1. The Three Major Components of a Computer System

1. **<u>What are the three major components of a computer system?</u>**

   What are the three major components of a computer system? Hardware, Software, and Humanware.

2. **<u>How does the article define / describe the *first* of these three components?</u>**

   “These are computer system components that can be touched by the human hand."

3. **<u>According to the article, what is the most important piece of this first component?</u>**

   "The most important piece of hardware is the microprocessor chip, which is commonly known as the central processing unit (CPU)."

4. **<u>What does the article say about the so-called *graphics processing chip (GPU)*?</u>**

   "New and slim laptop computers merge the traditional CPU and the graphics processing chip (GPU) into what is called an accelerated processing unit (APU)."

5. **<u>The article then goes on to describe another component that is just as important. What is it and how is it described?</u>**

   It is the **disk drive**. The article describes it as the place "where computer data is stored" and states "it is classified as secondary memory."

6. **<u>The article says this component comes in two types. What are they and how are they described?</u>**

   Hard disk: "This drive is mechanical by design and stores data on magnetic and metallic platters."

   Solid state disk: "This new type of disk drive stores data on flash memory chips and is less prone to erratic behavior."

7. **The article mentions another component that is vital within a system. What is it and how is it described?**

It is the **motherboard**. It is described as follows: "It provides communication and direct connectivity to devices throughout the computer."

8. **According to the article, connectivity to that component can be of two types. What are they? Provide three examples of each.**

"Internal or external."

Internal: "Microprocessor (CPU)", "Disk drive", "Random access memory (memory modules)".
External: "Monitor", "Keyboard", "Mouse".

9. **How does the article define / describe the *second* of these three components?**

"The software component refers to the instructions, programs, data, and protocols which run on top of hardware."

10. **Regarding that second component, the article distinguishes four different types. What are they and how are they defined/described?**

Software can be divided into **(1) system**, **(2) application**, **(3) malicious**, and **(4) programming** categories.

The article defines / describes them as follows:

1. **System Software:** "The system manages other software and devices inside the computer."

2. **Application Software:** "This is designed for end-users to perform a specialized assignment in order to output useful information."

3. **Malicious Software:** This "refers to exploitative code designed by criminals and black hat hackers to maim normal operations of a computer."

4. **Programming Software:** "These are tools used by developers to create all kinds of software like Windows OS and Word processing."

2. The Four Categories of Computer Hardware

11. **How does the article define hardware?**

    Computer hardware refers to the physical devices that make up a computer.

12. **How many categories of hardware devices are there? What are they and how does the article encapsulate their function?**

    Input devices: "For raw data input."

    Processing devices: "To process raw data instructions into information."

    Output devices: "To disseminate data and information."

    Storage devices: "For data and information retention."

13. **How is processing described by the article?**

    the core function of a computer. It is the stage where raw data is transformed into information.

14. **How does the article define components of the computer that are categorized under processing?**

    Components that manipulate data into information are categorized under processing.

15. **What is the major device in that category? How is its action described?**

    Major device: "The microprocessor is the major device in this category."

    Action: "It works closely with primary memory during its operations.

16. **The article goes on to discuss three important parts of that device. What are they and how are they described?**

1. **The control unit:** "It manages and supervises the operations of the processor and other components that are crucial in data manipulation."
2. **Arithmetic and logic unit:** "The ALU is responsible for all arithmetic and logic operations like addition, multiplication, subtraction, division, and comparison logic operations."
3. **Register and cache:** "These are storage locations inside the processor that respond to the instructions of the control unit by moving relevant data around during processing."

17. **How does the article describe output devices?**

Hardware components that disseminate and display both data and information

18. **How are they categorized? And how are these categories described? Provide a few popular types of each.**

Sub-categorized under softcopy and hardcopy output.

Softcopy : Described as "the intangible experience." (Examples: Monitor, Speakers).

Hardcopy : Described as "tangible, like printouts of paper and 3D models." (Example: Dot matrix printer, 3D printer).

19. **How does the article describe storage devices?**

Components that retain/store data are classified under memory/storage devices.

20. **How is storage further subdivided?**

Storage is subdivided into primary and secondary memory.

21. **What is the difference between volatile memory and nonvolatile memory?**

Volatile: It "retains data only when the computer is powered up."

Non-volatile: It "permits long time storage as opposed to volatile memory."

22. **How is secondary memory further subdivided?**

Internal devices (e.g., hard disk).
External devices (e.g., optical disks).

3. What is Computer Hardware? Definition plus 20 Examples

1. **How does the article define hardware?**

   It can be defined as the physical components that a computer system needs to function.

2. **How does the article define software?**

   It consists of written instructions that tell the physical components what to do

3. **How can hardware components be categorized? How are these categories defined?**

   Categorization: "The components that make up hardware can be categorized as being either internal or external."

   Internal components: Defined as "those installed inside the computer."

