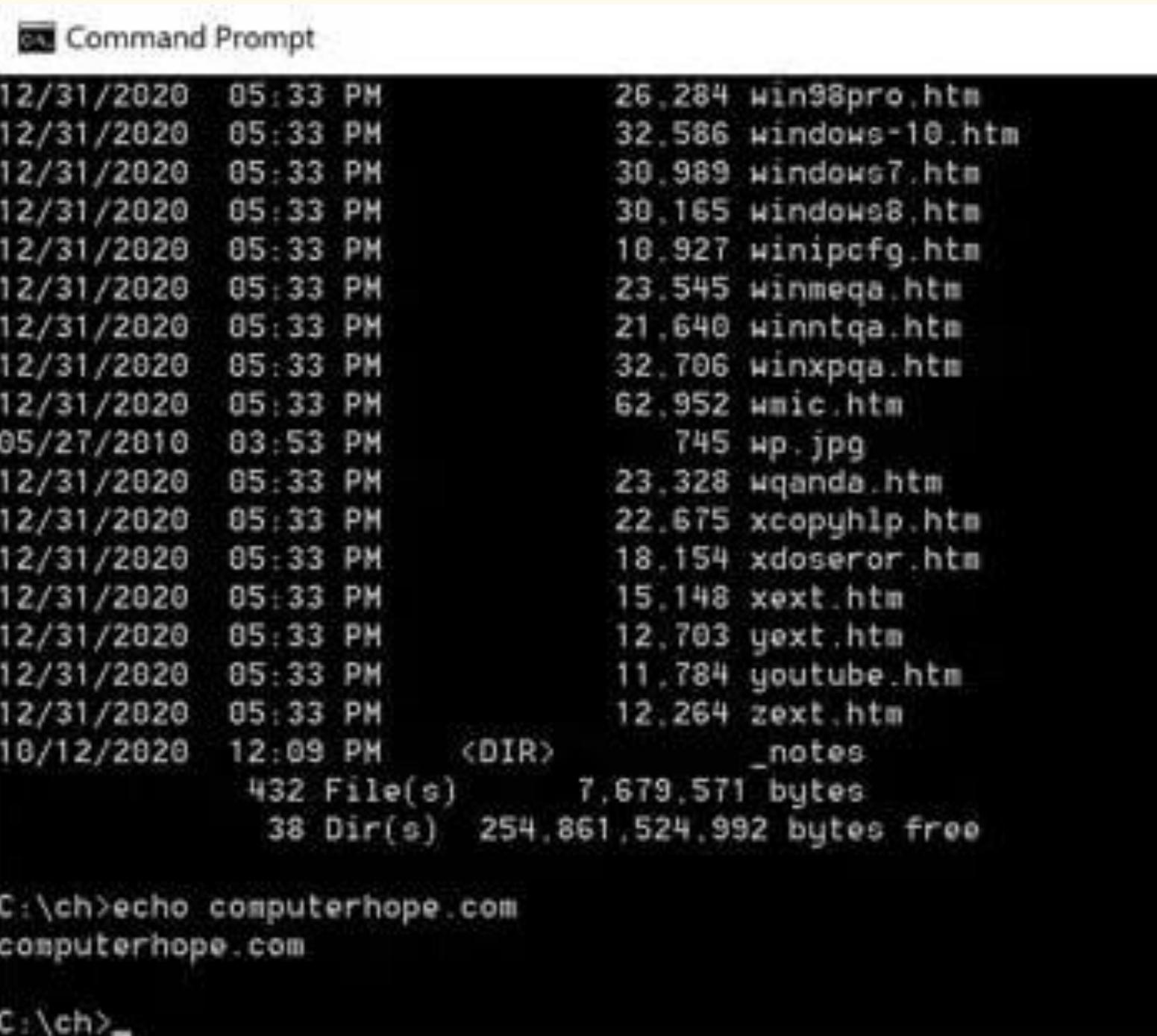
Graphical User Interface (GUI)

A Graphical User Interface (GUI) is a system of interactive visual components of software. It displays objects that convey information and represent actions taken by the user. Objects change color, size, or visibility when the user interacts with them.



