

CSE321
ANSWER TO QUIZ 1 QUESTIONS

1. A user is using a word processing software to write a document and simultaneously playing music in the background. How do programs and processes interact in this scenario?

Answer: The word processing software and the music player are separate programs. Each program is executed as a separate process, allowing the user to perform multiple tasks concurrently.

2. A user opens a word processing application on their computer. What state does the process enter after it is launched?

Answer: The "Ready" state.

3. A data analysis program is crunching large datasets, performing intensive computations. Is this program likely to be CPU-bound or I/O-bound?

Answer: CPU-bound. Since the program is primarily performing computations on data, it will spend most of its time utilizing the CPU rather than waiting for input/output operations.

4. A developer is debugging a software application while it is running. Explain how the concepts of program and process relate to this debugging process.

Answer: The software application being debugged is the program, while the debugging session itself is a process. The debugger tool runs as a separate process alongside the program, allowing the developer to analyze its behavior and identify issues.

5. A web server receives a request for a webpage and begins processing it. What state does the process enter during the processing of this request?

Answer: The "Running" state.

6. A file transfer application is copying large files from one disk to another. Would you classify this process as CPU-bound or I/O-bound?

Answer: I/O-bound. The process spends a significant amount of time waiting for data to be read from and written to disk, making it dependent on input/output operations rather than CPU computations.

7. A user is switching between different windows of applications on their computer. How does the operating system handle context switching in this scenario?

Answer: When the user switches between application windows, the operating system performs context switching to ensure that the CPU resources are allocated to the currently active application. The OS saves the state of the previously active application, including its CPU registers and memory mappings, and restores the state of the newly activated application, allowing seamless transitions between applications.

8. Two processes running on the same machine need to share a large dataset efficiently. How can IPC facilitate this data sharing?

Answer: Shared memory can be employed for efficient data sharing between the processes. The operating system allocates a region of memory that both processes can access, allowing them to read from and write to the shared dataset without needing to copy data between them. This reduces overhead and improves performance compared to other IPC mechanisms like message passing.

9. A chat application allows multiple users to communicate in real-time. Describe how inter-process communication (IPC) is utilized in this scenario.

Answer: IPC mechanisms like sockets or message queues are used. Each instance of the chat application running on different users' computers communicates with a central server using sockets. The server relays messages between users via message queues, allowing real-time communication among multiple processes.