

Introduction to computers and programming

Mid Suggestions with answers

1. What are the processes of Information Processing Cycle? Describe it.

2. Describe about CMOS battery

3. What is File Systems?

4. Describe about Fusion Drive?

5. Describe about the History of Computer.

1. The information processing cycle is a sequence of events that occur when data is processed by a computer. The cycle includes four main stages: input, processing, output, and storage. The input stage involves collecting data from various sources and inputting it into the computer system. In the processing stage, the data is manipulated and processed by the computer's CPU, memory, and other components. The output stage involves presenting the results of the processing to the user in a useful form, such as on a screen or through a printer. Finally, the storage stage involves saving the processed data for later use, either on the computer's hard drive or in external storage devices such as USB drives or cloud storage.
2. A CMOS battery is a small, button-shaped battery that is used to power the CMOS (Complementary Metal-Oxide-Semiconductor) memory in a computer. The CMOS memory is used to store the system configuration information, including the date and time, BIOS settings, and other system information. The CMOS battery provides power to this memory even when the computer is turned off, ensuring that the configuration information is retained. CMOS batteries typically have a lifespan of 3-5 years and need to be replaced periodically to avoid system errors.
3. A file system is a method used by computer operating systems to organize and store files and directories on a storage device such as a hard drive, SSD, or flash drive. It provides a hierarchical structure for organizing data, allowing users to create, move, copy, and delete files and folders. File systems also provide security mechanisms such as file permissions to control access to data, and they often use file metadata to store additional information about the files such as the creation date, file type, and file size. Common file systems used in modern operating systems include NTFS, FAT32, HFS+, and APFS.
4. Fusion Drive is a technology developed by Apple that combines a traditional hard drive (HDD) and a solid-state drive (SSD) into a single logical volume. The technology is designed to take advantage of the strengths of both types of storage devices, with the SSD providing faster read and write speeds and the HDD providing larger storage capacity. The Fusion Drive technology uses an algorithm to intelligently manage the data stored on the two drives, moving frequently accessed data to the SSD for faster access and less frequently accessed data to the HDD for storage. The result is a storage solution that offers the best of both worlds: fast performance and large capacity.
5. The history of computers dates back to the early 1800s, with the development of the first programmable mechanical computer by Charles Babbage. However, it was not until the mid-20th century that computers became more widely used, with the invention of the first electronic computers such as ENIAC and UNIVAC. Throughout the rest of the century, computers continued to become more powerful and more accessible, with the introduction of personal computers, graphical user interfaces, and the Internet. In recent years, advancements in artificial intelligence, cloud computing, and mobile technology have continued to push the boundaries of what computers can do, paving the way for new applications in fields such as healthcare, finance, and entertainment.

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Mid Suggestions with answers

1. Write about the difference between HDD and SSD.
2. Write about the difference between RAM and ROM.
3. Describe about all the properties of CPU,

1. Difference between HDD and SSD: Both HDD (Hard Disk Drive) and SSD (Solid State Drive) are used to store data on a computer, but there are some key differences between the two.
 - Speed: SSDs are generally faster than HDDs due to the lack of moving parts. An HDD uses spinning disks and a read/write head to access data, while an SSD uses flash memory to store data, resulting in faster access times and data transfer rates.
 - Durability: SSDs are more durable than HDDs. Since there are no moving parts in an SSD, it is less likely to fail due to physical damage. HDDs, on the other hand, can be more susceptible to damage from drops or impacts.
 - Capacity: HDDs generally have a larger capacity than SSDs, especially at lower price points. This is because HDDs have been around longer and are more mature technology.
 - Cost: SSDs are generally more expensive than HDDs, especially at higher capacities. However, the gap in price has been decreasing as SSDs become more popular and production costs decrease.
2. Difference between RAM and ROM: RAM (Random Access Memory) and ROM (Read-Only Memory) are both types of computer memory, but they serve different purposes.
 - Function: RAM is used for temporary storage of data that the computer is currently using, while ROM is used to store permanent data that cannot be changed, such as the computer's firmware.
 - Read/Write Access: RAM is volatile, meaning that its contents are lost when the power is turned off. It is also read-write, meaning that the computer can read from and write to it. ROM, on the other hand, is non-volatile, meaning that its contents are retained even when the power is turned off. It is also read-only, meaning that the computer can only read from it.
 - Capacity: RAM typically has a much larger capacity than ROM, since it is used to store temporary data. ROM is generally limited in capacity to the permanent data that needs to be stored.
 - Usage: RAM is used for running programs and applications, while ROM is used for storing firmware, BIOS, and other critical system data.
3. Properties of CPU: The CPU (Central Processing Unit) is the "brain" of the computer, responsible for executing instructions and processing data. Here are some of the key properties of a CPU:
 - Clock Speed: The clock speed of a CPU refers to how many cycles per second it can execute. This is typically measured in GHz (gigahertz) and determines how fast the CPU can process instructions.
 - Cores: CPUs can have multiple cores, which allow them to process multiple tasks simultaneously. More cores generally mean better performance for tasks that can be parallelized, such as video editing or rendering.
 - Cache: CPUs have a small amount of high-speed memory called cache, which is used to store frequently accessed data. This allows the CPU to access data more quickly than if it had to access it from RAM.
 - Architecture: The architecture of a CPU refers to how it is designed and how it processes instructions. Different CPU architectures have different strengths and weaknesses, and some are better suited for certain types of tasks than others.
 - Thermal Design Power (TDP): TDP is a measure of how much power a CPU consumes and how much heat it generates. This is important for determining what kind of cooling solution is necessary to keep the CPU operating at a safe temperature.