A Brief History of GUI

Before graphical user interfaces, users interacted with computers using character user interfaces, or CUIs. In a CUI, users type text commands on their keyboard to execute actions on the device.



The screenshot shows a Windows Command Prompt window titled "Command Prompt". It displays a file list from a directory. The list includes various files and folders with their sizes and creation dates. At the bottom, there is a command prompt history showing the user's previous commands.

Date	Time	File/Folder	Size
12/31/2020	05:33 PM	26,284 win98pro.htm	
12/31/2020	05:33 PM	32,586 windows-10.htm	
12/31/2020	05:33 PM	30,989 windows7.htm	
12/31/2020	05:33 PM	30,165 windows8.htm	
12/31/2020	05:33 PM	10,927 winipcfg.htm	
12/31/2020	05:33 PM	23,545 winmega.htm	
12/31/2020	05:33 PM	21,640 winntqa.htm	
12/31/2020	05:33 PM	32,706 winxpqa.htm	
12/31/2020	05:33 PM	62,952 wmic.htm	
05/27/2010	03:53 PM	745 wp.jpg	
12/31/2020	05:33 PM	23,328 wqanda.htm	
12/31/2020	05:33 PM	22,675 xcopyhlp.htm	
12/31/2020	05:33 PM	18,154 xdoseror.htm	
12/31/2020	05:33 PM	15,148 xext.htm	
12/31/2020	05:33 PM	12,703 yext.htm	
12/31/2020	05:33 PM	11,784 youtube.htm	
12/31/2020	05:33 PM	12,264 zext.htm	
10/12/2020	12:09 PM	<DIR>	_notes
		432 File(s)	7,679,571 bytes
		38 Dir(s)	254,861,524,992 bytes free

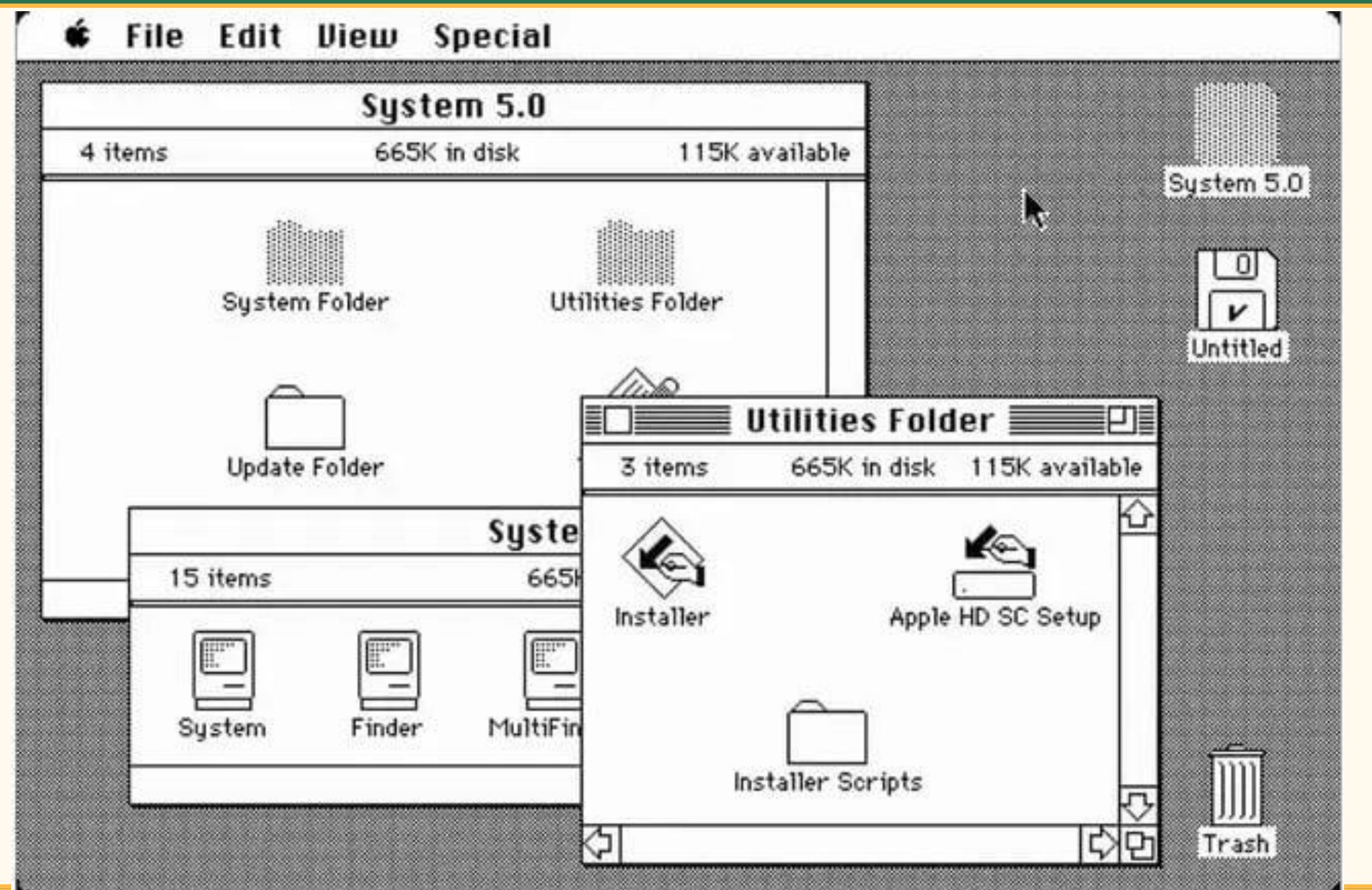
```
C:\ch>echo computerhope.com  
computerhope.com  
C:\ch>_
```