   External components: Defined as those "connected to the outside of the computer; these can also be referred to as peripherals, or peripheral devices."

4. What is a Peripheral Device ? Definition and 10 Examples

4. **How does the article define peripherals?**

   A peripheral device, also sometimes called an auxiliary device, is any connected device (internal or external) that provides a computer with additional functionality.

5. **How can peripherals be categorised?**

   Input devices: "send data to the computer."
   Output devices: "receive data from the computer."
   Input/output devices: "are also known as storage devices."

6. **Be prepared to provide a short definition/description of the 10 peripherals mentioned in the article**

(voir vocab.)

5. What is an Input Device ? 10 Examples

7. **How does the article define input devices?**

   An input device is essentially a piece of hardware that sends data to a computer.

8. **What is the key distinction between input devices and output devices?**

   The key distinction... is that the former sends data to the computer, whereas the latter [output] receives data from the computer.

9. **What are peripheral or auxiliary devices?**

   Input and output devices that provide computers with additional functionality.

10. **Be prepared to provide a short definition/description of the function of the 10 input devices mentioned in the article**

    Keyboard: The most common input device; users press keys to "feed data and instructions to the computer."

    Mouse: Interacts via "point and click" where moving the device moves a pointer on the screen in a corresponding direction.

    Touchpad: A "specialized surface" that detects finger movement to direct a pointer; a common substitute for a mouse on laptops.

    Scanner: Uses "optical technology to transfer images (or sometimes text) into a computer," converting them into digital images.

    Digital Camera: Captures photos and videos independently, which can later be "transferred to a computer."

Microphone: Captures audio and sends it to a computer to be "converted to a digital format" for recording or streaming.

Joystick: A handle that "pivots on a base and sends its angle or direction to the computer," commonly used for gaming.

Graphic Tablet: Also known as digitizers, these allow a user to draw with a stylus on a surface to convert "hand-drawn artwork into digital images."

Touch Screen: A "touch-sensitive monitor screen that reacts to fingers moving across it" to select options or drag objects.

Webcam: A camera that cannot operate independently (no inbuilt memory); used to "live-stream videos or facilitate video chats."

6. What is an Output Device ? 10 Examples

11. How does the article define output devices?

An output device is a piece of computer hardware that receives data from a computer and then translates that data into another form.

12. What is the key distinction between input devices and output devices?

The key distinction... is that an input device **sends** data to the computer, whereas an output device **receives** data from the computer.

13. What are peripheral or auxiliary devices?

They are devices that provide additional functionality; the text states that "Both output and input devices are examples of auxiliary, or peripheral, devices.

14. How many categories of output devices are there and what are they?

There are four different categories of output device: **visual**, **data**, **print**, **sound.**

15. How is an expansion card defined?

It is defined as a card that "can be added to the motherboard". The text also notes that it is a component that "slots into the motherboard"

16. **Be prepared to provide a short definition/description of the function of the 10 output devices mentioned in the article**

Monitor: "Displays data from a computer onto a screen so the user can interact with the data via a digital interface."

Printer: Its function is "to create a copy of whatever is sent from the computer... [and] generate a hard copy."

Headphones: They "output audio from a computer through two individual headphones for a single listener."

Computer Speakers: Hardware devices that "transform the signal from the computer's sound card into audio" using internal amplifiers.

Projector: An output device that "'projects' computer images or video onto a wall or screen."

GPS: A "radio-based navigation system" composed of a sender and receiver that uses satellites to determine location.

Sound Card: An expansion card that "controls the output of sound signals, enabling devices like speakers and headphones to work."

Video Card: An expansion card that "processes images and video, enabling visuals to be seen on a display."

Braille Reader: A peripheral that "enables a blind person to read text displayed on a computer monitor" by translating it into a braille format (raised bumps).

Speech-Generating Device (SGD): Devices that "generate text-to-speech"; when a user types a command, the SGD "reads the sentence out loud."

7. Ten Examples of Storage Devices for Digital Data

17. **How does the article define/describe digital data storage?**

The article defines it as "the recording of digital information in a storage medium, usually by electronic means."

18. **The article describes some of the uses of digital data storage. What are they?**

- Computers rely on them "to function."

- It is used to "back up important information" (making independent copies).

- It is used to "transfer information from one computer to another" (portability)

19. <u>How many categories of digital storage devices are there and what are they?</u>

1. Magnetic storage devices
2. Optical storage devices
3. Flash memory devices
4. Online/cloud storage
5. Paper storage

20. <u>Be prepared to provide a short definition/description of the 10 digital data storage devices mentioned in the article</u>

1. **Hard Disk Drives (HDD):** Uses magnetic storage on spinning disks to store operating systems, software, and user files; found in most computers.

2. **Floppy Disks:** An older magnetic storage medium using a diskette (8-inch, 5.25-inch, or 3.5-inch) common until the early 21st century.