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1. Draw and Describe about the Software Layers.

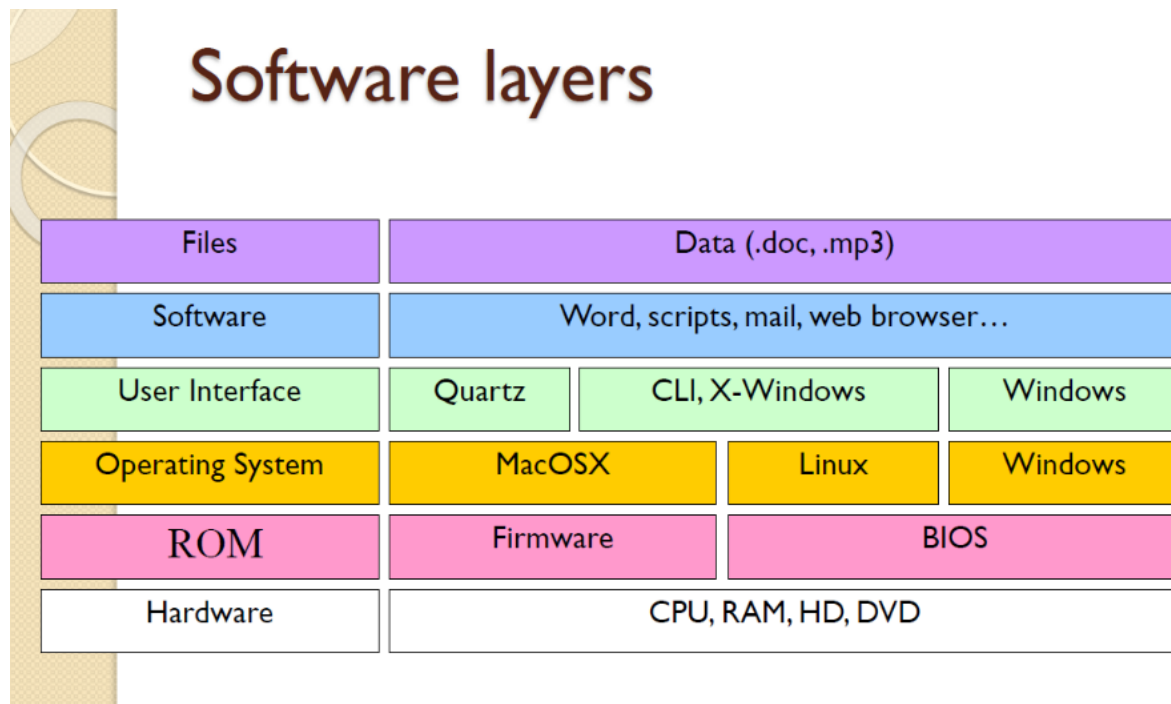
2. Write a program in C to show "Hello I'm (Your Name), your College name and CGPA."

1. Software Layers:

Software layers are the levels of software abstraction that provide specific functions and services to the users. These layers can be depicted in the form of a hierarchical diagram with each layer building on top of the other. The four basic layers are:

- i. Application layer: This is the layer that interacts directly with the user. The application layer provides the user interface and handles user input and output. Examples of application software include word processors, web browsers, and video players.
- ii. Operating system layer: This layer manages the hardware and software resources of the computer system. The operating system layer is responsible for tasks such as memory management, file system management, and process management.
- iii. System software layer: This layer provides system-level services to the operating system layer. These services include network communication, device drivers, and system utilities.
- iv. Hardware layer: This is the lowest layer of the software hierarchy. It consists of the physical hardware components of the computer system, including the CPU, memory, hard drive, and other input/output devices.

The following diagram illustrates the layers of software:



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2. C program to show "Hello I'm (Your Name), your College name and CGPA:

```
3. #include <stdio.h>
4.
5. int main() {
6.     char name[] = "Ahsan Habib";
7.     char college[] = "Govt. Syed Hatem Ali College";
8.     float cgpa = 3.5;
9.
10.    printf("Hello I'm %s, studying at %s with a CGPA of %.2f.\n", name, college, cgpa);
11.
12.    return 0;
13. }
```