A Brief History of GUI

Apple released its first GUI operating system, Macintosh, in 1984. Microsoft debuted its first GUI the following year in Windows 1.0. These two groundbreaking operating systems introduced icons to represent things like files, folders, applications, and buttons.

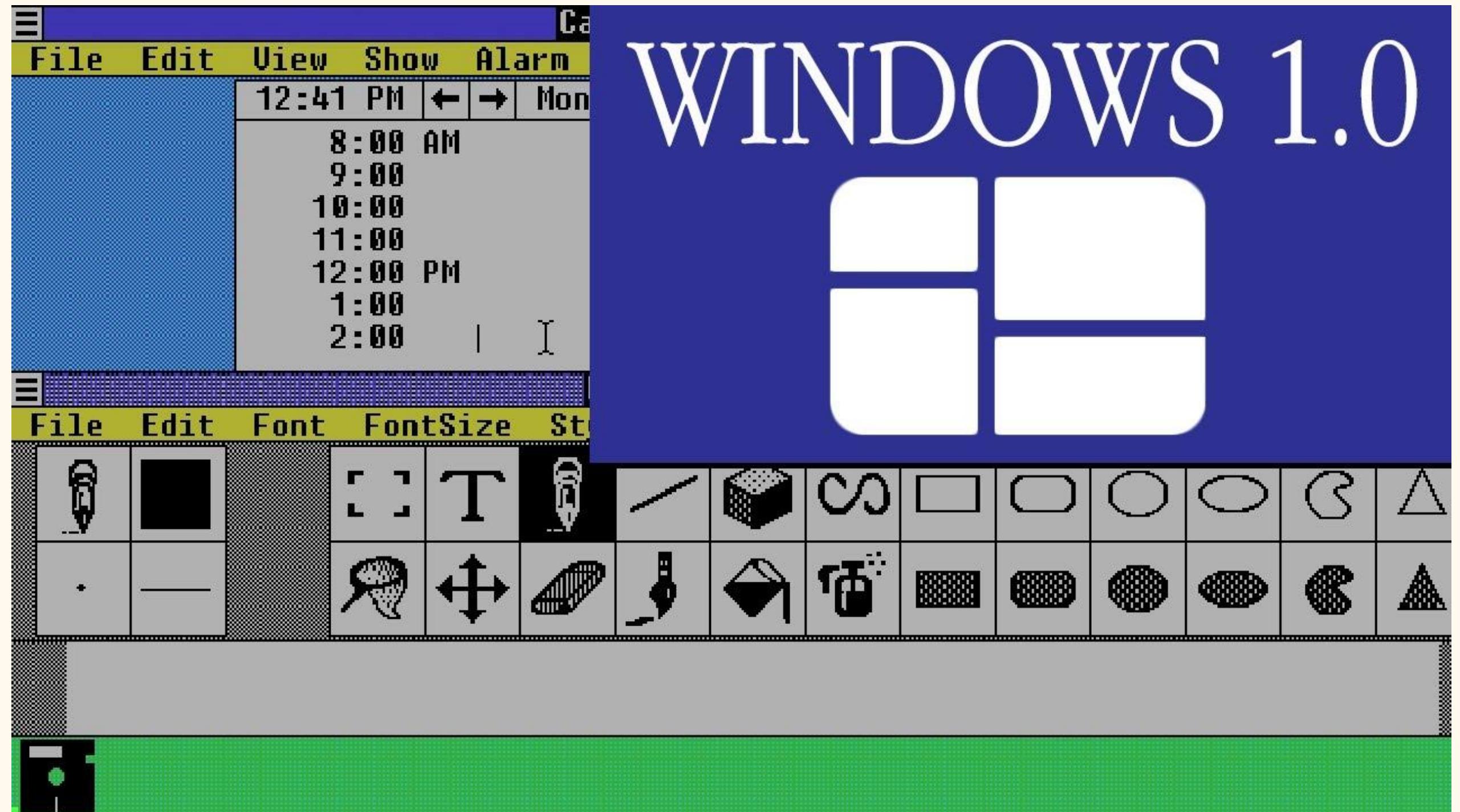
A Brief History of GUI

Apple
Macintosh



A Brief History of GUI

MICROSOFT
WINDOWS



A Brief History of GUI

Difference Between GUI and CUI

