Haley Candia Perez

December 7, 2024

Module Six Assignment

CS-230

Memory management is critical to ensuring that Draw It or Lose It functions effectively, providing a seamless experience for users across various platforms. This requires optimizing the system's ability to handle transferring and rendering files quickly, especially when dealing with 200 high-definition images, each approximately 8 MB in size. To ensure effective memory management, there are various approaches that can be used. Dynamic image loading allows the program to use lazy loading to load images only when required during gameplay. This prevents preloading all 200 images into memory, reducing the application's runtime memory footprint. Another approach is compression and resizing, where the program can compress images and dynamically resize them to fit the display requirements of different devices. This approach decreases the memory consumption without compromising the user experience. Utilizing efficient rendering would implement hardware-accelerated rendering to improve frame rates and reduce CPU load when displaying images. Finally, garbage collection can ensure efficient garbage collection to free up memory from unused objects promptly, minimizing the risk of memory leaks. By managing memory effectively, the application will maintain high performance, allowing drawings to render at a steady rate and ensuring smooth gameplay transitions.

Storage management involves determining how the game's assets, such as high-definition images and configuration files, are stored and accessed. Given the large library of images, efficient storage planning is paramount. There are various considerations for storage management that may be used. Utilizing centralized asset repository allows the program to store images on a cloud server or content delivery network rather than locally on the user's device. This reduces the application's size and ensures fast access to assets from any platform. Another approach would be local caching, where the program will cache frequently used images locally on the device to minimize repeated downloads and reduce latency during gameplay. Platform-specific storage is another option that will use platform-specific APIs to manage user data, such as scores or settings, in an efficient and secure manner. Finally, scalable storage solutions help plan for scalability by using cloud storage services to handle potential growth in asset libraries and user base. Storage solutions must balance local caching for performance with cloud storage for scalability and convenience.

Memory and storage management serve distinct but complementary roles in the application. Memory refers to the system's RAM and involves temporary, fast-access resources used during gameplay. Effective memory management ensures images are rendered in real-time, and gameplay remains smooth. For example, loading an image into memory during a round requires speed, as delays could disrupt the user experience. Storage refers to permanent storage, either on the device or in the cloud. Storage management ensures that all game assets, such as image libraries, are organized and accessible. While storage affects the application's size and scalability, memory affects its runtime performance. By balancing memory and storage

management, Draw It or Lose It can achieve both scalability and high performance, ensuring a

positive experience for users across all platforms.

Sources:

- Varshachoudhary. (2023, September 6). Memory management in operating system.

  GeeksforGeeks. https://www.geeksforgeeks.org/memory-management-in-operating-system/

- Sheldon, R. (2022, June 6). What is memory management in a computer environment?.

  WhatIs. https://www.techtarget.com/whatis/definition/memory-management

- Storage management basics and 4 ways to maximize your storage. Cloudian. (2024, August 8).

  https://cloudian.com/guides/data-backup/storage-management-basics-and-4-ways-to-

  maximize-your-storage/

- Memory vs storage: Key differences explained: HP® Tech takes. Memory vs Storage: Key

  Differences Explained | HP® Tech Takes. (n.d.). https://www.hp.com/us-en/shop/tech-takes/

  computer-memory-vs-storage