3. **Tapes:** Magnetic tape wrapped around wheels; low cost and high capacity, but slow and unreliable, so largely abandoned.

4. **Compact Discs (CDs):** Optical storage using lasers to read/write data; types include CD-ROM, CD-R, and CD-RW.

5. **DVD and Blu-ray Discs:** Optical disc formats that supersede CDs due to much greater storage capacity (up to 50GB for Blu-ray).

6. **USB Flash Drives:** Portable devices with flash memory and an integrated USB interface; they are durable with no moving parts.

7. **Secure Digital Cards (SD Cards):** Rectangular flash memory cards used in cameras and phones, designed with a "chipped off" corner to prevent incorrect insertion.

8. **Solid-State Drives (SSDs):** Storage using flash memory instead of spinning disks; they are faster, noiseless, and more reliable than HDDs but more expensive.

9. **Cloud Storage:** A solution involving "accessing services over a network via a collection of remote servers."

10. **Punch Cards:** Paper cards with perforated holes used to store data for early computers; they have now disappeared.

21. <u>The article describes six common causes of digital data loss. Name them and describe them.</u>

1. Accidental deletions: Deleting files by mistake or reformatting a device, resulting in lost information.

2. **Power failures:** Sudden loss of electricity or power surges that disrupt functions and destroy data.

3. **Spills, drops, and other physical accidents:** Physical damage (like knocking over coffee) that corrupts data or prevents access.

4. **Viruses and other forms of malware:** Malicious software from the internet that corrupts data directly or damages the operating system.

5. **Theft:** Losing the entire device and its information due to burglary, pickpocketing, or mugging.

6. **Fires, floods, explosions, and other catastrophic events:** Major events that destroy the physical location and the data stored there.

8. Different Types of Software with Examples A Complete Guide

22. <u>How does the article describe software?</u>

Consists of instructions that direct a computer's operations." It acts as the "brain of your device," is "invisible yet powerful," and "enables computers to perform specific tasks.

23. The article distinguishes different types of software. What are they?

- System Software
- Application Software
- Programming Software
- DevOps and Automation Software
- Embedded Software

24. How does the article describe the first type of software?

System Software is described as software that "oversees the core components of a computer system" and "allows hardware and other software to work in harmony."

25. The article names some common instances of that first type of software. What are they and how are they described?

- **Operating Systems (OS):** Described as the "computer's most crucial software" that "manages all hardware components."

- **Device Drivers:** Described as "compact programs that help hardware interact with the operating system."

- **Utility Software:** Described as software that "keeps your computer in good shape" impacting tasks like virus scanning and backup management.

26. How does the article describe the second type of software?

Application Software is "designed to perform specific jobs like writing, painting, studying, or gaming" with "End users" as its main focus.

27. The article names some common instances of that second type of software. What are they and how are they described?

Productivity Software: Tools "made to speed up work" used to make and handle content (e.g., word processors).

Multimedia Software: Tools that "deal with audio, video, graphics, and animations."

Web Browsers: Described as "digital doors" that "allow users to reach websites and online platforms."

Communication Software: Apps that "keep teams connected" via messaging and video calling.

28. **How does the article describe the third type of software?**

Programming Software is described as software that "allows coders to write and test programs" and is "used to create other software."

29. **The article names some common instances of that third type of software. What are they and how are they described?**

- **Code Editors:** described as "basic text environments used to write source code."
- **Compilers and Interpreters:** tools that "change human-written code into a language machine can understand."
- **Debuggers:** tools that "help find and fix bugs in code" by following errors and looking at logs.

30. **How does the article describe the fourth type of software?**

DevOps and Automation Software is software that "brings development and operations teams together," makes processes automatic, and "cuts down on deployment mess."

31. **The article names some common instances of that fourth type of software. What are they and how are they described?**

Configuration Management Tools: Tools that "have an influence on infrastructure management and control."
CI/CD Tools: Tools that "make build, test, and deployment cycles automatic."

Containerization and Orchestration Tools: Tools that "operate applications in containers and coordinate how they grow."

Monitoring and Alerting Tools: Software that "keeps an eye on system health and performance."

32. How does the article describe the fifth type of software?

Embedded Software is described as software that "runs in machines we don't think of as computers" (like IoT gadgets), "comes pre-loaded," and "does things in real-time."

33. The article names some common instances of that fifth type of software. What are they and how are they described?

- **Firmware:** A "special kind of embedded code stored in hardware chips" that helps a device start up.
- **Real-Time Operating Systems (RTOS):** Software that "manages time-critical tasks" giving "minimal delay and top accuracy."

34. At the end of the article, software is categorized in another way. What is this categorization based on and what (sub)types are distinguished?

This categorization looks at "who owns and can access software." The types distinguished are :

- **Open-Source Software:** Tools that are "free for anyone to use, change, and help improve."
- **Proprietary Software:** Tools owned by companies where "You need to buy a license to use them."