The main difference between GUI and CUI is that in GUI, the user interacts with a computer using graphics like images and icons, while in CUI, the user interacts with a computer using commands like text.



Graphical User Interface



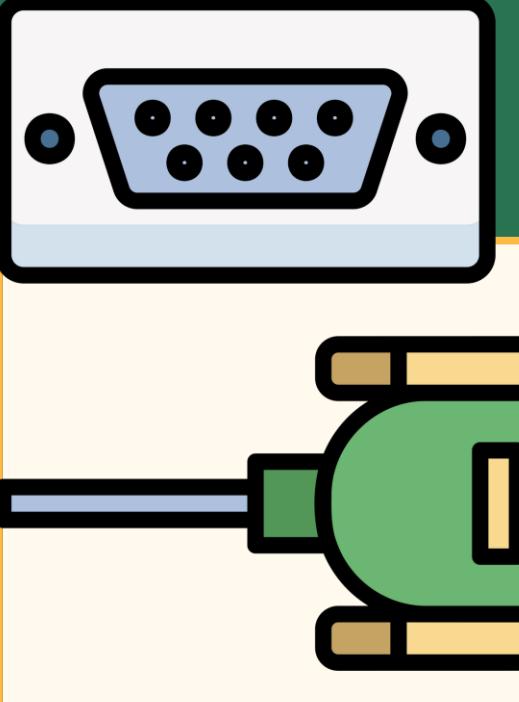
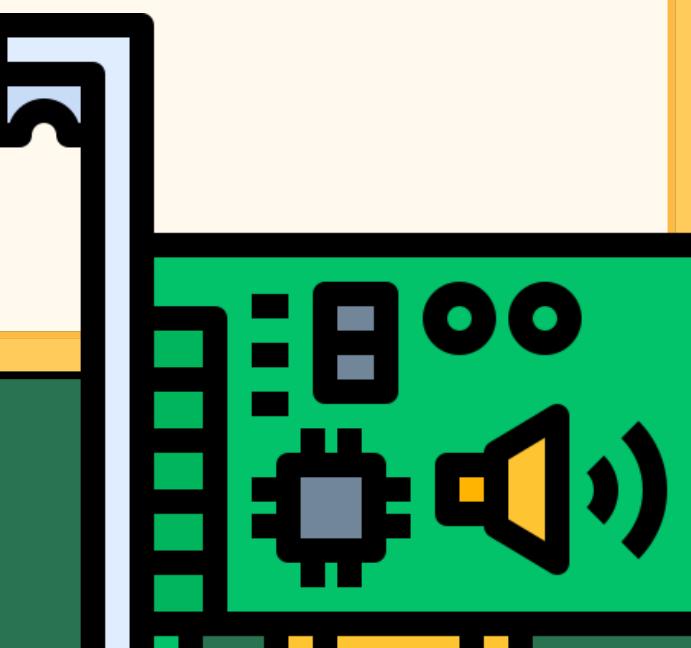
Command Line User Interface



How GUIs Work

GUI works using a **visual elements** represent actions users can take, objects that users can manipulate, and other information relevant to the user.

