كلية العلوم
قسم علوم التقانة الاحيائية الطبية

Lecture: (3)

Computer Troubleshooting

Subject: Computer Science (II)
**Level: Second**
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Computer Troubleshooting:

A. Identifying and solving common hardware and software problems that computer users encounter.

B. Basic troubleshooting techniques and tools for diagnosing and resolving issues.

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Computer Troubleshooting: is the process of identifying and solving technical problems. It starts with general issues and then gets more specific. Most troubleshooting begins with hardware. Hardware is any physical device that you use to operate your computer.
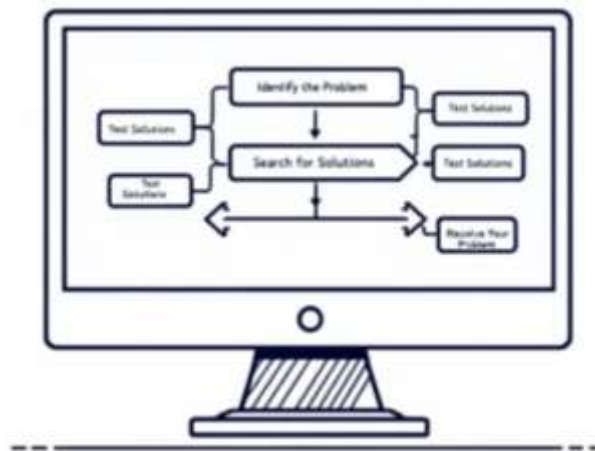
Why is Troubleshooting Important?

- **Minimizing Downtime**

Effective troubleshooting minimizes downtime, allowing you to quickly resume important tasks and avoid costly delays. Addressing issues promptly ensures you can continue working or enjoying your computer without significant interruption.

- **Saving Money**

By diagnosing and fixing problems yourself, you can avoid expensive repair services or premature hardware replacements. Learning basic troubleshooting skills can save you a considerable amount of money over time.

- **Improving Knowledge**

Troubleshooting enhances your understanding of computer systems, making you a more knowledgeable and confident user. Each solved problem contributes to your overall technical expertise and problem-solving abilities.

Common Hardware Problems: An Overview

A. Power Supply Issues

Problems with the power supply can prevent your computer from turning on or cause it to shut down unexpectedly. These issues often involve faulty cables, power surges, or a failing power supply unit.
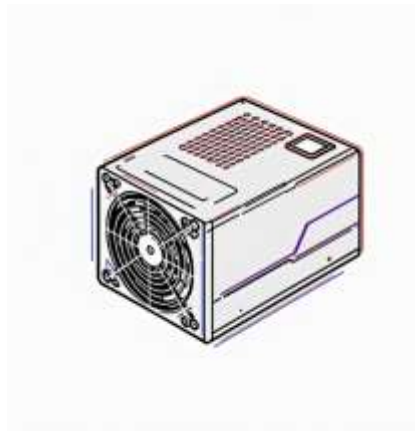
B. RAM Failures

RAM (Random Access Memory) issues can lead to system instability, crashes, and the infamous Blue Screen of Death (BSOD). Diagnosing RAM problems typically involves memory tests and hardware inspections.

C. Hard Drive Problems

Hard drive failures can result in data loss, slow performance, and startup errors. Identifying these problems often requires checking drive health and performing data recovery procedures.

Problem: Computer Won't Turn On

1. Check the Power Cord

Ensure the power cord is securely plugged into both the computer and the wall outlet. A loose connection can prevent the computer from receiving power.

2. Test the Outlet

Plug another device into the same outlet to verify it is working correctly. If the outlet is faulty, try a different one.

3. Inspect the Power Supply

Look for any signs of damage to the power supply unit. A burned smell or visible damage indicates a potential power supply failure.

Troubleshooting the Power Supply

1. Use a Multimeter

A multimeter can be used to test the power supply's voltage output. Compare the readings to the specified voltage levels to identify any discrepancies.

2. Check the Fan

Ensure the power supply fan is spinning when the computer is turned on. A non-spinning fan indicates a potential power supply failure or overheating issue.

3. Inspect Cables

Examine the power supply cables for any signs of damage, such as fraying or exposed wires. Damaged cables can cause power delivery issues.

Diagnosing RAM Issues

1. Run Memory Diagnostics

Use the built-in Windows Memory Diagnostic tool or a third-party memory testing program to check for errors. These tools can identify faulty RAM modules.

2. Reseat the RAM

Remove the RAM modules and reinsert them firmly into their slots. This ensures a secure connection and can resolve intermittent memory errors.

3. Test One Module at a Time

If you have multiple RAM modules, test them individually to identify the faulty one. This helps isolate the problem and simplifies the replacement process.

Hard Drive Failures and Solutions

1. Check Drive Health

Use disk diagnostic tools like CrystalDiskInfo to monitor the hard drive's health status. These tools provide information about the drive's temperature, error rates, and overall condition.

2. Run CHKDSK

The CHKDSK utility can scan and repair file system errors on the hard drive. Running CHKDSK can resolve issues that cause slow performance or startup problems.

3. Consider Data Recovery

If the hard drive is failing, consider using data recovery software or services to retrieve important files. Prompt action can prevent permanent data loss.

Common Software Problems:

Blue Screen of Death (BSOD)
Slow Performance
Application Crashes
Network Connectivity Issues

The Dreaded Blue Screen of Death (BSOD)

Update Drivers
Check Hardware
Review Recent Changes

Dealing with Slow Performance

Close Unnecessary Programs
Run Disk Cleanup
Defragment Hard Drive

Network Connectivity Problems

1. **Check Router**

Verify that your router is powered on and functioning correctly. Restarting the router can often resolve network connectivity issues.

2. Inspect Cables

Ensure that all network cables are securely connected. Damaged or loose cables can prevent network access.

3. Troubleshoot WiFi

Check your WiFi connection and ensure you are connected to the correct network. Resetting the network adapter can help resolve WiFi problems.

Basic Troubleshooting Tools

Task Manager

The Task Manager provides insights into running processes, CPU usage, and memory consumption. It is useful for identifying resource-intensive applications and terminating unresponsive processes.

Event Viewer

The Event Viewer records system events, including errors, warnings, and informational messages. It is valuable for diagnosing software and hardware issues by providing detailed logs.

Command Prompt

The Command Prompt allows you to execute commands for diagnosing network issues, checking disk health, and performing system maintenance tasks. It provides advanced troubleshooting capabilities.

System Restore: Turning Back Time

A. Create Restore Points

Regularly create system restore points to capture the system's configuration. Restore points allow you to revert to a previous state if issues arise.

B. Revert to a Previous State

Use System Restore to revert to a previous state when encountering software problems or system instability. This can undo recent changes and restore system functionality.

C. Select a Restore Point

Choose a restore point that predates the onset of the problem. Selecting an appropriate restore point ensures that the system is reverted to a stable configuration.

Preventing Future Problems: Best Practices

1. **Regular Backups**
2. **Antivirus Software**
3. **Keep Software Updated**

Preventing future computer problems involves regular backups, using antivirus software, keeping software updated, and practicing safe browsing habits. Proactive measures can minimize the risk of issues and ensure a stable computing experience.