1. What Is Software?

- **Software** is a set of instructions or code that tells a computer what to do.
- There are many types of software:
    - **Application Software**: Programs you interact with (e.g., video games, music players, internet browsers).
    - **System Software**: Helps run the computer itself (e.g., operating systems like Windows, macOS, Linux).

Key idea: If you can see it on your phone or computer and it does something for you (like showing Instagram photos or playing music), it's some form of software.

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2. The Difference Between Coding, Scripting, and Programming

These three terms can seem a bit blurry, but here's a simple breakdown:

1. **Coding**
    - **Definition**: Converting one language to another.
    - **Context**: When we talk about "coding an application," we typically mean *writing instructions* in a computer language (like English to Python).
2. **Scripting**
    - **Definition**: Coding in a *scripting language* (e.g., JavaScript, Python, Bash).
    - **Purpose**: Scripts usually perform *specific* or *automated tasks*—like automating routine processes on a server or creating small functionalities on websites.
3. **Programming**
    - **Definition**: Coding in a *programming language* (e.g., C++, Java, Go).
    - **Purpose**: Used to write more *complex* or *larger* applications (like entire video games or full web browsers).
    - **Note**: When people say "software is programmed," they mean code has been written in these languages to build it.

Don't stress too much over these labels—people often use them interchangeably.

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3. How Software Is Made

1. **Idea**: A developer (or team) decides what problem or need the software will address.
2. **Design & Planning**: They figure out the features, user interface, and overall structure.
3. **Coding/Programming**: They write instructions in a programming or scripting language to create the functionality.
4. **Testing & Debugging**: They run the software, look for bugs, and fix them. This process is repeated until it's stable.

5. **Deployment**: The finished software is released so users can download or access it.

Many applications today also need internet connectivity (e.g., social media apps, messaging apps). This connectivity is built in to the code. There's no magic—just careful programming to enable network requests.

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4. Who Builds Software?

- **Software Developers / Programmers**: Write the actual code.
- **Designers**: Create the user interface and experience (UI/UX).
- **Testers / QA Specialists**: Ensure software works as intended, catching bugs before users do.
- **IT & DevOps Teams**: Help deploy software on servers, manage updates, and keep everything running smoothly.

Nowadays, anyone can learn to code—thanks to online tutorials, bootcamps, and community forums.

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5. Installing and Managing Software in IT

As an IT professional, you'll interact with software in various ways:

1. **Installation & Configuration**
    - Downloading software from official websites or app stores, then installing and setting it up.
    - Adjusting settings to fit company policies or user needs (e.g., configuring user accounts or permissions).
2. **Updates & Patches**
    - Keeping software up-to-date is crucial for *security* and *performance*.
    - You might automate updates or schedule them to minimize downtime.
3. **Troubleshooting**
    - If software crashes or shows errors, you'll need to investigate logs, error messages, or conflicts with other applications.
    - Could be as simple as reinstalling or as complex as patching system libraries.
4. **Security**
    - Ensuring only authorized users can run certain software.
    - Using antivirus tools and firewalls to protect software from malware.

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6. Common Software Problems (and How to Deal With Them)

1. **Software Crashes**
    - Could be due to bugs in the code, memory leaks, or conflicts with other programs.
    - *Fix:* Restart the software, update it, or check system logs for error messages.

2. **Compatibility Issues**
    - Sometimes new software doesn't play well with older operating systems or hardware.
    - *Fix:* Install updates or driver patches, or switch to a supported OS version.
3. **Installation Failures**
    - Might happen if user permissions are too restrictive or if the download was corrupted.
    - *Fix:* Check permissions, re-download or reinstall.
4. **Network & Connectivity Errors**
    - If the software relies on the internet (like a messaging app), issues can stem from network outages or incorrect proxy settings.
    - *Fix:* Diagnose with ping/traceroute, verify router or firewall configurations.

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7. Why Understanding Software Matters in IT

- You'll often **support users** who experience software bugs and errors.
- You might help **deploy or configure** software on multiple machines or servers.
- Knowledge of **coding basics** can help you create scripts to automate routine tasks (e.g., running backups, generating reports).
- Being able to **communicate** with developers about issues or improvements is crucial in a tech-focused environment.

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8. The Bigger Picture

- Software underpins almost *everything* digital we do, from sending emails to playing video games.
- Apps that require the internet are built with **network functionality** in mind (APIs, servers, databases).
- As technology evolves, so do software tools and frameworks—learning never really ends in IT.

In a Nutshell

1. **Software** = Instructions telling computers what to do.
2. **Coding, Scripting, Programming** = Different labels for writing those instructions.
3. **Building Software** = Plan →\rightarrow→ Code →\rightarrow→ Test →\rightarrow→ Deploy.
4. **IT's Role** = Install, maintain, troubleshoot, and secure software.
5. **Ongoing Learning** = As an IT professional, staying updated on tools, languages, and best practices is key.

By grasping these fundamentals, you'll be better equipped to handle software-related tasks, understand how applications are created, and troubleshoot problems effectively in any IT environment.