ELEMENTS OF GUI



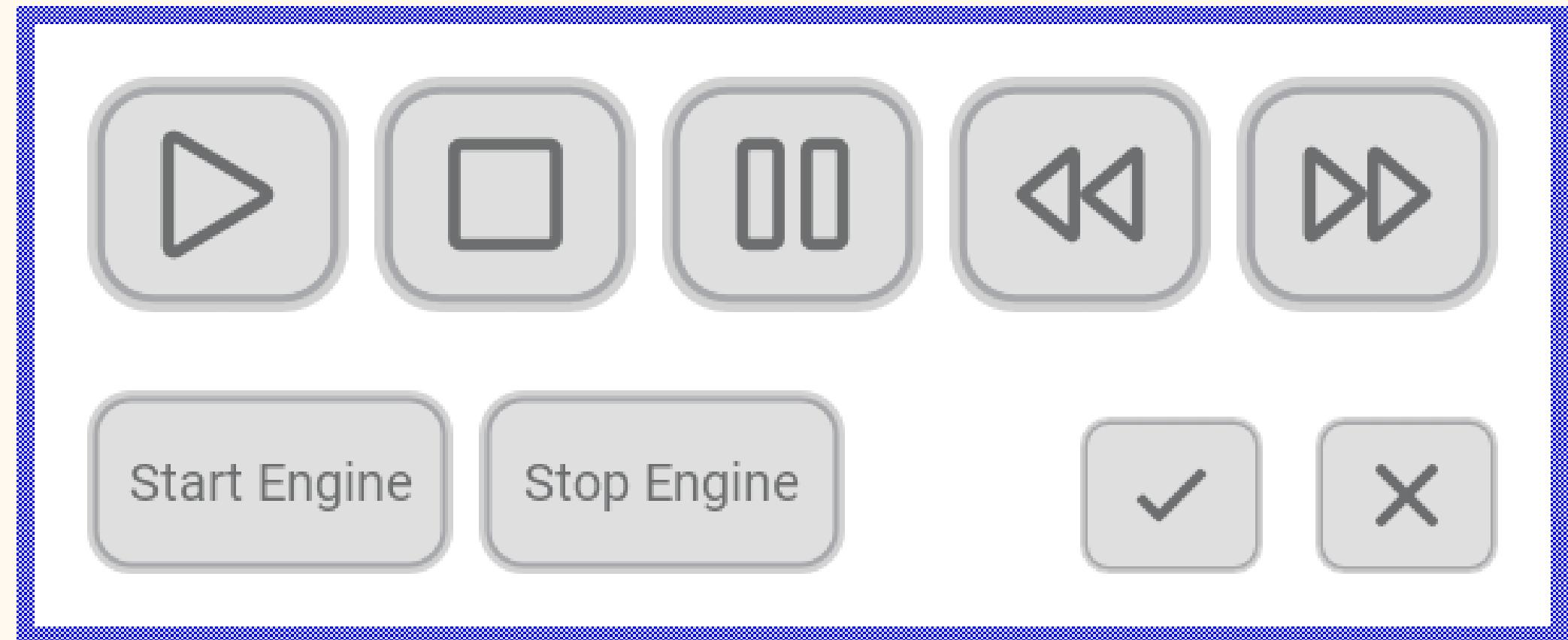
ICONS

Symbolic representations of actions or objects.



Buttons

Clickable areas for actions or submissions.



Menus

List

acti

or

Analysis (*Discussion*)

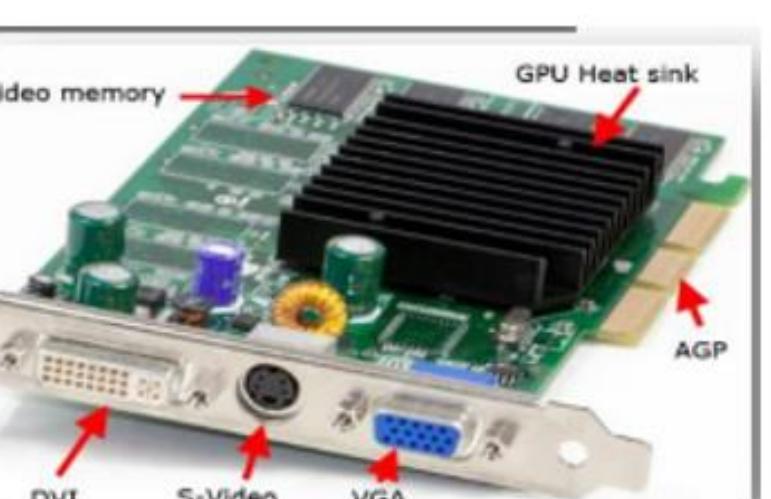
Video Cards | Sound Cards| GUI

REMEMBER THIS✓

A **motherboard** has expansion slots that can extend the computer's functionality, like a **video card** or a **sound card**.

The **expansion card** is plugged directly into the expansion port so that the motherboard has direct access to the hardware. However, since all computers have a limited number of expansion slots, it's important to open your computer and check what's available before you buy one.

The **video card** is an expansion card that allows the computer to send graphical information to a video display device such as a monitor, TV, or projector. A video card is a piece of computer hardware that's rectangular in shape with numerous contacts on the bottom of the card and one or more ports on the side for connection to video displays. The video card contains a GPU (Graphics Processing Unit) which is responsible for rendering graphics and displaying them on the screen. It also contains memory for storing temporary data and a heat sink to dissipate heat generated by the GPU.



Typography

Text styles, sizes, and fonts.

Serious

Objektiv Mk1

HIPSTER

Trend Sans

Techy

Exo 2

Casual

Recursive Sans

Personal

Super Marker

booring

Helvetica Neue

Retro

Mona Lisa Solid

happy

Modak

Just bad

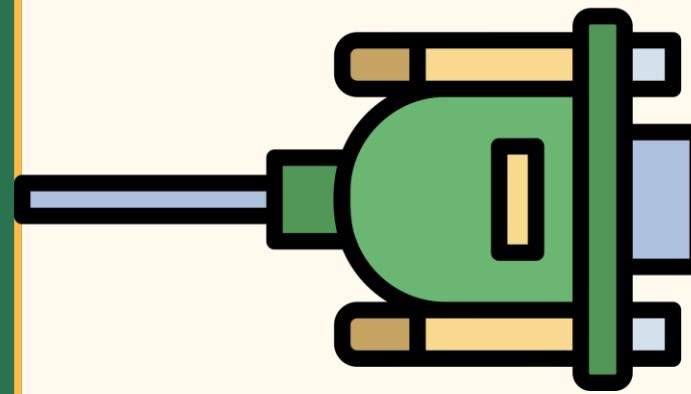
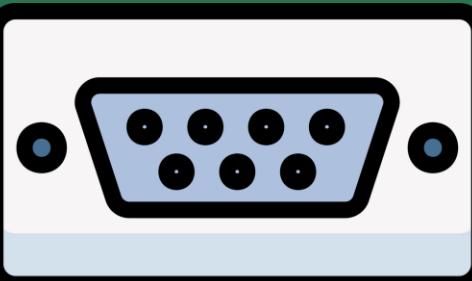
Papyrus

OTHER ELEMENTS:

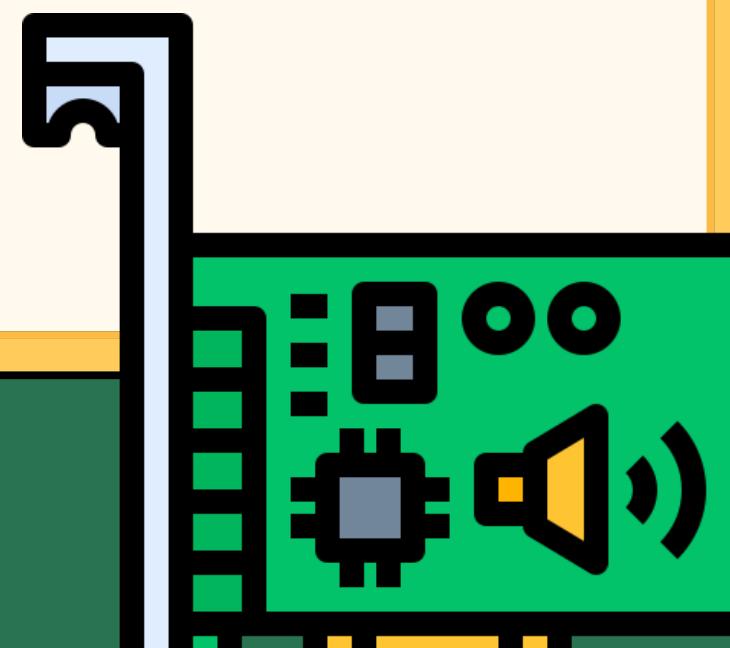
- **Imagery:** Images, graphics, or animations.
- **Input Fields:** Text boxes, checkboxes, radio buttons, etc.
- **Notifications:** Alerts, warnings, or messages.

OTHER ELEMENTS:

- **Toolips:** Brief descriptions or hints.
- **Progress Indicators:** Loading animations or progress bars.
- **Search Bars:** Input fields for searching content.
- **Color Scheme:** Palette of colors used throughout the interface.



PRINCIPLES OF GUI



PRINCIPLES OF GUI

- 1. Clarity:** Clear and concise communication, avoiding ambiguity.
- 2. Consistency:** Uniform design language throughout the interface.
- 3. Intuitiveness:** Easy to understand and use, minimizing learning curves.

PRINCIPLES OF GUI

- 4. Responsiveness:** Prompt feedback and smooth interactions.
- 5. Aesthetics:** Visually appealing and engaging design.
- 6. Accessibility:** Inclusive design for diverse users and abilities.

PRINCIPLES OF GUI

7. **Usability:** Efficient and effective interaction.
8. **Flexibility:** Adaptive to different user needs and contexts.

GUI EXAMPLES



ACTIVITY # 3 "GUI Exploration"

"GUI Exploration"

Objective: Analyze and evaluate the Graphical User Interface (GUI) of a website.

Instructions:

1. Divide students into pairs.
2. Each pair will choose a website
3. Explore the website's GUI.

ACTIVITY # 3 "GUI Exploration"

Identify the following elements on your chosen website

1. Icons
2. Buttons
3. Menus
5. Color scheme
6. Typography
7. Imagery and other elements

ACTIVITY # 3 "GUI Exploration"

Discuss and answer the ff. questions:

1. Did the website's GUI elements are used effectively?
2. Which principles are well-implemented?
3. What areas need improvement?
4. How would you redesign the GUI?

ACTIVITY # 3 "GUI Exploration"

SUBMISSION: November 13, 2024

- Font: Arial/12
- Short bond paper

Names:

Section:

Website:

ACTIVITY # 3 "GUI Exploration"

PRACTICAL TEST # 2.1

"Computer Hardware Installation and GUI Design"

Objective:

1. Install sound and video cards.
2. Insert devices into a computer.
3. Design GUI windows applying design principles and elements.

PRACTICAL TEST # 2.1

Materials:

1. Computers with compatible sound and video cards.
2. Sound and video cards.
3. Windows or Linux operating system to design the GUI.

PRACTICAL TEST # 2.1

Part 1: Sound and Video Card Installation

1. Prepare sound and video cards.
2. Shut down the computer.
3. Locate the PCIe slots.
4. Install the sound

PRACTICAL TEST # 2.1

Part 2: Device Insertion

1. Connect speakers and microphone to the sound card.
2. Connect a projector to the computer.
4. Test devices:
 - Play audio.
 - Record audio.
 - Present a PPT and Video

PRACTICAL TEST # 2.1

Part 3: GUI Design

Apply design elements and principles:

- Color scheme.
- Typography.
- Imagery.
- Icons